

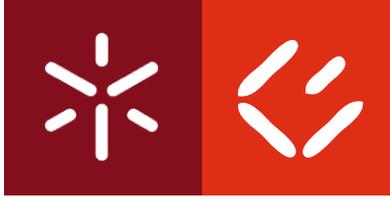


University of Minho
School of Economics and Management

Samer Hamati

**Economic Growth in Post-Civil
Conflict Countries**

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**Economic Growth in Post-Civil
Conflict Countries**

Doctoral thesis
Ph. D. in Economics

Work conducted under the guidance of
Professor Doctor Francisco José Alves Coelho Veiga
and
Professor Doctor Miguel Angelo Portela

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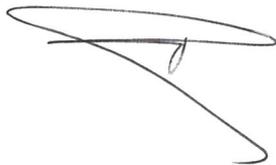
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*“Os vossos filhos não são vossos filhos.
São os filhos e as filhas da Vida que anseia por si mesma.
Eles vêm através de vós, mas não de vós.
E embora estejam convosco não vos pertencem.*

Podéis dar-lhes o vosso amor, mas não os vossos pensamentos, pois eles têm os seus próprios pensamentos.

Podéis abrigar os seus corpos, mas não as suas almas, pois as suas almas vivem na casa do amanhã, que vós não podereis visitar, nem em sonhos.

Podereis tentar ser como eles, mas não tenteis torná-los como vós, pois a vida não anda para trás nem se detém no ontem.

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O arqueiro vê o sinal no caminho do infinito e Ele com o Seu poder, faz com que as Suas flechas partam rápidas e cheguem longe.

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O Profeta, Khalil Gibran

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Economic Growth in Post- Civil Conflict Countries

Abstract

Economic growth is a very challenging field due to its essential role in improving people's lives, and to the complexity of its causes, results, and the environment wherein it is achieved. This complexity is especially high in developing countries as many have suffered from different sorts of crises, including civil conflicts which makes the data needed to assess economic growth difficult to access. There exists, then, a substantial gap in the literature, especially in the post-conflict studies. This is due, not only to the lack of available data, but also to the vagueness of term; *post-conflict period*. The current thesis, therefore, ventures into this underexplored field and studies different aspects of post-conflict economic growth. This thesis investigates different geographical scopes, funneling from a quasi-world dataset, in the Second Chapter, to a case study of Syria in the Fourth Chapter. It also studies the post-conflict economic growth from a regional perspective by looking at the cases of the Middle East and North Africa.

The thesis covers different topics that influence economic growth, using a variety of techniques. The First Essay explores the effects of decentralization on economic growth in countries emerging from civil conflicts. To do so, we explore the effects of two types of decentralization; political and fiscal. Thus, we run two main sets of regressions: cross-sectional for political decentralization, and panel-data regressions for fiscal decentralization. In addition to the OLS and fixed effects estimation strategies that are used in the main text of the essay, we implement several robustness checks, including graphical depictions. We find no significant effect of political decentralization, implying either that no real political decentralization exists, or that political decentralization in post-conflict countries is ineffective. We find, on the other hand, that fiscal decentralization slows down the rate of economic growth, a finding that is consistent with other scholars who have warned about the dangers of decentralization.

The Second Essay narrows the geographical scope of the dataset, focusing on the MENA region. Additionally, it investigates a different field tracing the effect of a monetary variable, exchange rate volatility, on economic growth. This topic has not been addressed before in the MENA region, since countries there depend more on fiscal policy tools rather than monetary ones. We first calculate the exchange rate volatilities for 23 currencies and then insert them in a function of annual economic growth

between 1970 and 2014. To account for endogeneity and country-specific unobserved characteristics, we follow different estimation strategies including System-GMM, fixed effects, the bias-corrected least squares dummy variable model, and the iterative bootstrap-based bias correction for the fixed effects estimator. The results show that exchange rate volatility is a key cause of recession in the MENA region, especially in labour-abundant countries, in different phases of peace and conflict cycles.

The Third Essay moves to different levels of concepts and techniques used. It utilizes the concept *inclusive economic growth*, and focuses on a case study of Syria, the site where one of the bloodiest civil conflicts of recent years is taking place. We use microsimulation techniques to nowcast the poverty figures and profile within the country, based on a sample of households covered in an income and expenditure survey in Syria conducted in 2009. The essay shows, not only the overall effect of the current civil conflict, but also the distributional effects on poverty. Moreover, we present the poverty profile differences before and during the conflict. The findings show that overall poverty rate jumped from 12.3% in 2009 to 87.5% in 2015, with this rate soared to 94% in Deir Azzor. The Fourth Chapter also sketches some of the demographical and economic characteristics of the poor families who lived in Syria in 2015.

In addition to the contribution the last essay seeks to make in terms of Syria's rebuilding strategy, it also adds to methodological knowledge surrounding the nowcasting of poverty rates within countries suffering civil conflict. Existing research uses this technique to nowcast poverty in some developing countries; however, to the best of our knowledge, no one has yet utilized this approach to estimate poverty rates in cases such as these.

Crescimento Económico nos Países Pós-Conflito Civil

Resumo

O crescimento económico é um tema desafiador, quer pelo seu papel essencial na melhoria de vida das pessoas como, também, pela complexidade das suas causas, resultados e ambiente em que é atingido. Esta complexidade é especialmente elevada nos países em desenvolvimento, dado que muitos sofreram com diferentes tipos de crises, incluindo conflitos civis, tornando difícil o acesso a dados que são necessários para avaliar o crescimento económico. Existe, portanto, uma lacuna substancial na literatura existente, em especial nos estudos de países pós-conflitos. Esta lacuna na literatura deve-se, não apenas à falta de dados disponíveis, mas também à imprecisão do conceito *período pós-conflito*. A presente Tese aventura-se neste campo pouco explorado e estuda diferentes aspetos do crescimento económico pós-conflito. Assim, esta Tese tem como objetivo investigar diferentes dimensões geográficas, partindo de uma base de dados quase-mundial, no Capítulo 2, para um estudo de caso da Síria, no Capítulo 4. Adicionalmente, no Capítulo 3 é também estudado o crescimento económico sob uma perspetiva regional, olhando para os casos do Médio Oriente e do Norte de África.

O Primeiro Ensaio explora os efeitos da descentralização no crescimento económico em países emergentes de conflitos civis. Para isso, foram analisados dois tipos de descentralização, a política e a fiscal. Com a utilização de um conjunto de duas regressões (uma transversal para a descentralização política e dados em painel para a descentralização fiscal), uma estimação OLS com efeitos fixos e, ainda, os testes de robustez necessários, não foram encontrados efeitos significativos da descentralização política, implicando que não existe uma descentralização política real ou que a descentralização política em países pós-conflitos é ineficaz. Por outro lado, a descentralização fiscal reduz a taxa de crescimento económico, um resultado que é consistente com parte da literatura existente.

O Segundo Ensaio restringe o conjunto de dados concentrando-se apenas na região do Médio Oriente e Norte de África (MENA). Adicionalmente, neste Ensaio é traçado o efeito de uma variável monetária, a volatilidade da taxa de câmbio, sobre o crescimento económico. Este tópico não foi abordado antes na região MENA, dado que os esses países dependem mais de instrumentos de política fiscal do que

monetários. Para o estudo foi calculado a volatilidade da taxa de câmbio para 23 moedas, a qual foi inserida na função de crescimento económico entre 1970 e 2014. Para considerar a endogeneidade e as características específicas não observadas de cada país, foram utilizadas diferentes estratégias de estimação, incluindo o Modelo GMM com efeitos fixos, o Modelo OLS de variável fictícia corrigida, e a correção de tendência do *bootstrap* iterativo para o estimador de efeitos fixos. Os resultados mostram que a volatilidade da taxa de câmbio é uma das principais causas de recessão na região MENA, especialmente em países abundantes em trabalho, em diferentes fases dos ciclos de paz e conflito.

O Terceiro Ensaio incide sobre o conceito de *crescimento económico inclusivo*, focando-se no caso de estudo da Síria, país onde um dos mais sangrantes conflitos civis dos últimos anos está a ocorrer. Para o estudo, neste Ensaio foram utilizadas técnicas de microsimulação para gerar números da pobreza e o perfil dentro do país, tendo por base uma amostra de um inquérito realizado às famílias Sírias em 2009. É também analisado, não apenas o efeito geral do conflito civil atual, mas também os efeitos distributivos sobre a pobreza, sendo apresentadas diferenças no perfil de pobreza antes e depois do conflito. Os resultados mostram que a taxa geral de pobreza passou de 12,3%, em 2009, para 87,5%, em 2015, mas subindo para 94% em Deir Azzor (cidade Síria).

O Quarto Ensaio também esboça algumas das características demográficas e económicas das famílias pobres que viviam na Síria em 2015. Além do contributo que o que o último ensaio procura fazer em termos da estratégia de reconstrução da Síria, também contribui para o conhecimento metodológico em torno da previsão das taxas de pobreza dentro dos países que sofrem conflitos civis. A pesquisa existente usa esta técnica para transmitir a pobreza em alguns países em desenvolvimento. No entanto, até onde se sabe, ainda não foi utilizada esta abordagem para estimar as taxas de pobreza em casos como estes.

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Abbreviations

ADF	Augmented Dickey Fuller
ARCH	Autoregressive Conditional Heteroscedastic
BCFE	The Iterative Bootstrap-based Bias Correction for The Fixed Effects Estimator
BCLSDV	The Biased Corrected Least Square Dummy Variables
BLUE	Best Linear Unbiased Estimator
CBS	Central Bureau of Statistics
CoW	Correlates of War
CPI	Consumer Price Index
ERV	Exchange Rate Volatility
ESCWA	United Nations Economic and Social Commission for Western Asia
FDI	Foreign Direct Investment
FPL	Food Poverty Line
GARCH	Generalized Autoregressive Conditional Heteroscedastic
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HIES	Household Income and Expenditure Survey
IDP	Internally Displaced People
IMF	The International Monetary Fund
IFAD	International Fund of Agricultural Development
IFRC	International Committee for Red Cross and Red Crescent
IOM	International Organization of Migration
LDCs	The Least Developed Countries
LPL	Lower Poverty Line
MDGs	Millennium Development Goals
MENA	Middle East and North Africa
MEPV	Major Episodes of Political Violence and Conflict Regions
ODA	Official Developmental Goals
OECD	Organization of Economic Cooperation and Development
OLS	Ordinary Least Squares
PC	Post-Conflict
PCCs	Post-Conflict Countries
PRIO	Peace Research Institute Oslo
RER	Real Exchange Rate
SAM	Social Accounting Matrix
SAR	Syrian Arab Republic
SCPR	Syrian Center for Policy Research
SE	Standard Errors

SD	Standard Deviation
SP	Syrian Pound
UAE	United Arab Emirates
UCDP	Uppsala Conflict Data Program
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner of Refugees
UNICEF	United Nations Children's Fund
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UPL	Upper Poverty Line
VIF	Vertical Fiscal Imbalances
WB	The World Bank
WFP	World Food Programme
2SLS	Two-Stage Least Squares

Chapter I

1 Introduction

Economic growth is essential for improving people's well-being and is, therefore, a primary concern of economic policy. On the one hand, it is the main goal of this policy, and on the other hand, it is the frame wherein different policies move. Moreover, Economic growth is a challenging issue, and theoretical models and empirical research have reached inconclusive results, so it is unclear what exactly induces either growth or the huge gap between the poorest and richest countries. Thus, a researcher can find a large strand of economic growth literature investigating either the proximate causes of growth shown in the production function, or the fundamental causes, i.e., the potential reasons for why the proximate causes vary (Acemoglu and Robinson, 2000; Lucas, 1988; Sala-i-Martin, 1997; Mankiw et al., 1992; Romer, 1986; Barro, 1991; Caselli et al., 1996). Most of these studies present suggestive, yet indecisive, conclusions, bearing in mind the technical shortages distorting those conclusions.

Theoretical models were the cornerstone of the economic growth literature since the early years preceding the Great Depression. Although his short life did not allow him to become famous then, Ramsey was the pioneer who developed the Neoclassical Theory of economic growth in 1928 (Ramsey, 1928). Together with Solow (1956), Cass (1965), Swan (1956), and Koopmans (1965), he supported the exogenous perspective, which holds that economic growth can be ascribed to out-of-control factors. They predict that the existing technology and the exogenous rates of saving, population growth, and technological progress are the factors that determine the steady-state level of income.

Many scholars, especially in view of the growth miracles of some economies, regarded this exogenous perspective as irrational. Although economic growth might be partially sourced to luck, one cannot acknowledge that chance alone led some countries to be much richer than others (Becker et al., 1990). The endogenous growth theory emerged in the 1980s, arguing that technological progress is endogenous

and that human capital is equally important to physical capital. This trend started with Romer (1986) and Lucas (1988), and is supported by Rebelo (1991), Mankiw et al. (1992), and Ortigueira and Santos (1997), and attributes economic growth to human capital, which has both direct and spillover effects on the economy.

Starting from the 1990s, economic growth studies switched toward an empirical emphasis, and journals started publishing more research that is empirical. Hence, studies such as Barro (1991) and Islam (1995) tried to find empirical evidence of the determinants of economic growth. Engerman and Sokoloff (1997), Hall and Jones (1997), Acemoglu et al. (2001), and Easterly and Levine (2003) further investigate institutional factors. Tavares and Wacziarg (2001), Murin and Wacziarg (2014), and Giuliano et al. (2012) focused on the effects of political regimes. Others, including Galor and Weil (2000), and Urdal (2004), follow demographic effects on economic growth. Gallup et al. (1998) and Sachs and Warner (1997) identify the effects of geographical factors: temperature and climatic conditions. Later, and due to progress in technical methods and big data processing, the empirical literature of economic growth exploded. This huge literature, theoretical and empirical, assures the complexity of economic growth, and it is consistent with what Lucas argued, “once one starts to think about [economic growth], it is hard to think about anything else” (1988, 5).

Making things more difficult, we should not isolate economic growth from the environment where it takes place. This environment affects both the saddle path and the steady state of economic growth, and it is not always under normal conditions or near the mean, but it is affected by abnormal situations, or sometimes, crises. Crises are becoming more frequent, and more countries are coexisting with shocks as normal events. Internal conflict, the theme of the current thesis, is one of those widely growing crises.

This thesis investigates economic growth in post-conflict countries. It inspects three different topics in three different geographic scopes. We start by examining economic growth in a semi-world sample of post-conflict countries. Then we focus on the Middle East and North Africa since it is one of the tensest zones in the world. Finally, we explore the Syrian case. Additionally, the thesis explores various topics that influence economic growth. These include institutional arrangements, monetary policy, and poverty.

This thesis, furthermore, avoids adopting a unique definition of economic growth, but rather uses different concepts of economic growth. In doing so, it moves from its standard definition used in the following two chapters to the new concept of the inclusive growth, adopted by the *Sustainable Development Goals*, in

the Fourth Chapter. In addition, the thesis follows diverse techniques including standard econometric regressions, dynamic panel data models, and a bootstrap method. Added to that, Chapter IV uses microsimulation techniques to nowcast poverty rates and profiles, which are essential for setting an inclusive growth strategy.

1.1 Civil Conflicts

1.1.1 Overview

“All societies have conflict; it is inherent to politics”, Collier writes in his book, *The Bottom Billion* (Collier, 2007, 17), discussing one of the four traps the poorest countries may fall into. However, conflicts are different across the world. While most developed countries face types of political conflict, more than half of the developing countries have faced, or are facing at least one civil conflict. Thus, we agree with Blattman and Miguel who argue that “an episode of civil conflict, rather than its absence, is the norm in most countries” (2010, 8), so that war is probably the nation’s most important historical event.¹

In the Twentieth Century, the number of civil conflicts peaked by the end of the 1980s, and the international community thought that civil wars would become less frequent. This was the trend during the 1990s, when the *Cold War* ended. However, civil wars have since returned to their former dominance, and scholars are focusing again on conflict and, recently, post-conflict studies.

Another reason motivating us to investigate this topic is the catastrophic consequences of the civil conflict in human, physical, and social terms. Buildings and factories are destroyed, capital vanishes, local savings are devaluated, labourers get less education due to educational leakage, social ties become more fragile, and, above all, people are killed. In brief, civil conflict is development in reverse (Collier, 2007), and conflict is a major determinant of polarization in economic performance. Rodrik (1999) suggests that outbreaks of social conflict are a primary reason why national economic growth rates lack persistence, and why so many countries have experienced a growth collapse since the mid-1970s.

¹ Moreover, Murdoch and Sandler (2004) find that conflict affects the surrounding countries, meaning that much more than half of the countries have been affected by a sort of conflict.

1.1.2 Consequences of Conflicts

Following the *Economics of The Supply Side*, using a production function to study economic growth, we examine how civil conflict may strongly affect different elements of this function. Physical and human capital, institutions, social capital, investment, and other factors influencing economic growth are changing in abnormal ways. Collier et al. (2003) point out that the destructive consequences of internal conflict may be so great as to be a factor in the growing income gap between the world's richest and poorest nations.

Conflict destroys physical capital, either totally, or partially. Factories, mines, lands, and public buildings and enterprises are lucrative and therefore tempt annexation or seizure especially by oppositionist groups, so violent clashes take place there leading to huge destruction. Household durables may be stolen or destroyed, while capital runs away. Not only monetary capital flees, but also capitalists, who become, with their families, prey for militias in order to get ransom. As discussed by Collier et al. (2004), countries at war are likely to see massive flight of mobile forms of capital, since foreign assets offer higher relative returns at lower risk.

Post-conflict periods, however, may offer a good opportunity for capital to maximize its returns. Many incentives motivate companies to invest in post-conflict countries. Flores and Nooruddin argue, "the post-conflict period likely offers potentially lucrative rebuilding opportunities" (2009, 6). Moloo and Khachaturian (2009) attribute these opportunities to two primary reasons: first, due to damage incurred during the conflict, demand for infrastructure projects increases, providing investment opportunities for foreign investors. Second, many states involved in civil war are rich with natural resources, which are attractive to investors. Furthermore, investors have reason to invest early in the post-conflict phase since there are negative consequences of delays. The early investment allows investors to avoid competition, and thus have proprietary access to profitable contracts. Furthermore, early investments are often less expensive. As the state emerges from conflict and begins to develop economically, there is likely to be a corresponding increase in the costs of doing businesses in the state, such as higher labour costs. Nevertheless, it is irrational to say that investors become optimistic when the conflict ends, since many investors are afraid of war recurrence, or even the permanent level of insecurity following the conflict (Collier, 1999; Imai and Weinstein, 2000; Gupta et al., 2004).

Conflict also hits savings, a key source of economic growth. People spend their savings during the conflict to pay for medical bills or buy necessities, which become expensive. This *dissaving* also occurs within the state itself. War might be financed by public debt, and servicing that debt requires high taxes and switching expenditures to less productive investments (Koubi, 2005).

On the other hand, remittances may partially offset this dissaving. Many people immigrate to other countries during the war in order to build their future in safe and prosperous communities, but they still send money to their families. Remittances become an essential source of income for households that remain within the conflict. However, these remittances may play diverse roles. The diaspora, according to Collier (2006), plays a key role in fuelling the conflict. Since they and their families are far away from clashes, those in the diaspora are more enthusiastic to support fighting than those who stay.² Their remittances provide weapons to the fighting groups. Thus, one should cautiously explain the diaspora effects and their remittances.

Labour is another victim of conflict. Young people leave their jobs and schools to become fighters and so may be killed or injured. Others immigrate seeking safety and a better life. Consequently, the dependence ratio is much higher at the end of the conflict. Nevertheless, one can argue that the capital-per-worker ratio may increase due to the huge number of people lost. This is a superficial analysis. Blattman (2010) argues that when life is lost, so is human capital. Moreover, the destruction of families affects social networks and social capital. Hence, the numerator of the capital-per-worker ratio may fall as fast as the denominator.

Human capital deteriorates hugely during conflicts. A big part of citizens become refugees in surrounding countries and seldom do they come back home. In addition, many students drop out of educational institutions, since these institutions become less accessible, or because some of the students join one of the armed factions. This interruption has long-lasting effects. Shemyakina (2011) shows for Tajikistan that adolescent girls whose homes were destroyed during the civil war are less likely to obtain a secondary education, again with adverse long-term effects on wages and life chances. Furthermore, in some cases, educated population groups may be specifically targeted by the conflict. De Walque (2006) shows that individuals with urban and educated backgrounds were more likely to have died during the Cambodian Genocide of 1975-1978. This forces a large part of the professional and highly educated labourers to

² In his example of an average state, Collier (2006) found that the chance of continuing conflict is 36 % if the country has an unusually large American diaspora and only 6% when it has a small diaspora.

immigrate to other countries.³ In addition, food scarcity, common during conflicts, has long-term effects on human capital. Using panel data on child nutrition, Alderman et al. (2006) find that young children who suffered from war-related malnutrition in Zimbabwe are significantly shorter as adults, which may affect their lifetime labour productivity.

Social capital, recently found to be key for economic growth, is strongly influenced by conflict. Fighting parties are polarized based on their sectarian or ethnic identities, so grievance peaks. Costalli et al. (2017) find that civil war destructs interethnic trust, and heterogeneous societies pay a high price. This price includes higher costs of controlling diverse communities and higher opportunity costs of shifting public spending to security instead of productive investments. In addition, Tirole (1992) argues that the incentive to maintain a good reputation is disrupted during civil war, leading to a persistent high-corruption equilibrium in the war-torn society.

Conflict reshapes the institutional structure in two different directions. Many scholars mention that war destroys institutions that were proven to have failed before the war. Olson (1982) argues that conflict removes an exploitative extractive government, destroys vested interests inhibiting innovation, and allows the mobilization of resources which allows faster growth. War may increase public participation, and the suffering it causes makes people more aware of the importance of peaceful coexistence (Bellows and Miguel, 2009; Blattman, 2009). Empirically speaking, Collier (2009) argues that there is strong evidence of rapid improvement in the quality of institutions and economic management in post-conflict periods as shown by changes in the CPIA index.⁴ However, in civil war, the government may lose legitimacy, while different factions and parties coexist in the same society, potentially exacerbating political and social divisions. These inconclusive results are due to the fact that the relation between civil war and institutions is not simple, direct, and one-sided.

Technology, the main engine of growth in exogenous economic growth theories, tends to see an upgrade when conflict ends. Olson (1982) argues that war changes the political structure and distributional coalitions, with entrenched coalitions work to slow the society's capacity to adopt new technologies,

³ Education tends to recover more slowly than physical capital due to a number of reasons. Blattman argue that,

"A labour force killed or maimed will need to wait a generation to fully recover its size and skill level. For those who saw schooling interrupted, skills may be reacquired, but the pace of education has obvious physical and logistical limits, and so is difficult to accelerate. Moreover, those deterred from school often do not return, meaning that the rate of recovery for a whole cohort may be zero. Finally, war may have destroyed school infrastructure, or teachers may not want to serve in poor and war-torn areas. Therefore, rates of return to school, and the speed of recovery, appear to be tied to the length of war, the scale of destruction in the school system, opportunities for (and cost of) remedial or vocational education, and post-war returns to schooling" (Blattman, 2010, 4).

⁴ *CPIA* is the Country Policy and Institutional Assessment Index set by the World Bank. It rates the countries against a set of 16 criteria grouped in four clusters: economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions.

satisfying their own interests at the expense of the public ones. Subsequently, their actions retard the process of economic growth. Easterly (2001) points out that stakes have played a key role in retarding the adoption of new technology. Koubi suggests that “the destruction of such vested interests during a war can create conditions that are favourable to the introduction of new and superior technologies, leading to a higher growth rate” (2005, 70).

1.2 Post-Conflict Research

The last twenty years show an explosion in the *Economics of Conflict*. Most of the literature investigates the causes of conflict. This is because more data are available before a conflict occurs. Poverty, inequality, inflation, public debt, institutional failure, and an abundance of natural resources have been shown to fuel civil conflicts. Later on, journals started publishing articles examining the consequences of conflicts. Nonetheless, post-conflict research is still scarce, and few studies look into economic growth in post-conflict countries. In a 43-pages comprehensive article about the economic literature of civil conflict, Blattman and Miguel (2010) review what has been written in post-conflict process in only six pages. They attribute this empirical scarcity to the absence of the growth theoretic approaches required to study the consequences of conflict.

However, more authors have recently started exploring post-conflict evidence. Three facts support this new trend; two are related to the end of the Cold War. The first is pertinent to the number of post-conflict cases, which is dramatically increasing. Kreutz (2010) points out that since many conflicts during the Cold War were proxy wars wherein the superpowers supported the belligerents, termination of civil conflict was rare. He states that “[d]uring the 45 years of the Cold War, a total of 141 intrastate conflict episodes terminated, while the 15 years post-Cold War have witnessed 147 terminations” (Kreutz, 2010, 246). The second is due to the ability of the international community to intervene robustly. Until the end of the Cold War, the international community was not in a good position to intervene in post-conflict situations due to the bi-polar system. Consequently, there was little call for analysis. Following the end of the Cold War, numerous opportunities for intervention have appeared.

More importantly, and parallel to internal conflict occurrence, a phenomenon referred to as the ‘conflict trap’ became more dominant. It is one of the four traps highlighted by Collier (2007) in his book *The Bottom Billion*, where he investigates why the least developed countries are ‘least developed’. This trap refers to a situation when a post-civil conflict country falls again in another civil war. Collier et al. (2008)

mention that about 40% of post-conflict countries revert to civil war within a decade. Walter (2015) finds strong evidence of a 'conflict trap'; 57% of all countries that suffered from one civil war during the 1945-2009 period experienced at least one conflict thereafter. Furthermore, she points out that by the 2000s, 90% of all civil wars were repeated civil wars. Moreover, Collier (2007) shows that the risk of further conflict in countries emerging from civil war is almost twice as high as it was on the eve of that conflict. Therefore, it is intuitive to agree with Elbadawi et al. who argue that effective handling of post-conflict periods is allegedly "the most important component in international efforts to bring down the incidence of civil war" (2008a, 458).

Therefore, many scholars started investigating how we can sustain peace. Some test the efficiency of international interference including peacekeeping forces and financial and technical aids. Others explore the importance of free elections to sustaining peace. Recently, many authors have found that economic growth plays a key role, not only in improving living conditions for people, but also in keeping a country from getting drawn back into conflict. Flores and Nooruddin (2009) conclude that if a country does not economically recover in its first post-conflict year, a relapse into another violent conflict becomes dramatically more likely. Collier et al. (2008) find that the decade risk of post-conflict peace collapse falls from 42.1% to 26.9% if the economy grows at a rate of 10% rather than remaining stagnant.

1.3 Conflict and Growth in The Literature

The literature finds two contradictory effects of civil conflict on economic growth. The first is the *Phoenix Effect*, adopted by the *War Renewal School*. It points out that armed conflict tends to usher in an era of fast growth, due to postwar technological innovation, rapid capital replenishment, and the weakening of rent-seeking special interests (Organski and Kugler, 1977; Olson, 1982; Przeworski, 2000). The second is the *Conflict Trap* supported by the *War Ruins School*. It finds that economic recovery takes a long time, and that the adverse effects of civil conflict endure (Kang and Meernik, 2005; Collier, 2007). Most of the cross-country regression studies show the dominance of the first effect. However, one should keep in mind the *File-Drawer* problem when encountering many papers with significant evidence.⁵ Besides, Cerra and Saxena (2008) document a big degree of growth heterogeneity in post-conflict countries. They found that, since the end of its civil war in 1992, Mozambique's GDP per capita has grown at an average rate

⁵ A File-Drawer problem refers to the bias introduced into the scientific literature by a tendency to publish positive results but not to publish negative or nonconfirmatory results.

of 5.2% a year. In contrast, Guinea-Bissau experienced negative average per capita growth in the first decade following its short civil conflict in the late 1990s.

Reviewing this growing literature, one can classify it according to different topics. Some scholars study the time profile of economic growth after conflict (unconditional relation), while others examine the policies and factors affecting growth (conditional relation). In addition, one can distinguish this research into macro studies and micro ones. The former focus on physical capital, economic growth, and population, while the latter look mainly at human capital. As for the data scope, some of the papers use only data of post-conflict countries, while others study economic growth in all countries, while controlling for variables referring to civil conflict outbursts.

Organski and Kugler (1977), who are among the first presenting evidence on catch-up, find that while economies suffered heavy short-term losses from the two world wars, these effects dissipated after 15 to 20 years, when the economy had returned to pre-war growth trends. The same conclusion was found in Wheeler (1980), Rasler and Thompson (1985), and Miguel and Roland (2011). Nonetheless, it is invalid to generalize this conclusion to our cases, i.e., to civil conflicts. According to Blattman and Miguel (2010), this evidence concerns with international war rather than internal, and it suffers from aggregation problem that leads to zero effect, omitting variables, and reverse causality.

Authors studying unconditional effects observe consistent results. Cerra and Saxena (2008) find that, while output falls immediately after the conflict by 6% on average, the economy recovers soon afterward, with half of the fall made up within a few years. Carefully observing the situation within 10 years of conflict-ending, Hoeffler and Reynal-Querol (2003) reveal that post-conflict recovery sets in slowly, but accelerates in the fourth, fifth and sixth years after the end of the conflict. This is consistent with Collier and Hoeffler (2004), who analyze growth performance in 62 post-conflict countries from 1974 to 1997, and note that economic recovery tends to be marked by a growth rebound within the first three years, followed by an 'above normal' growth rate over the next four to seven years.

Further, a new trend investigates the conditional effects. It examines whether the characteristics of conflicts: their intensities, durations, and severities, and the characteristics of countries involved, influence the existence and the properties of the conflict-economic performance nexus. Authors of this trend find distinct conclusions. Investigating the determinants of economic growth from 1965 to 1985, Barro and Lee (1994) regress growth on various country characteristics, but not on war characteristics.

They find that the estimated coefficient of conflict effects is insignificant. Nevertheless, they speculate, “[their] failure to find important growth effects from external wars involves the poor quality of [their] data, rather than the unimportance of war” (Barro and Lee, 1994, 36). By poor quality, they mean the lack of variables that measure the seriousness of the wars (expenditures, casualties). Collier (1999) discusses how civil war reduces the desired stock of production factors, and how its duration affects economic performance of post-conflict countries. In a cross-country empirical analysis, Przeworski (2000) finds that post-conflict economic recovery is rapid; around six percent during the 5 years preceding a conflict. He also finds that conflicts cause more damage under dictatorships than under democracies, but recoveries are more rapid under dictatorships.

Barro and Sala-i-Martin (2003) examine the case where the physical-to-human capital ratio deviates from its steady-state value due to war damage. They find an imbalance effect, meaning that when adjustment costs for human capital accumulation are greater than for physical investment the disproportionate loss of human capital in war results in slower economic growth and recovery than the destruction of physical capital, during the transition back to steady state growth.

In addition to production factors, Murdoch and Sandler (2004) use variables concerning the occurrence of civil conflict and its length by months. They study the long-run effect over 35 years (1961-1995) and the short-run effects using 5-year intervals. They find that civil conflict reduces a country’s growth by 85% in the first five years, and while there is recovery, growth is still reduced by 31% after thirty-five years. On the other hand, they find that the duration variable is insignificant, arguing that its influence may be more complicated, so it is not captured by a simple linear model. Therefore, they test other specifications of duration variables and replace the continuous variable with dummy variables that categorize duration into three groups; they find significant estimates just for long-duration conflicts.

Using data for 41 countries involved in civil conflicts over the period of 1960-2003, Chen et al. (2008) compare not only economic indicators, but also other social, demographic, and political ones for seven years in pre and post-conflict periods. They use event-study methodology, examining first the average difference between the pre and post-conflict periods, and then the average rates of change in the years following the conflict. The analysis considers the experience of conflict countries, both on their own and with respect to two control groups of countries: the full sample of non-conflict developing countries, and the subset located in the geographic region of the conflict country. The authors find a post-conflict growth

rate that is 2.4 percentage points higher than the pre-conflict growth rate, and the increase is larger when compared with the change experienced by the control groups.

David et al. (2011) investigate quantitatively the existence of systematic determinants underlying different post-conflict growth performances among 30 sub-Saharan African countries in the period between 1950 and 2007. They tried to simplify the study by considering only those countries that have indeed experienced post-conflict episodes. Using three different binary dependent variables to indicate whether the economy recovers, the authors find that changes in the terms of trade have emerged as the most influential determinant of post-conflict economic growth, and its impact tends to vary with the measure of institutional quality, *constraints on the executive*, meaning that countries with better institutional quality are less affected by changes in the terms of trade. They add that since “short-term movements in the terms of trade could be dominated by exogenous factors, it is possible to say that there is an important element of ‘luck’ in post-conflict recoveries” (David et al., 2011, 23).

Flores and Nooruddin (2009) study the difference in the time required for post-conflict economies to recover. Depending on data for the period of 1946-2003, they use a duration-analysis technique to analyze the effects of political regime types, before and after the conflict, in determining the recovery time. They use two equations: one for recovery, and the other for recurrence. They adopt a definition of recovery that is equal to the highest level of GDP per capita reached by the country in the five-year period preceding the conflict. In addition to variables reflecting the democracy regime, democratisation, and regime stability, the authors control for variables concerning the political and economic attributes of the country (pre-conflict per capita GDP, aid received, measure of contract-intensive money) and characteristics of the conflict (the origin of conflict, its duration, its economic severity, conflict termination). Their findings show that post-conflict democratization retards recovery, and democratic stability is associated with the fastest recovery time of about two years. In terms of recurrence, their results indicate that “moving away from democracy is the best guarantor against short-term recidivism” (Flores and Nooruddin, 2009, 18). Furthermore, they find that “outright military victory sets the stage for a longer peace than negotiated settlements” (2009, 3). However, the authors admit that their results may suffer from biasedness due to the non-random sample they use.

The impact of international aid on economic growth in post-conflict countries was the theme of Elbadawi et al. (2008a), who try to investigate it through the channel of the real exchange rate (RER). They first study the effect of aid on RER misalignments through an error correction model based on an annual data

sample for 83 countries. Next, by controlling for the variables affecting economic growth, they try to follow the impact of peace, RER misalignments, aid, and financial development on post-conflict economic growth, using panel data covering 78 countries in the period of 1970 to 2004. Those countries include post-conflict countries, developing, and industrial ones. To account for endogeneity they use the System-GMM estimator. Their results show that direct linear effects of peace on growth fade away when considering the interaction between foreign aid and post-conflict periods. This indicates that it is the latter interaction that matters significantly for economic growth. Hence, peace per se never improves economic growth. The results also show that since post-conflict periods are characterized by moderate RER overvaluation, the latter has reduced post-conflict economic growth. Moreover, aid and RER overvaluation have a combined negative growth effect, but the negative effects of RER overvaluation decline notably with financial development.

Cevik and Rahmati (2015) also use a System-GMM approach to determine post-conflict economic performance by analyzing 146 civil conflicts in 94 countries during the period of 1960 to 2010. Besides economic, demographic, conflict, and institutional variables, they use an estimated measure of conflict-recurrence risk as an explanatory variable. Hence, following a logistic regression approach, the paper first models the probability of conflict recurrence with the latest available information in each period and finds a high degree of persistence in conflict-recurrence risk in countries with a history of civil conflict. This variable has a strong and significant effect on economic growth. A 1% increase in the probability of conflict recurrence in the subsequent period would lower real GDP per capita growth by about 10%. Next, when regressing economic growth, the results show that real GDP per capita growth barely accelerates after the end of conflict, with an annual average of 1.5% over the subsequent five years, with significant cross-country variation. They find a statistically significant negative coefficient on the initial level of real GDP per capita, confirming conditional convergence after the end of conflict. In addition, the results show a significant negative effect of the duration of conflict, but they could not identify the effects of conflict intensity or the depth of economic contraction during the conflict. The paper reveals other interesting findings. Human capital and institutional factors appear to contribute positively to post-conflict growth, while resource-dependent countries suffer from a double curse of higher risk of conflict recurrence and lower post-conflict growth. Ethnic fractionalization seems to have a significant negative effect on post-conflict economic growth, even when controlling for conflict-recurrence risk. Moreover, the authors find that global real GDP growth and net foreign direct investment flows are significant variables, with large economic effects on post-conflict growth process. Contrary to popular expectations, the results show that

UN peacekeeping operations, foreign aid, and IMF-supported economic programs appear to have an insignificant influence on post-conflict growth.

Koubi (2005) examines the implications of intrastate war for subsequent economic growth in a large cross-section of countries over the period of 1960–1989. He adds variables reflecting duration, severity, and intensity of war, and uses two models; one is for the period of 1960-1989, and the other is for the period of 1975-1989 to avoid simultaneity. His results show that the more severe or long the war is, the higher the subsequent medium-term economic growth. According to his study, doubling duration from its mean value increases per annum economic growth by 22%, while doubling war severity from its mean value increases per annum economic growth by 11%.

Few papers focus on policies enhancing economic growth in post-conflict countries. Collier (2009) is one of the exceptions, and he presents policies recommended for immediate post-conflict years. He suggests that the best strategy would be a package involving low taxation, high aid, intense scrutiny of public spending, and low inflation. Collier argues that in the face of great social need, governments in post-conflict societies should avoid taxing aggressively. High taxation slows down the recovery of the private sector. Instead, governments should rely on income flowing from natural resources or on aid. It is also plausible, he argues, that the political context can be more favorable to growth-enhancing reforms in post-conflict situations, despite the fact that these economies usually have a low capacity to implement these reforms. On the other hand, Bräutigam et al. (2008) argue that taxation plays the key role in building and sustaining government power and legitimacy. She says that taxation helps form a social contract through the bargaining it creates, and that the desire to raise revenue creates an imperative to build sound financial institutions. Sangrey (2014) refers to the relevance of a tax on natural resources, but since effective taxation systems take time to implement, he states that many countries are forced to rely on external donors in the years following a conflict.

Overall, the recent literature is digging further, and we read now several papers and articles exploring economic growth in countries emerging from civil conflicts. Moreover, this literature is various in term of technical methods, specifications, and data scope. The majority of articles find evidence of *Phoenix Effect*, which is equivalent to the convergence term in the growth literature. In addition, several papers confirm the conditionality of the growth, meaning that the characteristics of the country, as well as the characteristics of the conflict, are key determinants.

However, many issues and unanswered questions still exist (Robertson, 2013). Economic growth is a large topic and many dimensions have not been explored, especially in time of crisis. Scholars have not investigated factors that lack data or are unmeasurable. Moreover, evidence of many factors is inconclusive, and ‘significant cross-country variation’ is a familiar phrase in the recent literature. Although suggestive, results built on aggregation studies are general and lack applicability. Few study countries or cases individually, and microdata have been barely used. Therefore, a significant biasness of macro studies based on worldwide dataset appears.

1.4 The Development of The Thesis

As already mentioned, although the literature investigating post-conflict economic growth is growing, it is evident from the description above that there are still large gaps. These are due mainly to the lack of available data that prevents researchers from studying some dimensions of the problem or from achieving significant results. Thus, many scholars move far away from this field, or may unconsciously select specifications that give a significant result leading to a *publication bias*, a notable trend that recently increased in Economics and other Social Sciences (Gelman and Loken, 2013). However, the current thesis ventures into this underexplored field and studies different aspects of post-conflict economic growth. In addition, this thesis investigates different geographical scopes, so it funnels from a quasi-world dataset in the Second Chapter to a case study of Syria in the Fourth Chapter. It also studies post-conflict economic growth from a regional perspective, i.e., in the Middle East and North Africa.

It is worth mentioning that this thesis is a purely empirical one. Empirical studies are growing in the social sciences, while journals are publishing less theoretical papers (Hamermesh, 2013). This trend has accelerated since the Great Recession of 2008, when theoretical models, despite the advanced level of mathematics they imply, failed to predict the crisis or to establish solutions for it (Stiglitz, 2015). Thus, doubts have been raised that such economic theories are now known to be untrue (Joffe, 2017), and that economics became a science that provides answers to almost every question but its main and most pressing questions (Aydinonat, 2017). Thus, our thesis is relevant to this empirical trend and uses figures, indicators, and raw data to find empirical evidence on post-conflict economic growth correlates.

The First Essay, Chapter II, explores economic growth effects of decentralization, one of the institutional arrangements, which are “arguably the most important but least understood of all war impacts” (Blattman and Miguel, 2010, 42). Though intensively studied, decentralization has not been investigated

yet as a tool to drive economic growth in post-conflict countries. Most of the related studies show how decentralization can help countries avoid war's occurrence or recurrence. Therefore, this chapter is going to further investigate the effect of both kinds of decentralization, fiscal and political, on economic growth in post-conflict cases. To do so, the chapter follows two approaches: cross-sectional and panel data. Since it barely changes over time, political decentralization is considered to be a status variable and is studied through a cross-sectional approach. On the other hand, fiscal decentralization varies year by year, so it is considered a process, and is studied through a panel-data approach.

The effect of exchange rate fluctuations on post-conflict economic growth is the theme of the Second Essay, Chapter III. Unlike the previous chapter, Chapter III restricts the sample to include just countries located in the Middle East and North Africa. The MENA is one of the tensest regions in the world, and conflicts taking place there have worldwide, in addition to bloody local, consequences. Moreover, focusing just on one region may make the units studied semi-homogenous, hence leads to reliable results in a region lacks conclusive findings regarding the correlates of economic growth. The chapter associates the volatile exchange rates, shown when the conflict terminates and during the first years of peace, with a negative effect on economic growth, since they send bad signs for local people and investors and switch available capital to speculative activities rather than productive ones. This chapter employs different descriptive and panel data techniques. First, it explores the descriptive statistics and illustrates graphically few variables. Next, the chapter utilizes other techniques which deal well with endogeneity and country-specific unobserved characteristics: System-GMM, fixed effects, and the bias-corrected least squares dummy variable model, in addition to another technique recently proposed for dynamic panels, the iterative bootstrap-based bias correction for the fixed effects estimator.

In spite of the common characteristics that most of post-conflict countries share, every single country is a special case where conflict and post-conflict attributes are changing and interacting differently. Thus, the Third Essay, Chapter IV, focuses on one case study, Syria, which is involved in a civil conflict that is as bloody as the tragic civil conflict which took place in Rwanda in 1994. Furthermore, the chapter uses different concepts of economic growth, so it moves from the traditional concept used in the previous chapters to a new concept, *inclusive growth*. Inclusive growth is a bulk of the rebuilding process in post-conflict Syria. It ensures that the whole community, including the poor, contributes and reaps the benefits of the economic growth achieved. Therefore, achieving inclusive growth requires diagnosing up-to-date poverty figures and profiles, which is the core of this chapter. Consequently, and based on a sample from a household income and expenditure survey conducted in 2009 in Syria, Chapter IV presents a

methodological contribution to nowcast poverty figures and profiles. Following microsimulation techniques, it explores not only the overall effect of the current civil conflict, but also the distributional effects on poverty. Existing research uses this technique to nowcast poverty in some developing countries; however, to the best of our knowledge, none follows this approach to estimate poverty in countries engulfed with bloody civil conflicts.

Chapter V concludes this thesis. It presents the main takeaways, conclusions, and implications found in the previous chapters. In addition, Chapter V raises some of the shortcomings and weaknesses of the analyses undertaken in this thesis, and proposes possible ways of overcoming them. Finally, it supplies some food for thought for future research in order to shrink the gaps that characterize the literature on post-conflict studies.

Chapter 2

2 Decentralization Effect on Economic Growth in Post-Civil Conflict Countries

2.1 Introduction

Civil conflict occurs for many reasons and there exists a vast literature on its causes. Blattman and Miguel (2010) present a review of the models and the empirical papers investigating this topic. The *Contest Model*, presented by Haavelmo (1954), is one of the earlier examples in the conflict literature. It considers two competing parties, a rebel group and a government, and analyses how each side allocates resources to production versus appropriation. Since then many scholars have built on that early model and presented other models (Grossman, 1991; Fearon, 1995; Esteban and Ray, 2001; Acemoglu and Robinson, 2001; Besley and Persson, 2008; Chassang and Miquel, 2010; Dal Bó and Dal Bó, 2011). Further, the empirical literature on the reasons for civil conflict expanded using a different set of control variables to interpret the eruption of civil conflict. These controls are demographic, geographic, political, and social variables including ethnic and religious fractionalization and polarization.

In particular, fractionalization and polarization prove key when interpreting the incidence of civil conflicts. Since conflicts are group events as opposed to pertaining to individuals, understanding group-based divisions are essential in explaining these violent behaviors. Esteban and Ray (1994) propose that greater conflict risk is linked to a bimodal distribution of preferences or resources and Montalvo and Reynal-Querol (2005) create an empirical measure of polarization and find support for Esteban and Ray's Theory.

Attempting to locate equality as a main reason for civil conflicts, Stewart (2008) argued that earlier scholars had largely missed inequality's war-causing effect. She attributes this to the way the earlier scholars measured inequality between individuals within a society, while most internal conflicts are organized group conflicts, where "people with particular shared identities or goals attack others in the name of the group" (Stewart, 2008, 4).

In light of this, a call to study civil conflicts through group-related perspectives rapidly spread. This includes the institutional framework which is "arguably the most important but least understood of all war impacts" (Blattman and Miguel, 2010, 42). Decentralization is at the core of this institutional framework. It is seen to provide local people, who might belong to different identity groups, a form of self-rule, and therefore is seen as a means of prompting better outcomes. Following its effects, however, is challenging in an insecure atmosphere such as within a conflict or post-conflict-zone. This chapter tries to follow the effects of decentralization and distinguish between its various manifestations in a post-conflict (PC) period. To our knowledge, this is the first article studying the effects of decentralization on economic growth in post-conflict countries (PCCs), and it explores both the fiscal and political dimensions of decentralization.

The chapter highlights some conceptual issues regarding the definition of the post-conflict period. When the conflict terminates, a period of no-peace and no-war arises and this vague period may confound the findings. Thus, we follow a moderate criterion to specify the cases under study. Furthermore, the chapter identifies the time span to follow the effects of a conflict and so we detect the long-term effects for the whole PC period. These moderate criteria shrink the number of cases, and hence the test's power and this compromises the study's ability to produce significant results. Thus, we use simpler statistical techniques to support some suggestive conclusions.

The chapter proceeds as follows. Section 2.2 introduces decentralization and its effects found in the literature. Section 2.3 identifies the channels through which decentralization affects economic growth in PCCs. Section 2.4 is the core of the chapter and presents the empirical part. The results are introduced in Section 2.5, and Section 2.6 runs some robustness checks. Section 2.7 concludes.

2.2 Decentralization: Definition, Trends, and Effects

Decentralization is an institutional arrangement, as it has to do with choices of how to design and use power (Selway and Templeman, 2012). Most define it as “the transfer of political and fiscal power and responsibilities from a central government to sub-national jurisdictions” (Farzanegan et al., 2018, 187). The UNDP defines it “the restructuring or reorganization of authority, so that there is a system of co-responsibility between institutions of governance at the central, regional, and local levels according to the principle of subsidiarity, thus increasing the overall quality and effectiveness of the system of governance, while increasing the authority and capacities of sub-national levels” (UNDP, 1999, 2). Similarly, Faguet and Sanchez (2008) define decentralization as “the devolution by the central government of specific functions, with all of the administrative, political, and economic attributes that these entail, to regional and local governments that are independent of the center within given geographic and functional domains” (Faguet and Sanchez, 2008, 1296).

Decentralisation has spread in the democratic world since WWII. Later, it became dominant in other parts of the world including PCCs. Veiga and Kurian argued that “political changes resulting from the end of long civil wars, an increase in the number of multiparty political systems, and pressures from regional or ethnic groups for more autonomy have increased the demand for decentralization” (2015, 66). In brief, decentralization is being implemented essentially everywhere. Manor (1999) stated, “Decentralization has quietly become a fashion of our time. It is being considered or attempted in an astonishing diversity of developing, developed and transitional countries, by solvent and insolvent regimes, by democracies (both mature and emergent) and autocracies, by regimes making the transition to democracy and by other seeking to avoid that transition, by regimes with varied colonial inheritance and with none. It is being attempted where civil society is strong or where is weak.” (Manor, 1999, 1)

There are many reasons why the trend towards decentralization has been adopted in low and middle–low-income countries. Decentralisation was widely promoted by international agencies such as WB and regional multilateral banks in the early nineties as a part of their structural adjustment policies (Van Lindert and Verkoren, 2010). The collapse of Communism in Eastern Europe supported this trend later on. Central planning was a key feature of communist-led countries and so many states went the other way decentralizing power, as a reaction against decades of central totalitarianism. Sharma (2003) holds that decentralization became widespread because of democratization, economic development, political heterogeneity and conflicting demands. Overall, decentralization is slowly spreading throughout the world

and it is considered a 'quiet revolution' as stated by Campbell (2001), who argues that it has generated a new model of governance based on innovation, high popular participation, and a new implicit contract governing local taxation.

Nevertheless, decentralization is an umbrella term and in practice has more than one form. The literature distinguishes three different forms of decentralization: political, administrative, and fiscal. Political decentralization includes power-sharing through the recognition of autonomous regions. It aims to raise the participation of citizens when selecting their representatives and making public decisions. Administrative decentralization involves the devolution of bureaucratic structures away from the central government to lower levels of power without removing their accountability to the central government (Grasa and Gutiérrez Camps, 2009). Fiscal decentralization occurs when sub-national governmental units are granted autonomy over the provision and financing of public goods and services (Bjedov et al., 2010). It runs by either delegation of central authorities to sub-national units, which act on behalf of the central government in implementing revenue and expenditure policies, or devolution, whereby local governments have considerable power to decide financial mechanisms (Golem, 2010). It is worth mentioning that different forms of decentralization may not move consistently together. Fiscal and administrative decentralization are more common than political decentralization as is clear in many developing and underdeveloped countries. In addition, fiscal expenditure is less centralized than revenues in many of those countries.

This diversity of decentralization's forms is mirrored in its many effects and outcomes. Scholars investigate those effects on economic growth and war occurrence and recurrence in both peace and wartime. Oates (1977) introduced the 'diversification hypothesis', implying that local governments are closer to their people and know better about their preferences. Moreover, local politicians become more accountable to their electorates, and therefore must take more interest in providing for their needs. Decentralization, accordingly, improves consumer efficiency by providing public services. However, this pro-efficiency is arguable in terms of the producer. While Shah and Thompson (2004) discuss the incentives for opportunistic behavior of authorities at local levels that are created by decentralization, Martinez-Vazquez and McNab (2003) suggest that fiscal decentralization promotes economic growth through the 'productivity enhancement hypothesis'. This hypothesis states that by transferring accountability to sub-national governments, local governments are given the incentive to actively seek innovations in the production and supply of public goods and services. Thus, production costs and prices of public goods and services become lower and their quality becomes better. 'Leviathan restrain' is

another growth-enhancing hypothesis that claims that decentralization reduces the government size and limits the potentially abusive power of the central government (Brennan and Buchanan, 1980).

Decentralisation, nevertheless, holds many disadvantages that may override its benefits. Many scholars discuss the 'dangers of decentralization' due to some of its potential problems, including corruption. Goldsmith (1999), Treisman (2000), and Lessmann and Markwardt (2010) found higher corruption in federal states. Also, fiscal indiscipline, competition between localities, loss of economics of scale (Oates, 1985), and extra administrative costs are other drawbacks of decentralization (Cai and Treisman, 2004; Veiga and Kurian, 2015).

In addition to its effect on economic growth, decentralization may cause, or prevent, the occurrence of civil conflict. It helps create more homogenous communities. Veiga and Kurian (2015) argue that "[i]n order to serve their constituency, subnational governments choose to offer different sets of public goods and charge different local taxes. If individuals have geographic mobility, they will choose to live in the jurisdiction that better serves their preferences in terms of local public goods and services and local taxes" (Veiga and Kurian, 2015, 71). Thus, decentralization reduces the number and scope of issues that must be resolved at the central government level among different groups who have different preferences (Selway and Templeman, 2012). Consequently, decentralization can reduce tension among people in heterogeneous communities and is an applicable solution that discourages heterogeneous parties from seceding (Stepan, 2004; Inman and Rubinfeld, 2011). Bermeo (2005) shows that unitary states face twice the number of civil conflicts that federal countries, where minorities have lower incentives to engage in violent activities, do. On the other hand, decentralization "exacerbates the risk of regional secession, by institutionalizing social or ethnic cleavages and establishing the formation of regional parties that might drive a secessionist agenda" (Veiga and Kurian, 2015, 95).

Decentralisation may also underpin peace in a PC context. There is a wide agreement among scholars that societies with deep ethnic divides growing within PC periods are more prone to further political violence than those without serious identity cleavages (Østby, 2008; Corvalan and Vargas, 2015). This identity-based violence is more difficult to resolve through simple majority rule than other types of conflict (Selway and Templeman, 2012) and so decentralization becomes an important strategy to avoid war recurrence. In addition, Strasheim and Fjelde (2014) find that decentralization provides security guarantees and acts as a confidence-building measure, reassuring weaker parties that they are not marginalized. Other scholars, nonetheless, argue the opposite by claiming that before decentralization

can be introduced, there has to be “something to decentralize” (Ohlson and Söderberg, 2002, 30). Thus, the question of whether it is better to support a strong central state or to enhance the authority of localities when conflict tapers off is still unsolved, and the literature remains divided. Accordingly, we need to further investigate the possible channels through which decentralization affects economic conditions in PCCs. One of these channels is economic growth, the theme of the current chapter.

2.3 Channels of Effects in Post-Conflict Countries

Besides the aforementioned effects it has on economic growth in normal, peaceful time, decentralization affects economic growth in PC periods. It bridges social ties in war-torn communities, and hence supports the reestablishment of social capital, a key factor of economic growth. In addition, it saves the economy from the resource curse and international price shocks while enhancing democratization. All these factors support political stability and national security necessary for economic growth.

Most of the PCCs have a lot of natural resources that may bring about the resource curse (Collier and Hoeffler, 1998). This curse impedes economic growth through the effect of the *Dutch Disease*. Corden and Neary (1982) find that an increase in natural-resource revenues appreciates the exchange rate, making the manufacturing sector less competitive. Fearon and Laitin (2003) show that, due to the larger opportunities the manufacturing sector provides for technical innovation, the resource sector plays a destructive role in state capacity when it grows alongside the loss of the manufacturing sector, the engine of economic growth. Decentralisation, however, undermines this effect by making the local government more accountable and so it comes to depend on efficient and productive sources of income and seeks to spend efficiently (Farzanegan et al., 2018). In addition, decentralization reduces the effect of price shocks. Since natural resources are not equally distributed among geographic areas, the shock in a unitary country affects the whole country, while it is limited to one locality in the case of decentralization. This mitigates the dependency of economic growth on a key natural resource and hence mitigates its potential volatility.

Decentralisation is the best way to start a democratization process in fragile war-torn countries. Decentralisation, indeed, is a necessary condition for democratization and this corroborates Paris (2004)'s Call to 'institutionalization before liberalization'. Paris argues that early elections risk political stability since weak institutions might be unable to contain the electoral success of non-democratic actors. Furthermore, Weingast, as quoted in Faguet (2014), suggests that by decentralizing government,

a culture of democratic practice arises while limiting the power of central authorities.⁶ Brinkerhoff has stated that “Local governance sets up a learning laboratory for people to acquire political and conflict resolution skills that can be used in other settings” (2014, 12). Moreover, decentralization “lowers the cost to entrenched elites of losing power, as parties losing national power can still hope to retain control of subnational levels, so deterring them from undermining the system” (Faguet, 2014, 9).

Decentralisation also bridges the gap between different groups of a divided society. Social tension peaks by the end of the conflict, and *particularized trust* grows at the expense of *generalized trust*. Traunmüller et al. (2015) find that experiences of civil war result in trust patterns that resemble a polarized culture of trust rather than a post-conflict ‘hunkering down’. Decentralisation brings people from the same group together and diminishes the issues they need to solve with other groups. This lack of connections, however, is often functional only for a temporary period after the conflict. In parallel, the interim government has to put trust-building procedures between different groups into action so that eventually inter-group relations can recover, and the grievances of the war can fade away.

Finally, yet importantly, decentralization legalizes the *de facto* authority. Warlords and local seniors usually control remote zones during the PC period making it difficult to apply the official laws issued by the central authorities (Brinkerhoff, 2005). Transferring power to those local leaders brings the *de facto* authority closer to the *de jure* one, providing the possibility for the central government to maintain order from afar. Moreover, this can convince warlords not to impede the inter-relations of local markets while supervising their intra-relations. Hence, it mitigates the negative consequences of market fractionalization that may have emerged due to the conflict.

2.4 Empirical Analysis

Our empirical section is challenging. It deals with a puzzling topic, decentralization, in the highly ambiguous situation of *post-civil conflict*, which takes place in developing or underdeveloped countries, where institutions are often less developed. Therefore, one should cautiously consider these difficulties and sufficiently clarify some technical and conceptual issues where necessary.

⁶ However, democratisation, as the process of transferring from autocratic regime to a democratic one, may mitigate peace and reignite the conflict again (Flores and Nooruddin, 2009).

2.4.1 Measurement-related Issues

Decentralisation: Decentralisation is a broad and relative, as opposed to absolute, concept. It is not a matter of black or white; one cannot say for definite whether a specific country is decentralized or not. This relativity limits us from finding a definite effect. Decentralization, on the other hand, is a concept that contains political, financial, and administrative dimensions. These dimensions do not necessarily go together along the same line. Some localities may enjoy a high degree of fiscal discretion, but with limited political autonomy, and vice versa (Ezcurra and Rodríguez-Pose, 2013). Schneider (2003) finds that there are countries where all three dimensions are high (Canada), medium (Norway), or low (Botswana), whereas some countries are low in two dimensions and high in one. Therefore, one can find opposing results (Kyriacou and Roca-Sagalés, 2011). Furthermore, each dimension has no single indicator that can clearly reflect the real level of subnational autonomy within a specific country (Ebel and Yilmaz, 2002).

Moreover, the decentralization mentioned in the official documents, *de jure*, may be hugely different from the *de facto* decentralization. A locality may not enjoy the same political and fiscal independence as declared in the Constitution. Another important question is whether decentralization is a process (Schneider, 2003), or a status (Treisman, 2002). The answer here identifies how to study decentralization- its time profile for each country or its current status compared with a benchmark. We, indeed, consider decentralization as both a process and a status and combine this classification with the various forms of decentralization. Thus, we use two different variables in two different equations: one is for the fiscal decentralization, in Equation 2.2, and the other is for political decentralization, in Equation 2.3.⁷

The fiscal decentralization varies within years, as the level of decentralization forty years ago was different from its level now for the same country. Thus, we consider fiscal decentralization a process and we proxy it by using one of the variables mentioned in the literature. Although it is a better indicator, *vertical fiscal imbalance* is not available for many years in the cases of the countries of interest. Thus, and since we are looking for a longer series of data, we use the *expenditure decentralization index* computed from the World Development Indicators (2017), published by WB, although we are aware that it may overestimate

⁷ Other difficulties regarding observing the real effects of decentralisation exist. It is puzzling to isolate the impact of decentralization policies in one particular area, because their effects exist in many fields simultaneously. Furthermore, decentralisation is a long process; it takes time to implement decentralisation, and it needs more time to impact. Therefore, and considering that 60% of conflicts reignite during the first decade, it is hard to catch the effect of decentralization in a PC environment.

the decentralization level. This index is simple and represents the average share of local expenditure as a percentage of the overall expenditure in a specific country.

Unlike fiscal decentralization, the political decentralization rating hardly changes continuously since it relies on constitutional or juridical amendments. Thus, we consider political decentralization a status represented by a dummy variable. The chapter uses the Peace Agreement Dataset, published by UCDP/PRIO (Högbladh, 2011), since it includes a section about the regulation of territorial incompatibility that asks whether the peace agreement offers some form of self-rule (autonomy or federalism). In order to equal one, the dummy has to meet two conditions: the existence of a peace agreement including one arrangement of territorial incompatibility and the sustainability of that agreement. These arrangements range from full independence to regional development,⁸ and the peace agreement is no longer considered fully implemented if its validity is contested by one or more of the warring parties involved.⁹

Overall, and as we are going to see below, our dataset contains just 13 conflicts ending with a peace agreement that includes at least one arrangement of self-government. Ten of these cases sustain that agreement. In addition, we add two cases where the provinces were a part of the central state but became independent. We consider these cases as an extreme type of decentralization.

After twenty-seven years of being occupied by its neighbour, Indonesia, Timor-Leste became an independent country in 2002. The country's independence followed a highly violent decades-long conflict between separatist groups and the Indonesian troops. The same level of violence took place between Ethiopian troops and the separatist groups who were fighting for the independence of Eritrea, an eastern African country. Although Eritrea was federated with Ethiopia under the prompting of the United States, following the adoption of UN Resolution 390A in December 1950, this did not prevent large groups of Eritreans fighting for independence. Thus, a year after founding the Eritrean Liberation Front in 1961, Emperor Selassie dissolved the Eritrean parliament and annexed the territory. The Eritrean War for Independence went on for 30 years until a referendum led to independence in 1993. Consequently, we end up with 12 cases with sustainable peace agreement containing a sort of decentralization.¹⁰

⁸ Although it is better not to stack all political decentralization arrangements in one category, it is inapplicable to split the available dataset, since each category includes just very few cases.

⁹ One can see Elazar (1995), Castles (1999), Henderson (2000), Treisman (2002), Stegarescu (2005), Arzaghi and Henderson (2005), Marks et al. (2008), and Ivanyina and Shah (2014) for more research about different fiscal, political, and administrative decentralisation indices.

¹⁰ We would have liked to include the case of South Sudan, but it has been facing a civil conflict since independence.

Economic growth: The chapter extracts its dependent variable from the World Development Indicators (2017). Since two equations exist, we use the same dependent variable, but a small difference lies in the calculations due to the method used. Identifying the effect of the yearly variant fiscal decentralization variable, we follow a panel data technique. Although it is common to use five-year average observations in the economic growth/ panel data literature, our first model uses annual growth of GDP per capita based on annual observations. Averaging helps avoid high-frequency fluctuations, which are widespread in the economic growth data in developing countries and peak in periods following crises such as civil conflicts. However, it may not be the best option in our case. Although year-to-year variations may include cyclical components, averaging does not necessarily eliminate the cyclical effects (Cevik and Rahmati, 2015). Moreover, cycles tend to be the trend in developing countries (Aguilar and Gopinath, 2007). Thus, and considering that many PCCs return to conflict within a few years of peace, we use annual observations to fully exploit the time-series dimension of the data. On the other hand, and since we use a cross-sectional technique to explore the effect of the quasi-time-invariant political decentralization variable, the other equation regresses the annual growth of GDP per capita based on two observations per case: the conflict termination and peace termination, covering the whole PC period.

2.4.2 Time Span: Post-Conflict Episodes

Other challenging issues in the current chapter stem from the following question: what do we mean by PC period? There is no clear-cut definition of civil conflict and, more importantly in our study, the PC period. Glancing over the world security situation, one finds that tension and clashes still appear in several conflicts that have officially ended. Elbadawi et al. (2008a) mention that current conflicts are those that are the hardest to solve and therefore they remain ongoing with different intensities.

Identifying a 'Post-Conflict Period' requires answering two sub-questions regarding the starting and the ending points of this period; *when does war stop and when do its effects vanish?* Regarding the first question, it is a conceptual, as well as data-related, matter. Conflict termination is a vague concept. A conflict may fade in the center of a territory, while violence still emerges in the peripheries. Even a written peace agreement does not guarantee full peace. Kreutz (2010) shows that conflicts do not end with decisive outcomes such as a victorious party or with a peace agreement, but more often under unclear circumstances where fighting simply ceases, and this became more common after 1989 (Fortna, 2004). Doyle and Sambanis asserted, "No peace is perfect. Public violence [...] never gets completely eliminated" (1999, 1).

Inactive years make the situation more puzzling. When the number of deaths does not reach the threshold in a given year, but exceeds it in the following, the literature considers this case as two separate episodes where peace fails. Kreutz (2010) clarifies this point by mentioning that the UCDP/PRIO dataset lists a total of 231 armed conflicts that are disaggregated into a total of 403 conflict episodes.¹¹

The best way to express how hard it is to define the termination of war is to introduce the dataset used by Chen et al. (2008). They picked just 41 cases with well-defined pre- and post-war periods out of 200 civil-conflict episodes mentioned in UCDP database. They used a strict criterion to define PC periods as those involving at least 10 consecutive years of peace. The 'war event', then, includes the war, a short interwar peace, and the resumption of war. If a country underwent two wars with more than 10 years of peace in between, the wars are treated as independent events.

Walter (2015), on the other hand, followed less strict criteria to identify a PC period. She did not code an episode of civil war as having ended until it experienced two years with under 1,000 battle deaths and at least one year with fewer than 25 battle deaths. She used this coding rule in order to ensure that ongoing wars with short lapses in fighting or small fluctuations in deaths were not included as separate episodes of conflict. Her database contains 75 spells.

The chapter uses a mix between Walter (2015)'s and Chen et al. (2008)'s methods. We consider a PC period as that following the end of a conflict, but is not interrupted by violence leading to more than a thousand victims for three years. Since we are concerned with a country facing conflict, not the conflict per se, it does not matter whether the violence following it has the same roots or involves the same belligerents.

It is also difficult to define the end of a PC period. Like the other shocks mentioned in macroeconomic models wherein scholars investigate the time profile of getting back to the saddle path, the effects of civil conflict fade and the economy follows a new path toward a new steady state. Accordingly, one has to distinguish between the persistence of the conflict effects and the new growth trajectory. Moreover, economic growth dynamics in the short-term, within 5 years, are distinguishable from those of the long-term; that is within 40 years.

¹¹ The situation is more confusing when we study economic variables. Economic growth may start going up before the war is over, since the rebuilding process may take place while the conflict is still active. The same is true for our main explanatory variable, decentralisation. A peace agreement may just legitimize a de facto situation, so it is not a real intervention. Moreover, the peace agreement may not cease the military actions.

Is it necessary, then, to study peacetime as a whole or just the period called 'Post-Conflict'? Put differently, shall we only address economic recovery, or look further into economic development? Most of the scholars investigate peacetime as a whole. They justify their perspective by the persistent effects civil war has on long-term economic growth factors such as human capital (Collier, 1999), technology (Koubi, 2005), and informal institutions (Cox, 2008; Traunmüller et al., 2015). Cevik and Rahmati have stated that, "in contrast to business cycles in advanced economies, some shocks tend to have a permanent impact in developing countries and especially in post-conflict episodes during which an economy is subject to various structural breaks" (2015, 576).

Another motive to follow the long-term effects of war is the conflict-recurrence risk. Investors and other parties avoid participating in an environment with a high risk of war, which is dominant in PCCs (Collier et al., 2003; Flores and Nooruddin, 2009; Walter, 2015). This hampers the possibilities of long-term economic growth. In a recent study, Cevik and Rahmati (2015) find that the average risk of conflict recurrence in the 2000s is highly correlated with conflict occurrence in the 1960s, indicating a highly persistent risk of conflict recurrence in countries with a history of civil conflict. This persistence reflects "a wide range of underlying factors including unresolved grievances and hostilities as well as dysfunctional institutions and economic weaknesses" (Cevik and Rahmati, 2015, 593).

Scholars have defined the term PC period in different ways. Some conduct studies over the decade following the end of a conflict and some at 7 years, dividing it into peace onset and PC periods (Collier and Hoeffler, 2002; Collier et al., 2008; Elbadawi et al., 2008a; Chen et al., 2008; Flores and Nooruddin, 2009; Appel and Loyle, 2012).¹² Others study the entirety of peacetime regardless of its length. David et al. (2011) defend that choice as it provides more time variation and ability to examine within-event effects. Some researchers consider the PC period as a single unit of observation (Koubi, 2005) using a cross-sectional technique, while others study it year-by-year using different panel data techniques (David et al., 2011; Cevik and Rahmati, 2015; Walter, 2015). Few investigate the two effects in conjunction (Murdoch and Sandler, 2004).

The current chapter investigates the long-term effect. Decentralization seldom fluctuates in the short-run, and its impact on economic growth needs time to appear. Furthermore, in order to study the latter variable, this chapter uses an augmented version of the neoclassical growth model to account for the

¹² Collier and Hoeffler (2002) distinguish between 'post-conflict' periods and 'post-post-conflict' ones. The same was done by Flores and Nooruddin (2009), who differentiated between the 'immediate post-conflict period' and the 'beginning of the transition to long-term economic recovery'.

impact of human capital which is still affected many years after the war is over. Nonetheless, we avoid inserting the PC observations during the active conflict years of later civil wars.

2.4.3. Datasets

Building our post-conflict dataset requires starting from a conflict dataset. Thus, we use the UCDP/PRIO database, which contains 2,166 observations of conflict years starting from 1946 to 2014, as a starting point (Gleditsch et al., 2002; Themnér & Wallensteen, 2013; Uppsala University, 2015).¹³ Since we are only interested in internal armed conflicts, we keep 1,927 observations.¹⁴ Next, we drop the less intensive conflicts, those with less than 1,000 battle-related deaths in a cumulative base which gives 1,375 years of conflicts. Since we are concerned just with PC years, we pick the last year of a conflict and track the inactive years following it. The number falls to 184 PC cases in 61 countries. Then, we check the cases individually, and we drop those where the conflict (1) was short-term, less than one week, which come to a total of 23 cases; (2) ended before 1958, since most of our controlling variables are available from 1960, that are 15 cases;¹⁵ and (3) that have different characteristics from the core concerns of this study such as the Chechen War in Russia, the war in Northern Ireland, and the *Generals' Putsch* in France, and therefore we keep 143 cases.

Next, we combine overlapping cases that have occurred in the same country. The outcome variable, economic growth, is an aggregate indicator that we cannot spatially split within sub-states.¹⁶ This makes finding the effects of overlapping conflicts in a given country more demanding. Thus, following Flores and Nooruddin (2009) and Appel and Loyle (2012), we combine conflicts taking place simultaneously in a single country into one observation. Although simple assembling into one observation casts doubt on our analysis, since overlapping conflicts may be very different in terms of goals, tools, and zones, its affordability motivates its application here.¹⁷ Hence, we end up with 102 cases.¹⁸ Table A.1 presents the conflict cases individually.

¹³ We did not use the CoW dataset because “[t]he uncertainty regarding the coding decisions made during the development of [... this dataset] might raise concerns about the validity of findings based on this data” (Dahl and Høyland, 2012, 428).

¹⁴ We keep the case if its *Type of Conflict* equals 3, Internal armed conflict, or 4, Internationalized internal armed conflict, according to UCDP/PRIO database.

¹⁵ We changed the year when the war ended in Lebanon (1958), India (1958) and Cuba (1959) to be 1960.

¹⁶ Actually, one could calculate the sub-state GDP, but this takes huge efforts, and computations are not accurate.

¹⁷ Warring parties in a given country may sign a peace agreement in a time when other conflicts are still ongoing. In this case, we do not consider the period following the signature of this agreement a post-civil conflict one.

¹⁸ Yemen is a fuzzy case, since it suffered from many episodes of division and unification. To deal with this case, we used a weighted average for Yemen in the period of 1967-1989. The weight depends on population size, so it takes the ratio of 3:7 for South Yemen and North Yemen, respectively. Besides, we used the index of North Yemen as a representative of Yemen before 1967.

Next, we trace the post-conflict period for each of these conflicts. As mentioned earlier, we drop the cases of unsustainable peace to follow the real PC periods. Therefore, we include only the peaceful PC period of at least three consecutive years which leaves 69 cases. This means that about one-third of the PC cases are improper ones in which the conflict is ongoing with low intensity, or the country is not enjoying a sustainable peace. We also drop the PC years when another conflict occurred in the same country. This is necessary so as not to confound the effects of the dependent variable from another conflict.

It is worth mentioning that the chapter considers the PC cases independent of each other. Put differently, the individual units are the PC spells, not the countries. Thus, the number of cases is larger than the number of countries since some countries showed two or more non-overlapping conflicts. Chad, the Democratic Republic of Congo, India, Indonesia, Lebanon, and Yemen are clear examples. Nonetheless, this assumption of null correlation between the spells ignores the fact that some cases pertain to the same country and this biases the results. We deal with this issue in the empirical section.

2.4.4 Descriptive Summary

The following two tables introduce a descriptive overview of the data in both datasets; the full dataset and a shorter one, which includes only cases with at least three consecutive years of peace. The full dataset contains 102 cases, where PC periods range from one to fifty years with an average of 9.9 years, while the average conflict lasts around 8.5 years, as shown in Panel 1 of Table 2.1. We find also that GDP per capita grows 3.6% per year over the whole PC period with a huge standard deviation of 5%. It is worth mentioning that negative growth is found just in nine cases, and this, principally, shows the presence of the 'Phoenix Effect'. We notice that when a civil conflict erupts, a country is growing with a positive economic growth of 1.5%, on average, with a large disparity, while it emerges from that conflict with a GDP level 11.3% less than its pre-conflict level. Table A.1 shows a larger variance of economic growth in the first PC year with a negative economic growth of 14% recorded in Bolivia in 1968, while Bosnia recorded the highest growth of 92% in 1995.

Next, we split the dataset into two sub-datasets: one includes the PCCs following at least one arrangement of political decentralization and the other includes those that do not. We find that, out of 102 cases, just 12 followed at least one procedure of political decentralization. Comparing Panels 2 and 3 in Table 2.1, we notice that countries in the second group, where a form of political decentralization exists when the conflict terminates, enjoy more years of post-conflict stability, with a seven-year difference between the

two groups. This is consistent with Lustick et al. (2004), Inman and Rubinfeld (2011), and Bermeo (2005) who conclude that political decentralization promotes peace. On the other hand, those countries, in the second group, suffer longer conflicts with an average of 10.6 years compared with 8.2 years of conflict in the first group.

Table 2. 1: Descriptive Statistics of The Full Dataset

	War Period (Years)	Peace Period (Years)	GDP pc Growth (%) ¹	GDP pc Level (USD) ³	Prewar GDP pc Growth (%) ⁴	Prewar GDP pc Level (USD) ⁵	Economic Damage (%)	Secondary School Enrollment (%) ²	Executive Constraints ²	Voice and Accountability ²	Population Growth (%) ²	Ethnic Fractionalization ²
102 Cases of post-conflict periods												
Mean	8.48	9.92	3.61	1.66	1.49	1.36	11.25	44.19	3.53	-0.76	2.12	0.56
SD	10.49	10.55	4.97	3.41	6.53	2.36	42.11	27.51	2.08	0.72	1.29	0.25
Min	1	1	-6.26	145	-14.62	144.9	-66.35	2.28	1	-1.98	-2.86	0.0023
Max	63	50	37.13	24.3	39.39	19.1	250.9	100.3	7	0.73	4.83	0.93
90 Cases of post-conflict periods with no forms of political decentralization (88.2% of the cases)												
Mean	8.2	9.13	3.58	1.46	1.48	1.37	12.73	40.62	3.26	-0.92	2.25	0.56
SD	9.98	10.6	5.22	3.02	6.42	2.46	43.08	25.61	2.05	0.69	1.12	0.25
Min	1	1	-6.26	145	-11.1	144.9	-66.35	2.28	1	-1.98	-2.86	0.0023
Max	63	50	37.13	24.3	39.4	19.1	250.9	99.22	7	0.73	4.83	0.93
12 Cases of post-conflict periods with at least one arrangement of political decentralization (11.8% of the cases)												
Mean	10.58	15.83	3.78	2.95	1.57	1.23	-3.36	62.9	5.09	-0.17	1.32	0.51
SD	14.1	8.45	2.89	5.27	8.16	813.4	29.42	31.28	1.51	0.51	1.9	0.21
Min	1	3	-0.40	212	-14.62	281.6	-65.28	18.41	3	-1.26	-2.59	0.045
Max	47	35	10.63	18.5	9.51	2.64	19.77	100.3	7	0.57	3.88	0.79

Sources: Author's computations based on Table A.1.

Notes: ¹ means that the value mentioned is an average for the whole PC period; ² means that the value mentioned is an average for the first two years in the PC period; ³ means that the value mentioned is for the first year in the PC period; ⁴ means that the value mentioned is an average for the last three years in the pre-conflict period; ⁵ means that the value mentioned is for the last year in the pre-conflict period. SD stands for the standard deviation. The GDP per capita is measured with constant 2005 USD. Table A.12 describes the variables.

We find no significant difference in our main concern, post-conflict economic growth, between both groups. The average per capita GDP growth in the second group is just 0.2 percentage points higher than the other group's growth. However, the war is less severe with less economic damage in the second group. Indeed, an average second-group country emerges from a conflict with an economic level higher than its pre-war level. It also emerges with a higher educational attainment compared with that in countries with no PC political decentralization arrangements. We notice, on the other hand, that the pre-conflict economic level in the second group is lower than in the other group, while the latter grows, pre-conflict, slightly better than the former.

Furthermore, PCCs that adopt political decentralization tend to have better PC institutions than those who do not. This is shown in institutional variables, executive constraints and accountability. It is intuitive to say that this reflects a sort of association between political decentralization and institutions rather than a causal effect of the former on the latter, although it can be said that decentralization does help provinces to improve their local institutions (Farzanegan et al., 2018; Strasheim and Fjelde, 2014). Authoritarian regimes tend to be more corrupt and refuse to transfer power to localities, causing both lower levels of decentralization and worse institutions. Finally, and counterintuitively, a median PCC with a form of political decentralization is slightly less fractionalized and shows less population growth rates than the other PCCs. This implies that the PCCs which have yet to adopt a form of political decentralization follow an unfavorable centralized way of ruling.

Table 2.2 presents the descriptive statistics of the short dataset containing 69 cases that have had a sustainable PC period. The fact that all cases dropped are from the first group, with no political decentralization, implies that adopting a form of political decentralization is associated with sustainable peace. More importantly, we find here a clear difference in PC economic growth in favor of the countries adopting a form of political decentralization. A mean PCC following a form of political decentralization achieves an average PC economic growth of 3.8%, a percentage point higher than in the other group. We also notice that economic growth in the first group is much less dispersed now, indicating that those unfitted cases of peace show a higher degree of volatility. In addition, the peace period in both groups converges but is still in favor of the second group, while the period of war becomes shorter but with more severe damage in the first group. Comparing other figures in this table yields similar findings with comparisons in Table 2.1.

Although these figures are just descriptive, with no indications of causality, they are necessary companions for the causality statistical tests provided later, especially for our political decentralization equations. Moreover, and since the dataset is very small, it lacks the power to detect significant results, and therefore we must turn to descriptive findings in order to draw implications from our results.

The fiscal decentralization database contains 1,163 PC and conflict-termination years in 53 countries. When we set the condition of three consecutive years of peace for a unit, the dataset shrinks to 69 cases including 1,046 years in 48 countries. For the sake of brevity, we show descriptive statistics for the short, stricter dataset in Table 2.3, while the full dataset is presented in Table A.2. We find that conflict and peace last an average of 8 and 22 years respectively. Per capita GDP grows at 2.7% for the whole PC period, while it grows at 6.8% at the first post-conflict period.

Table 2. 2: Descriptive Statistics of The Stricter Dataset of Political Decentralization (Three Consecutive Years of Peace)

	War Period (Years)	Peace Period (Years)	GDP pc Growth (%) ¹	GDP pc Level (USD) ³	Prewar GDP pc Growth (%) ⁴	Prewar GDP pc Level (USD) ⁵	Economic Damage (%)	Secondary School Enrollment (%) ²	Executive Constraints ²	Voice and Accountability ²	Population Growth (%) ²	Ethnic Fractionalization ²
69 Cases of post-conflict periods												
Mean	7.83	13.96	3.03	1523	1.79	1.12	12.25	45.09	3.82	-1	2.15	0.55
SD	8.72	10.68	2.81	2634	7.42	1.14	44.16	27.6	2.07	1	1.21	0.25
Min	1	3	-4.37	146.8	-14.62	144.9	-66.35	2.28	1	-1.98	-2.59	0.0023
Max	47	50	11.46	18531	39.4	4.93	250.9	100.3	7	1	4.83	0.91
57 Cases of post-conflict periods with no forms of political decentralization (82.6% of the cases)												
Mean	7.25	13.56	2.86	1167	1.83	1.11	14.62	41.24	3.53	-1	2.33	0.56
SD	7.17	11.11	2.79	1249	7.40	1.19	45.76	25.6	2.08	1	0.94	0.26
Min	1	3	-4.37	146.8	-11.1	144.9	-66.35	2.28	1	-1.98	-0.07	0.0023
Max	30	50	11.46	5189	39.4	4.93	250.9	99.22	7	0	4.83	0.91
12 Cases of post-conflict periods with at least one arrangement of political decentralization (17.4% of the cases)												
Mean	10.58	15.83	3.78	2947	1.57	1.35	-3.36	62.9	5.09	0	1.32	0.51
SD	14.1	8.45	2.89	5270	8.16	813	29.42	31.28	1.51	0.51	1.92	0.21
Min	1	3	-0.40	212	-14.6	281.6	-65.28	18.41	3	-1.26	-2.59	0.05
Max	47	35	10.63	18531	9.51	2.64	19.77	100.3	7	1	3.88	0.79

Sources: Author's computations based on Table A.1.

Notes: ¹ means that the value mentioned is an average for the whole PC period; ² means that the value mentioned is an average for the first two years in the PC period; ³ means that the value mentioned is for the first year in the PC period; ⁴ means that the value mentioned is an average for the last three years in the pre-conflict period; ⁵ means that the value mentioned is for the last year in the pre-conflict period. SD stands for the standard deviation. The GDP per capita is measured with constant 2005 USD. Table A.12 describes the variables.

The variable representing fiscal decentralization, *the expenditure decentralization index*, ranges between zero and one. It is notable that the mean of this variable is much bigger than the median, meaning that it is right-skewed. Exploring further, we find that around two-thirds of the observations are between zero and 0.45, while the other third is one, meaning that these observations witness full fiscal decentralization. These observations are found in six countries.

2.4.5 Model

The chapter follows Cevik and Rahmati (2015) who relied on an augmented version of the neoclassical growth model extended by Mankiw et al. (1992). Thus, we use an equation that is similar to Equation (8) in Mankiw et al. (1992), $Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta}$, where an economy's output (Y) is determined by the stock of physical capital (K), the stock of human capital (H), and the stock of labour (L). The last component enters the equation multiplicatively with technology (A). AL is referred to as effective labour,

and technological progress that enters in this fashion is known as labour-augmenting or *Harrod-neutral* (Romer, 2012). We add (Z), which represents other covariates, so our equation is revealed as follows:

$$Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta} Z_t \quad (2.1),$$

where α and β are the output elasticities of capital and labour, respectively. Both should be positive, and their sum ($\alpha + \beta$) is less than unity. Accordingly, it is obvious that the production relationship here stands on diminishing returns to each input involved and on constant returns to scale and so output changes with the same proportion as the inputs.

Table 2. 3: Descriptive Statistics of The Stricter Dataset of The Fiscal Decentralization (Three Consecutive Years of Peace)

	War Period (Years)	Peace Period (Years)	GDP pc Growth (%)	GDP pc Level (USD)	Expenditure Decentralization	Economic Damage (%)	Secondary School Enrollment (%)	Executive Constraints	Accountability	Ethnic Fractionalization
Obs.	69	69	958	965	177	69	627	942	620	1011
Mean	7.66	21.54	2.66	1703.5	0.44	6.44	49.12	4.06	-0.58	0.52
SD	7.67	12.9	6.25	2217.4	0.4	32.44	26.14	2.03	0.7	0.25
Min	1	3	-31.34	146.7	0	-66.35	2.05	1	-2.18	0.002
Median	4	19	2.	804	0.24	0.76	45.58	3	-0.46	0.53
Max	47	50	92.36	19096.4	1	250.86	110.76	7	0.87	0.91

Sources: Author's computations based on Table A.1.

Notes: Means are the averages over the completely post-conflict period for the full post-conflict dataset. SD stands for the standard deviation. The GDP per capita is measured with constant 2005 USD. Table A.12 describes the variables.

Moving to the empirical part, we include the components of the production function in the empirical equations shown below. *Gross capital formation* and *gross secondary school enrolment* represent the stocks of physical (K) and human capital (H), respectively, while *population growth* stands for labour (L). Following Mankiw et al. (1992), we assume that technology (A) grows constantly across countries, and that the initial level of technology reflects, not just technology, but also other factors including institutions. Moreover, standard growth accounting traces the effect of technological changes through the unexplained Solow residual part. There is therefore no need to include a variable representing the technological advancement in both equations.

As mentioned earlier, we consider decentralization as both a process and a status. Thus, we use two equations: one is for political decentralization, and the other is for fiscal decentralization. For the former, we use one observation per case, simply because we build on peace agreements of the respective cases

to extract the dummy variable of the existence of political decentralization. Since the value of this variable seldom changes, we use the following cross-sectional equation:

$$EG_i = \alpha + \theta y_{i,1} + \delta PD_i + \eta F_i + \varepsilon_i \quad (2.2),$$

where EG_i stands for the average economic growth of a country i , and its computation, $EG_i = \frac{y_{i,t+n} - y_{i,0}}{n}$, builds on the annualized difference in the log of real per capita GDP between the end of the conflict, $y_{i,0}$, and the end of the PC period, $y_{i,t+n}$, where n is the number of PC years. EG_i is a function of the initial outcome, $y_{i,1}$, which represents GDP per capita in the first peaceful year; PD_i , which is a dummy variable taking a unitary value if the peace agreement involves at least one form of decentralisation; F_i , a set of control variables, discussed below, in the beginning of the peaceful time; and ε_i which indicates an unmeasured random country-specific effect. We use the logarithmic value of some right-hand side variables in Equation (2.2) such as initial GDP pc, capital formation, and public consumption, since it is easier to interpret the elasticities obtained, and it is more appropriate in terms of economic growth models based on Human Development Theory.

For the fiscal decentralization equation we use a panel data technique and begin from the following dynamic equation:

$$y_{i,t} = \beta y_{i,t-1} + \delta FD_{i,t} + \eta F_{i,t} + \gamma_i + v_t + \varepsilon_{i,t} \quad (2.3),$$

where $y_{i,t}$ is the log of real per capita GDP in a country i in a year t ; $y_{i,t-1}$ is the lagged economic level; $FD_{i,t}$ represents the fiscal decentralisation index in country i in year t ; $F_{i,t}$ is a set of control variables discussed below; γ_i indicates unobserved country-specific effects; v_t captures the time-specific effects, and $\varepsilon_{i,t}$ is the error term.

2.4.6 Control Variables

Although the literature has found many variables affecting economic growth, our model includes only a few of them. This is to avoid the serious multicollinearity problem, and because our key goal is to study the impact of decentralization in a specific environment, not to locate all growth determinants. Consequently, we include some variables relevant to the social, economic, and institutional structures of the country in addition to the conflict characteristics.

Since our model is based on that formulated by Mankiw et al. (1992), we include the *gross capital formation* and *the gross secondary school enrolment rate* to capture the respective effects of physical and human capital.¹⁹ Besides, the model includes *executive constraints* from Polity IV (Marshall and Jaggers, 2002), which measures the degree of institutionalized constraints on decision-making powers of chief executives. This variable fits with our PC cases, since public officers tend to become more accountable during peaceful and democratic transitions. The model contains other standard variables: *population growth, trade openness, and government expenditure*.

It has become common to control for fractionalization in the literature on economic growth and conflict. Alesina et al. (2003) compile a dataset measuring the degree of ethnic, linguistic, and religious heterogeneity in various countries. They found that ethnic fractionalization affects economic growth more than other sorts of fractionalization did and we therefore use it in the current chapter. This variable ranges between: 0, complete ethnic homogeneity; and 1, complete heterogeneity. Moreover, we use the religious fractionalization index when the ethnic index is absent.²⁰

The model accounts for convergence, meaning that countries with lower economic levels, initially or due to a crisis, show higher degrees of growth. Since we are using two different techniques, we use different terms to capture the convergence. Because our political decentralization equation builds on one observation for each PC case, we use the log of real income, $y_{i,t}$, in Equation (2.2) and consider the year when peace comes, $t = 1$, as the initial one, while we rely on the lagged economic level, $y_{i,t-1}$, to capture the convergence term in Equation (2.3), which follows a panel-data strategy. Nevertheless, later we move the lagged economic level from the right-hand side to the left-hand side in Equation (2.2) and therefore do not explicitly test the convergence term in the fiscal decentralization equation.²¹

Following the conditional approach, the model studies economic growth looking deeply at the context and the legacies of a conflict. Many variables present the reasons, sizes, and damage of conflicts. Including these variables may only increase the volatility and sensitivity of empirical results because “this arrangement subdivides an already uncommon event into smaller subcategories where there may not be

¹⁹ Although Doppelhofer and Miller (2004) find that primary school enrolment rate is a robust determinant of economic performance, it is widespread to use the secondary school enrolment in the literature.

²⁰ We change some years in order to cope with other datasets used in this chapter. We think that this is not a problem, since this variable is quasi-invariant.

²¹ Reviewing the literature, we find that the convergence hypothesis is inconclusive in PCCs. Many authors find an evident convergence in PCCs (Collier and Hoeffler, 2002; Koubi, 2005; Elbadawi et al., 2008a; Flores and Nooruddin, 2009) and some call it the phoenix effect; doubts, however, emerge. Cevik and Rahmati (2015) argue that although the coefficient of the level of per capita income at the end of conflict is statistically significant and consistent with conditional convergence, it is less auto-correlated in the aftermath of civil conflict than in normal times. In addition, scholars find that PC periods are full of uncertainty and fluctuations. Aguiar and Gopinath (2007) state that the economy is subject to various structural breaks during PC periods.

statistical power to demonstrate the validity of a typology” (Blattman and Miguel, 2010, 31). Accordingly, we use only a variable reflecting the economic damage. To avoid complexity, and following Appel and Loyle (2012), we measure the economic damage using the simple GDP change between the beginning and the end of a conflict.²²

2.4.7 Endogeneity and Reverse Causality

Endogeneity is a problematic question in this chapter. Not only are the independent variables endogenous, but so too is the post-conflict context of the study. Unlike other exogenous disasters such as natural and economic ones, civil war is no doubt endogenous to socio-economic, political and institutional factors. Furthermore, the limited scope of the dataset design, data availability, and reverse causality are inevitable sources of endogeneity in our case. It is intuitive to say that most of the PCCs that record economic growth figures are those considered successful cases and so a selection bias appears (Blattman and Miguel, 2010). Furthermore, David et al. notify that the UCDP/PRIO dataset is “somewhat biased against the inclusion of conflicts in earlier decades and in developing countries because of lack of reliable information for the earlier years” (2011, 7).

The small dataset we use in the current chapter, due to the limited coverage of decentralization data, is another source of bias. Datasets of political and fiscal decentralization are growing; however, seldom do they contain figures for developing countries. This poor coverage leads to a sort of sample selection bias. Furthermore, the situation is worse when it comes to PCCs which may prevent us from producing significant results. Collier et al. (2008) investigate the effect of autonomy on the risk of war recurrence in the decade following conflict termination. Because of the few cases of autonomy, they attribute the large effect of autonomy either to chance or because cases in which autonomy is granted are already fundamentally safer.

Reverse causality is another reason causing endogeneity, especially in Equation (2.2). The intent to institute political decentralization is declared in the peace agreement, usually signed before peace is officially declared, and this lowers possible reverse causality. However, Table 2.2 reveals the non-random nature of our political decentralization variable, as the PCCs applying at least one form of political decentralization are more advanced economically, educationally, and institutionally. Furthermore,

²² In order to compute the economic damage of wars starting before 1960, we consider 1960 as the pre-war year, since we do not have data before that year, in nine cases including Cameron 1959, Cuba 1955, India 1955, Indonesia 1957, Israel 1949, Laos 1958, Lebanon 1957, Myanmar 1948, and Vietnam 1954.

federalism may be the last solution for heterogeneous communities to keep their countries united. Collier et al. (2008) argued, “[we] might expect that the normal preference on the part of the politically powerful is for a unitary state, so that regional autonomy is granted only in situations that are too demanding for hopes of a unitary state to be realistic” (Collier et al., 2008, 471).

Trying to avoid endogeneity, we control for the main differences between the two groups of countries involved in Equation (2.2), and in order to prevent endogenous control variables we use their initial values. Obviously, most of the right-hand side variables are unstable in the PC period. Because of this, and so as to smooth out the values of those variables in Equation (2.2), we involve their average values of the first two PC years. In addition, we include the cases which show at least 3 consecutive years of peace. Later in the robustness check section, we use an instrumental variable approach in a try to support the causal interpretation of the results.

2.4.8 Estimation Strategies

As mentioned above, since we are exploring the effects of two forms of decentralization, we follow two approaches, each fitting the nature of the variable used to measure the particular form. We use a cross-sectional and a panel data approach respectively to identify the effects of both political and fiscal decentralization.

2.4.8.1 Cross-Sectional Approach for the Political Decentralization Equation

Although containing less information, cross-sectional analysis is key to our investigation. In the use of this technique we collapse the entire PC period into one observation, using averages over time or initial values. Appel and Loyle (2012) justify using a whole-PC-period snapshot, rather than a yearly observation, as a unit of analysis by arguing that snapshotting loosens the fluctuations of GDP and other related variables that change dramatically during the PC period. Moreover, snapshots better correspond to the presence or absence of a political decentralization arrangement, which is quasi-time-invariant. We also argue that, since our dataset contains large amounts of missing data, using the snapshot-based analysis assists us in overcoming this gap in some PC periods.

Diagnostic Tests: When regressing the equation, we run some diagnostic tests for normality, multicollinearity, and heteroscedasticity to check whether our model has met the OLS assumptions to avoid misleading results. The normality test shows if a dataset is well modeled by a normal distribution.

There are many graphical and frequentist tests of normality including the Jarque-Bera Test (1987), which is derived from skewness and kurtosis estimates. The Jarque-Bera Test is based on asymptotic standard errors with no corrections for sample size. Thadewald and Büning (2007), however, argue that this test has low power for distributions with short tails and so we use the Shapiro-Wilk normality test (1965), which has the best power for a given significance, according to Razali and Wah (2011).

Table 2. 4: Diagnostic Tests for The Political Decentralization Equation

Breusch-Pagan Test for Heteroskedasticity	
Chi2: 3.590	p-value: 0.058
Variance Inflation Factor to Check Multicollinearity	
Population Growth	1.92
Sustainable Political Decentralization	1.29
Secondary School Enrollment	3.13
Log of Capital Formation	1.73
Log of Economic pc Level Initial	1.71
Constraints	1.31
Log of Public Consumption	1.22
Economic Damage	1.57
Ethnic Fractionalization	2.27
Trade Openness	1.31
Shapiro-Wilk W Normality Test	
z: 0.671	p-value: 0.25

Source: Authors' computations based on the political decentralization dataset.

Notes: The Null Hypothesis of the Breusch-Pagan Test (1979) assumes homoscedasticity. The variance inflation factor is the ratio of variance in a model with multiple terms, divided by the variance of a model with one term alone; its acceptable value is less than 5 (Hair et al., 2016). The Null Hypothesis of the Shapiro-Wilk W Normality Test assumes that the data (1965) came from a normally distributed population. Table A.12 describes the variables.

Even though it does not violate OLS assumptions, which means that OLS estimates are still *BLUE*, multicollinearity is a serious question within our study. It inflates the standard errors leading to a *Type II error*. Hence, we minimize the number of right-hand side variables to avoid multicollinearity. Furthermore, we apply the Variance-Inflation-Factor Test.

Violating Assumption (3) of the *Gauss-Markov Assumptions* creates heteroscedasticity where the error terms have different variances. Although heteroscedasticity does not affect the bias of the estimator obtained, OLS estimates are no longer *BLUE*, meaning that among all the unbiased estimators, OLS does

not provide the smallest variance estimate. This is a common problem in cross-section studies, and it may emerge in our topic also. People are different due to their mentalities, traditions, and habits, and so the variance of error terms, which catches the effects of unobservables, varies between countries hosting different populations. Thus, we use the Breusch-Pagan Test (1979).

Table 2.4 shows that our estimation strategy is free from the aforementioned problems. The Breusch-Pagan Test has a p-value of 0.058 which means that we do not reject the Null Hypothesis of homoscedasticity at the 5% significance level but we reject it at the 10%. We therefore use robust standard errors, which are larger than the non-robust standard errors, in the regressions to lessen concerns surrounding heteroscedasticity. Checking for multicollinearity, we find no variable with a high value within the Variance-Inflation-Factor Test, and this eliminates our concerns surrounding multicollinearity. The p-value of the Shapiro-Wilk W Normality Test shows that we cannot reject the Null Hypothesis; hence, the data fit the normal distribution.

2.4.8.2 Panel-Data Approach for the Fiscal Decentralization Equation

Panel data sets provide more information, and explanatory variables vary over two dimensions rather than one. Thus, estimators based on panel data are probably more efficient. In addition, using panel data allows the identification of certain parameters without making restrictive assumptions (Verbeek, 2008). Furthermore, with panel data, we control for omitted variable bias as well as an unobserved source of individual heterogeneity that varies across individuals but does not vary over time.

The OLS method that is applied to the political decentralization equation does not fit in a panel data set as it ignores the panel structure of the data. This makes the estimators of the parameters biased and inconsistent since the country-specific term in Equation (2.3), γ_i , is correlated with the lagged dependent variable, $y_{i,t-1}$, which raises the dynamic panel bias, and potentially correlated with other regressors. Thus, in order to nullify the unobserved country-specific term, we follow a Fixed Effects method and demean, subtracting time averages from the initial model, as follows: $\dot{y}_{i,t} = y_{i,t} - \bar{y}_i$, $\dot{y}_{i,t-1} = y_{i,t-1} - \bar{y}_{i,-1}$, $\dot{F}D_{i,t} = FD_{i,t} - \overline{FD}_i$, $\dot{F}_{i,t} = F_{i,t} - \bar{F}_i$, $\dot{\gamma}_{i,t} = \gamma_i - \bar{\gamma}_i = 0$, $\dot{v}_{i,t} = v_{i,t} - \bar{v}_i$, $\dot{\epsilon}_{i,t} = \epsilon_{i,t} - \bar{\epsilon}_i$, where -1 denotes an average of all observations for individual i except the first, for which no lagged value exists, $\bar{y}_i = (1/T) \sum_{t=1}^T y_{i,t}$, and $\bar{y}_{i,-1} = (1/T) \sum_{t=1}^T y_{i,t-1}$. This yields the following *within model*:

$$\dot{y}_{i,t} = \beta \dot{y}_{i,t-1} + \delta \dot{F}D_{i,t} + \eta \dot{F}_{i,t} + \dot{v}_t + \dot{\epsilon}_{i,t} \quad (2.4),$$

Although this within-transformation throws the country-specific effect out of the equation, it redefines the residuals and introduces another problem; the transformed lagged dependent variable becomes endogenous. In the within transformation, Nickell (1981) noted that $\ddot{\varepsilon}_{i,t} = \varepsilon_{i,t} - \bar{\varepsilon}_i$ is associated with $\ddot{y}_{i,t-1} = y_{i,t-1} - \bar{y}_i$ due to the following reasons:

1. By demeaning the residuals term, $\ddot{\varepsilon}_{i,t}$ now includes $\varepsilon_{i,t-1}$ that is an element when computing $\bar{\varepsilon}_i$. $\varepsilon_{i,t-1}$ is the error term that helps form $y_{i,t-1}$.
2. The transformed lagged dependent variable, $\ddot{y}_{i,t-1}$, builds on \bar{y}_i that contains $y_{i,t}$, which is formed by its error term, $\varepsilon_{i,t}$.

In addition, some independent variables in Equation (2.4) are exogenous within the period but may become endogenous over time.²³ Therefore we prefer to use another estimation strategy that lies under the General Method of Moments (GMM), introduced first by Pearson (1894) and developed by Hansen (1982), Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). GMM relies on the idea of instrumentation, which is developed to deal with the probable correlation between independent variables and error terms, the most important source of endogeneity. The growth literature has recently followed this approach as its framework is flexible enough to accommodate unbalanced panel data and it accounts for the country-specific effects (Veiga and Morozumi, 2016).

Holtz-Eakin et al. (1988) and Arellano and Bond (1991) have developed a Difference-GMM estimator for dynamic panel data regressions using the lagged levels of the regressors as instruments for the equation in first differences. However, this estimator suffers from small sample bias due to the short time series, which is frequently in our study, so the lagged levels are weak instruments for subsequent first differences. This bias tends to be larger in economic growth models (Bond et al., 2001). Moreover, using Difference-GMM introduces downwardly biased standard errors when error terms are not homogenous. In addition, this estimator is known to be somewhat inefficient when instruments are weak because they make use of information contained in differences only. Therefore, Blundell and Bond (1998) suggest making use of additional level information besides the differences. The combination of moments restrictions for differences and levels results in an estimator called System-GMM. This allows for the production of estimations with lower bias and higher accuracy (Bond, 2002).

²³ It is worth mentioning that the first-differencing transforming faces the same problem.

The results of the System-GMM estimations, presented below in Column (1) of Table 2.7, show a positive effect of the fiscal decentralization variable but indistinguishable from zero. However, the very large value of beta, nearly one, raises doubts about the validity of applying the System-GMM approach here and the findings of the following stationarity tests call for another strategy.

Stationarity Tests: Since we are dealing with panel data, we must test their stationarity. Unfortunately, most of the panel stationarity tests fit only balanced panel datasets, meaning that they are an ill fit for a dataset in which there is frequent conflict. Choi (2001) proposes a standardized statistic based on a Fisher-type test. It works well with unbalanced data and performs a unit-root test on each country time-series separately. It then combines the p-values to obtain an overall test of whether the panel series contains a unit root. Here we apply the Augmented Dickey-Fuller (ADF) unit-root tests for each panel and control for the cross-sectional dependencies.²⁴ Table 2.5 indicates that some of the independent variables are stationary, while the others are not. Thus, we use the first differences of these latter variables.²⁵

Table 2. 5: Unit Root Test based on Choi (2001)-Inverse Normal Z- and Hadri (2000) for The Independent Variables

Variable	Statistic	P-value
Choi (2001) Test		
Log of GDP pc	-1.7915	0.0366
Log of Capital Formation	-2.3495	0.0094
Log of Public Consumption	-3.4718	0.0003
Population Growth	-5.8193	0.0001
Executive Constraints	0.809	0.8048
Trade Openness	-1.5749	0.0576
Expenditure Decentralization	-1.3039	0.0961
Secondary School Enrolment	1.6991	0.9553
Hadri (2000) Test		
Log of GDP pc	18.818	0.0001

Source: Authors' computations.

Notes: The Null Hypothesis in Choi (2001) Test is that all panels contain unit roots, while the Null Hypothesis in Hadri (2000) Test is that all the panels are (trend) stationary. Table A.12 describes the variables.

²⁴ To determine the lag length in this test, we need to balance between the power of the test and the remaining serial correlation in the errors (size) that may bias the test. Nevertheless, we should not forget that our dataset is too small, so the length might not exceed 2 or 3.

²⁵ Among the four Fisher-Type ADF unit root tests: Inverse chi-squared (94) P, Inverse logit t(194) L, Modified inverse chi-squared Pm, and Inverse normal Z, Choi (2001) suggests that it is better to use the last one's statistics, because it offers the best trade-off between size and power.

A key drawback of Choi (2001)'s Test is that it takes as the Null Hypothesis that all panels contain unit roots, making the probability of rejecting H_0 higher. Classical statistical methods are designed to reject the Null Hypothesis only when the evidence against it is sufficiently overwhelming. However, because unit-root tests are not typically very powerful against alternative hypotheses of somewhat persistent but stationary processes, reversing roles and testing the Null Hypothesis of stationarity against the alternative of a unit root is preferable here (Kwiatkowski et al., 1992). Accordingly, we apply Residual-based Lagrange Multiplier Test, proposed by Hadri (2000), to trace any unit root in the GDP per capita level. The p-value of the test rejects H_0 that all panels of GDP pc are stationary and so we conclude that at least one panel of the economic level has a unit root. Moreover, Column (1) of Table 2.7 shows that beta is too close to one, confirming the non-stationarity of the main economic variable.

Since beta is very close to one, we move $y_{i,t-1}$ to the left-hand side in Equation (2.2) as follows:

$$y_{i,t} - y_{i,t-1} = \delta FD_{i,t} + \eta F_{i,t} + v_t + \varepsilon_{i,t} \quad (2.5).$$

The left-hand side is nothing else but economic growth between t and $t - 1$ and so we move to the following equation:

$$EG_{i,t} = \delta FD_{i,t} + \eta F_{i,t} + v_t + \varepsilon_{i,t} \quad (2.6),$$

where the dependent side, $EG_{i,t} = y_{i,t} - y_{i,t-1}$, is the difference in the log of real per capita GDP between years t and $t - 1$ in a country i . Moving from Equation (2.3) to Equation (2.6) implies that we turn the dynamic panel model specified in Equation (2.3) to a model in first-differences for the dependent variable, as described in Equation (2.6). Accordingly, we look for another estimation strategy that is relevant to Equation (2.6) and therefore reconsider using a fixed effects strategy.

Fixed Effects Model: The fixed effects approach takes into account country-specific effects and so it eliminates unobserved heterogeneity between countries (Baltagi, 2008). Furthermore, the fixed effects estimation uses only within-individual differences, essentially discarding any information about differences between individuals. Our main concern is to study these within-country differences, since we care more about economic growth changes in the period following the conflict for each country.

It is worth mentioning that, although it controls for the effects of time-invariant variables, the fixed effects estimator cannot estimate those effects. The within transformation wipes the time-invariant variables out

meaning that we cannot estimate their coefficients. Thus, using a random effects strategy might yield better results. This estimator uses both the within and between-country variances and is therefore able to estimate the effects of the time-invariant variables and present a more efficient estimator. However, applying this strategy requires satisfying strict exogeneity and orthogonality between the regressors and the specific fixed effects. Hence, we use the Hausman (1978) Test, where the Null Hypothesis implies the advantage of the random effects model, while the alternative is for the fixed effects model (Greene, 2008). The Chi-square of Hausman Test is $\chi^2 = 38.89$ with a significant p-value. We therefore reject the Null Hypothesis, indicating a correlation between the unique errors and the regressors, and confirming the advantage of the fixed effects strategy.

Specification Tests: Applying a panel data approach calls for other pre-estimation tests. First, we check for serial correlation, which is common in panel data. Since our regression uses spells rather than countries as units, it ignores the correlation existing between two or more units that belong to the same country. This brings about the possibility of increases in serial correlation. Serial correlation biases the standard errors, so the estimates become less efficient. Several serial correlation tests in panel data exist (see Baltagi, 2008), but they require specific assumptions about the nature of the individual effects. However, Wooldridge (2002) proposes a test that requires relatively few assumptions and is easy to implement. Drukker (2003) finds that this test has good size and power properties with moderate samples. Applying this test, we get an *F – statistic* = 0.097, with a *p – value* = 0.76, so we do not reject the Null Hypothesis that indicates that there is no serial correlation. However, erring on the side of caution, we cluster the standard errors by country. Additionally, we account for heteroscedasticity that is probable in our data since the model may not capture all differences between countries involved. A modified Wald statistic has a $\chi^2 = 1203.28$ with a significant p-value, implying group-wise heteroskedastic variances of error terms. Accordingly, we use robust standard errors in the regressions.

2.5 Results

2.5.1 The Cross-Sectional Approach for Political Decentralization

We begin with Equation (2.2) and we regress four political decentralization models, moving gradually from simplicity to complexity.²⁶ The first model contains just the standard variables affecting economic

²⁶ Here we follow the same method of Koubi (2005).

growth in order to test whether our specification is appropriate. The second one contains just our key explanatory variable: political decentralization. This is a relevant way of exploring any association between our dependent and main independent variables, and to make sure that no observation drops due to a missing value in one of the control variables. The third model includes two variables: the political decentralization and the economic damage, while the fourth model is the full one. Table 2.6 introduces the results using robust standard errors to control for heteroscedasticity.

Table 2. 6: OLS Estimation for Political Decentralization Equation using Robust Standard Errors

Dependent variable: The annualized difference in the log of per capita GDP between the end of the conflict and the end of the PC period				
Variables	Model PD1	Model PD2	Model PD3	Model PD4
Log of Initial GDP pc	-0.00840** (0.00343)			-0.00741* (0.00367)
Log of Capital Formation	0.0363*** (0.0117)			0.0270 (0.0177)
Log of Public Consumption	-0.0136*** (0.00432)			-0.00958* (0.00520)
Population Growth	-0.00639*** (0.00209)			-0.00758*** (0.00264)
Executive Constraints	-0.000330 (0.00130)			-0.000919 (0.00183)
Secondary School Enrolment	0.000282** (0.000129)			0.000328** (0.000150)
Trade Openness	0.000196*** (6.68e-05)			0.000168* (8.44e-05)
Ethnic Fractionalization	-0.0191 (0.0142)			-0.0152 (0.0167)
Political Decentralization		0.00858 (0.00797)	0.0100 (0.00930)	-0.00260 (0.00382)
Economic Damage			0.000170** (7.31e-05)	6.58e-05 (9.08e-05)
Obs.	40	64	53	35
R-squared	0.635	0.016	0.087	0.657
RMSE	0.016	0.026	0.026	0.016

Source: Authors' computations based on regressing Equation (2.2).

Notes: The regressions build on an annual unbalanced panel covering 69 cases of post-civil conflict periods in 48 countries and spanning between 1960 and 2014. The R^2 reported is the within- R^2 . Robust standard errors are in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. Table A.12 describes the variables.

Model PD1, which contains just the standard variables, supports the validity of the control variables included in the model. Almost all variables included are robustly significant and are relevant to the theory. Results of the other models show mixed effects of the political decentralization. Applying a form of political decentralization has a positive effect in two out of three models but, when we control for more variables, the effect turns negative in Model PD4. However, none of the effects is statistically significant. This refutes the findings extracted from the descriptive statistics.

The results derived from the full model, PD4, are intriguing. The political decentralization variable shows a negative effect with smaller magnitude compared with its positive effects found in the previous two models, yet insignificant. Its coefficient indicates that implementing one arrangement of decentralization decreases the economic growth rate by 0.003 percentage points when compared with the same country had it not applied any kind of political decentralization. The other variables are in agreement with the literature. The population growth is strongly significant at a 1% level with a negative sign and the human capital formation proves significant. Trade openness promotes economic growth, and the initial economic condition goes along with the convergence hypothesis in that the countries emerging poorer from a civil conflict achieve higher economic growth in the PC period. It is notable that public consumption hampers growth significantly, with a large magnitude. The coefficients of other variables such as economic damage, fractionalization, capital formation, and good governance, show insignificant effects in the full model.

2.5.2 The Panel Approach for Fiscal Decentralization

Similar to what we did in the political decentralization equation, we regress economic growth in four fiscal decentralization models that develop from simple to complex. Thus, the first Model, FD2, contains only the standard variables affecting economic growth. The second one, FD3, is the parsimonious model that only contains the key explanatory variable. The third one, FD4, includes the variables with less missing values and that proved significant in Model FD2 or in political decentralization equations such as population growth, public consumption, and capital formation, as well as fiscal decentralization, which is our concern variable. Model FD5 is the full model.

Assuming that after a conflict a new spell starts implies, from an econometric perspective, that we have a 'new' country. By doing so, we ignore in the variance-covariance matrix a non-null correlation between spells of the same country. We address this by clustering standard errors by country. It is worth mentioning that doing so prevents us from applying the joint significance test for the presence of the fixed effects (Cameron and Miller, 2015). Nevertheless, we can replicate the fixed effects estimates by using least square dummy variables. Via this alternative, we can test for the presence of specific effects by running a joint significance test on the dummies for the cases. Once we run the test, we conclude the existence of the fixed effects.

Table 2.7 shows a negative impact of the key explanatory variable, fiscal decentralization. Since the value

of this variable ranges between zero and one, its parameters indicate that a percentage point increase in the fiscal decentralization variable decreases economic growth by 0.015 – 0.038 percentage points. The effect is insignificant in both the parsimonious and the full models, while it is robustly significant at 1% level in Model FD4 with a magnitude of 0.024 percentage points. The last robust effect is smaller than the effects found in other studies concerning the effect of the fiscal decentralization. Davoodi and Zou (1998), for instance, find that an additional decentralization of functions by 10% reduces the growth of real GDP per capita in developing countries by 0.7 – 0.8 percentage points. Iimi (2005) found a similar magnitude of impact but with an opposite sign.

Table 2. 7: System-GMM and Fixed Effects Estimation for Fiscal Decentralization Equation using Robust Standard Errors

Variables	Model FD1-System-GMM	Model FD2	Model FD3	Model FD4	Model FD5
L. Economic Level	0.952*** (0.0677)				
Log Capital Formation	0.0751** (0.0340)	0.0376** (0.0184)		0.0522*** (0.0171)	0.0684** (0.0252)
Log Public Consumption	-0.0963 (0.0692)	-0.0292** (0.0129)		-0.0507*** (0.0161)	-0.0208 (0.0210)
Population Growth	-1.210 (1.670)	-0.610 (0.626)		-1.576*** (0.291)	-3.366** (1.181)
D. Executive Constraints	0.0624** (0.0301)	0.00109 (0.00180)			0.00468 (0.00404)
D. Secondary School Enrolment	0.00220 (0.00327)	-0.000341 (0.00122)			0.000458 (0.00224)
Trade Openness	0.00197 (0.00247)	7.14e-05 (0.000243)			-0.000486 (0.000786)
Fiscal Decentralisation	0.0311 (0.0421)		-0.0150 (0.0142)	-0.0242*** (0.00479)	-0.0380 (0.0297)
Obs.	118	464	167	167	103
R-squared		0.082	0.011	0.237	0.330
Number of Wars	17	51	19	19	15
Number of clusters		40	16	16	12
Arellano-Bond AR(1), p-value	0.12				
Arellano-Bond AR(1), p-value	0.93				
Hansen, p-value	0.99				
F-Test for Joint significant of Fixed Effects		51.51***	14.19***	140.31***	482.15***
RMSE		0.039	0.033	0.029	0.028

Source: Authors' computations based on regressing Equation (2.6).

Notes: The regressions build on an annual unbalanced panel covering 69 cases of post-civil conflict periods in 48 countries and spanning between 1960 and 2014. System-GMM estimation for dynamic panel data models is used in Model FD1. Constant and time dummies are not shown for brevity. All explanatory variables were treated as endogenous except for lagged GDP pc. *warnumber* is considered as strictly exogenous variable. The R^2 reported is the within- R^2 . Robust standard errors are in parentheses. Fixed effects regressions use robust standard errors clustered by country. System-GMM regressions collapse the instrument matrix and use 2 lags. Orthogonal deviation was used to transform variables. ***, **, * indicate significance at the 1, 5, and 10%, respectively. In the case of two-step GMM, the Windmeijer (2005) finite sample correction for standard errors is employed. Hansen Test is used for testing over-identifying restrictions in the model. Arellano-Bond AR (1) examines the hypothesis that the error terms in first differences are not serially correlated. Arellano-Bond AR (2) examines the hypothesis that the error terms are not serially correlated. L. means that we use the first lagged value for this variable. D. means that we use the first differences for this variable. Table A.12 describes the variables.

Considering the fact that our dataset contains for the most part LDCs, we attribute these insignificant findings to the invalidity of the fiscal decentralization, meaning that central authorities are reluctant to

fully actualize decentralization, only institutionalizing it nominally through fiscal or administrative arrangements. On the other hand, the significant negative coefficient of the fiscal decentralization variable shown in Model FD4 implies that applying fiscal decentralization in a country lacking transparent local governance may raise local corruption and, in turn, hamper economic growth.

Looking briefly at Model FD5, we find that the standard regressors are relevant to the theory. Significance is robust for population growth and has a meaningful effect. This is also true for physical capital formation. According to the results, a 0.1 percentage point increase in the population growth decreases economic growth by 0.34 percentage points. This is, in general, relevant to the growth literature (Barro, 1991; Levine and Renelt, 1992), but does not corroborate other research done specifically on papers investigating economic growth in a PC period (David et al., 2011).

The coefficient of physical capital formation is always positive and distinguishable from zero. Model FD5 shows that, if the share of physical capital formation over GDP goes up by a percentage point, economic growth goes up by 0.07 percentage points. This is consistent with the growth literature (Mankiw et al., 1992; Sala-i-Martin, 1997; Doppelhofer and Miller, 2004) and with the post-conflict literature (Koubi, 2005; Chen et al., 2008).

Although its coefficient is not significant in Model FD5, governmental consumption shows a significant effect in Models FD2 and FD4. According to Table 2.7, if the share of public consumption over GDP increases by a percentage point, economic growth goes down by 0.03-0.05 percentage points. This goes along with Koubi (2005) and Elbadawi et al. (2008a), who also investigate post-conflict economic growth. It is also relevant to the famous economic growth paper of Caselli et al. (1996). Other control variables such as trade openness, executive constraints, school enrolment, and public consumption show insignificant influences. It is notable that the fiscal decentralization equations run with few observations, since we have lost around 90% of observations, because they contain at least one missing value in one of the variables included. Thus, insignificant results for relevant factors are normal.

2.6 Robustness Check

The main findings show a mixed effect of political decentralization, in a small dataset, and a negative effect of fiscal decentralization, in a larger dataset. The effects are insignificant in all political decentralization models, while it is significant in just one fiscal decentralization model. Further

investigations are therefore required, especially to measure the effect of political decentralization, since endogeneity may confound the findings. Our goal is to find credible results, even if they are insignificant, in order to avoid the file-drawer bias recently growing in the literature.²⁷

2.6.1 A Stricter Criterion of Post-Conflict Period

As we argued earlier, PC period is an ambiguous term. Furthermore, many conflicts have passed through phases of low intensity before exploding again. The original database considers that case a failed peace between two separate wars. To mitigate this problem, we only include PC countries with four consecutive years of peace, as opposed to three. In doing so, our dataset decreases to 61 cases and average peace and conflicts periods become 15.4 and 7.7 years, respectively, while GDP per capita grows by 3.25% annually (see Table A.3). Again, economic growth in decentralized PCCs is around one percentage point higher than economic growth in centralized ones. However, the results displayed in Table A.5 show insignificant mixed effects. Again, the parsimonious model, PD5, exhibits a positive effect and the full model, PD6, shows a negative one. On the other hand, FD7 in Table A.8 shows a significant negative effect of fiscal decentralization at the 5% level, with a magnitude higher than that found in the main findings. This confirms the hampering effect of fiscal decentralization.²⁸

2.6.2 A Binary Dependent Variable

Using continuous dependent variables in a post-crisis era raises many questions including those surrounding the degree of fluctuation as this could hide any systemic relations between the dependent and right-hand side variables. Therefore, we follow other scholars and use a binary variable that equals one when the post-conflict economic growth rate is higher than the pre-conflict one (Flores and Nooruddin, 2009; David et al., 2011). Using a binary variable rather than a continuous one smooths out high-frequency fluctuations and improves the results, especially in the case of an unbalanced database like ours, and helps avoid producing biased and inconsistent estimates when right-hand side variables are endogenous. To capture the true economic capabilities not affected by the probable recession leading to the conflict, we use an indicator of economic growth averaged over the three years preceding the

²⁷ For the sake of brevity, we present the results of this section in Tables A.5-A.10.

²⁸ The next robustness tests are performed under this criterion of four consecutive years of peace.

conflict. Thus, we end up with the same equations; Equation (2.2) for the political decentralization and Equation (2.6) for the fiscal decentralization but with a binary dependent variable.

Since the dependent variable here is binary, it is inappropriate to apply an OLS method. The linear regression may lead to predictions that are greater than one or less than zero. In addition, a residuals plot would quickly reveal heteroscedasticity. Therefore, we use either a logit or a probit model. Both models solve the problems mentioned by fitting a nonlinear function to the data. That is, they apply a nonlinear function to a linear model. Thus, using equation language, they move from a linear model, $Y = \alpha + \beta X$, to a nonlinear model, $Y = f(\alpha + \beta X)$. Logit and probit models differ in how they define the function. The logit model uses the cumulative distribution function of the logistic distribution, while the probit model uses the cumulative distribution function of the standard normal distribution to define the function. Both functions will take any number and rescale it to fall between zero and one. However, the results of both estimates may be similar. Gill (2001) argues that they provide identical substantive conclusions, confirming Greene's finding that "in most applications, it seems not to make much difference" (2008, 875). Chambers and Cox (1967) conclude that the results of both models are different provided that the sample sizes are larger than 1000 and certain extreme patterns of independent variables appear. Since we observe extreme distribution in the dependent fiscal decentralization variable, as mentioned when discussing Table 2.3, we follow the logit estimate.

Contrary to previous findings, Model PD13 and Model PD14 in Table 2.7 indicate that political decentralization decreases the probability of achieving positive post-conflict economic growth compared to its pre-war level. However, the confidence intervals cast doubts on the significance of this result since they include zero. In addition, we cannot isolate this finding from the fact displayed in Table 2.2 that pre-conflict economic growth in post-conflict decentralized countries is lower than in the other PCCs. This implies a certain level of endogeneity.²⁹

For fiscal decentralization, we estimate the logit fixed effects models using the population-averaged estimator, which specifies only the marginal distribution of the population rather than the full distribution. Moreover, due to the small dataset size, we calculate robust standard errors using a bootstrap method

²⁹ 52.5% of our PCCs dataset face a lower economic growth in the first year of peace compared with the period preceding the conflict.

with 500 and 200 replications in the parsimonious and full models, respectively.³⁰ Models FD12 and FD13 in Table A.9 show that none of the variables, including fiscal decentralization, is significant.

2.6.3 Instrumenting The Decentralization

As mentioned frequently, our key explanatory variable might be endogenous. Political decentralization tends to be the last solution in countries where different groups cannot live together. This endogeneity leads to biased and inconsistent parameters. Therefore, we look for methods to avoid it in the political decentralization equation, Equation (2.2). The instrumental variable is one of these methods, and it became popular in the literature. It is based on finding a variable with exogenous variation, Z_i , that is relevant, being strongly correlated with the independent variable of political decentralization so $Cov(Z_i, PD_i) \neq 0$, and valid, i.e., uncorrelated with any other determinants of the outcome, EG_i , so $Cov(Z_i, \varepsilon_i) = 0$, hence it affects economic growth just through political decentralization.

Finding such an instrument is arduous, especially when the dependent variable is economic growth. Most of the possible social, economic, cultural, and political variables are directly associated with growth and therefore lack exogeneity, or fail to satisfy the exclusion restriction criterion. Therefore, following Miguel and Roland (2011) in their use of a geography-based instrumental variable which was the distance to the 17th parallel demilitarized zone, we use the geographical instrument of *country size*.³¹

This instrument is relevant, since large countries with remote areas need a high degree of decentralization. In addition, geography is “as exogenous a determinant as an economist can ever hope to get” (Rodrik et al., 2004, 136). Geographical size also satisfies the exclusion restriction, since it does not necessarily affect natural endowments, climate, and disease burden, all variables associated with economic growth. It also does not directly affect economic growth. Rodrik et al. (2004) clarify this point when comparing the average personal income of Sierra Leone, 71,740 km^2 , with Luxembourg, 2,586 km^2 . Additionally, we normalize our dependent variable so that it becomes independent of the size and population effects.

However, whether this instrument is valid is highly questionable. It is not always difficult to control extended territories from the political centre. Other factors matter. Some large countries are easily

³⁰ Since the error terms are dependent, as the economic growth rates for the same country are correlated, it is better to employ statistical methods that are able to account for the within-country correlation.

³¹ In fact, *country size* is a geopolitical variable, and its political part is endogenous to historic characteristics that are associated with current rates of economic growth.

centrally controlled when their lands are flat. Therefore, it may be better to look for another instrument that can accommodate this variety. The *mountainous terrain index* set by Gerrard (2014) is useful here. It is commonly used in conflict literature, especially in articles supporting the greed perspective on the occurrence of conflict (Fearon and Laitin, 2003; Collier et al., 2004; Collier and Hoeffler, 2004; Miguel et al., 2004; Collier et al., 2008). Unfortunately, we could not access Gerrard (2014)'s dataset and we therefore keep out former instrument. In addition, we cannot test the validity of our instrument since we use only one.

Using *2SLS*, we find that political decentralization has a positive estimated coefficient in both models PD7 and PD8 in Table A.5. Although insignificant, these positive effects suggest that political decentralization may enhance economic growth in the complier countries, i.e., the large PCCs applying a form of political decentralization. Furthermore, it is worth mentioning that none of the standard control variables is significant in both models.

2.6.4 Using another Dependent Variable

As is evident in our database, most of the PCCs included are poor and have badly functioning institutions and so informality is widespread in those countries. This brings into play the variable GDP per employed worker to measure both economic growth and output level. The results reported in Table 2.8 show no significant effect of political decentralization (PD15 and PD16). Again, this may be due to the small dataset we have that prevents us from reaching significant results. However, we find a significant effect of fiscal decentralization at the 5% level in both models FD14 and FD15 in Table A.10, with a higher negative magnitude in the latter model than in previous models. This indicates that, if the fiscal decentralization variable rises by one percentage point, the economic growth rate decreases by 0.51 percentage points.

2.6.5 War Recurrence Risk

Since we are investigating a PC environment, we account for the possibility of conflict recurrence, which limits any economic recovery efforts. Cevik and Rahmati (2015) found a high persistence in conflict recurrence risk in countries with a history of civil conflict. They find a strong significant effect of this risk for economic growth. According to their findings, a 1% increase in the probability of conflict recurrence in the subsequent period would lower real per capita GDP growth by about 10%. We instead use a variable

containing the number of civil conflicts the country has faced since 1960, since it is intuitive to argue that countries that had an intensive history of civil conflict are at greater risk of relapse.

We find again mixed effects of political decentralization on economic growth, both being indistinguishable from zero, as presented in Models PD9 and PD10 in Table A.5. Hence we find another evident refutation of any causal effect of political decentralization on economic growth in PCCs. The risk effect is insignificant, indicating that the risk of war has no effect on economic growth. This finding stands in contrast to the literature reviewed here.

2.6.6 Communism-Fall Trend

Decentralisation became common by the nineties when many of the highly centralized, communist regimes fell. This led to a new trend of economic and political transitions and growth. Many countries then reacted against decades of autocratic centralization and adopted decentralization. To account for this new trend, we add a dummy time variable where 1990 is the structural break year. We find that 60% of conflicts finished after 1990, and this is relevant to Kreutz (2010). Both PD11 and PD12 in Table A.5 show an insignificant effect with a negative sign on economic growth, meaning that controlling for the new era has changed nothing. On the other hand, the coefficient of the new dummy variable is significantly positive in PD11 at the 1% level, indicating that the wars terminating after 1990 show stronger economic recovery than those that finished before. This dual increase points to a spurious association between decentralization and economic growth post-1990. The fiscal decentralization variable is significant with a negative sign and a similar magnitude to the main finding, as shown clearly in Model FD9 in Table A.8. Population growth and capital formation are significant in Model FD9.

2.6.7 Using another Variable of Fiscal Decentralization

Recent studies distinguish between the devolution of the power to tax and the devolution of the power to spend, and these two shifts in power have not been implemented in equal measure. Decentralisation, indeed, has materialized more substantially on the latter than on the former (Dziobek et al., 2011), creating 'vertical fiscal imbalances' (VIF). VIF measures the extent to which sub-national governments' expenditures are financed through their own revenues including the incurrence of subnational debt liabilities. Although VIF has just a few observations, we use it to check the robustness of our results.³²

³² VIF has been intensively used in the literature (Rodden et al., 2003; Wilson and Wildasin, 2004; Baskaran, 2010; Okma et al., 2010; Karpowicz, 2012; Eyraud and Lusinyan, 2013; Farzanegan et al., 2018).

The fiscal decentralization parameter, reported in Model FD10 in Table A.8, now shows a small negative effect which is marginally significant at 11%. The magnitude of this effect is around one-third of the magnitude reported in the main finding. On the other hand, both capital formation and public consumption appear significant with a positive and a negative sign, respectively.

2.6.8 Using another Estimator for The Fiscal Decentralization Equation

Although the Hausman Test confirms the advantage of fixed effects estimation, it is preferable to check the results using a strategy more appropriate for the data. Table A.11 shows different characteristics of dependent and independent variables in terms of their individual standard-deviation components. Breaking down the standard deviations of the model variables into two dimensions of the panel between countries, *between*, and over time within countries, *within*, we find that the *within* component of the standard deviation of our dependent variable is larger than its *between* component, meaning that this variable is volatile over time within a single country rather than between countries. The situation, however, is not the same for other independent variables, some of them having a larger *between* deviation and the others having a larger *within* deviation. Thus, we search for a mixed effect method; the one proposed by Hausman and Taylor (1981). This estimator adopts the features of both fixed effects and random effects models and provides the measurements of time-invariant variables as well as controlling for endogeneity. It assumes that a sub-set of the explanatory variables is correlated with the individual-level effects, but that none of the explanatory variables is correlated with the idiosyncratic error. Moreover, it corrects for the correlation between the country-specific effects and the explanatory variables by using generalized instrumental variables (Wooldridge, 2002).

Applying this method requires us to determine which of the explanatory variables are endogenous. To do this, we follow a procedure inspired by Baltagi et al. (2003) and applied in Szirmai and Verspagen (2015). Thus, we run several parsimonious regressions of the dependent variable on the explanatory variables on an individual basis and then run a Hausman Test to compare between a random-effects and a fixed-effects estimation. If the test does not reject the Null Hypothesis, the random effects estimation is appropriate and the variable is considered as exogenous. If the Hausman Test indicates that the random effects estimation is inappropriate, we consider the variable as endogenous in the Hausman–Taylor estimations.

Model FD11 in Table A.8 shows a significant impact of the fiscal decentralization variable at the 5% level. It indicates that economic growth decreases by around 0.05 percentage point when the fiscal decentralization variable increases by one percentage point. This result strengthens the position of fiscal decentralization as a significant factor, hampering economic growth in a PC period. It is notable here that this robust significant effect appears when the model includes time-invariant variables, one of which conditions the conflict consequence; economic damage. Like previous fiscal decentralization models, the results show a robust significant enhancing effect of the capital formation, and a negative effect of the population growth that is distinguishable from zero. Trade openness appears significant from this perspective, but with a trivial magnitude.

2.6.9 Graphical Illustration

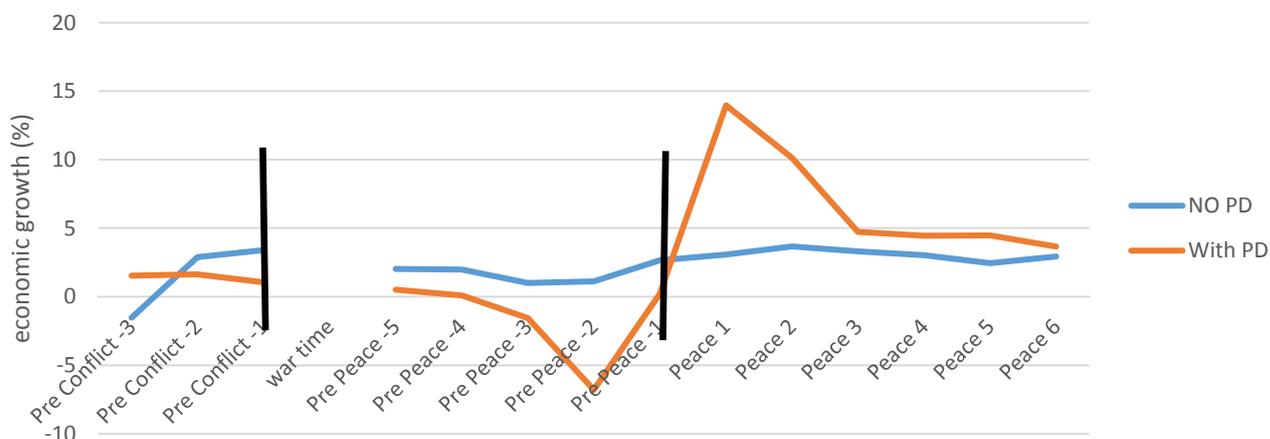
It is clear that the main statistical investigation, as well as the robustness checks, tell us little about the effect of political decentralization on economic growth in the PC period. As frequently mentioned earlier, this might stem from the small dataset we are using which makes tracing a small probable effect of political decentralization very hard. Thus, relying on the familiar significance tests is not preferable and must seek alternative tools for investigation. Gigerenzer et al. point out that Statistics “offers a toolbox of methods, not just a single hammer” (2004, 2). They follow Maslow who stated that, “it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail” (1966, 15-16). These statements suggest that the use of significance tests are not essential but, rather, one option among many. The descriptive statistics in Table 2.2 suggest that growth is higher in the group of PCCs that implement a political decentralization arrangement. This result is not confirmed in the significance tests; hence, we rely on a graphical illustration to clarify further.

Figure 2.1 presents a graphical comparison of economic growth during the conflict circle between the two groups of countries.³³ We notice that economic growth in the group of countries that are to some degree politically decentralized is much more volatile than the other group which is not.³⁴ Indeed, it is intensively volatile during the period around the conflict termination. On average, economic growth in the former group dramatically jumps within the end of conflict period and the first year of peace, strongly declining in the following two years and finally stabilizing with a clear convergence with the other group’s economic growth. This sizable fluctuation’s components nullify each other in the case of PCCs that have

³³ We draw the graph using the stricter criterion of peace sustainability, four consecutive years of peace.

³⁴ Table A.4 introduces the data on which the figure is based on.

followed some form of political decentralization. Therefore, if we exclude this four-year period, we find that economic growth in both groups is somewhat similar.³⁵



Source: This figure builds on Table A.4 and summarizes 61 cases.

Notes: The horizontal line represents the years in terms of conflict occurrence and peace. The first bold black vertical line indicates the last year before the conflict occurred, while the second black line indicates the last year of conflict. The white area following the first black line refers to the wartime, and it finishes five years preceding the peace. The orange line represents the average of economic growth in countries witnessing civil conflicts where the peace agreements include at least one arrangement of decentralization. The blue line represents the average of economic growth in countries witnessing civil conflicts where the peace agreements do not include any arrangement of decentralization.

Figure 2. 1: Comparing Economic Growth Series between Centralized and Non-Centralized Courtiers Witnessing a Civil Conflict.

2.7 Conclusions

Many societies have been recently facing bloody conflicts with historical roots in ways consistent with the conflict trap theory (Collier, 2007). Moreover, Walter (2015) mentions that recurring civil wars have become the dominant form of armed conflict in the world today, while Elbadawi et al. argue that effective handling of PC periods is allegedly “the most important component in international efforts to bring down the incidence of civil war” (2008a, 458). The current chapter, therefore, has tried to add a new knowledge to the PC literature by investigating the role decentralization might play in enhancing economic growth in PCCs.

Decentralisation is one of the institutional arrangements, which are, although important, the least understood of all war impacts. Recently, institutions have become seen as more and more important as growth-enhancing factors, yet some of their effects, including those of decentralization, are still difficult to understand. Moreover, following the effects of decentralization is more puzzling in an insecure

³⁵ This high fluctuation in pre-peace and post-conflict years prevents us to apply a diff-in-diff technique, which was going to help us make the things clearer.

atmosphere such as those found within conflict zones and post-civil conflict territories. This chapter distinguishes two dimensions of decentralization, political and fiscal, and identifies their effects in a PC period. This distinction is essential in our investigation since totalitarian authorities in PCCs often try to manipulate the popular aspiration for real political decentralization with superficial administrative and fiscal reforms.

The current chapter is, to the best of our knowledge, the first contribution to explore the effect of decentralization on economic growth in countries emerging from civil conflicts. This uniqueness is due, to a large part, to the difficulties faced by researchers, most of whom opt to avoid dealing with a topic so difficult to quantify in the ambiguous and insecure atmosphere of a post-conflict or developing country where institutions are immature. Despite of these difficulties, we undertook the investigation. Our goal was to provide first-insight results that, although inconclusive, might be suggestive.

The causality tests do not provide us with significant results about the effect of political decentralization on economic growth. The results, moreover, are mixed. Thus, the chapter reaches neither conclusive nor suggestive results regarding the impact of following a form of political decentralization on economic growth in a post-conflict country. An influential problematic issue that has led us towards insignificant and mixed findings is the very small size of the dataset used. Nevertheless, we argue that, going beyond the issue of the limited scope of the data can provide other implications. Namely, that these insignificant results may reflect the insignificance of the means by which political decentralization procedures are actually implemented in many of the countries mentioned. We suggest that our insignificant findings may point to the superficial modes in which decentralization is utilized by autocratic regimes attempting to disguise dictatorship through policy which appears 'modern and fashionable'.

This conclusion supports a distinction made between a real *de facto* decentralization and the official *de jure* one. Thus, we concur with Hartzell and Hoddie (2003), who distinguish between what is stipulated in a negotiated settlement and its actual implementation suggesting that *de facto* implementation is necessary. We also follow Williamson (1994) who assesses the efficacy of the *de facto* institutional environment, as opposed to the *de jure*.³⁶ This distinction validates the belief that, although central authorities in many countries pretend to apply decentralization, they do so only through superficial legal procedures, thus creating 'nominal' decentralization depicted via nice words in Constitutions and laws.

³⁶ Others also distinguish between the *de facto* and *de jure* decentralisation. Sacchi and Salotti (2014) investigate more about the real fiscal autonomy, and Montero and Samuels (2004) probe this distinction in Latin America.

Fiscal decentralization regressions, on the other hand, always show a negative effect with a medium magnitude. This negative effect is significant in some models, indicating that fiscal decentralization slows economic growth. This is consistent with other scholars who warned against the effects of fiscal decentralization. They claim that detrimental impacts of fiscal decentralization stem from the opportunistic behavior of local officeholders, more common in less well-centralized areas (Shah and Thompson, 2004), fiscal indiscipline, ignoring externalities (Veiga and Kurian, 2015), the extra administrative costs, and poor-but-excessive spending by subnational governments, which leads to lower growth, even if the expenditure assignment is optimal (Davoodi and Zou, 1998).

Considering that most of PCCs are low-income ones, we concur with Fiva (2006) who argues that a relatively high threshold level of economic development at which fiscal decentralization becomes attractive exists. This level exists because at a relatively low economic output, the demands for public goods and services may be sufficiently homogeneous for the central government to have all information necessary to provide for consumer and producer efficiency (Thiessen, 2003). Furthermore, expanding fiscal decentralization in places where institutional mechanisms to control different forms of corruption are absent, which is the case in the post-conflict atmosphere, facilitates, and in turn spreads, local corruption. This raises Paris (2004)'s point about 'institutionalization before liberalization', meaning that some liberalization steps, including democratization and decentralization, may incur negative consequences, unless they are preceded by real institutional reforms.

Besides inhibiting the finding of robustly significant results, especially in terms of political decentralization, the very small size of the dataset used lacks the power to detect any significant results, especially if they are of small magnitude. This leads to a higher probability of a *Type-II error* which is a false negative finding. Accordingly, we use the significance test cautiously and engage in statistical thinking rather than a statistical ritual (Gigerenzer et al., 2004). Thus, we look for other techniques.

Notwithstanding the questions of endogeneity and causality, descriptive statistics in Table 2.2 suggest that higher economic growth is associated with political decentralization. While the average economic growth of a median PCC that is ruled centrally is 2.9% for the whole PC period, a PCC that follows at least one form of political decentralization grows at 3.8% per year. However, the graphical depiction alerts us not to take this conclusion for granted. It illustrates the dramatic fluctuations of economic growth at the end of the conflict and the beginning of peace in countries following some sort of political decentralization. Later, if and when peace is sustained, economic growth converges steadily with the

economic growth of the other group of PCCs. Locals, investors, and the international community become optimistic by the end of the conflict phase when the factions reach an agreement including some kind of self-rule, and this motivates the prosperity of economic life. Often, though, the state of peace is somehow compromised and tensions grow which again causes insecurity and capital flight from a PCC. Later, security spreads and stabilizes the economy. This is because a conflict relapse is less probable in the period following the first PC year and the eventual securitization of the environment supports a business-friendly environment.

This chapter raises concerns over the presumed superiority of political decentralization as a post-conflict political system. Considering that the absence of evidence does not mean an evidence of absence, we think that, all too often, political decentralization is implemented only through paper and rarely exists as a political reality in the cases of the countries studied. Either this, or governments simply expand the fiscal delegation of seniors in localities, leading to higher corruption. Our assertion concurs with Alm and Boex (2002), who argue that without the institutionalized capacity for action and political know-how, fiscal decentralization is meaningless.³⁷ Thus, the present chapter supports the implementation of a more genuine political decentralization in PCCs, which would be an actual concretization of power-sharing between the fighting parties to sustain peace and, in turn, foster economic growth. We are consistent with Kernan (2000), who recognizes two forms of decentralization: decentralization of policy implementation and of political decision-making, with the real decentralization including the right to decide in addition to the right to act.

Our assertion of the superiority of political decentralization, on the other hand, is full of caveats. Political decentralization may raise incentives to local corruption (Goldsmith, 1999; Treisman, 2000; Lessmann and Markwardt, 2010), especially in immature democracies, where sub-central politicians are probably elected on the basis of tradition rather than performance (Tendler, 1997). In addition, applying political decentralization in conflict countries raises the danger of ethnic massacres, particularly when ethnic groups are geographically dispersed. In such circumstances, the federal plan may end up sparking a conflict between ethnic groups making competing claims over the same land in which each tries to conquer territories of neighbouring groups, through violent means if necessary (Hardgrave, 1993; Lake and Rothchild, 2005).

³⁷ Our conclusion, on the other hand, does not agree with that of Kyriacou and Roca-Sagalés (2011), who concluded that fiscal decentralization improves government quality, but not if it is accompanied by political decentralization.

To reach conclusive, and not only suggestive, findings, we recommend further investigation using larger datasets. Nevertheless, this does not imply loosening the criterion identifying the PC period. A key option here is not to allow enquiry to stop at the official peace agreements that are well documented, but to study the unofficial peace arrangements for each case individually. Moreover, we recommend that researchers review the fiscal records of PCCs and look for an available index that properly reflects fiscal decentralization. Though the database used here includes about 1050 observations of PC years, fiscal decentralization data is available just for 177 observations, and this lowers the robustness of our results. Following these recommendations would require communal efforts and generous funding, neither of which is an option for the author of this thesis.

Last, but not least, it is important to state that countries are different in terms of their socio-economic characteristics besides their ethnic, sectarian, and linguistic compositions. This means that different countries have different 'optimal levels of decentralization'. Put differently, decentralization is not a panacea and must be tailored to the country's particular context (Bastian and Luckham, 2003), as its effect depends on the gap between the real and optimal levels of decentralization. An index for the optimal level of decentralization consists of different sub-indicators, for example: religious and ethnic fractionalization; population size; inequality; government expenditure; and the size of the country. We strongly recommend a further investigation which includes such an optimal variable in future decentralization-economic growth nexus research.

Chapter 3

3 Exchange Rate Effects on The Short-run Growth in The Post-Civil Conflict MENA Countries

“And then God created the Middle East and said, let there be breaking news and analysis.”
Karl Remarks

3.1 Introduction

Among natural and man-made disasters, civil conflict often bears the highest economic, social, and humanitarian costs. Besides the tragic consequences a civil conflict brings, its impacts are everlasting. Murdoch and Sandler (2004) find that civil war decreases a country's growth rate by 85% in the first five years of peace and while there is recovery, growth is still lower by 31% after thirty-five years. In brief, civil conflict is development, but in reverse (Collier, 2007).

As the war-torn society in question collapses, so do the public institutions. The state becomes ineffective and unable to fulfill its functions. Accordingly, the regulations-based market fades away and more and more transactions tend to be done within the black market. These unregulated transactions place at risk both the micro dealers and the overall economy. Fundamentals become unstable, and different agents lose confidence and try to minimize their connections with their formal economy, including the local currency. Some people, mostly the rich, are able to exchange a part of their wealth to alternative stores of value such as foreign currency and precious metals (Addison et al., 2002) with unlicensed bankers, who lack compliance with regulations and custom. Later, these unregulated transactions pull down the value of the local currency, often leading to a disastrous overall economic contraction in addition to pro-rich distributional effects. Both effects are potentially long-lasting and hamper post-conflict peaceful efforts, making the achieved peace unsustainable and leading to a vicious conflict trap. This trap is tighter in the world's most conflict-prone region, the Middle East and North Africa (MENA).

Due to its strategic geographical position, the MENA region has witnessed many events whose consequences have gone beyond not just its borders, but also their time. Barakat stated that “The

centrality of the Arab World in ancient and modern times has qualified it to serve as an important nodal point in human history. It has acted as a passage connecting Asia, Africa, and Europe. It has produced some of the most important intellectual, cultural, and religious contributions of recorded history. It is this position at human and geographic crossroads, and not merely its oil and other resources that makes the Arab World so strategically significant” (Barakat, 1993, 31). As a consequence of this central geographical position, conflicts have been frequent, and this trend has dominated in recent history.

Since its modern foundation, the MENA region at large has experienced civil conflicts leading to a permanent atmosphere of instability. Nonetheless, these conflicts are not purely ‘civil’ and many Arabic countries have a hand in conflicts outside of their territories. This political and security interference is not just because of the common borders, but also because of the strong connections of their people where the majority hold similar beliefs, culture, and religion and share the same history.

These civil conflicts, on the other hand, strongly influence the economic output and growth of the region. Furthermore, the economic effects persist years after the conflict terminates. Thus, one can say that political instability generates economic instability, hence motivates price instability, including instability in the exchange rate, which retards economic growth.

The exchange rate, as well as other tools of monetary policy, has not been under intensive discussion in the economic literature concerning the MENA. This is because of the backwardness of the monetary systems in the region, alongside the underdevelopment of economic education. Therefore, the present chapter tries to fill this gap by analyzing the exchange rate volatility (ERV) of the MENA countries and identifying the volatility impact on their economic growth as they emerge from civil conflict. In doing so, the chapter employs various technical methods. First, we observe graphical illustrations and descriptive statistics to draw out some preliminary findings. Next, the chapter applies other techniques that address the endogeneity and country-specific unobserved characteristics, System-GMM and fixed effects in addition to other techniques proposed for dynamic panels, the iterative bootstrap-based bias correction for the fixed effects estimator (BCFE) and the bias-corrected LSDV.

The rest of the chapter proceeds as follows: Section 3.2 introduces the geographical scope of our investigation and discusses the context of conflicts there. Section 3.3 surveys the literature on the exchange rate-economic growth nexus, while Section 3.4 discusses the reasons behind high volatility post-conflict and the channels through which exchange rate stability supports economic growth. Section

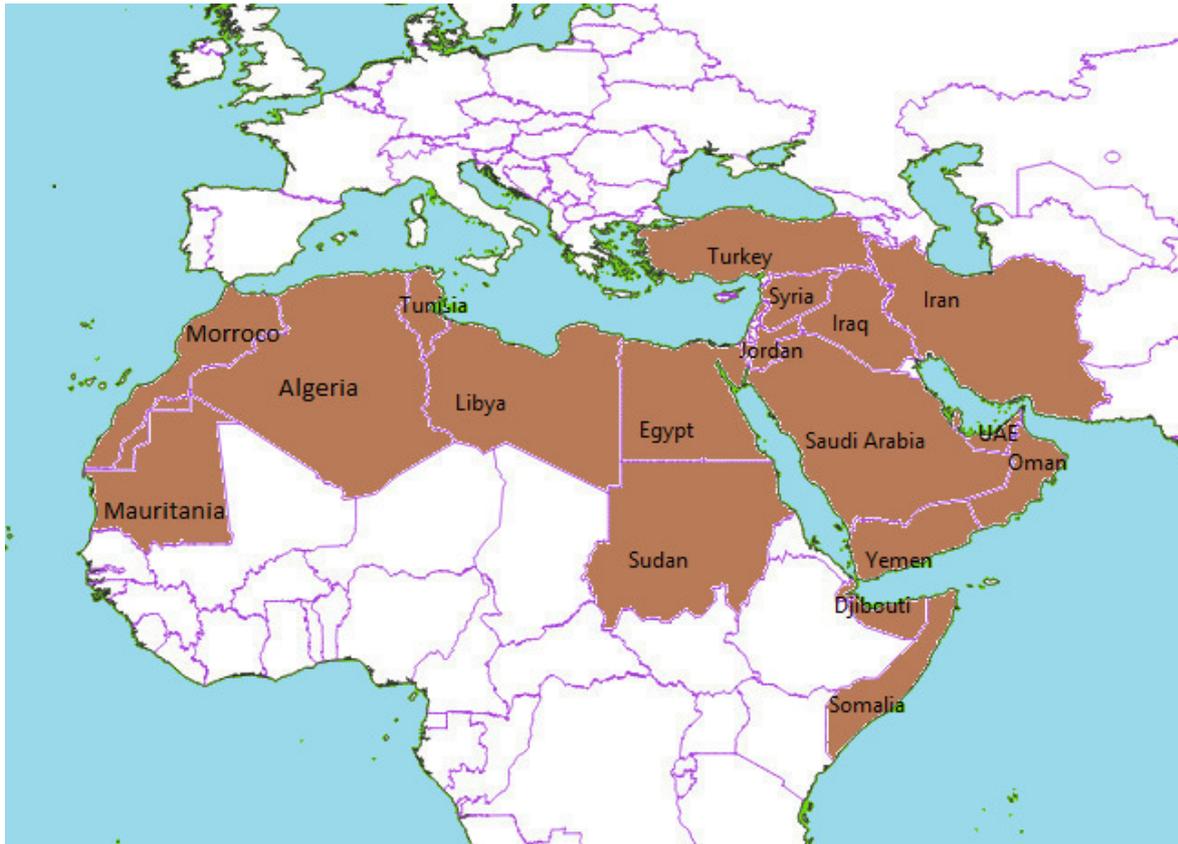
3.5 is the empirical part of the chapter in that it introduces the model and methodologies used in our analysis and then presents the empirical results. Section 3.6 performs a further robustness analysis of the findings, while Section 3.7 offers a brief discussion of the results. Section 3.8 offers concluding remarks.

3.2 The Middle East and North Africa

3.2.1 Geographical Scope

The term *the Middle East* appeared centuries after the western concern of this region had increased. Since the Crusades, East, *Orient*, was identified with Islam and West, *Occident*, became identical with Christianity. The regions were thus symbolically divided according to two belief systems. Later, in the last quarter of the Eighteenth Century, Europeans referred to the territories controlled by the Islamic Ottoman Empire as the *Near East*, while Mahan and Chirol used the term *the Middle East* to call the Gulf of Aden and India in separate articles published in 1902 (Davison, 1960). Due to the political changes after WWI, a need to change the definition of the geographical area referred to as the Middle East appeared, and in March 1921, Winston Churchill, with the help of the Royal Geographical Society, was re-mapping the Middle East from the Bosphorus to the western borders of India (Özalp, 2011). Later, this term appeared frequently in the international literature.

However, notwithstanding the adoption of the term the Middle East in the international literature, there is no a common agreement on the extension of the geographical areas and the Middle East countries (Johannsen, 2009). Scholars have included different countries, although overlapped, when using this phrase. Many consider it the countries that were occupied by the Ottoman Empire (Tunçdilek, 1971; Brown, 1984; Tibi, 1989), others referred to it as the Islamic countries (Steinbach, 1979), some consider it as limited to the Arabic countries (Hudson, 1976), and a few have included more African countries such as Ethiopia (Davison, 1960). To make our contribution consistent with the recent literature, we follow Owen (2013) who defines the Middle East and North Africa countries as being made up of the Arabic countries in addition to three non-Arabic countries: Iran, Israel, and Turkey.



Source: QGIS Application.

Notes: The MENA region includes Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, Sudan, United Arab Emirates, and Yemen.

Map 3. 1 The Middle East and North Africa.

3.2.2 Civil Conflicts in The MENA

The MENA region has frequently suffered from violence for many years. This violence became a normal way of ruling and transferring power since the modern political foundation of the MENA by the end of WWI. In the first half of the 20th Century, a second wave of European Colonialism spread over the MENA countries and was confronted by national liberation movements that used violent, armed resistance. Later, and during the first phase of independence, national comrades began to fight each other and many civil conflicts occurred, leading in many cases to dictatorship. A few countries became democratic, but this did not always lead to a peaceful transfer of power. On the other hand, pre-1990 conflicts were part of the Cold War with factions receiving support from their allies in Moscow or Washington. Violence decreased in the nineties and the region became stable after Kuwait's Liberation Process in 1991. However, violence has spread again and there are currently many conflicts today in the MENA region.

Bloodiness, tragic consequences, and externalities distinguish the civil conflicts in the MENA. According to UCDP, the region accounts for 40% of the estimated global total of battle-related deaths since 1946. Besides, Rother et al. (2016) argue that three years of conflicts following the Arabic Spring led to GDP losses of 6 to 15 percentage points in the MENA conflict countries compared with 4 to 9 percentage points worldwide. Furthermore, MENA conflicts generate large externalities represented by refugee outflows and energy-price fluctuations. Around two-thirds of current refugees worldwide come from the MENA, with the three main countries being Syria, Afghanistan, and South Sudan.³⁸ On the other hand, energy-price instabilities are still the clearest externality caused by conflicts occurring in the MENA. This region owns 55% of global oil reserves (Guidolin and La Ferrara, 2010); and therefore any sort of tension there affects prices, output, employment, and economic growth worldwide. One can easily notice two abnormal shocks in global economic graphs: one appeared in 1973-1974, and the other arose in 1979-1980. These shocks stemmed from two events occurring in the MENA region: the 1973's *Yom Kippur War* and the 1979's *Iranian Revolution*. Using event study methodology to analyze the impact of conflict on a selection asset markets, Guidolin and La Ferrara (2010) find that the Middle East is very important for commodity indices including oil prices as 73% of conflicts occurring in this region have an impact on oil futures, and this impact is distinguishable from zero.

Conflicts in the MENA are connected, both spatially and over time. Cevik and Rahmati (2015) define the temporal links of the conflicts and show that countries in the Middle East appear to suffer from a high risk of conflict recurrence without much decline over subsequent years. On the other hand, the MENA countries are connected geographically, economically, and culturally, showing a strong tendency for intervention from other nations in the region. The famous words of Elias Hrawi, the former President of Lebanon, when describing the civil conflicts in his home: "it was not our conflict, but others' in our land," attest to this (Atallah, 2008, 217).

This between-MENA-countries interference has historical roots. During the thirteen centuries preceding WWI, the majority of the region's territories were controlled by different powers that ruled through one ideology, Islam. The Ottoman Empire was the last great state controlling the region, and its fall finished the *Caliphate* and paved the way to construct modern artificial countries that host people sharing a common history, culture, alphabet, feelings and demographical connections including tribal relationships. Heydemann (2008; quoted in Yousef, 2004, 95), points out that, "the region's exceptionalism is a recent

³⁸ UNHCR. (2018, May 25). *Figures at a Glance*. Retrieved from: <http://www.unhcr.org/figures-at-a-glance.html>

phenomenon and in no sense a cultural one derived from intrinsic beliefs, values and norms in Arab-Muslim societies.” These sharing values and senses prevent the creation of different identities in new-born societies, hence they validate Anderson’s theory of ‘imagined communities’ (Anderson, 2006); communities within the Middle East are similarly produced, and engineer similar power hierarchies between them, leading to a strong collective imagining.

The establishment of the MENA modern states by the end of WWI explains the main part of this connectedness. The Allies, who won WWI, including Britain and France, divided the Arabic territories formerly occupied by the Ottoman Empire. Later, these colonial powers would create the key structures and the public management of the new states. Owen (2013, 9) discusses this development:

“As far as the Middle East was concerned, it was generally the dominant colonial power that first created the essential features of a modern state, by giving it a centralized administration, a legal system, a flag and internationally recognized boundaries. In some cases this was done on the basis of some pre-existing administrative entity, as in Algeria; in others it involved either detaching a part of a former Ottoman province (for example, Trans-Jordan) or, more usually, adding several provinces together (for example, Syria and Iraq). This gave many of the new states a somewhat artificial appearance, with their new names, their new capitals, their lack of ethnic homogeneity and their dead-straight boundaries that were so obviously the work of a British or French colonial official using a rule.”

These new states host people that belong to different ethnic, linguistic, and religious groups. Barakat said that “[c]ertain communities were imposed on others within the same country” (1993, 6). Thus, these heterogeneous communities are more probably to be involved in civil conflicts. One year after the civil conflict erupted in Lebanon, Anne Sinai and Chaim Waxman argued in the introduction to the Middle East Review (1976, 5):

“[T]he current civil war in Lebanon is but the latest and most publicized in a broad range of events and situations which belie the contention that the Middle East is a unitary world of Arabs with a common background, culture, language and identity. The Middle East in fact consists of an intricate mosaic of different peoples... There are Shi’ites . . . Alawites, Druze, Yazidis, Isma’ilies and followers of various other Muslim denominations, who cling determinedly to their own style of faith and their own set of beliefs. They are not even necessarily ethnically ‘Arab,’ being the descendants of many different peoples conquered and converted by the Islamic armies. . . . The first of the three great monotheistic religions, Judaism, and the people with whom it is identical, have been part of the Middle East mosaic from their beginning. . . . There are, in addition . . . other small religious groupings, each clinging to its own distinctive identity. No Arab state, thus, can claim societal homogeneity and all consist of major and minor religious, linguistic.”

Moreover, the ethnic and religious groups, as well as tribes and families, were divided between adjacent countries. This created socially and culturally incomplete entities, where people in one country are annexed to their counterparts in other countries. Hence, a motivation and a tool to intervene in neighboring countries arose.

Furthermore, current economic ties, especially employment, support the social roots and make people of different MENA countries more connected. Millions of the migrant MENA labour force work in the rich Gulf countries, and their remittances support their families and their governments in their homelands. These remittances are not only financial but also social, meaning that migrants transfer new ideas, values, and behavior to their home countries (Levitt, 1998) having an influence on political attitudes and behavior of families staying in the homelands. Investigating the diffusion of political Salafism among Egyptians working in Saudi Arabia, Karakoç et al. (2017) find that the strongest support for the *Nour Salafism Party* came from individuals whose family members had immigrated to Saudi Arabia.³⁹

Intra-trade and investment flows are other economic ties supporting Arabic connectedness. According to reports published by the Arab Monetary Fund (2017), many Arabic countries heavily rely on trading with other Arabic countries. Somalia, Djibouti, Jordan, Lebanon, Syria, Egypt, and Sudan export 91%, 85%, 50%, 45%, 40%, 32%, and 30% of their total exports respectively to other Arabic countries, while the intra-Arab investments jumped from 3% to 15% of the total Arabic GDP between 2000 and 2008 due to oil-price booms.

Combined with soft budget constraints in the oil-exporting countries, these strong interconnections facilitate inter-country interventions. Besides, the military rule, common in most of the MENA countries, intensifies this trend. Picard (1993) argues that the statist preferences, mass politics, and anti-colonial struggles which existed in the post-Ottoman Middle East, lead to strong involvement of the military in politics. Those military governments appear to operate according to a logic of expansion and hence intervene in the political life of neighboring states.

3.2.3 Economic Growth in The MENA

Over the last fifty years, the MENA per capita GDP has grown by 2% per year, 0.2 percentage points more than the World mean. However, this growth was much higher during the sixties and seventies when the economic growth rate was 5.8% and 2.9%, respectively, as one notices from Table 3.1. The region suffered a deep recession during the eighties, when the annual growth was negative of 0.6%, due to the high political instability. The economy improved by the last decade of the Twentieth Century before it fixed with a low level of growth of 1.8% in the New Millennium. These fluctuations in economic growth

³⁹ Nour Salafism Party, which means Party of The Light, is one of the political parties created in Egypt after the 2011 Egyptian Uprising. It has an ultra-conservative Islamist ideology, which believes in implementing strict Sharia law.

reflect the unsustainable factors on which MENA growth depends and the sensitivity of MENA economies to internal and external shocks.

Table 3. 1: Economic Growth over The Period 1960-2014 (%)

Country	1960-2014	1960s	1970s	1980s	1990s	2000s	2010-2014
Oil-exporting Countries							
Bahrain	0.2	na	na	-1.81	2.54	-0.91	1.34
Iran	1.78	8.68	3.1	-4.07	2.88	3.62	-0.55
Iraq	4.67	-0.26	6.85	-0.03	11.4	1.84	2.93
Kuwait	-2.5	-2.6	-4.01	-5.07	-1.84	1.04	-1.74
Libya	2.45	na	na	na	na	2.75	1.85
Oman	8.28	40.06	2.22	4.79	1.56	1.2	-4.93
Qatar	1.64	na	na	na	na	0.89	2.98
Saudi Arabia	1.06	2.03	6.43	-5.72	0.29	2.3	2.76
UAE	-2.35	na	-0.53	-4.55	0.1	-4.85	0.69
Other Countries							
Algeria	1.46	1.36	4.18	-0.21	-0.41	2.41	1.37
Djibouti	0.06	na	na	na	-4.02	2.13	3.29
Egypt	2.61	0.33	3.96	3.18	2.29	3	0.51
Israel	3.01	5.43	2.94	1.84	4	1.63	1.88
Jordan	2.41	na	11.04	0.14	0.55	4.05	0.45
Lebanon	2.55	na	na	-42.62	7.88	2.37	1.29
Mauritania	1.17	5.04	-0.28	-0.59	-0.25	1.52	2.83
Morocco	2.73	3.52	3	2.48	1.54	3.61	2.25
Somalia	-0.3	-1.18	-0.43	0.8	-2.05	na	na
Sudan	1.35	-1.57	1.04	0.3	1.33	4.1	3.88
Syria	2.61	3.38	5.21	-0.55	2.75	2.25	na
Tunisia	3	2.54	4.95	1.03	3.28	3.54	1.41
Turkey	2.56	3.22	2.28	1.91	2.32	2.38	4.09
Palestine	2.8	na	na	na	12.27	-0.9	0.75
Yemen	0.42	na	Na	na	1.37	1.29	-3.88
Total	2	5.81	2.89	-0.57	2.37	1.79	1.29

Source: World Development Indicators, World Bank.

Notes: 'na' stand for non-available data.

Moreover, economic growth varies between countries and not just over time. The MENA region consists of different countries with different economic structures. Some are very poor, while others are very rich due to oil resources. Pamuk (2006) finds that oil-exporting countries showed high rates of growth since the interwar period due to the new discoveries of oil at that time. These rates slowed down by the mid-seventies. Indeed, these economies shrank by 2.35% in the eighties and, since the New Millennium, the growth has not exceeded 1%. Other countries enjoy a stable economic performance, and they have achieved more annualized growth than the former group over the whole period. Nonetheless, the economic performance in the non-oil exporting group follows the other's.

The literature confirms the core role of oil, but not the standard determinants, in the region's economic output. Al-Mulali (2011) argues that the economy of the region has been heavily affected by the fluctuations in oil prices and the political disorder. Determining the overall growth performance of the MENA region over the period 1960–2000, Makdisi et al. (2006, 31) conclude that:

“In comparing the growth pattern of the MENA region within an international perspective, we have found that: capital is less efficient; trade openness less beneficial to growth and the impact of adverse external shocks more pronounced. In addition, Total Factor Productivity Growth (TFPG) in the MENA region was not an important source of growth in comparison to the other regions owing to among other things, the lower quality of its institutions, modest stock of human capital and its educational system that focused on preparing students for public sector employment.”

3.3 Literature Review

The Solovian Growth Models, which assumed a closed economy, highlighted little, if any, importance of international trade (Lewis, 1954; Solow, 1956; Kaldor, 1966). Accordingly, early research considered the exchange rate a nominal variable that had nothing to do with real long-term economic performance (Bayoumi and Eichengreen, 1994; Levy-Yeyati and Sturzenegger, 2002). Later, recent growth models assume an open economy, so they include trade effects when exploring the determinants of growth. The Import-substitution and Export-led Growth paradigms are the most famous ‘Open Economy’ models on which scholars depend to study the effects of international trade on growth. The Export-led Growth paradigm preceded the Import-Substitution models that had dominated development thinking in the thirty years following WWII. It builds on the idea that exchange rate depreciation supports the competitiveness of exports, hence the steady-state rate of economic growth moves up.⁴⁰

Nevertheless, raising the competitiveness of exports is not the only way in which the exchange rate influences economic growth. Razmi et al. (2012) predict a positive association between the degree of exchange rate undervaluation and the capital accumulation rate in countries where underemployment dominates and are reliant on imported capital goods.

Although based on a simple theoretical background, the empirical literature shows mixed evidence. We charge this inconclusiveness to the various variables and methodologies used to trace the exchange rate effect, and to the complicated, nonlinear association. Misalignment, for example, which measures the gap between the real exchange rate and the equilibrium exchange rate, appearing extensively in the

⁴⁰ Balance-of-Payments Constrained Growth Model (BPCG), first developed by Thirlwall (1979), is the most famous Export-led Growth Model. It suggests that the external balance requires setting a limit on the sustainable levels of aggregate demand. To the extent that real exchange rate depreciations relax the external constraint, a depreciation would promote growth in this framework.

literature, is computed differently among empirical studies (see Edwards, 1989; Williamson, 1994; Stein, 1994; Rodrik, 2008; Elbadawi et al., 2008b). Moreover, using this variable, Razin and Collins (1997) and Aguirre and Calderón (2005) find a nonlinear association; while moderate undervaluation might support growth, extreme undervaluation leads to less growth.

Therefore, many authors use non-linear techniques to claim that a certain amount of misalignment advances economic growth. Couharde and Sallenave (2013) show that undervaluation up to 18.7% supports growth, but any additional undervaluation of 1% will shrink economic growth by 3%. Some, however, confirm the importance of keeping the real exchange rate around its equilibrium level due to their belief that real exchange rate misalignment, regardless of its sign, leads to efficiency reduction and resource misallocation. Focusing on the nonlinear link between real exchange rate misalignments and the growth performance of six Latin American countries, Mejia-Reyes et al. (2004) suggest that countries have no incentive to use undervaluation to enhance growth, but rather to ensure that exchange rates remain around their equilibrium levels.

Other authors, on the other hand, look for empirical proofs for the Export-led Growth model, by exploring the effects of exchange rate trends such as depreciation or appreciation. Identifying determinants of 'growth episodes' in the second half of the Twentieth Century, Hausmann et al. (2005) find a positive association between growth acceleration and real depreciation. This conclusion is similar to that shown by Guitian (1976) and Dornbusch (1989) that a depreciated currency leads to economic growth via the channels of export and domestic demand. However, the Structuralism School (Alejandro, 1963; Van Wijnbergen, 1986) opposes the previous findings by proving a potentially adverse impact of depreciation. It implies that the expected imported inflation can reduce any induced incentives to invest (Calvo et al., 1995). Moreover, Levy-Yeyati and Sturzenegger (2007) find evidence of the virtuous depreciation-growth circle via investment rather than exports. Eichengreen and Hausmann (1999) present another contractionary channel of depreciation: *the Original Sin*. This Sin demonstrates how difficult it is for economies with depreciated currencies to borrow from financial markets or even from their domestic markets.

Recently, volatility has dominated the literature tracing the effects of the exchange rates on economic growth. This recent literature shows mixed evidence. While Dollar (1992), Kandil (2004), and Bosworth et al. (1995) find negative effects of ERV on economic growth, due to different channels including inflation and total factor productivity, Vieira et al. (2013) and Gadanecz and Mehrotra (2013) find that higher

volatility has a positive effect. The latter finding suggests nonlinearities between ERV and output volatility among emerging economies and suggests that real ERV absorbs shocks and limits output volatility. Eichengreen and Gupta (2013) on the other hand, argue that excess ERV reduces economic growth by creating business uncertainty, deteriorating competitiveness, and increasing domestic prices as well as lowering productivity and profits.

The variety in measuring the main explanatory variable extends to the dependent variable. Some authors investigate the direct effects of the exchange rate on economic growth, while others trace its impact on other fundamentals, particularly on exports (Neary and Van Wijnbergen, 1986; Corden and Neary, 1982). Another group studies the effects on foreign direct investment or on other sorts of capital inflow and outflow. Razmi et al. (2012) find a positive relationship between real exchange rate undervaluation and investment growth.

Further, authors started conditioning the nexus using different variables to dissolve the perplexing relation. Elbadawi et al. (2008b), for example, find that institutional development, represented by financial development, not only improves growth directly, but also ameliorates the negative repercussions of real exchange rate overvaluation. Their conclusion is similar to that of Aghion et al. (2009). Others, on the other hand, find that the exchange rates is a channel through which nation's natural resources affect its economic competitiveness. While Corden and Neary (1982) confirm the 'deindustrialization' effect, meaning that an increase in natural resource revenues will deindustrialize a nation's economy by raising the exchange rate, and thereby making the manufacturing sector less competitive, others highlight the relative unimportance of the exchange rate, showing that the abundance of natural resources may affect economic growth through different channels, for example by encouraging rent-seeking behaviour (Corden and Neary, 1982; Neary and Van Wijnbergen, 1986; Al-Kasim et al., 2013) or diverting attention and resources from human capital development (Gylfason et al., 1999; Gylfason, 2001).

This vast literature, however, does not investigate the nexus in a PC period. Most of the related papers control for the exchange rate when investigating the effects of international aid on economic growth, while others explore the effect of exchange rate appreciation caused by PC aid and capital inflow on exports (Collier and Hoeffler, 2004; Clemens et al., 2012; Kang and Meernik, 2004; Elbadawi et al., 2008b). Elbadawi et al. (2008b) is, to our knowledge, the only study that investigates the direct and indirect effects of exchange rate misalignments in PC countries. After showing that a median PC country is Dutch-Disease free and suffers from moderate real exchange rate overvaluation, which is not attributed to the

aid flow, the authors found that real exchange rate misalignment has a large, linear negative effect on PC growth. In other words: the direct effect of half a standard deviation change in real exchange rate misalignment would amount to approximately 5% loss in economic growth.

The current chapter is more geographically concentrated and uses different estimation techniques. While the aforementioned literature uses a global database, the present chapter focuses more on the MENA. Focusing on just one region may make the units studied semi-homogenous, which would lead to reliable results. Moreover, studying the effect of exchange rate volatilities on economic performance is key in the MENA context due to a high level of connectedness between the countries there and the reliability of economic indicators, including growth and the ERV, on oil revenues and shocks. In addition, the chapter uses different techniques to trace the effect, using simple but less used dependent variable: exchange rate volatilities.⁴¹

3.4 Volatility Mechanism and Effects

Based partially on Table (4) of Elbadawi et al. (2008b) and on glancing over various countries that have faced civil conflicts, especially the current Syrian civil conflict (SCPR, 2016a), we notice puzzling trends of the exchange rates during the conflict circle. In short, the exchange rate stays stable during the early phase of the conflict. Suddenly, it starts to fall down, interrupted with periods of stability. Later, the path becomes more confusing and the exchange rate fluctuates intensively just before the conflict terminates and within the first years of peace. It briefly stabilizes should peace is foreseen, but tends to increase and decline dramatically both immediately before and after the end of the conflict. This general path, however, varies between different cases due to pre-conflict social and economic systems as well as the conflict's severity and duration. The present section discusses the reasons behind this unstable path and shows the channels through which exchange rate stability influences economic growth.

Conflict effects last economically and psychologically. Locals have already lost their assets, and currency depreciation has likely downgraded their savings. Furthermore, they feel the peace itself to be unstable. Thus, they lose confidence in their economy and use their local currency, as a medium of exchange and a store of value, less. Moreover, the hyperinflation growing during the conflict exaggerates this mistrust

⁴¹ It is worth mentioning that, unlike the worldwide-focus research, papers investigating the nexus in the MENA countries reach a conclusive finding. They show that the Middle East's cycle of boom, bust, and slow recovery is arguably tied to the natural-resource curse (Sachs and Warner, 1995; Auty, 2001). However, in their recent work, some papers notice the institutional development those countries are having recently, hence find positive effects. Apergis and Payne (2014) show that starting from 2003, and in some countries with less population, oil reserves have a positive impact on growth, contrary to the *Oil Curse Hypothesis*.

and leads to a high 'dollarization', intensively using U.S. Dollars in daily transactions as an alternative to the local currency (Addison et al., 2002). This phenomenon reveals a ratchet effect or an asymmetric reaction since depreciation increases dollarization, whereas appreciation decreases it less proportionally. Thus, neither stability nor appreciation of the exchange rate can fully recover confidence in the local currency.⁴²

The PC local currency, on the other hand, rebounds partially since it enters the time of peace with a mildly undervalued exchange rate observed during the four years preceding the peace (Elbadawi et al., 2008b). Further, international aid, remittances, and capital flow to a PC country cause the local currency to appreciate. Aid rises fourfold between the pre-peace and PC periods (Elbadawi et al., 2008b), and remittances surge since the numbers of refugees and immigrants peak by the end of the civil conflict. A growing body of literature has shown that diaspora support family or friends living at home (Horst, 2008; Lindley, 2009; Carling et al., 2012) and Collier (2007) suggests that money transferred from the diaspora strongly contributes to the rebuilding process, but he warns that an overvalued exchange rate taxes remittances and, therefore, discourages them.

Capital flows tend to increase as peace is restored, and lucrative rebuilding opportunities that motivate companies' entry into PC countries appear. Moolo and Khachaturian (2009) state various reasons for this. First, due to conflict damage, a likely demand for infrastructural projects emerges, providing investment opportunities for outside investors; second, many states engulfed with civil war own abundant natural resources, which are attractive to investors (Farzanegan et al., 2018). Further, investors tend to invest early to capitalize on cheap investments to avoid potential competition and have proprietary access to lucrative contracts. As the state emerges from conflict and begins to develop economically, there is likely to be a corresponding increase in the costs of doing business there.⁴³

The aforementioned factors are intensified during the very early years of peace, making the interim government's goals of recovering the economy and sustaining peace more difficult to achieve. By stabilizing the exchange rate, the interim government regains confidence in the local currency and

⁴² Indeed, not just the local currency becomes less trustworthy, but also the complete financial system. Addison et al. (2002) show that conflict significantly reduces financial development. They argue, "[l]egislation to protect the public interest is either not forthcoming or it is not enforced. Unsound banks are licensed, and unsound lending practices are not restrained. The resulting financial crises undermine public confidence in the formal financial system, and the use and availability of formal financial-instruments contract" (Addison et al., 2002, 1).

⁴³ However, investors are worried of war recurrence or even of the permanent level of insecurity following the conflict (Gupta et al., 2004; Collier, 1999; Imai and Weinstein, 2000). Hayakawa et al. (2013) show that among various sorts of the risks, only the political risk is adversely associated with FDI inflows, and this effect is stronger in the case of developing countries.

economy and, more importantly, in the peace process. This helps activate commodity and financial markets and attract investments. Appel and Loyle (2012) find a strong negative effect of ERVs on FDI in a PC atmosphere, while Cevik and Rahmati (2015) argue that the PC feeling of instability, reflected by the expectation that war will be resumed, negatively impacts economic growth.

In addition, exchange rate stability supports the productive investment of capital. In times of shocks, when the exchange rate fluctuates widely, capital moves from productive investments to speculative activities. Dibeh (2002) claims that speculation against the Lebanese Pound during the bloodiest phase of the Lebanese civil conflict, 1986-1988, became one of the vehicles of profit making for banks and that bank loans for speculative purposes substituted loans for productive purposes.

Exchange rate stability, moreover, may relax the budget constraints of the interim government. Besides being highly indebted, a PCC emerges from conflict with the entire work of rebuilding to carry out, while often lacking sufficient funds to cover the large public expenditure. Addison and Murshed (2003) state that in a prolonged conflict the tax base declines along with the economy, thereby reducing the size of the fiscal transfer the state is able to offer, compared with the initial transfer it should have made to avoid relapsing into war. As such, the ability of many PCCs to deliver collective goods heavily relies on access to foreign credit that is constrained due to the *Original Sin* (Eichengreen and Hausmann, 1999). Exchange rate stability is then reflective of political stability and good macroeconomic management of the State. This encourages creditors to lend to the interim government. Barro (1979) mentions that borrowing provides the state with the ability to face unexpected increases in public expenditure without increasing tax rates.

3.5 Empirical Study

3.5.1 Model

Based on the literature review, our analysis starts from the following dynamic equation:

$$y_{i,t} = \delta y_{i,t-1} + \beta ERV_{i,t} + \varphi F_{i,t} + \omega D_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (3.1),$$

where $y_{i,t}$ stands for the log of real per capita GDP in a country i in the time period t . $y_{i,t-1}$ is the lagged economic level; $ERV_{i,t}$, stands for exchange rate volatility, the key explanatory variable; μ_i captures the country-specific effects; v_t stands for time-specific effects; $\varepsilon_{i,t}$ is the white-noise error

term; $F_{i,t}$ is a vector of control variables discussed below; and $D_{i,t}$ is a vector of dummy variables indicating whether a country is involved in an international conflict, faces a military coup or international sanctions in period t , and the time profile of the conflict, as we are going to clarify below.

In order to find the economic growth equation, we subtract $y_{i,t-1}$ from both sides. Thus, we move to the following equation:

$$y_{i,t} - y_{i,t-1} = (\delta - 1)y_{i,t-1} + \beta ERV_{i,t} + \varphi F_{i,t} + \omega D_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (3.2),$$

where the left-hand side is the economic growth, which equals the yearly difference between the logarithmic value of real per capita GDP and its lagged value. The lagged economic level in the right-hand side, $y_{i,t-1}$, captures the convergence term.

3.5.2 The Main Variable: Exchange Rate Volatility

No clear or accurate measure of volatility exists (Serenis and Tsounis, 2012). This results in various methods of measuring ERV and tracing its effects; hence the mixed evidence (Siregar and Rajan, 2004). Most researchers have used a simple statistical measure of volatility, this being the standard deviation of the first difference in the natural logs of the exchange rates over a specific time span (See Brodsky, 1984; Frankel and Wei, 1993; Kenen and Rodrik, 1986; Tenreyro 2007; Dell’Ariccia, 1999).

Other studies follow more novel approaches. Perée and Steinherr (1989) propose that the average absolute difference between the previous forward and current spot rates is a better indicator of ERV to bilateral exports. Others use the residual variance of regressing the real exchange rate on a time trend, while many recent studies heavily used an autoregressive conditional heteroscedastic (ARCH) model, advanced by Engle (1982) or a generalized model (GARCH), developed by Bollerslev (1986) and Taylor (2008).⁴⁴ The advantage of the ARCH and GARCH methods over the standard deviation measures lies in their ability to distinguish between predictable and unpredictable elements in the exchange rate formation process, so they serve as accurate measures of volatility (Arize et al., 2000; Darrat and Hakim, 2000).

⁴⁴ Conditioning the measure of ERV on historical information using the GARCH approach results in a better index of volatility and more robust conclusions regarding the effect of ERV on economic variables.

Kenen and Rodrik (1986) and Grobar (1993), nevertheless, find a high correlation between the ERV measures, which suggests that the simple measures perform as well as sophisticated ones. In addition, Rey (2006) found that the moving-average standard deviation approach introduces more privileged results than those that stem from ARCH models which remain very strong in high-frequency data but diminish with monthly, quarterly and yearly series. Combining the latter findings with the fact that most of the economies involved in the current investigation are underdeveloped, we use a simple measure of the ERV: the yearly standard deviation of the monthly differences of the exchange rate logarithms.⁴⁵ Thus, we first transform the value of the exchange rate, $x_{i,m}$, into the logarithmic one which is represented by $X_{i,m} = \log x_{i,m}$. Then, we find the month differences represented by $D_{i,m} = X_{i,m} - X_{i,m-1}$. Finally, we find the standard deviation for the twelve differences on a yearly base using the following form: $SD(D_{i,1}|D_{i,2}| \dots |D_{i,12})$.

Next, we address other technical issues regarding the volatility variable. It is important here to ask whether it is better to use a real or nominal exchange rate, a short or long-run volatility, conditional or unconditional volatility, and bilateral or aggregate volatility? The answers rely on the context of the chapter, which focuses on the MENA countries, most of whom are in the lower middle rank of the human development index and follow a fixed exchange rate regime.

Real Vs. nominal exchange rate. The real value of money changes leading to a gap between the nominal and the real fundamentals of economics. This gap is bigger in developing and underdeveloped countries, where the pricing system is highly distorted and the official prices reflect state intervention rather than market forces. Thus, real exchange rates are preferable, especially when the scope of the study is longer. This chapter, accordingly, uses real rates when available. Otherwise, we use the nominal rates. This variety causes no serious problem since, in a world of integrated financial markets, greater volatility of the nominal exchange rate tends to associate with greater volatility of the real exchange rate (Rey, 2006). Clark et al. suggest “prices of goods in local currency tend to be ‘sticky’ in the short-to-medium run. In this case, real and nominal exchange rate volatilities are virtually the same for practical purposes” (2004, 17).

⁴⁵ The literature, however, shows some drawbacks of the standard deviations method. First, the standard deviation measures of ERV ignore relevant information on the random process that generates the exchange rate (Dennis, 1989). Second, this method chooses the moving average order arbitrarily and is noted for underestimating the effects of volatility on decisions (Pagan and Ullah, 1988). Third, it fails to capture the potential effects of high and low peak values of the exchange rate (Serenis and Tsounis, 2012). Finally, the standard deviation measure of volatility is characterized by a skewed distribution.

Conditional Vs. unconditional volatility. Volatility per se is not worrisome, while uncertainty is. While the predicted volatility is hedged away using financial derivatives, only unforeseen volatility is problematic. This suggests that an appropriate measure of risk considers the deviations between actual and predicted exchange rates (Clark et al., 2004). However, these hedging instruments are unavailable for the developing countries including those in the MENA region. In addition, Della Corte et al. (2009) find that exchange rates are unpredictable, especially in the short term. Thus, the chapter uses the overall volatility.

Short Vs. long run volatility. Achievements within the first year of peace are key to determine the future path of the country and seem to determine either sustained peace or a relapsing into war. Flores and Nooruddin (2009) conclude that if a country does not recover economically in its first PC year, a relapse into violent conflict becomes more likely. The chapter, thereby, first computes shifts in the exchange rate over one month, and then calculates the standard deviation of this change over a one-year period as an indicator of short-term volatility, for five consecutive years to capture the medium-term variability.

Bilateral Vs. aggregate volatility. Some papers focus on bilateral exchange rates, which is between pairs of countries, while others center on aggregate exchange rates. Both ways are applicable, and each has advantages and disadvantages, and so, again, the trade-off depends on the purpose of the paper. The aggregate volatility, for example, may hide the true fluctuation of the local currency because bilateral exchange rates move in offsetting directions. It is, on the other hand, more applicable in non-advanced economies that deal with one currency or two for their international transactions, and whose people rely on the dollar to observe the depreciation or the appreciation of their local currencies.

The current chapter, therefore, chooses a solution that draws from both approaches. It uses the bilateral volatilities aggregated using trade shares as weights to obtain the 'effective volatility' of a country's exchange rates. Such a measure of 'effective volatility' presupposes that the exchange rate uncertainty facing an individual firm is an average of the variability of individual bilateral exchange rates (Lanyi and Suss, 1982).

3.5.3 Control Variables

Economic growth is a challenging topic since it interacts with many factors, and causality goes both ways. These factors vary between countries and over time in terms of the magnitude, significance, the signs of the effects, and the way they interact with each other. Furthermore, things are more puzzling when

investigating economic growth in developing countries, including those in the MENA, where “the rule of growth [...] is that anything can happen and often does,” (Pritchett, 2000, 247). Thus, one should be careful when including the control variables so as to prevent any possible bias in the results while also being careful not to insert too many controls, in a way that raises multicollinearity. Thus, we will insert the controls individually. Below, we describe the candidate controls.⁴⁶

Lagged economic level, represented by GDP per capita, is key in our equation since it captures convergence. Convergence is debatable in our case as some scholars confirm it (Organski and Kugler, 1977; Organski et al., 1980; Olson, 1982; Przeworski, 2000; Cevik and Rahmati, 2015), while others refute it (Kang and Meernik, 2004; Collier, 2007). Since it is hard to set a unique initial year for the countries under investigation, we use the lagged dependent variable as a proxy for the convergence term.

Institutions, and the study of them, is a growing field that is taking on more relevance in Economics and other social sciences. It has both direct and indirect effects on economic growth (Engerman and Sokoloff, 1997; Acemoglu et al., 2001; Easterly and Levine, 2003). Furthermore, strong institutions absorb the ERV effects (Elbadawi et al., 2008b). However, controlling for institutions in a PC period is a problematic issue, leading to contradictory, ambiguous findings. The nexus between civil war and institutions is not simple, only direct, or just one-sided. Furthermore, impacts may depend on the conflict itself: its causes, how it is fought, and how it ends. Moreover, the vagueness of the term *institutions*, and the difficulty its measurement presents exacerbate the complication. We follow recent empirical studies and use a variable commonly mentioned in the economic growth literature, *executive constraints*, which measures the degree of institutionalized constraints on the decision-making powers of the chief executive. We extract this variable from the *Polity IV* database, which is a quantitative research project on political governmental organizations (Marshall and Jaggers, 2002).

The inflation rate serves as a proxy reflecting not just the real deterioration of a local currency, but also the trust and perceptions of the populations and investors. Addison et al. (2002) argue that the hyperinflation shown during the conflict, as the authorities lose control of the currency supply or set less constrained fiscal and monetary policy to finance the war, lowers confidence in the domestic currency. On the other hand, and since interest rates in less developed countries are centrally fixed rather than

⁴⁶ We call them 'candidates' since some of them are not included due to technical reasons.

market-determined (Bahmani, 2013), the public may use the inflation rate to gauge the economic and political riskiness of the PC environment, and to estimate the opportunity cost of holding money.

Moreover, inflation has a differential effect on capital flight in a PC environment. Potential investors use the inflation rate as a signal for a PC government's commitment to sound economic management and reform. Davies (2008) finds that, postwar, a percentage point increase in the rate of inflation is associated with an increase in annual capital outflows of about 0.005 to 0.01 percentage points of GDP. Given that, in his panel, inflation falls by an average of 50 percentage points following war termination, the associated decline in capital outflows due to this differential effect would be 0.25 to 0.5 percentage points of GDP, a substantial effect in a PC period.

While the inflation rate sends the public signs reflecting the power of peace and the seriousness of the rebuilding process, it does not echo the real **public trust in their currency**. Therefore, we look for another monetary variable showing whether the people use their local currency to save their wealth. People in developing countries, where financial markets are less developed, tend to move their funds away from productive assets, bank deposits and capital to nonproductive assets such as gold (Addison et al., 2002). Accordingly, and following Elbadawi et al. (2008b), we use the ratio of liquid liabilities, known as broad money, to GDP. However, since we are dealing with non-advanced economies, we use *M2* which represents the money and quasi-money, instead of *M3* as a proxy for liquid liabilities.⁴⁷ Aleem and Kasekende (2001) find that the conflict and the financial repression in Uganda lower the ratio of *M2/GDP* from 25% in the early 1970s to only 6% in 1991.

Global trade has become less restricted since the last decade of the 20th Century, so the movement of goods and services between countries increased. Recently, starting from the New Millennium, the boom in high technology in transportation, e-commerce, and financial services have accelerated world trade to unprecedented levels. However, the level of acceleration is heterogeneous between countries, and developing countries, including the countries concerned in this study, still face difficulties in liberalizing trade. Therefore, we control for the degree of trade freedom. Improvements in trade openness have contradictory effects on economic growth through their effects on ERV. They raise the short-run volatility since the economy becomes more exposed and, therefore, more sensitive to international shocks.

⁴⁷ *M3* is a measure of the money supply that includes *M2* as well as large time deposits, institutional money market funds, short-term repurchase agreements, and larger liquid assets.

However, these improvements support the long-run stability of the exchange rate, determined in this case by market powers. Thus, the exchange rate narrowly fluctuates around its equilibrium level.

International aid is essential when studying economic growth in PC periods, and the literature includes many empirical investigations about the effect of international aid on peace sustainability or on economic growth in such times.⁴⁸ Overall, most of those papers find a high association between aid effectiveness and the quality of policies and institutions (Collier and Dollar, 2002; Elbadawi et al., 2008b) which in our case implies avoiding real exchange rate overvaluation. However, disaggregating aid by its purpose, Clemens et al. (2012) find that the growth impact of disaggregated aid flows is larger than previously found regardless of recipient countries' policy environment.

Financial development improves the quantity, quality, and efficiency of financial intermediary services and positively affects economic growth. Elbadawi et al. (2008b) find that financial development, not only improves growth directly, but also ameliorates the negative repercussions of real exchange rate overvaluation. Several indicators mirroring financial development in a given country exist. However, many of those indicators strongly correlate with the liquid-liabilities variable already contained in the equation. Therefore, we use claims on other sectors (not governmental) of the domestic economy as an indicator in this case. According to Beck et al. (2000), this indicator isolates credit issued to the private sector compared to credit issued to the government sector. It, thereby, measures the mobilized savings that are channeled to private firms.

Foreign capital inflow is the main source of the physical capital in the PC period when the local capital is almost exhausted. Due to the permanent insecurity following the conflict, foreign investment tends not to flow into PCCs (Collier, 1999; Gupta et al., 2004; Imai and Weinstein, 2000). Hayakawa et al. (2013) find that among the various risks, only the political risk is adversely associated with FDI inflows. Thus, FDI mirrors the foreign trust in the peace process and this is why we include it as a measure of the investment rate.

Countries emerge from civil conflicts with huge fiscal burdens. As mentioned above, public expenditure contracts less than public revenue, so the deficit grows and the government relies on foreign and local

⁴⁸ Country-specific aid flows could be endogenous because well-intentioned donors may give more aid to countries that are growing more slowly. This form of endogeneity will generate a spurious negative correlation between aid and growth and bias downwards any estimated positive causal effect of aid on growth. It is also possible that donors are more willing to give aid to those poor countries that are growing faster, because they expect successful countries to operate better their aids. In the latter case, a spurious positive correlation between aid and growth tends to bias upwards any estimated positive effect of aid on growth.

creditors. Indeed, evidence suggests that many developing countries' debt spikes in recent decades are in part motivated by leaders' willingness to incur long-term costs for short-term power (Easterly, 2002). This burden prevents the State from implementing many development projects during the first phase of the rebuilding process. In addition, a sharp depreciation of the currency increases the debt burden which is repaid in foreign currency (Fallon and Lucas, 2002). Therefore, the model controls for the **public debt** as a percentage of GDP.

Since the MENA is the geographical span of our interest, it is important to include a variable reflecting the abundance of **natural resources**, which is a motive for conflict (Collier and Hoeffler, 1998, 2004). Although they are key for economic growth in many countries, abundant resources may slow down economic growth by deconstructing state capacity and the manufacturing sector which is seen by many as the engine of economic growth (Corden and Neary, 1982; Fearon and Laitin, 2003). Further, the resource curse moves to poor MENA countries due to the huge aid flows coming from rich MENA countries (Sachs and Warner, 1995; Auty, 2001; Apergis and Payne, 2014).

Furthermore, seldom does the economy grow normally in abnormal times such as a civil conflict circle. The economy emerges exhausted from a conflict and human capital recovers only slowly (Barro and Sala-i-Martin, 2003). Moreover, conflict changes the technological, institutional and social dimensions of a place so the equilibrium path moves far from its pre-war level. Therefore, the model traces the time profile of the economic recovery by introducing time dummy variables for the conflict years and the termination year alongside the first five peaceful years. In addition, and based on previous studies (Schnabl, 2008; Elbadawi et al., 2008b; Arratibel et al., 2011; Ebaidalla, 2014), the essay uses other control variables including **population growth**, human capital, represented by **secondary school enrolment**, **gross domestic saving**, and **government consumption** as percentages of GDP.⁴⁹

Last, but not least, since the region has witnessed frequent violence in different forms, it is imperative to include and differentiate between them. Skimming the database used, we notice that some countries, Iraq and Mauritania for example, faced just one civil conflict within 3-4 years but also witnessed bloody coup d'états in recent history. We also find that many MENA countries have been involved in regional conflicts or under UN or US economic sanctions. Thus, the essay contains dummy variables reflecting

⁴⁹ We did not account for the exchange rate regimes in the main investigation, since the degree of ERV a country is exposed to is unnecessarily closely related to the type of exchange rate regime it has adopted. Polak (1988) argued that a country may peg its currency to an anchor currency, but it will float against all other currencies if the anchor does as well. Moreover, Levy-Yeyati and Sturzenegger (2002) mentioned that many countries that in theory have a flexible rate intervene in exchange rate markets, so very little difference appears in practice with countries that have fixed exchange rate regimes. Later, nonetheless, we account for the exchange rate regimes when checking the robustness of our findings in Section VI.

whether a country had a military coup,⁵⁰ international sanctions,⁵¹ or was involved in an international conflict.⁵²

In addition to using a logarithmic dependent variable, we use the logarithmic form of some right-hand side variables. This is because it is easier to interpret the elasticities obtained, and it helps avoid questions emerging from using skewed variables. Thus, we transform just the variables that are right-skewed with a long tail at the high end. This strongly influences the estimates, so we eliminate skewedness and report it in Table B.4. We follow Chemingui and Ben Lallouna (2013) and transform the variables whose skewness equals at least three; that are, FDI, and GDP level.⁵³

3.5.4 Data Sources

Conflict database. A PC period is difficult to quantify, as there exists no agreed upon definition of civil conflict or, therefore, a reliable means by which to define a PC period. Skimming different conflict databases shows inconsistency when identifying the conflict episodes. This inconsistency is clearer in terms of the MENA conflicts, many of which have officially terminated but where supposed peace is often uneasy. Moreover, conflict may be implicit in that violence is widespread in the society and becomes “a fact of life for many people” (Addison et al., 2002, 1). In order to involve solid cases, the chapter relies on two databases, UCDP (Gleditsch et al., 2002; Themnér & Wallensteen, 2013; Uppsala University, 2015) and MEPV (Center for Systemic Peace, 2016),⁵⁴ and checks each PC episode individually.

Exchange rate database. Following monthly exchange rates tends to be difficult in some cases. The literature has mostly extracted data from the *International Financial Statistics* published by IMF. This

⁵⁰ The failed bloody military coup in Sudan in 1976 is included.

⁵¹ The value of this dummy variable is not clear in the case of Israel. Since founded in 1948, Israel had been isolated from its Arabic neighbours, and the economic boycott of Israel started in 1954. To face this bad relationship with its neighbours, Israel found good diplomatic and commercial connections with the western community, OECD countries. Further, the Arabic boycott partially collapsed when the Egyptian-Israeli Peace Treaty was signed in Camp David in 1978. Therefore, we set the value of international sanction dummy variable of Israel to be equal 1 until the year 1978 and 0 from 1979 on.

⁵² Although it is key in the economic growth theories and proved significant as the major factor behind economic growth in MENA in the period between 1960 and 1990 (Nehru and Dhareshwar, 1993), the physical capital formation was dropped from our models. We follow Andreano et al. (2013) who confirm the existence of problems concerning the availability and the reliability of capital stock data in the MENA countries, the assumptions about depreciation, the definition of initial capital stock, and the determination of investment flows.

⁵³ Although Table B.4 shows that Inflation is highly skewed, its histogram refutes this high skewness, and thus we do not transform its values.

⁵⁴ The Centre for Systemic Peace publishes MEPV, standing for *Major Episodes of Political Violence and Conflict Regions*. This dataset defines major episodes of political violence by the systematic and sustained use of lethal violence by organized groups that result in at least 500 directly-related deaths over the course of the episode. Episodes are coded for time span and magnitude and assigned to one of seven categories of armed conflict: international violence (IV), international war (IW), international independence war (IN), civil violence (CV), civil war (CW), ethnic violence (EV), and ethnic war (EW). Each episode is designated to span a certain number of years and judged to have been of a certain, general magnitude of societal-systemic impact (an eleven-point scale, 0-10; magnitude scores are considered consistent and comparable across categories and cases, that is, approximating a ratio scale). The episode's magnitude of impact score enters for each year of the designated time span and for each country considered to have been directly affected by the warfare experience.

dataset, however, provides just the nominal exchange rate for our countries of concern. Therefore, we depend on the dataset provided by BRUEGEL (Darvas, 2012).⁵⁵ BRUEGEL collects exchange rates against the US dollar and uses them to calculate the bilateral rates between all countries. It provides data on both real and nominal effective exchange rates.

Lebanon, Syria, and Somalia are exceptions where we imported the data from *Banque du Liban* for Lebanon and Syria, and OANDA (a currency conversion website) for Somalia (OANDA, 2017). As for Syria, BRUEGEL lacks monthly exchange rate data before 1993, and since we investigate the civil conflict occurring by the beginning of the 1980s, we use the data from *Banque du Liban* (2018). Importing data from the *Banque du Liban* works well for the Syrian case since these data is more transparent and credible, and Lebanon has good commercial connections with Syria, though the ruling economic ideologies have been very different since independence.

The dependent variable and other regressors. We depend mainly on the *World Development Indicators* (2017), published annually by WB, to get per capita GDP and most of the explanatory variables. As for the institutions indicator, we rely on the *Polity IV* database (Marshall and Jaggers, 2002).

3.5.5 Cases Involved

Arab countries constitute the majority of the MENA region, thus our investigation includes the twenty-two countries members of the Arab League. In addition, we follow Owen (2013) and include three countries whose actions contribute to the political and security situations in the MENA region: Turkey, Iran, and Israel, even though these states followed a somewhat different historical trajectory from the Arab states and have different economic structures that in the Arab countries.

Despite the interest in the Palestinian case, we exclude it from our database. People in the occupied Palestinian territories use different currencies in their daily transactions, for example the Israeli Shekel, Jordanian Dinar, and US Dollar. Therefore, it is unfeasible to include Palestine in our study since the key independent variable is unidentified. We also exclude the Comoros Islands, the most recent member of the Arab League, for two reasons: insufficient data, and the fact that they are so little included in pre-existing scholarly work on the region. We end up with 23 countries, shown in Table B.2, including 31 cases of conflict. Later, when regressing, we drop the cases of Iraq in 1963 and Yemen in 1970 and

⁵⁵ BRUEGEL is an independent and non-doctrinal think tank based in Brussels and devoted to policy research on international economic issues.

1982, because we did not find a monthly exchange rate database for those cases.⁵⁶ After these extractions we end up with 28 conflict cases. Also when regressing, the models drop Somalia due to insufficient data, leading to 22 countries and 25 civil conflicts involved in the regressions.

3.5.6 Descriptive Statistics

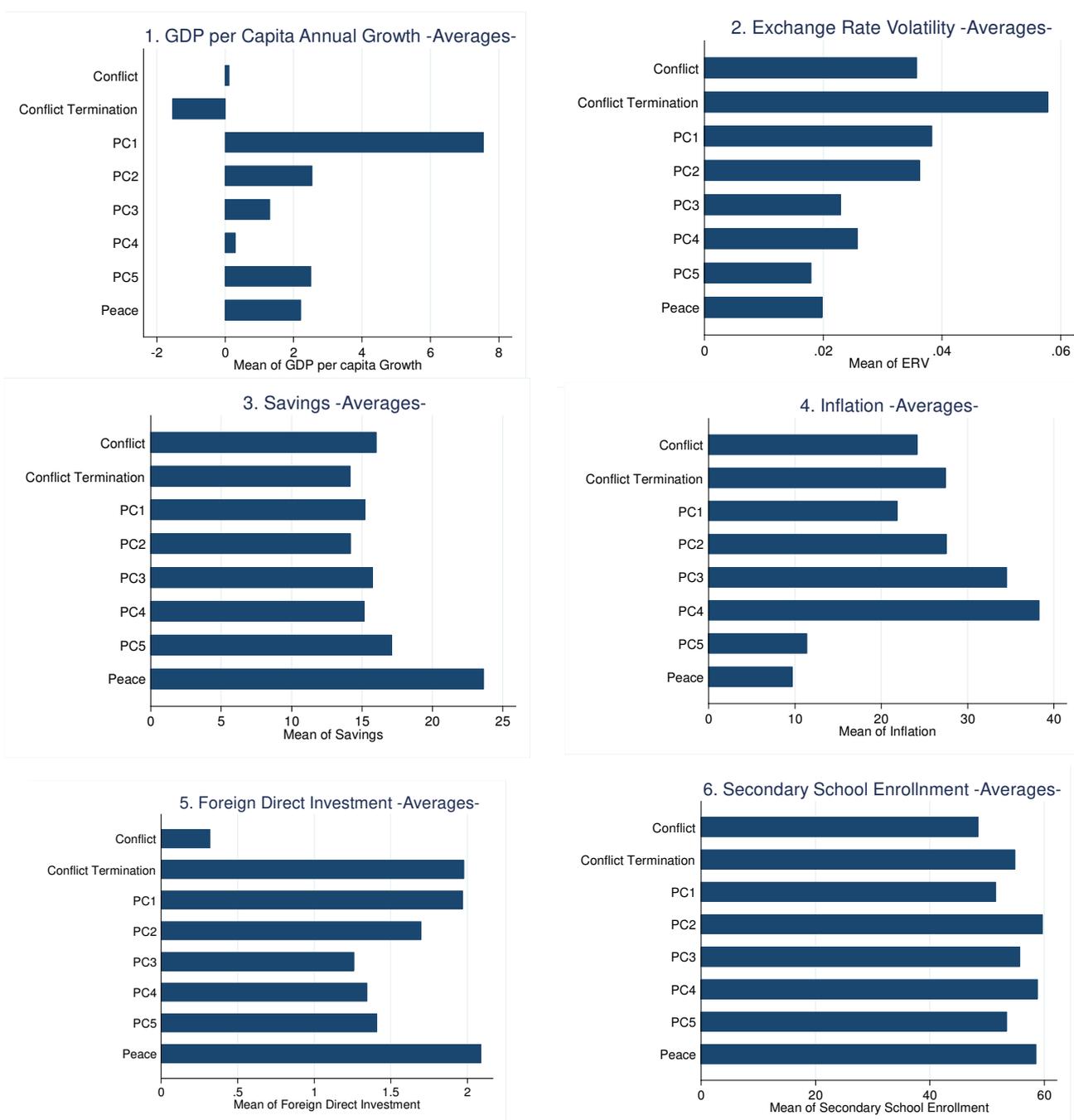
Table B.2 shows that our dataset includes 1265 year/country observations for the 23 countries range between 1960 and 2014. Out of the total years, 172 observations are in conflict time, while 134 years are post-conflict ones.

Table B.3 presents the descriptive statistics. It indicates a high degree of volatility of economic growth in the MENA countries where its standard deviation is 10.7% compared with a mean of 2%. This deviation in economic growth is larger in conflict time, while it declines during the first peaceful years. In order to make the information reported in this table legible, we depict the time profile of our main variables in Figure 3.1. The first left panel of the figure shows that economic growth is almost null during the conflict time and it turns negative of 1.5% when the conflict terminates. As soon as peace is regained, it highly jumps to 7.7%. However, huge disparity of growth rates among PC countries exists, as shown in Table B.6; 50% in Iraq in 2004 and -8% in Djibouti in 1995. Panel 2 of Figure 3.1 shows that the exchange rate intensively fluctuates in the year when the conflict ends. It is clear that the fluctuations, during and by the end of the conflict, are two and threefold higher respectively than in times of peace. The volatility in the first post-conflict year is slightly higher than in the conflict time, while volatility in the second post-conflict year is smaller. Later when peace sustains, the volatility becomes less extensive in the fifth PC year and it gets back to the level dominant during peacetime. As for savings depicted in Panel 3, even though the total income diminishes alongside total saving, people try to save as much as possible during the conflict years. This level of saving slightly declines when peace is resumed.

Panel 4 shows that inflation explodes during the conflict years and strongly peaks when the war ends. Even though it declines in the first PC year, the inflation rate recovers again and jumps to an unprecedented level in the fourth, before strongly declining and starting to stabilize by the beginning of

⁵⁶ The case of Yemen needs a special treatment. This is due to the demographical, tribal, historical and social connections between its main parts, the North and the South. By the end of WWI, the current Yemen was divided between different tribes. North Yemen was unified under the rule of Mutawkillites, who were involved in a bloody civil conflict against the republicans, supported by Egypt, in 1962. Later, many military coups and political assassinations occurred until Ali Abdallah Saleh became the President in 1978. On the other hand, the Republic of South Yemen was founded in 1967, and it was totally supported by the Soviet Union. Like North Yemen, South Yemen faced many political violence and conflicts. It is worth to mention that different sides from both countries supported different factions in the other country. Furthermore, there were direct clashes between the two countries. The countries united in 1990, and a bloody civil conflict occurred between the two parts of the United Yemen in 1994.

the fifth PC year. Panel 5 presents the foreign direct investment that dramatically declines almost to zero during the conflict years, and then it jumps to 2% of GDP in the last conflict year. Finally, the secondary school enrolment during the conflict is ten percentage points less than in peaceful time (Panel 6). This rate recovers rapidly once the conflict ends.



Source: Based on the information reported in Table B.3.

Notes: *Conflict* stands for the years when the conflict was active except the last year of it; *Conflict Termination* stands for the year when the conflict terminates; *PC1* stands for the first post-conflict year; *PC2* stands for the second post-conflict year; *PC3* stands for the third post-conflict year; *PC4* stands for the fourth post-conflict year; *PC5* stands for the fifth post-conflict year; *Peace* stands for the peaceful years either in countries that have faced civil conflicts, or in countries that have not. Table B.13 presents a description of the variables used.

Figure 3. 1: Comparing Indicators in Different Phases of Conflict and Peace Cycle.

Exploring the individual countries, we build on Table B.5 to say that the MENA countries vary in terms of ERV. Extremely high levels of ERV exist in Sudan, Yemen, Iran, Turkey, Lebanon, and Syria. All these countries have been involved in civil conflicts. Other MENA countries show mildly high levels, while Tunisia is the country with the lowest volatilities.

3.5.7 Estimation Strategy

Endogeneity is a core concern in our estimation. Most of the right-hand side variables in Equation (3.2) are likely to be jointly determined with growth as well as responsive to future anticipated growth performance. Ito et al. (1997), for example, find that fast growth attracts foreign capital since some investors in industrial countries pursue high returns as part of a diversified portfolio. Capital inflows push the exchange rate to appreciate. The Balassa–Samuelson effect is another source of endogeneity and countries with high productive growth experience high wage growth leading to exchange rate appreciation. Therefore, we should follow a strategy that properly accounts for endogeneity and country-specific unobserved characteristics. Furthermore, and in order to find a proper estimation method, it is essential to explore the stationarity of the time series' used here and identify the relationship between them. Therefore, we start by running unit-root tests.

3.5.7.1 Unit-Root Test

We start by testing for unit root behaviour as it has implications for our main models and in order to avoid spurious regressions. This is key when we use GDP as a dependent variable since Nelson and Plosser (1982; quoted in Ozturk and Kalyoncu, 2007) note that a unit root in real output is irrelevant with the notion that business cycles are stationary fluctuations around a deterministic trend. They suggest that shocks to real output have permanent effects on the system.

Notwithstanding the wide application of the Augmented Dickey-Fuller Test, the current chapter uses another test. The conventional ADF test suffers from poor power when real GDP is highly persistent, the process is likely to be non-linear, or the sample size is small (Taylor, 2001; Pierse and Snell, 1995). In addition, the time-series unit root tests, including the ADF, fail to consider information across units, thereby leading to less efficient estimations (Chang et al., 2006). Therefore, the appropriate solution is to apply panel unit root tests which succeed in finding evidence of stationarity that cannot be found by univariate methods. The major advantage of adopting panel unit root tests is their high power, gained from exploiting cross-sectional dependence. In addition, in contrast to individual unit root tests that have

complicated limiting distributions, panel unit root tests lead to statistics with a normal distribution in the limit (Baltagi, 2008).

Panel unit root tests are widely used in the literature, and two generations of the tests have appeared. The first assumes a cross-sectional independence,⁵⁷ an assumption under which any central limit theorem can be applied to derive the asymptotic normality of panel test statistics.⁵⁸ The second generation relaxes this assumption and specifies the type of cross-sectional dependencies.⁵⁹

Table 3. 2: Unit Root Test based on Choi (2001)

Variable	Statistic	P-value
Log of GDP pc	-1.3335	0.0912
Exchange Rate Volatility	-7.2639	0.0001
Financial Trust	-0.2349	0.4071
Government Consumption	-2.7961	0.0026
Trade Openness	-0.2755	0.3915
Log of FDI	-2.4824	0.0065
Central Government Debt	-0.5897	0.2777
Secondary School Enrollment	1.6613	0.9517
Saving	-1.9451	0.0259
Inflation	-2.7185	0.0033
Financial Development	0.8874	0.8126
ODA	-3.8436	0.0001
Population Growth	-2.5625	0.0052
Total Natural Resources Rents	-1.4995	0.0669

Source: Authors' computations.

Notes: The Null Hypothesis in Choi (2001) Test is that all panels contain unit roots. Table B.13 presents a description of the variables used.

However, most of these tests are improper in our case since they fit only balanced panel data. Here Choi (2001), among others, proposes a standardized statistic based on a Fisher-type test and is proper for unbalanced-data. This method performs a unit-root test on each country's time series separately and then combines the p-values to obtain an overall test of whether the panel series contains a unit root. Thus, we apply the ADF unit-root test for each panel and it controls for the cross-sectional dependencies.⁶⁰

⁵⁷ This generation includes Levin and Lin (1992, 1993), Wu (1996), Im et al. (2003), Maddala and Wu (1999), Harris and Tzavalis (1999), Hadri (2000); Breitung (2001), and Choi (2001). As time moves forward, these tests add seasonal properties and different deterministic parts.

⁵⁸ This cross-sectional independence assumption, on the other hand, is quite restrictive in many empirical applications. Thus, these first-generation tests are likely to yield biased results if applied to panels with a cross-sectional dependency.

⁵⁹ Some of the second-generation tests are, for instance, Choi (2006), Chang (2004), Pesaran (2007), Bai and Ng (2004), Moon and Perron (2004), and Phillips and Sul (2003).

⁶⁰ To determine the lag length in this test, we need to balance between the power of the test and the remaining serial correlation in the errors (size) that may bias the test. Nevertheless, since our sample is finite, the length should not exceed two or three.

Table 3.2 shows that the Choi Test, applied to the variable under concern, which is GDP per capita, strongly rejects the Null Hypothesis, meaning that at least one of the panels of the dependent variable is stationary.⁶¹ Furthermore, we find that some right-hand side variables are stationary and just a few of them, including the economic level variable, are not.⁶²

Table 3. 3: Unit Root Test based on IPS (Im et al., 2003) and Hadri (2000)

Variable	Statistic	P-value
IPS (Im et al., 2003) Test		
Log of GDP pc	-3.0054	0.0013
Log of Exchange Rate Volatility		
Financial Trust	-1.4885	0.0683
Government Consumption	-6.1088	0.0001
Trade Openness	-2.3852	0.0085
Log of FDI	-5.8573	0.0000
Central Government Debt		
Secondary School Enrollment		
Saving	-3.7239	0.0001
Inflation		
Financial Development	1.3433	0.9104
ODA		
Population Growth	-3.646	0.0001
Total Natural Resources Rents	-5.8606	0.0001
Hadri (2000) Test		
Log of GDP pc	58.37	0.0001

Source: Authors' computations.

Notes: The Null Hypothesis in IPS (Im et al., 2003) Test is that all the panels contain a unit roots, while the Null Hypothesis in Hadri (2000) Test is that all the panels are (trend) stationary. The number of panels for Hadri Test is six balanced panels, while it is 22 panels for IPS Test. We cannot test the secondary school enrollment, ERV, inflation, the public debt, and ODA due to insufficient observations. Table B.13 presents a description of the variables used.

To confirm our results we use the IPS Test,⁶³ proposed by Im et al. (2003), as it is appropriate for use with unbalanced data. This test is unrestrictive since it allows for heterogeneous coefficients. Moreover, the IPS Test has higher power than some other unit root tests have and is better in cases of small samples.⁶⁴ We choose the number of lags for the ADF regressions by minimizing the Akaike Information Criterion, subject to a maximum of 4 lags.⁶⁵ Here the p-value corresponding to $W\text{-t-bar}$ is essentially zero, and therefore we strongly reject the Null Hypothesis that all series contain a unit root. Table 3.3 indicates

⁶¹ Among the four Fisher-type ADF unit root tests, Choi (2001) suggests a superiority of using the inverse normal Z-statistics in stationarity tests, because it offers the best trade-off between the size and the power.

⁶² Those variables are the financial trust, secondary school enrolment, trade openness, private claims, and public debt. We exclude the last two variables, in addition to ODA, from the main equations, since their observations are scarce.

⁶³ IPS Test is for the first letter of the developers: Im, Pesaran, and Shin, who developed this method.

⁶⁴ However, it is worth mentioning that Breitung (2001) finds that IPS suffers a dramatic loss of power when including individual trends. He also finds that the test is sensitive to the specification of deterministic trends.

⁶⁵ This number varies between the tests due to the finite sample size that we are working with.

that only the logarithm of private claims, which stands for the financial development, is not stationary.⁶⁶ We could not test the secondary school enrollment, ERV, inflation, the public debt, and ODA due to insufficient observations.

Furthermore, the unit root tests include null stationary tests besides the null non-stationary tests. Henricsson and Lundbäck (1995) note that extra information and strengthened unit root inferences emerge by comparing the results of null non-stationary tests with the null stationary ones. The residual-based LM Test, proposed by Hadri (2000), is one such non-stationary test that builds on the Kwiatkowski-Phillips-Schmidt-Shin Test (KPSS). Thus, we apply this test to the dependent variable. However, this test requires strongly balanced data, thus we drop the unbalanced part of the data to apply the Hadri Test. The lower panel of Table 3.3 shows that the p-value of the test rejects H_0 that all panels of GDP pc are stationary. We therefore conclude that at least one panel of the economic level has a unit root. Thus, it is better to use its differences rather than its levels, hence Equation (3.2).

3.5.7.2 Specification Tests

Applying a panel data approach calls for some specification tests on serial correlation and heteroscedasticity. Serial correlation biases the standard errors, which undermines the efficiency of the estimates. The classical linear panel data model assumes serially uncorrelated disturbances. This assumption is possibly violated since the dynamic effect of shocks to the dependent variable is often distributed over several time periods (Baltagi, 2008). Most of the serial correlation tests require specific assumptions about the nature of the individual effects. However, Wooldridge (2002) proposes a test that requires relatively few assumptions and is easily applicable. Applying this test, we get an F -statistic of 10.903, and we reject the Null Hypothesis at the 5% significance level. This indicates that we do not reject the existence of serial correlation. Therefore, we cluster the standard errors by country.

Furthermore, we account for heteroscedasticity that probably appears in our data, since the model may not capture all differences between countries involved. A modified Wald statistic, which is viable when the assumption of normality is violated, at least in asymptotic terms (Greene, 2008), has a $\chi^2 = 2017.69$ with a p-value that rejects the Null Hypothesis at the 1% level. This implies that group-wise heteroskedastic variances of error terms (variances that are homoskedastic within cross-sectional units but may differ

⁶⁶ Further, we test for the stationarity of the first difference of the financial development, and we find it non-stationary. Thus, we drop this variable from our model.

across units) are present. Accordingly, we use robust standard errors in the regressions and cluster at the country level.

3.5.7.3 General Method of Moments

It is clear from the Equation (3.3), which is the same as Equation (3.2) except where we change the left-hand side to represent growth, Δ , that the OLS estimator is biased due to the correlation between the lagged dependent variable, $y_{i,t-1}$, and the fixed effect, μ_i , which is added to the idiosyncratic component to form the composite error term, $\mu_i + \varepsilon_{i,t}$. This correlation leads the OLS estimator to be inconsistent. In particular, it inflates the coefficient estimate for the lagged dependent variable by attributing predictive power to it that actually belongs to the country fixed effect.

$$\Delta y_{i,t} = (\delta - 1)y_{i,t-1} + \beta ERV_{i,t} + \varphi F_{i,t} + \omega D_{i,t} + v_t + \mu_i + \varepsilon_{i,t} \quad (3.3),$$

To solve this problem the literature on economic growth intensively follows one of the estimation strategies that lies under the General Method of Moments (GMM). Since 1982 different kinds of GMM estimations have been developed and are grouped into two classes: the first is the direct biased corrected estimations (Kiviet, 1995; Hansen, 2001); and the second lies under the class of instrumental estimation. The second is more appropriate when endogenous variables are probably in the right-hand side of the equation, while the first results in estimators that are more efficient when right-hand side variables are exogenous (Behr, 2003). This chapter follows both classes, and we start with the second class of estimation, which is the general method of moments (GMM).

Arellano and Bond (1991), expanding on Anderson and Hsiao (1981), developed the Difference-GMM estimation. Their estimator aims to remove the specific-country effect without creating another source of endogeneity, which is based on the correlation between the transformed lagged dependent variable and the transformed idiosyncratic component of the composite error term. Thus, they propose using longer lags of regressors to instrument the first-difference transformation of the lagged dependent variable on the right-hand side as represented by $\Delta y_{i,t-1}$.⁶⁷

However, this estimator suffers when the dependent variable tends to be a random walk so its past levels do not have much influence over its current ones. Hence, the lagged explanatory variables perform badly as instruments for its current level. The existence of this problem is more probable in our context when the variance of country-specific characteristics increases relative to transitory shocks, which is the case

⁶⁷ Their estimator, however, creates a new source of endogeneity based on the correlation between the differences of the independent variables and the error term, but allows a neat solution based on lags of variables used as instruments.

during and after a civil conflict (Cevik and Rahmati, 2015). In addition, since our dataset is short, the small sample bias is more likely to appear. Thus, the Difference-GMM estimator is not a suitable approach to study post-conflict economic growth.

Instead, Arellano and Bover (1995) and Blundell and Bond (1998) propose the System-GMM approach. This approach builds on transforming the instruments to make them endogenous to the fixed effects rather than transforming the regressors to drop the fixed effects. They use differences as better instruments to the levels, which are random walk. They then combine these two systems of equations including the equation in differences and the equation in levels. From here, two sources of information appear: lagged levels and differences of the regressors. Consequently, the System-GMM estimator performs better, because the instruments in the levels equation remain good predictors for the endogenous variables in the model even when the series' are very persistent (Blundell and Bond, 1998).

In order to avoid problems regarding high numbers of instruments, we control for the number of the instruments used. In doing this we first group the years of observations: Group 1 contains the peaceful years before 1980; Group 2 contains the peaceful years of the 1980s; Group 3 contains the peaceful years of 1990s; Group 4 contains the peaceful years of 2000s; Group 5 contains the peaceful years of the period (2010-2014); Group 6 includes the years of civil conflict; Group 7 includes the years when the conflict terminates; Group 8 includes the first post-conflict years; Group 9 includes the second post-conflict years; Group 10 includes the third post-conflict years; Group 11 includes the fourth post-conflict years; and Group 12 includes the fifth post-conflict years. It is obvious that observations are not equally distributed between groups and that the majority of our observations are in peaceful years. Second, we collapse the instrument set, making the instrument count linear in T . By collapsing, we transform the GMM-style instrument matrix, which consists of the second lag of y , one for each time period, and substitute zeros for missing observations, into a one-column matrix, as follows:

$$\begin{pmatrix} 0 & 0 & \cdots & 0 \\ y_{i1} & 0 & \cdots & 0 \\ 0 & y_{i2} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & \cdots & 0 & y_{i,T-2} \end{pmatrix} = \begin{pmatrix} 0 \\ y_{i1} \\ \vdots \\ y_{i,T-2} \end{pmatrix}.$$

Roodman (2009) has demonstrated the superiority of collapsed instruments in some common situations with simulations.

We first trace the effect of the exchange rate volatility in the MENA. Thus, we use a parsimonious model of Equation (3.2). Table 3.4 shows the results and compares them with the results obtained by using different methods including the OLS, fixed effects, random effects, and System-GMM. ERV seems to

affect negatively economic growth in the MENA region, but the magnitude varies between the different methods. The results, nevertheless, are insignificant in all models, implying that the effect is indistinguishable from zero. On the other hand, the convergence term proves significant in three models, but not in the System- GMM model. It is worth mentioning here that the validity tests in Table 3.4: the Hansen Test; the Arellano-Bond AR (1) Test; and the Arellano-Bond AR (2) Test, confirm the validity of the instruments in the System-GMM model.⁶⁸

Table 3. 4: The Effect of ERV on Economic Growth in The MENA Countries using Different Methods

Dependent Variable: The difference in the log of per capita GDP in two consecutive years				
Variables	OLS Model	Fixed Effects Model	Random Effects Model	System GMM Model
L. Log of Economic Level	-0.00680*** (0.00232)	-0.0796*** (0.0145)	-0.00680*** (0.00232)	-0.0712 (-0.686)
Exchange Rate Volatility	-0.00782 (0.0487)	-0.0206 (0.0489)	-0.00782 (0.0487)	-0.121 (-0.341)
Group Dummies	Yes	Yes	Yes	Yes
Obs.	649	649	649	649
R-squared	0.041	0.079		
Number of Countries	22	22	22	22
RMSE	0.075	0.073	0.075	
Hansen, p-value				0.572
Arellano-Bond AR (1), p-value				0.178
Arellano-Bond AR (2), p-value				0.288
F-Test for Joint Significant of Fixed Effects		3.16***		
Number of Instruments				17

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. The four regressions include the same countries and time dummies and use the same observations. Time dummies, which are groups of years (group dummies), are not shown for brevity. Robust standard errors are in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. System-GMM regressions treat explanatory variables as endogenous except for lagged GDP pc, while time groups are considered as strictly exogenous variables. System-GMM regressions collapse the instrument matrix and use lags from period $t - 2$ to $t - 5$. In the case of two-step GMM, the Windmeijer (2005) finite sample correction for standard errors is employed. Hansen Test is used for testing over-identifying restrictions in the model. Arellano-Bond AR (1) examines the hypothesis that the error terms in first differences are not serially correlated. Arellano-Bond AR (2) examines the hypothesis that the error terms are not serially correlated. Table B.13 presents a description of the variables used.

We run more System-GMM models, including control variables, and present the results in Table 3.5. The exchange rate volatility now shows mixed effects, and it is insignificant in all models. Moreover, none of the parameters, including those that capture the convergence term, is significant. Doubts, therefore, are raised. In addition, the p-values of the two Arellano-Bond (AR) Tests in Models 4 and 5 reject the hypothesis that there is no autocorrelation between the error terms, and the p-values of J-Hansen Tests,

⁶⁸ Usually, the AR (1) Test rejects the Null Hypothesis, so it indicates an existence of auto-correlation. This is expected since $\Delta \varepsilon_{i,t} = \varepsilon_{i,t} - \varepsilon_{i,t-1}$ and $\Delta \varepsilon_{i,t-1} = \varepsilon_{i,t-1} - \varepsilon_{i,t-2}$ both contain $\varepsilon_{i,t-1}$.

1.00 and 0.95, in these models indicate a potential sign of problems and cast serious doubts on the validity of estimates, according to Roodman (2009).

Further, since we are exploring the effect of ERV in post-conflict time, we add interactive terms of the main variables with the time dummies' groups. Thus, we follow the effect of ERV in different phases of either conflict or peace. Table B.8 presents the results. We find that none of the standard variables and the interactive terms, except for the fourth PC year in Model 1, is distinguishable from zero. Further, we look for the validity tests. We first check that the idiosyncratic term, $v_{i,t}$, is not serially correlated. Otherwise, the second lagged dependent variable ($y_{i,t-2}$), which is an instrument for the lagged dependent one ($y_{i,t-1}$), becomes endogenous to the idiosyncratic term, $v_{i,t}$. Arellano and Bond AR (2) tests for the serial correlation in the error term in first difference. The p-values of this test, reported in Table B.8, do not reject the Null Hypothesis and therefore we are sure of the error terms' independence.

Table 3. 5: The Effect of ERV using Different System GMM Models

Dependent Variable: The difference in the log of per capita GDP in two consecutive years					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5
L. Log of Economic Level	-0.0712 (-0.686)	-0.0622 (-0.861)	-0.0607 (-0.749)	-0.0353 (-1.492)	0.0131 (0.238)
Exchange Rate Volatility	-0.121 (-0.341)	-0.0755 (-0.304)	0.0544 (0.0594)	-2.022 (-1.288)	0.170 (0.828)
D. Secondary School Enrollment				-0.00342 (-0.605)	
Government Consumption				-0.00237 (-0.531)	
Population Growth		0.253 (0.488)	0.871 (0.417)	-0.553 (-1.088)	-0.727 (-0.531)
D. Trade Openness			-0.000433 (-0.143)		
Log of FDI					0.00881 (1.334)
Group Dummies	Yes	Yes	Yes	Yes	Yes
Obs.	649	649	575	364	557
Number of Countries	22	22	22	21	21
Hansen, p-value	0.572	0.815	0.943	1.000	0.954
Arellano-Bond AR (1), p-value	0.178	0.186	0.202	0.0713	0.00492
Arellano-Bond AR (2), p-value	0.288	0.292	0.332	0.100	0.110
Number of instruments	22	27	32	37	32

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. Time dummies, which are groups of years (group dummies), are not shown for brevity. Robust standard errors are in parentheses. Regressions use robust standard errors clustered by country. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. D. means that we use the first differences of this variable. System-GMM regressions treat explanatory variables as endogenous except for lagged GDP pc, while time groups are considered as strictly exogenous variables. System-GMM regressions collapse the instrument matrix and use lags from period $t - 2$ to $t - 5$. In the case of two-step GMM, the Windmeijer (2005) finite sample correction for standard errors is employed. Hansen Test is used for testing over-identifying restrictions in the model. Arellano-Bond AR (1) examines the hypothesis that the error terms in first differences are not serially correlated. Arellano-Bond AR (2) examines the hypothesis that the error terms are not serially correlated. Table B.13 presents a description of the variables used.

However, we note that the J-Hansen Test, which checks the overall validity of the various instruments of the system, is equal to one in all specifications in Table B.8.⁶⁹ It is thereby clear that applying the System-GMM to our data leads to the problem of ‘instrument proliferation’, due to the large number of instruments used. A large collection of instruments, even if individually valid, can be collectively invalid in finite samples because they overfit endogenous variables (Roodman, 2009). Furthermore, the estimators easily generate results by default that are at once invalid yet appear valid in specification tests.

3.5.7.4 Fixed Effects

Since the post-estimation tests refute the validity of the instruments, we look for other techniques that fit the dynamic model and avoid the Nickell bias. Although they fit static, rather than dynamic panel data models, fixed and random effects could be good choices for the econometric framework of this chapter. Thus, we start with the fixed effects strategy. The advantage of applying a fixed effects approach is that it, by demeaning, nullifies the country-specific effect (μ_i) as follows:

$\ddot{y}_{i,t} = y_{i,t} - \bar{y}_i$, $\ddot{y}_{i,t-1} = y_{i,t-1} - \bar{y}_{i,-1}$, $E\ddot{R}V_{i,t} = ERV_{i,t} - \overline{ERV}_i$, $\ddot{F}_{i,t} = F_{i,t} - \bar{F}_i$, $\ddot{D}_{i,t} = D_{i,t} - \bar{D}_i$, $\ddot{\mu}_{i,t} = \mu_i - \bar{\mu}_i = 0$, $\ddot{v}_{i,t} = v_{i,t} - \bar{v}_i$, $\ddot{\varepsilon}_{i,t} = \varepsilon_{i,t} - \bar{\varepsilon}_i$, where $\bar{\cdot}$ denotes an average of all observations for individual i except the first, for which no lagged value exists, $\bar{y}_i = (1/T) \sum_{t=1}^T y_{i,t}$, and $\bar{y}_{i,-1} = (1/T) \sum_{t=1}^T y_{i,t-1}$. This yields the following *within model*:

$$\ddot{y}_{i,t} - \ddot{y}_{i,t-1} = (\delta - 1)\ddot{y}_{i,t-1} + \beta E\ddot{R}V_{i,t} + \varphi \ddot{F}_{i,t} + \omega \ddot{D}_{i,t} + \ddot{v}_t + \ddot{\varepsilon}_{i,t} \quad (3.4)$$

Based on Verbeek (2008), the fixed effects estimator for $(\delta - 1) = \gamma$, for example, is:

$$\widehat{\gamma}_{FE} = \frac{\sum_{i=1}^N \sum_{t=1}^T (y_{i,t} - \bar{y}_i)(y_{i,t-1} - \bar{y}_{i,-1})}{\sum_{i=1}^N \sum_{t=1}^T (y_{i,t-1} - \bar{y}_{i,-1})^2},$$

which is a biased and inconsistent estimator when $N \rightarrow \infty$ and fixed T (Nickell, 1981). Our panel, nevertheless, is far from that sense since N is limited. This validates the use of static panel strategies such as fixed effects and random effects estimators. However, we bear in mind the bias caused by the endogenous lagged dependent variable and try to avoid or minimize it as shall be seen below.

A random-effects estimator might be a better choice in this case. Applying a random effects strategy allows us to estimate the effects of the time-invariant control variables, which are wiped-out in the fixed effects method. The random effects approach attempts to model the country effects as drawings from a

⁶⁹ According to Andersen and Sørensen (1996) and Bowsher (2002), instrument proliferation vitiates the test, so its p-values equal one.

probability distribution instead of removing them.⁷⁰ It assumes that these country effects are a part of the disturbance term, $\eta_{i,t} = \mu_i + \varepsilon_{i,t}$, that is, zero-mean random variables, uncorrelated with the regressors. Moreover, the random effects estimator is less biased and hence leads to parameters that are more efficient.

Accordingly, the country-specific effects, μ_i , determines the best choice. The random effects approach assumes that the individual-specific effect is a random variable that is uncorrelated with the explanatory variables of all past, current, and future time periods of the same individual, i.e., $E[\mu_i, X_i] = 0$. Nonetheless, according to Greene, “[t]here is little justification for treating the individual effects as uncorrelated with the other regressors as is assumed in the random effects model. The random effects treatment, therefore, may suffer from inconsistency due to this correlation between the included variables and the random effect” (2008, 301).

To make the correct choice we used the Hausman Test, which suggests that the appropriate procedure in all cases is the fixed effects estimation. Fixed effects estimators are always consistent although not fully efficient (Hausman and Taylor, 1981). The Hausman Test basically tests for orthogonality of the random effects and the regressors. The Null Hypothesis is that they are not orthogonal. Its statistic is distributed as χ^2 and is based on the covariance matrix of the difference vector:

$$Var[b - \hat{\beta}] = Var[b] + Var[\hat{\beta}] - 2Cov[b, \hat{\beta}] \quad (3.5).$$

Hausman’s essential result is that the covariance of an efficient, random effects estimator ($\hat{\beta}$) with its difference from an inefficient estimator is zero, which implies that:

$$Cov[(b - \hat{\beta}), \hat{\beta}] = Cov[b, \hat{\beta}] - Var[\hat{\beta}] = 0.$$

Applying the Hausman Test using parsimonious models, we find that $\chi^2 = 13.09$ is significant at the 1% level, hence it rejects H_0 , and thereby rejects the validity of the random effects model while confirming the applicability of the fixed effects approach in our case.

Based on Equation (3.4), we regress twelve models using the fixed effects strategy. All models include our main independent variable, ERV, and its interactive terms with the time dummies. We add the control variables individually so that we trace their effects without losing observations due to missing observations

⁷⁰ The random effects estimator is the feasible generalized least squares (FGLS) estimator. The FGLS estimator is simply the OLS estimator applied to a transformed regression that purges the heteroscedasticity and/or autocorrelation. This estimator uses the information that the error term has non-constant variance or the errors are correlated, and it requires specifying a model of heteroscedasticity or autocorrelation. If the model of heteroscedasticity or autocorrelation is a reasonable approximation of the true unknown heteroscedasticity or autocorrelation, then it is asymptotically unbiased, efficient, and consistent.

of other control variables.⁷¹ Finally, we run the full model, which includes the whole set of variables that proved significant in the previous models. Notice that the number of observations in the final model falls to 301. This difference in the number of observations limits us to comparing the results emerging from the full model with those of previous models.

Table 3.6 indicates that, except in the first model, the exchange rate volatility shows negative effects. This effect is significant in eight equations. Since we are dealing with equations where the dependent variable is the difference in annual logs and the main independent variable is the annual standard deviation of monthly differences in the logarithmic value of the exchange rate, we interpret the coefficient as a percentage change in the dependent variable caused by a percentage change in the independent variable. Thus, we say that one percentage point increase in the volatility of the exchange rate decreases economic growth by 0.05-0.12 percentage points. This negative effect is the lowest when we control for many standard variables in the full model: Model 12.

The interactive terms, which reflect the indirect effect of ERV during the conflict cycle and capture how the effect of ERV changes over time, also show mixed evidence, some of which is statistically significant. We first run a joint significance test, an F-Test, to evaluate if the interactions are jointly non-significant, based on Model 12 of Table 3.6. We find that $F\text{-value} = 48.40$ which is robustly significant. Thus, we reject the Null Hypothesis and therefore the value of one of the interactive terms, at least, is different from zero.

In general, we can find two distinctive trends of the effect of ERV: an enhancing effect in the beginning and a hampering effect later. When the conflict terminates, any change in the exchange rate promotes economic performance. Out of twelve models, eleven introduce positive effects for this interactive variable, five of which are statistically significant. This means that more volatile exchange rates, surprisingly, support economic growth when the conflict terminates. Comparing the significant parameters, we notice that the magnitude shrinks when we control for foreign investment which is strongly associated with exchange rate volatility. We notice also that the parameter loses its significance when we control for standard variables in Model 12.

The positive sign is clear in the first post-conflict year. Three models, including the full model, find a significant positive effect but with large magnitudes. Thus, doubts about the magnitude of the ERV effect

⁷¹ Nevertheless, comparing the numbers of observations between the descriptive statistics, reported in Table B.3, and the regressions show that more than half of the observations miss at least one of the control variables.

in the first PC year arise. Next, we interpret this magnitude in the frame of the marginal effect. We clarify the interpretation using the following equation extracted from Equation (3.4):

$$y_{i,t} = \dots + \beta_1 ERV_{i,t} + \beta_2 CC_{i,t} + \beta_3 CT_{i,t} + \beta_4 PC1_{i,t} + \beta_5 PC2_{i,t} + \beta_6 PC3_{i,t} + \beta_7 PC3_{i,t} + \beta_8 PC4_{i,t} + \beta_9 PC5_{i,t} + \beta_{10} ERV_{i,t} CC_{i,t} + \beta_{11} ERV_{i,t} CT_{i,t} + \beta_{12} ERV_{i,t} PC1_{i,t} + \beta_{13} ERV_{i,t} PC2_{i,t} + \beta_{14} ERV_{i,t} PC3_{i,t} + \beta_{15} ERV_{i,t} PC4_{i,t} + \beta_{16} ERV_{i,t} PC5_{i,t} + \dots,$$

where $CC_{i,t}$, $CT_{i,t}$, $PC1_{i,t}$, $PC2_{i,t}$, $PC3_{i,t}$, $PC3_{i,t}$, $PC4_{i,t}$, and $PC5_{i,t}$ are dummy variables that equal one when a country passes: a civil-conflict year; a year when a civil conflict terminates; a first post-conflict year; a second post-conflict year; a third post-conflict year; a fourth post-conflict year; and a fifth post-conflict year, respectively, and are otherwise zero. We calculate the marginal effect for the ERV using the partial derivative of the dependent variable in term of the independent variable concerned (the ERV in our case) as follows:

$$\frac{\partial y_{i,t}}{\partial ERV_{i,t}} = \beta_1 + \beta_{10} CC_{i,t} + \beta_{11} CT_{i,t} + \beta_{12} PC1_{i,t} + \beta_{13} PC2_{i,t} + \beta_{14} PC3_{i,t} + \beta_{15} PC4_{i,t} + \beta_{16} PC5_{i,t} \quad (3.6),$$

Bearing in mind that when one of the dummy variables equals one, the others are null. In peacetime all of the time dummies are zero. Thus, and using the full model, we calculate the marginal effect of the ERV in the first post-conflict year as a combination of the direct effect, β_1 , and the indirect one, β_{12} , so it equals $-0.0451 + 1.7 = 1.65$. This means that increasing ERV in the first post-conflict year by one percentage point increases economic growth by 1.65 percentage points. A part of the interpretation of this very large magnitude builds on the fact that when the conflict terminates, economic growth rises from the low economic level that exists during the conflict and so this growth is associative with different, non-causal factors, including volatile exchange rates. Another part of the explanation builds on the large inflow of capital in the first peaceful year trying to capitalize on rebuilding opportunities, and leads to higher economic growth and more volatile exchange rates, simultaneously.

The negative effect is widely clear for ERV starting from the second post-conflict year. Without controlling for any variables, Model 1 shows a hampering indirect effect of ERV that is significant at the 10% level. The magnitude of this effect jumps in the full model and becomes robustly significant and is combined with a negative direct effect. Hence, a percentage point increase in ERV decreases economic growth by 1.9 percentage points. We think, however, that this large effect is due to the small sample of the full model, and we grant the significant magnitude found in Model 9 more credit. Next, the results show that none of the negative parameters is significant in the third post-conflict year, while the significant effect

appears in the fourth post-conflict year in three models, including the full model that is robustly significant.

Its magnitude is less than the other significant impact for the first and second post-conflict years.

Table 3. 6: Fixed Effects Estimation

Dependent Variable: The difference in the log of per capita GDP in two consecutive years												
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
L. Log Economic Level	-0.0511** (0.0238)	-0.0603** (0.0277)	-0.0637** (0.0280)	-0.0735* (0.0386)	-0.0392* (0.0190)	-0.0427** (0.0155)	-0.0343*** (0.0119)	-0.0300*** (0.00894)	-0.0649** (0.0275)	-0.0621 (0.0371)	-0.0656** (0.0303)	-0.0454** (0.0206)
Exchange Rate Volatility	0.00826 (0.0373)	-0.0596* (0.0296)	-0.0659** (0.0276)	-0.0721* (0.0413)	-0.105*** (0.0328)	-0.0664* (0.0354)	-0.118* (0.0581)	-0.0823** (0.0392)	-0.0735 (0.0514)	-0.0497 (0.0326)	-0.0808** (0.0334)	-0.0451 (0.0342)
Civil Conflict × Log ERV	-0.0642 (0.0718)	0.0744*** (0.0221)	0.0873*** (0.0221)	0.0783*** (0.0270)	-0.530** (0.209)	0.0815*** (0.0266)	0.123** (0.0442)	0.116*** (0.0344)	0.282 (0.294)	0.0837*** (0.0275)	0.0934* (0.0512)	-0.686** (0.292)
Conflict Termination × Log ERV	0.0312 (0.0667)	0.0900 (0.0551)	0.110** (0.0517)	0.0912 (0.0531)	-1.763 (1.834)	0.100 (0.0647)	0.175* (0.0974)	0.0941 (0.0550)	0.132** (0.0566)	0.103** (0.0382)	0.117* (0.0642)	0.774 (0.727)
Post Conflict1 × Log ERV	0.118 (0.155)	0.0698 (0.0868)	0.0884 (0.0873)	0.0533 (0.0821)	5.695** (2.726)	0.0612 (0.0869)	0.0700 (0.0560)	0.0629 (0.0524)	3.853** (1.676)	0.0437 (0.0441)	0.0852 (0.0877)	1.705*** (0.376)
Post Conflict2 × Log ERV	-0.203* (0.106)	-0.177 (0.146)	-0.145 (0.139)	-0.162 (0.151)	-1.437** (0.592)	-0.143 (0.152)	-0.222 (0.143)	-0.0913 (0.158)	-0.340** (0.154)	-0.135 (0.127)	-0.150 (0.152)	-1.880*** (0.502)
Post Conflict3 × Log ERV	-0.271 (0.358)	-0.370 (0.668)	-0.369 (0.651)	-0.245 (0.726)	-0.224 (0.754)	-0.248 (0.718)	-0.570 (0.574)	-0.426 (0.665)	-0.574 (0.831)	-0.671 (0.665)	-0.687 (0.756)	-0.552 (0.688)
Post Conflict4 × Log ERV	-0.431* (0.208)	-0.252 (0.398)	-0.295 (0.379)	-0.473 (0.424)	-0.648*** (0.161)	-0.468 (0.416)	-0.613 (0.374)	-0.337 (0.370)	-0.448 (0.329)	-0.274 (0.478)	-0.372 (0.448)	-0.626*** (0.0633)
Post Conflict5 × Log ERV	0.212 (0.399)	0.292 (0.739)	0.228 (0.712)	0.342 (0.795)	-0.681 (0.624)	0.377 (0.724)	0.0576 (1.023)	0.193 (0.770)	-0.418 (0.544)	0.179 (0.824)	0.0860 (0.829)	-0.435 (0.798)
Civil Conflict		-0.0389** (0.0178)	-0.0381** (0.0181)	-0.0408* (0.0197)	-0.00803 (0.0144)	-0.0241* (0.0127)	-0.0373*** (0.0124)	-0.0218** (0.00838)	-0.0183 (0.0157)	-0.0311* (0.0180)	-0.0306* (0.0151)	0.0109 (0.0118)
Peace Onset		-0.00966 (0.0118)	-0.00933 (0.0120)	-0.0134 (0.0124)	0.0186 (0.0394)	-0.00650 (0.0140)	-0.00302 (0.0126)	-0.00901 (0.0132)	-0.0143 (0.0112)	-0.0193* (0.0112)	-0.00193 (0.0134)	-0.0211 (0.0158)
Post Conflict 1		0.0273 (0.0215)	0.0275 (0.0214)	0.0213 (0.0162)	-0.0682 (0.0502)	0.0275 (0.0162)	0.00333 (0.0118)	0.00552 (0.0119)	-0.0388 (0.0293)	0.0259 (0.0227)	0.0289 (0.0200)	-0.0109 (0.0123)
Post Conflict 2		-0.00414 (0.0161)	-0.00447 (0.0157)	-0.0140 (0.0216)	0.0193 (0.0363)	-0.0103 (0.0214)	-0.0114 (0.0229)	-0.00366 (0.0198)	-0.000634 (0.0150)	0.00395 (0.0164)	-0.00346 (0.0149)	0.0603** (0.0273)
Post Conflict 3		-0.00166 (0.0253)	-0.00108 (0.0241)	-0.00706 (0.0288)	-0.0157 (0.0335)	-0.00206 (0.0286)	0.00675 (0.0228)	0.00284 (0.0261)	0.00715 (0.0317)	0.0178 (0.0259)	0.00789 (0.0265)	0.0159 (0.0203)
Post Conflict 4		-0.0156 (0.0259)	-0.0125 (0.0250)	-0.0152 (0.0267)	-0.00970 (0.0167)	-0.0117 (0.0267)	0.00547 (0.0179)	-0.0105 (0.0262)	0.000206 (0.0206)	-0.00844 (0.0338)	-0.0125 (0.0241)	0.00232 (0.0147)
Post Conflict 5		-0.00933 (0.0200)	-0.00681 (0.0194)	-0.0159 (0.0219)	0.0262 (0.0274)	-0.0122 (0.0204)	-0.00464 (0.0217)	-0.00453 (0.0222)	0.0161 (0.0151)	-0.00336 (0.0273)	-0.00632 (0.0192)	0.0296 (0.0371)
Population Growth			-0.615*** (0.175)									-0.351 (0.205)
D. Trade Openness				0.000358 (0.000772)								
D. Secondary School Enrollment					0.00295** (0.00130)							0.000661 (0.000891)
Government Consumption						-0.000594 (0.000459)						
D. Financial Trust							-0.00459** (0.00199)					-0.000791** (0.000374)
Executive Constraints								0.000366 (0.00229)				
Log of FDI									0.00608** (0.00266)			0.00643*** (0.00219)
Inflation										-0.00023** (0.000103)		-9.17e-05** (4.16e-05)
International Conflict											-0.0438 (0.0272)	
International Sanction											0.0150 (0.0298)	-0.0301*** (0.00696)
Military Coup											-0.00443 (0.0171)	
RMSE	0.073	0.072	0.072	0.070	0.045	0.049	0.058	0.051	0.058	0.070	0.072	0.034
F-Test for Joint Significant of Fixed Effects	960.12***	94805.77***	1.9e+05**	88243.39***	4.2e+05**	2.8e+05**	1.8e+07**	1.9e+06**	1.1e+07**	7.0e+05***	4.8e+05**	49180.26***
Obs.	649	649	649	575	419	570	616	622	557	543	648	301
R-squared	0.032	0.061	0.076	0.075	0.147	0.074	0.351	0.035	0.098	0.058	0.082	0.219
Number of Countries	22	22	22	22	22	22	22	21	21	21	22	20

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. Robust standard errors are in parentheses. Regressions use robust standard errors clustered by country. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. D. means that we use the first differences of this variable. Table B.13 presents a description of the variables used.

Getting back to the conflict time, we find that the interactive term shows mixed effects. Ten of the models are significant. Two of which, including the full model, hold a negative sign. Based on Equation (3.6) and using Model 12, the marginal effect of ERV shows that a percentage point increase in the ERV decreases economic growth by 0.73 percentage points. This result is significant at the 5% level.

Overall, we recognize two different effects of the ERV. The first is positive and appears when the peace comes and during the first peaceful year, while the other is negative and becomes apparent from the second post-conflict year. For the time being, we believe that the first positive effect is confounded by the strong momentum of economic growth in those moments and the large economic opportunities provided as soon as the conflict terminates. These opportunities are associated with high exchange rate volatilities. We also believe that the relevant negative effect of ERV in the later peaceful years indicates a real effect of volatility. In addition, due to the large magnitude of the ERV effect in the second post-conflict year, we should give more attention to its effects since the ERV stays high in that specific year.

When tracing the time profile of post-conflict economic growth, we follow the full model, since it estimates their parameters conditional on different control variables. We notice that the economy grows negatively when the conflict terminates, and it continues shrinking in the first PC year. This is not consistent with the findings of panel 2 of Figure 3.1 and skeptically highlights the elements that are reflected in the parameters of ERV in this period. It also implies that the existence of a positive effect of ERV when the conflict terminates and in the first PC year due to its association with high, self-promoted economic growth, is fake. One, on the other hand, can attribute the negative growth in the first years of peace to the high uncertainty spreading in that period, when peace is still uneasy. This confirms the importance of capitalizing on the first PC year to improve the economy and sustain peace in a fragile situation. Next, the parameters indicate that growth is sustained in the following years, especially in the second PC year with a larger magnitude that is statistically significant at the 5% level.

Checking the effects of other controls, we find relevant results. First, the convergence term remains robustly influential. This is consistent with the literature, both that which explores economic growth in general (Islam, 1995; Caselli et al., 1996; Beck et al., 2000), or that which investigates it in the MENA countries (Guetat and Serranito, 2007; Andreano et al., 2013). On the other hand, FDI has a robust positive effect on economic growth in the MENA region. This effect is significant when controlling for FDI individually or with other controls. Model 12 indicates that if the share of FDI over GDP goes up by a percentage point, economic growth goes up by 0.006 percentage points. This is an indirect channel through which the degree of ERV affects economic growth. Although not highly correlated in our sample,

exchange rate stability strongly affects FDI according to existing studies (Kaminsky et al., 1998; Schmidt and Broll, 2009). Moreover, analyzing FDI flows from the European Union to the MENA economies, Nicet-Chenaf and Rougier (2014) find that exchange rate crises become highly significant in explaining FDI volatility after the Barcelona Agreement, signed in 1995.

Inflation, another monetary indicator, negatively affects economic growth. Although this effect is small, it is statistically significant at the 5% level. Since the monetary system is still in its infancy in the MENA region, people there depend on inflation rates rather than interest rates to read the economic situation in their homes. On the other hand, consistent with the Malthusian perspective, Model 3 in Table 3.6 shows that higher population growth hampers economic growth in the MENA region, which has had one of the highest population growth rates in the world. However, this parameter loses its significance and half of its magnitude when controlling for other variables in the full model. This is similar to what happens to the human capital parameter, which positively affects economic growth in a significant way in model 5 but loses its significance in the full model. Counterintuitively, financial trust has a negative effect on economic growth and it is significant at the level of 5% in both Model 6 and the full model.

On the other hand, the results refute the influential effects of some variables included in the models. Trade openness, for example, has an effect that is indistinguishable from zero, although its sign is positive, as the literature would suggest. We find the same for the institutional variable, which shows a positive, yet insignificant, effect, and that of public consumption, which indicates a negative, yet insignificant, effect.

3.5.7.5 Iterative Bootstrap-based Bias Correction

Further, we perform another technique, the iterative bootstrap-based bias correction for the fixed effects estimator in dynamic panels. The bootstrap technique, introduced by Efron (1979), builds on resampling the dataset to estimate the distribution of a test statistic. Using this distribution can decrease inference bias by providing critical values that are more precise. The basic idea behind bootstrapping is that inferences about a population from sample data (sample \rightarrow population) can be modeled by *resampling* the sample data and performing inference on it (resample \rightarrow sample). As the population is unknown, the true error in a sample statistic against its population value is unknowable. In bootstrap-resamples, the 'population' is, in fact, the known sample and therefore the quality of inference from resampling data is measurable.

Everaert and Pozzi (2007) proposed using this technique with a fixed effects approach. Their estimator is based on work by Kiviet (1995) who derived a bias-corrected fixed effects estimator using an analytical approximation of its small sample bias in a first-order dynamic panel data model. Using Monte Carlo simulations, Kiviet showed that this bias-corrected fixed effects estimator has superior small sample properties compared to GMM estimators in that it is able to remove most of the bias of the fixed effects estimator while maintaining a relatively small coefficient uncertainty. However, Kiviet's correction method requires meeting a strict set of assumptions under which the bias expression of the fixed effects estimator is derived. These assumptions are applicably unrealistic. Everaert and Pozzi (2007) address this issue by using a bootstrap-based bias correction procedure. The main advantage of their approach is that it requires no analytical expression for the bias of the fixed effects estimator as this is numerically evaluated using bootstrap resampling. Using Monte Carlo simulations, Everaert and Pozzi (2007) show that the BCFE estimator outperforms the difference and System-GMM estimators, both in terms of bias and inference, in samples with small to moderate time series'. Furthermore, BCFE is insensitive to the non-normality of the errors, conditional heteroscedasticity, and nonstationary initial conditions and has a bias comparable to the analytical bias corrections of Kiviet (1995) and Bun and Carree (2005).

Applying this approach requires specifying some technical options. Choosing an appropriate resampling scheme is crucial to preserve the structure of the error terms in the resampling process. Since error variances vary within MENA countries and over time, we use the wild bootstrap suggested by Liu (1988) and Mammen (1993). This approach fits out unbalanced data and preserves both the cross-sectional and temporal structure of the error terms and is therefore robust to general heteroscedasticity. As for the initialization scheme for the bootstrapped lagged dependent variables, we use burn-in initialization since it relaxes the distributional assumption for the initial conditions and it allows us to build on the error-resampling scheme used to generate the actual sample to generate the initial values (De Vos et al., 2015).^{72,73} Finally, inference, which depends on the type of standard errors and confidence intervals, can be performed using either a parametric or non-parametric bootstrapped variance-covariance matrix, or percentile intervals. We use the latter since it has the advantage of not making any distributional assumptions and fits better into smaller datasets.

⁷² However, one should mention that a purely data-driven initialization, like the burn-in one used here, tends to be less stable compared with other options. This is of a particular importance for small datasets where the data may be nearly non-stationary or very noisy (De Vos et al., 2015).

⁷³ When the burn-in initialization is combined with the wild bootstrap (wboot), it results in blocked variants. This implies that the resampling pattern used for the creation of bootstrapped data is copied (several times) to generate the initial values over the burn-in period.

The results obtained when using the BCFE estimator, presented in Table B.9,⁷⁴ do not corroborate the main results we obtained with the fixed effects estimator exactly, while making the results in general more hard to read. The results show that the direct effect of ERV in peaceful time is mixed while none of its parameters is distinguishable from zero. The convergence term shows inconsistency in the different models. It is even significant just in one model with a positive sign, indicating a sort of divergence. Moreover, the parameters of time dummies show mixed evidence and therefore we infer nothing about the unconditional path of economic growth in the post-conflict period.

We find a similar confusion regarding the interactive terms. None of these terms is statistically significant in all models. The p-value of the F-Test of Model 13 in Table B.9 equals to 0.81, hence it confirms the insignificant effect of the interactive terms. Yet, the signs are quite similar starting from the second PC year, but the magnitudes of the effects are smaller in this case. We notice a negative sign for ERV parameters following the onset of peace and the first PC years in Model 13. This supports our doubts about the fake associations that were found earlier.

Table B.9 confirms the significant effect of three control variables: population growth, the financial trust, and FDI. They have the same signs that were reported in Table 3.6, but with a smaller magnitude for the first two variables, and a larger magnitude for the last variable. The other control variables show similar signs to what was reported in Table 3.6.

3.5.7.6 The Biased Corrected Least Square Dummy Variables (BCLSDV) Estimator

Since our main results are extracted from a fixed effect method, we are concerned about the endogeneity stemming from the correlation between the error term and the lagged dependent variables. This endogeneity leads to biased coefficients. Thus, we look for a method to account for this bias.

Although it is inconsistent, the LSDV estimator, which is identical to the fixed effects estimator, has a relatively low variance and hence can lead to an estimator with lower root mean square error after the bias is removed (Abonazel, 2017). Therefore, different bias-correction methods for the LSDV estimator were developed (Kiviet, 1995; Hansen 2001; Judson and Owen, 1999; Bun and Kiviet, 2003). These methods build on estimating the estimator which is likely to be biased, and then correcting this estimator by approximating the bias. Based on previous methods, Bruno (2005) developed feasible bias

⁷⁴ The convergence term here is the lagged economic growth, $EG_{i,t-1}$, since *Stata* adds it automatically.

approximations of the LSDV estimator. This is the biased corrected least square dummy variables (BCLSDV) estimator, which is suitable for small panels and fits unbalanced panels. The bias approximations can be estimated using an initial consistent estimator such as Anderson-Hsiao or the GMM estimator. Later, Bun and Carree (2005) proposed an alternative correction to the bias that directly uses the LSDV estimator, obviating the need to resort to initial consistent estimates.⁷⁵

Table B.10 introduces the results.⁷⁶ Less significant coefficients exist now, but the signs of influence are to some extent similar to what is reported in Table 3.6. The ERV variable shows negative direct effects in the thirteen models; none of them is significant, and the magnitude is smaller than that found in Table 3.6. The multiplicative terms of ERV are indistinguishable from zero, and the fourth and, surprisingly, fifth post-conflict years are exceptions. The full model, as well as Model 8, confirms the significant effect (at the levels of 1% and 10% respectively) of ERV in the fourth post-conflict year, while it shows a negative significant effect of ERV at the level of 1% in the fifth post-conflict year. Based on Equation (3.6), the overall effect of ERV in the fourth post-conflict year, which is the summation of the direct effect, θ_1 , and the indirect one, θ_{15} , is around 0.8 percentage points in both models, while the overall effect in the fifth post-conflict year (where we substitute θ_{15} with θ_{16} in the previous calculation) is 0.4. This implies that a percentage point change in the volatility of the exchange rate in the fourth post-conflict year brings a change in economic growth that is as twofold as the change that may occur in economic growth had the same change in the ERV happened in the fifth post-conflict year. It is notable that the parameters of the indirect ERV effect in the year when peace onsets and the following year hold a negative sign in the full model, confirming our previous doubts. Indeed, we are now convinced that the bias of the fixed effects estimator, corrected with the BCLSDV and BCFE estimators, is the main reason for obtaining a positive parameter of ERV when the peace is achieved and in the following year.

The convergence term shows a significant negative effect in the majority of the models. Few standard variables are significant here. While population growth affects economic growth negatively, school enrolment supports it. The parameter of the financial trust stays with its irrelevant negative effect that is robustly significant in Model 8. In addition, Model 12 shows that being involved in an international conflict hampers economic growth by 0.04 percentage points with a statistically significance level of 1%.

⁷⁵ In order to apply this method, we initialize the bias approximations, required for correction, using the consistent estimator of Anderson and Hsiao.

⁷⁶ The convergence term here is the lagged economic growth, $EG_{i,t-1}$, since *Stata* adds it automatically.

3.6 Additional Robustness Checks

3.6.1 Including a Variable for The Exchange Rate Regime

The model excluded all variables reflecting the exchange rate regime. Most of the MENA countries adopt a type of the fixed exchange rate regime and this brings a lack of variation between and within the observations gained. In addition, investigating economic growth under alternative regimes in 145 IMF-member countries, Ghosh et al. (1997) find that no significant differences in output growth across exchange regimes exist. Furthermore, Clark et al. (2004) have found a little connection between exchange rate variability a country is exposed to and the adopted exchange rate regime.

Nevertheless, many papers propose a variation of the ERV impact on economic growth due to the exchange rate regime. Mundell (1973), De Grauwe (1998), Frankel and Rose (2002), and Schnabl (2008) all claim that exchange rate stability is key to economic growth and are in favor of a fixed exchange rate regime. By contrast, the proponents of a flexible regime argued that the ERV reduces the negative impact of real asymmetric shocks on local and external disequilibria (Friedman, 1953; Levy-Yeyati and Sturzenegger, 2002). That is, in the case of real asymmetric shocks, if prices and wages adjust slowly, flexible exchange rates can adjust relative international prices to compensate for output losses (Mundell, 1961; Arratibel et al., 2011). Moreover, Ghosh et al. (1997) show that a pegged exchange rate may distort price signals in the economy by creating a misalignment of the real exchange rate and, in turn, leads to an inefficient allocation of resources across sectors. Nevertheless, some scholars suggest that findings are inconclusive. For example, Elbadawi et al. (2008b) argue that if central banks in post-conflict countries adopt more flexible exchange rate regimes, moving away from pegs or intermediate regimes of limited flexibility may strengthen monetary policy, but may also increase short and medium-term ERV.

Accordingly, we include a variable showing the exchange rate regimes adopted by countries under study. We use the *de facto* classification of exchange rate regimes, set by IMF (See Table B.1), to create a dummy variable whose value is 0 when the country follows a fixed regime, and 1 in all other cases. Table B.11 shows the results using just the fixed effects strategy.

The parameters of the ERV are negative in the five models. Two of these models are statistically significant at the 5% level and one at the 1% level. Their parameters indicate that one percentage point increase in the volatility of the exchange rate decreases the economic growth rate by between 0.06 and 0.12

percentage points. This magnitude is similar to what we find in the main investigation reported in Table 3.6. Similarly, the interactive terms, which show the effect of our key independent variable in the conflict and the post-conflict time, indicate similar results to those reported in the main analysis in Table 3.6. Model 5 shows that these terms are robustly significant in the first, second, and fourth post-conflict years, with the positive magnitude of 1.6 in the first post-conflict year, and negative magnitude of 2 and 0.7 in the second and the fourth years, respectively. These results were found using Equation (3.6). The new variable, exchange rate regime, shows a positive effect which is significant at the 10% level in Model 4, indicating that moving away from the fixed regime increases economic growth by 0.01 percentage point. The results, on the other hand, confirm the significant influence of foreign direct investment, financial trust, inflation, and international sanctions. The convergence term remains significant here, and trade openness becomes significant with a negative sign.

3.6.2 Splitting The MENA Countries into Groups

The MENA region contains heterogeneous countries in terms of both economic and institutional development. It is unreasonable to compare Somalia, one of the poorest countries in the world, with UAE or another oil-exporting country. Therefore, we rerun the empirical analysis using subsamples of countries to reflect this variance. We depend on the classification offered by the World Bank (2007) and Nabli and Arezki (2012) and used by Apergis and Payne (2014), splitting the MENA countries into three groups: Group 1, Resource Rich–Labour Abundant; Group 2, Resource Poor–Labour Abundant; and Group 3, Resource Rich–Labour Importing. The Resource Rich–Labour Abundant group includes countries owning significant oil resources, while simultaneously having relatively large populations and labour forces. These countries include Algeria, Iran, Iraq, Syria, Turkey, Sudan, and Yemen. The Resource Poor–Labour Abundant group includes countries with few oil resources but which have relatively large labour force and population. These countries include Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, Israel, Mauritania, and Somalia. Finally, the Resource Rich–Labour Importing group includes countries that are rich in oil resources but are major importers of labour. This group includes the Gulf countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) and Libya.

Dividing our sample into three subsamples reduces the dimension of countries involved (N); thus, the fixed effects estimator is probably consistent (Baltagi, 2008). Table B.12 shows the results of three models. The main independent variable is negative for the first two groups, where most countries have faced civil conflict. This negative sign is significant at the 10% level for Group 1, with oil resources and

large populations, and Group 2, with poor resources and large population, only in Panel (2). The negative effect in the second group is much larger than in the first one. Increasing the ERV by a percentage point decreases economic growth in the second group by 0.7 percentage points compared with 0.09 in the first group, using the parameters in Panel (2). On the other hand, the second and third panels show a significant effect of ERV in Group 3 (the rich MENA countries) but with a positive sign. This confirms the association between the volatilities of oil prices, a key determinant of economic growth in those countries, and the ERV therein. It is notable that the parameter of this variable for the rich group is robustly negative in the first panel, Model 3, where the model excludes standard variables, before it turns positive in the following panels. This indicates the negative contribution of other standard variables caught by the ERV coefficient in economic growth in these rich countries.

The view is, to some extent, foggy regarding the parameters of the interactive terms, with an exception of the conflict years. Before discussing these terms, it is notable that the number of observations of the interactive terms in the rich countries, Group 3, is small, as few of them have experienced civil conflicts and therefore we cannot infer the parameters in those cases. Thus, we focus on the first two groups. We find that ERV has now a clear negative effect during the conflict period, especially in the second group. Endogeneity is a source of caution here due to the bidirectional causality between growth and volatility. Further, the positive effect of ERV when the conflict terminates is unclear since its parameter shows positive signs in Panel (1) and negative signs in Panel (2), while Panel (3) shows a positive effect in Group 1 and negative effect in Group 2. The apparent confusion continues in the years following. However, it is clear that ERV hampers economic growth in all groups in the fourth year, and it has a negative effect in the second post-conflict year for Group 1 and in the third post-conflict year for Group 2.

Tracing the other standard variables clarifies the determinants of economic growth in the different groups of countries. The convergence term, for example, proves significant in the second group of resource poor-labour abundant countries, while the very richly resourced countries show suggestive but insignificant evidence of divergence in Panels 2 and 3. The fixed exchange rate regime supports, but not significantly, economic growth in Group 1, where most countries follow it, while, robustly significant, hampers economic growth in both groups of oil-abundant countries. Finally, countries in Group 2 witness significant time effects in both ways. The negative significant parameter in the first year of peace presents evidence of a conflict trap, while the significant positive sign of the time coefficient in the following years introduces a variation of the *Phoenix Effect*.

Already stated hampering factors for economic growth vary in terms of their significance between the three groups. Although financial trust maintains a negative sign, its parameters are indistinguishable from zero in the three models for all groups. Inflation has a small hampering effect that is only significant in Group 2, while it has a positive, yet insignificant, effect in the rich countries. Population growth, known to be a key determinant of economic growth in developing countries, is a significant determinant of economic growth in oil countries, both labour-abundant and labour-importing, while its effect is indistinguishable from zero in poor-oil countries in Group 2. Finally, international sanctions negatively affect economic growth in Groups 1 and 2, and their effect is statistically significant at the 1% and 5% levels, respectively.

3.7 Discussion

Although working with a small sample, so tracing significant effects is challenging, the current empirical section provides us with some conclusive results as well as suggestive ones. Furthermore, when discussing the findings, we should have in mind that the MENA region, including the Arabic World, is heterogeneous. Although sharing similar cultures and beliefs, MENA countries are economically heterogeneous which presents a major challenge when identifying their problems and potential solutions (Blair et al., 2014).

Skimming the available data we imported from different datasets, high fluctuations in the economic indicators were immediately visible, in either economic performance, prices, or exchange rates. The mean of economic growth, for example, is 2% while its standard deviation is 10.7%. This is strong evidence on the fragility of the MENA economies and their reliance on rental elements: oil, gas, and agriculture. These fluctuations peak in times of conflict, so frequent in the MENA region. ERV in years of conflict and in the first two PC years is twice its level in the normal, peaceful time, while it is threefold when the conflict terminates. These fluctuations make our data noisy and hence affect the robustness of the conclusions.

The main investigation, which uses a fixed effects strategy, affirms a direct, statistically significant, effect of the exchange rate volatility on MENA countries' economic growth in peacetime. A percentage point increase in the volatility of the exchange rate decreases economic growth by 0.05-0.12 percentage points. However, the indirect ERV effect, represented by the interactive terms, does not follow a clear trend. Yet we still find two distinctive trends: an enhancing effect in the beginning, and a hampering effect later on.

When the conflict terminates, any change in the ERV promotes economic performance. Increasing ERV in the first post-conflict year by one percentage point leads to an increase in the economic growth rate by 1.65 percentage points. This positive trend continues in the first post-conflict year. Later, a hampering effect appears in the following post-conflict years.

The unconditional economic growth, extracted from the time dummy variables, uncovers a part of the counterintuitive positive effect of the ERV when peace is regained. A negative path of growth at the beginning of peacetime supports the conflict trap view (Cevik and Rahmati, 2015; Collier, 2007) and rejects the growth rebound hypothesis in our case. Thus, one cannot attribute the positive ERV effect in that period to the positive growth trend but to the noisiness of the data which is higher when the conflict terminates. Nevertheless, still some support exists for the idea that a large inflow of capital, which capitalizes on rebuilding opportunities in the first year of peace, leads to higher economic growth and higher volatility of exchange rates, simultaneously; hence it is a possible interpretation of the positive effect of ERV. Accordingly, we conclude that the positive effect of the ERV, reported when the conflict terminates and in the first post-conflict year, is confounded by data noisiness and, to a smaller extent, to spurious associations. On the other hand, we conclude that the relevant negative effect of ERV in the later peaceful years indicates the real effect of volatility.

Other findings are consistent with the literature. The convergence term remains robustly influential. FDI, another indirect channel through which the exchange rate can influence economic performance, has a robust positive effect on economic growth in the MENA region in general. This confirms the importance of foreign capital to fill the savings gap, especially in poor countries. However, this channel is inactive due to the recent lack of foreign investment flowing to the region. According to UNCTAD (F.D.I., 2004), the FDI performance index shows that the MENA is far behind any other developing region except South-Asia.

Inflation, another monetary indicator, negatively affects economic growth. Although this effect is small, it is statistically significant at the 5% level. This is relevant to Barro, who finds that “households are thought to perform poorly when inflation is high” (2013, 85), and Clark, who argues that economic agents “devote productive resources to dealing with inflation” (1997, 70). In addition to its real detrimental effect regarding macroeconomic stability, inflation has a plausible effect that turns to affect the real fundamentals. On the other hand, our findings affirm the Malthusian Theory, that higher population growth hampers economic growth in the case of the MENA region, which has witnessed one of the

highest population growth rates in the world. We also find that the human capital parameter shows a significant effect that positively influences the chances of economic growth, and that International sanctions, which many of MENA countries have imposed upon them, affect economic growth also. Later, we find that adopting a fixed ER regime hampers growth and that abandoning it increases economic growth with 0.01 percentage point. We find also a negative effect of trade openness.

Other standard variables lack significance in our investigation. The variable of Institutions fails to prove significant. This is not relevant to the theory nor with the empirical literature investigating this nexus (Hakura, 2004; World Bank, 2003; Guetat, 2006; Kandil and Morsy, 2009). Moreover, the variable of public consumption lacks significant, so it fails to prove influential that is found in the literature, especially in Barro (1991). In addition, trade openness proves significant with a negative effect on growth, according to one of the techniques used.

Counterintuitively, financial trust has a negative effect on economic growth. The literature tracing the effect of financial development (and trust) in the MENA is rare and most studies find no systematic influences (Al-Awad and Harb, 2005; Abu-Bader and Abu-Qarn, 2008).⁷⁷ We attribute many causes to our findings. These include the low level of the financial development and the lack of financial literacy in the MENA region, making the variable used irrelevant to financial trust. On the other hand, Gregorio and Guidotti (1995) attribute this finding in Latin American countries to financial liberalization in a poorly regulated environment.

Splitting the data into three groups according to a country's demographical and natural resources uncovers one part of the previous findings, and shows the importance of not analyzing the nexus, based on aggregation, in such heterogeneous countries. The negative effect of the ERV in peaceful time is clear in the populated countries, Groups 1 and 2. The magnitude of the negative effect being much larger in Group 2, while this negative effect is not clear in the rich MENA countries contained in Group 3. Indeed, we find a positive effect in Group 3, indicating an association of some type between the volatilities of oil prices, a key determinant of economic growth in those countries, and the ERV there.

The interactive terms show slightly distinctive effects in the different groups, with unclear mixed evidence in some years, proving the noisiness of the data used. ERV has a negative impact during the conflict,

⁷⁷ When studying the financial development-economic growth nexus, the literature uses different variables including the ones we are using here as a proxy for the financial trust.

common in Group 1 and 2. This evidence lacks clarity for both groups in the year when the conflict terminates and for Group 2 in the first and second post-conflict years and for Group 1 in the third and fifth post-conflict years. ERV has a positive effect in Group 1 in the first post-conflict year and a negative effect in the second and fourth post-conflict years, while it has a negative effect in the third and fourth post-conflict years in Group 2. This distinction raises the importance of investigating the effects of ERV on an individual-country basis.

The distinction appears also for some standard variables. The convergence term, for example, proves significant only in the second group of resource poor–labour abundant countries. This same group holds significant parameters for the post-conflict year’s dummies. Inflation has a small hampering effect that is significant only in Group 2, while it has a positive yet insignificant effect in the rich countries. In contrast, population growth becomes insignificant in this group. On the other hand, the fixed exchange rate regime supports, but not significantly, economic growth of Group 1, where most countries have adopted fixed exchange rates. Simultaneously, robustly significant results show that fixed exchange rates hamper economic growth in both groups of oil-abundant countries. Finally, the parameters of *financial trust* lose significance in the three models for all groups.

3.8 Conclusion

Since peace is fragile, sustaining it is crucial in countries emerging from civil conflicts. This fragility increases in the MENA region, where countries appear to suffer from a higher risk of conflict recurrence without much decline over subsequent years (Cevik and Rahmati, 2015). Higher rates of economic growth prove key to sustaining peace (Collier et al., 2008). The risk of peace collapsing within a decade of the end of conflict falls from 42.1% to 26.9% if the economy grows at a rate of 10% rather than remaining stagnant. Thus, the current essay has investigated the volatility of exchange rates and their effects on economic growth in the post-conflict countries of the MENA region. We find that exchange rate volatility affects economic growth directly and indirectly in peaceful, conflict, and post-conflict times. We conclude by providing some recommendations based on the findings, although these are not robustly conclusive. These recommendations are useful for both the interim governments and the international community.

The investigation, first, suggests that peace per se is not enough as the findings do not prove an immediate rebound effect. Rather, a negative path of economic growth exists when the conflict terminates

and in the first post-conflict year. This is relevant to the *Ruins' School*, which claims that there are persistent adverse effects of civil conflict after its cessation (Kang and Meernik, 2005; Collier, 2007). Thus, it is advisable for post-conflict interim governments to enhance economic growth through fiscal and monetary policies and reform programs. Otherwise, the post-conflict country may find itself in a vicious conflict trap, and this is more probable in the MENA.

The chapter finds that excessive exchange rate volatilities hamper economic performance in the MENA region. Combining this finding with the high level of ERV found there shows the key detrimental impact of these volatilities. Thus, controlling these volatilities and alleviating their effects supports a stable economic growth and other economic outcomes.

Controlling exchange rate volatilities calls for controlling the monetary fundamentals that influence them. Although the current chapter has not empirically explored the determinants of this volatility, we can draw a few suggestions regarding the monetary policy followed in the post-conflict phase. High public debt and inflation rates are main concerns in the post-conflict period, and controlling them helps to recover the public's trust in the local currency. Policymakers may consider adopting inflation targeting as a strategy in addition to the autonomy of the monetary policy. Above all, stopping the money printing press is key when fighting hyperinflation. This requires improving the tax management and cutting public expenditure. Reducing the public debt is another strategy to solve exchange rate volatilities. It, however, remains a hard task for the interim government at a time it raises expenditures to meet the people's needs, while the tax base is still too narrow. Thus, relying on Arabic assistances based on oil-revenues is a feasible way to stop public debt growth.

Increasing assistance between Arabic countries requires the establishment of an Arabic fund with the main role of rebuilding the PCCs located in the MENA region. All Arabic countries may contribute to this fund based on their natural revenues. This fund could operate as a key means of pooling and distributing wealth gained from high oil revenues, which, if properly channeled, would contribute to the peace process.

Nevertheless, international and Arabic assistance may lead to harmful consequences when the PCC receives them at unsuitable times or uses them improperly. Elbadawi et al. (2008b) present a brief discussion of the best time to provide international assistance. They find that post-conflict countries cannot use aid, which generally increases at the beginning of a phase of peace, efficiently as soon as the

conflict terminates since state administrative and institutional frames are still exhausted. They argue that the growth impact of aid peaks between the sixth and tenth post-conflict years, for which reason the international community should smooth, and thus sustain the aid sent to those countries, so as to guarantee its efficient use. On the other hand, Elbadawi et al. (2008b) discuss the different aspects of the interim government's use of international financial assistance, including the amounts to be spent and saved, which percentage of spending should fall on traded and which on non-traded goods, and which part of saving should be used to build up foreign-currency and domestic-currency public-sector net assets. They claim the importance of achieving a fine balance between the goal of spending aid quickly on high priority social programs and infrastructural recovery and the objective of saving part of the aid funds by building up public-sector net assets by either accumulating foreign reserves or reducing public sector debt.

Foreign direct investment, an indirect channel associated with ERV, is one of the few key determinants of economic growth in the MENA. It is more important in the time after conflict as people have already spent their savings, which means that local savings are insufficient for the needed investments. Alas, FDI is too small in the MENA comparing with other regions in the world. Moreover, FDI rarely flows to an environment which is perceived to be insecure. Therefore, the interim government should look for methods of attracting international investment. This includes opening commercial attaches to foreign embassies and focusing on the investors that may have some sort of connections with the country; investors from the MENA region are much more likely to invest.

Another indirect channel of ERV is related to international trade. Although it is an inconclusive finding, it is better for the PC economy not to be hugely dependent on trading abroad. According to one of the robustness checks, trade openness has a negative effect, meaning that trading abroad is not in favor of the PC country. The exchange rate dramatically appreciates in an average PCC when the conflict comes to an end, making its products less competitive. It is, therefore, well advised to avoid immediate involvement in international trade, rather rebuilding local industry and then gradually liberalizing trade when the exchange rate is closer to its equilibrium level. On the other hand, the government may support the international competitiveness of other sectors. For example, government programs in support of agriculture, such as improving rural infrastructure and credit access, will contribute to the competitiveness and enhance economic diversification.

Another finding of the chapter regards the exchange rate regime. We reach different conclusions for the poor and rich MENA countries. The exchange rate regime adopted by the interim government in a PC country has an important role in stabilizing the exchange rate when the conflict terminates and in the PC phase. The fixed regime works better for the poor countries where most suffer from at least one civil conflict, while it does serve the rich MENA countries poorly. While it is better to adopt a flexible exchange rate regime due to its capacity to strengthen monetary authorities in peaceful countries, especially in the long-term, this flexible regime may increase short and medium-term ERV, impacting negatively on economic growth in a time of crisis. Therefore, a semi-fixed regime may be a good choice for an interim government when the conflict terminates, and a limited flexibility regime which would decrease volatility is likely a better choice from the third post-conflict year onwards. Furthermore, it is advisable that the interim government works with the central bank to move gradually into a flexible regime that maintains the long-term stability of the exchange rate.

Confidence in the local currency remains low when the conflict terminates and this restricts recovering efforts. Recovering the economy means recovering confidence in the local currency through real rather than monetary procedures. Increasing the attractiveness of the local currency through, for example, relatively high-interest rates, so as to entice people to shift to domestic currency and assets, may result in recessionary effects and is therefore not advisable as a policy. Therefore, the monetary authorities may look for other tools based on providing a stable macroeconomic environment. Moreover, the monetary authorities have to speed up the development of capital markets, so that people can choose among and buy a different selection of domestic financial assets.

Finally, yet most importantly, we consider monetary policy ineffective when the conflict terminates since it cannot control the stock of non-resident-held domestic money. The local currency of a PCC has spread around the world, while the quantity of money circulating on the black market is much higher than the quantity dealt with in official transactions. Therefore, the interim government, in cooperation with the international monetary authorities, must work to channel local currency towards official monetary channels. This requires simple and transparent exchange rate procedures that attract investors and the diaspora alike to use official channels to transfer money.

What we have already mentioned indicates the significance of monetary policy in the post-conflict MENA countries. It is established that monetary policy is less effective than fiscal policy in the developing

countries. This is because most of the problems in these countries are structural rather than monetary. The exchange rate is a key component of monetary policy, and the significant effect of its volatility highlights its vital role while prompting more concern surrounding the designing of effective monetary procedures when setting recovery strategies for PCCs.

Final Remarks

It is important, before closing the chapter, to mention two important points. First, when investigating the MENA region, one should bear in mind that it is a part of the Third World, and hence it is subject to the same universal process of underdevelopment as other Third World countries. In the preface of his book, Owen warns researchers not to explain everything happening in the MENA “by the fact that the majority of its people are Arab or Muslims who, until becoming rich from oil, lived as tribes in deserts” (2013, xii). Looking deeply at other conflicts in other regions of the world, for example Sub-Saharan Africa, South Asia, the Balkans, and Latin America, many similarities can be seen within the reasons and consequences of civil conflicts. On the other hand, scholars should not ignore the specific characteristics of the individual MENA countries. Case studies are more informative than global or regional studies. The next chapter, thus, delves deeply into the current case of Syria.

Second, the essential point in alleviating the ERV is the economic power of the state. This means that whatever the exchange rate regime is, and whether the facilities presented to the international investors are sufficient or not, nothing but a genuine industrial base and developed institutions can provide a strong and stable economy. Otherwise, the economies of the MENA will remain artificial, just like these countries. Few MENA countries have developed a strong economic basis in industry. Indeed, Turkey is the only country in the MENA region where a real industrialization process appeared. Other countries heavily rely on natural resources and on agriculture, whereas others rely on assistance. Furthermore, several of these countries have not built real institutions. Unlike the modern states in Europe and North America, slight differences between state, regime, and government exist in MENA countries. Owen points out that the Gulf countries lack this distinction meaning that: “if one shaikhly regime disappeared, the political entity it had created and ruled would most likely disappear as well” (2013, 3).

Chapter 4

4 A Consequence of a Tragedy: Nowcasting Poverty Rate in Syria

“As the conflict enters its 7th year, this is the worst man-made disaster the world has seen since World War II.”

Zeid Ra'ad Al Hussein, The UN High Commissioner for Human Rights

4.1 Introduction

As we have already discussed, economic growth is an emerging field in the PC arena. There being many instances of its having improved the post-conflict living conditions and helping to sustain peace (Cevik and Rahmati, 2015; Blattman and Miguel, 2010; Flores and Nooruddin, 2009; Chen et al., 2008; Collier et al., 2008). Nonetheless, economic growth is no longer seen as the primary means of achieving peace, as it fails to take into account the human element of conflict. Thus, although it is necessary, economic growth may be insufficient to avoid conflict relapse, particularly when the majority of people living in a PC country cannot reap its benefits.

This brings us back to the longstanding debate that has emerged in the development literature about which elements of growth should take priority. Is growth itself enough or, for example, should we emphasize conditional growth which prioritizes the poor (Kuznets, 1955; Kakwani and Pernia, 2000; Ravallion and Chen, 1997)? While this debate has moved from the normal, peaceful time, to the crises time, i.e., conflict and PC periods, the pro-Kuznets view still supports the *growth first* perspective. In his recent book, Collier, one of the Kuznetsists, mentions that the problem of the bottom billion, who live in the least developed countries (LDCs), has not been that they have had “the wrong type of growth, it is that they have not experienced any growth” (2007, 11). Thus, many scholars have argued that the failure

of the growth process in these societies should be the core concern of development theory (Easterly and Easterly, 2006; Powell, 2008).

Nonetheless, and starting from the 1980s, many scholars have criticized the Kuznets' assumption. This new trend was explicitly declared in 1987's UNICEF report of *Adjustment with a Human Face* (Cornia et al., 1987) which detailed the negative impact of structural adjustment programs on health and education. Prior to that, a study co-authored by the Vice President for Development Policy at the World Bank, Hollis Chenery, addressed the faults of the Bank's then current strategy of focusing on large projects, while expecting the market to resolve the problems of poverty and inequality (Chenery et al., 1974). It thereby comes clear that the presumption that "the rising tide would raise all boats" had been incorrect,⁷⁸ and that growth models that transcended the purely economic took precedence; new concepts, i.e., pro-poor growth and inclusive growth, have appeared. For example, Ali and Son (2007) and Jones (2013) find that the growth that is not inclusive can be both a danger to social and political stability and a threat to the sustainability of the growth process.

Inclusive growth became a popular term by the beginning of the 2000s as international organizations realized that growth alone would not solve the growth-poverty nexus (Bakker and Messerli, 2017). This realization shifted the concern from measuring progress in poverty reduction to including more people in the economic process through mechanisms such as job generation and entrepreneurship (Ianchovichina and Lundstrom-Gable, 2012). Moreover, and confirming the change in development mentality, the international community added the promotion of sustained, inclusive and sustainable economic growth as the eighth goal in the Sustainable Developmental Goals Agenda of 2030.

Setting an inclusive growth strategy relies on comprehensive data on the poverty profile. Moreover, it is better to use updated poverty data, especially in countries facing quick changes due to a specific event or crisis. Thus, the poverty profile and correlates reports and studies are cornerstones when setting rebuilding and recovery plans in countries emerging from bloody civil conflicts, including Syria.

The Syrian civil conflict is considered the "worst man-made disaster the world has seen since World War II", according to a UN officer (Al-Hussein, 2017). Many were killed, injured or became disabled. Others run away, either to less dangerous places inside Syria, becoming internally displaced people (IDP), or to other countries to become refugees there. Most of these people have lost all or a part of their wealth and

⁷⁸ This phrase is attributed to John Kennedy, who used it in a 1963 speech (Lazere, 2009).

income sources, and, while the Syrian economy shrank to less than half of its pre-war level after four years of conflict, the poverty rate jumped to unprecedented levels. Although many international agencies publish updated reports about poverty and food security status of Syrian refugees in the surrounding countries, only scanty information about the poverty projections of people still living in Syria is available. Thus, and although it is hard to obtain current data of Syrians living inside Syria, the current chapter tries to draw a poverty profile of Syrians using different techniques and different databases.

The chapter uses different microsimulation techniques which build on representative individual-level data. These techniques are the most common to nowcast micro figures, especially in the measurement of poverty. We developed a simple microsimulation model that is applicable to the Syrian context, modifying models from the existing economic literature, to assess the potential effect of the shock, represented by the bloody civil conflict, on poverty across different groups of the population and regions, by linking macro projections with pre-crisis household data.

The chapter proceeds as follows. After this introduction, Section 4.2 surveys the literature investigating the poverty-conflict nexus. Section 4.3 describes the Syrian context, including the causes and the consequences of the current conflict and a brief description of poverty in Syria. Section 4.4 is the core of this chapter and contains the empirical work including the results and discussion. Section 4.5 concludes.

4.2 Literature Review of The Poverty-Conflict Nexus

The literature on the theoretical and empirical studies investigating the poverty-conflict nexus is bountiful. The poverty effect on conflict occurrence is investigated more than the other direction of the nexus. Poverty was an essential element in Gurr (1970)'s *Relative Deprivation Theory*, which implies that the population of locations that are relatively poor and marginalized by the central government are more likely to support and join a rebel group that works to overthrow the government. Further, this theory has been supported empirically by studies showing that poorer countries face a greater risk of civil conflict (Collier, 1999; Collier et al., 2004; Collier and Hoeffler, 2004; Fearon and Laitin, 2003; Deininger, 2003). However, this finding is subject to varying interpretations: while Collier and Hoeffler (2004), Collier and Sambanis (2002), and Gates (2002) find that the poorer a country is, the easier it is for rebel leaders to recruit soldiers and maintain an army, Fearon and Laitin (2003) emphasize that poor countries suffer from lack of state capacity, so it is hard for them to control their entire territories.

However, many scholars have stated the insignificance of the effect of poverty on the likelihood of conflict. Using district-level evidence for Indonesia, Barron et al. (2004) find no statistical association between poverty and the onset of communal violence. Sánchez and Chacón (2006) partially confirm a similar result when investigating the guerrilla activity in Colombia. Krueger and Malečková (2003) find insignificant causal effects of poverty and low education on politically motivated violence and terrorism, and Collier and Hoeffler (1998, 2002) have found no statistical evidence for a relationship between grievances and violent conflict across samples of over 100 countries.

Other scholars suggest that poverty has an indirect effect on violence, meaning that its effects play out only through their relationship to other factors. Those factors include ethnic, religious or regional divides measured by the degree of ethnic fragmentation (Easterly and Levine, 1997), horizontal inequality (Stewart, 2000; Langer, 2004; Stewart et al., 2005), categorical inequalities (Tilly, 1998) or increased levels of social polarization (Esteban and Ray, 1994, 1999; Boix, 2010). In addition, other factors are considered. Ikejiaku (2009) claims that African conflicts are mainly a result of poverty rooted in political corruption. Marshall and Gurr (2003) argue that most African conflicts are caused by the combination of poverty and weak states and institutions, and these have had a devastating impact on Africa's development. Moreover, using the same conflict outcome measure in seventy-five Nepalese districts, Do and Iyer (2007) find that conflict intensity is strongly and positively related to the presence of mountainous and forested terrain, as well as higher local poverty and lower literacy rates.

On the other hand, papers investigating the effects of civil conflict on poverty were less numerous than those previously mentioned which investigated the nexus the other way round. *The Poverty-Conflict Trap* is the most well-known theorization of the consequence of the conflict. According to this assumption, a country experiencing an initial civil conflict enters a downward economic spiral that intensifies with the conclusion of the conflict. This spiral leads to higher and more severe rates of poverty. Next, since economic collapse itself can trigger a new civil conflict, the country faces a heightened risk of further violence, and the vicious cycle renews itself (Collier et al., 2004).

Empirically speaking, and using a microeconomic approach, few scholars investigate the channels through which the conflict affects the poverty status of households. According to Justino (2007), civil conflicts impact poverty through three central self-reinforcing mechanisms: economic capital, human capital, and displacement. In one of the very first analyses of the impact of conflict on household poverty dynamics, Justino and Verwimp (2006) show that around 20% of the Rwandan population moved into

poverty following the Rwandan Genocide in 1994. Also focusing on Rwanda, Serneels and Verpoorten (2013) find that households and localities that experienced more intense conflict had 36% lower consumption levels in 2000 than those that experienced no conflict in that year.

Some papers study the human capital effects of the conflict. With respect to health, Alderman et al. (2006), analyzing data for Zimbabwe, find that greater exposure to civil war has a negative effect on child height. Bundervoet et al. (2009), focusing on Burundi, find that an additional month of war decreases children's height for age z-scores by 0.05 standard error compared to non-affected children. Arcand and Wouabe (2009) find that conflict intensity worsens child health during and after the conflict in Angola. Besides, micro evidence for the effects of conflict on education existed. Akresh and De Walque (2008) show that the armed conflict in Rwanda had a negative effect on schooling outcomes, with exposed children completing half a year less. De Walque (2006) discusses how the civil conflict in Cambodia had a lasting impact on educational attainment, mostly because of the collapse of the education system, and Shemyakina (2011) presents evidence of the negative impact of conflict on schooling in Tajikistan. Chamrabguala and Morán (2011) find a strong negative effect of the civil war in Guatemala on the education of Mayan men and women in rural areas, these being the most disadvantaged groups in the country. Blattman and Annan (2010) find that child soldiering has persistent educational and labour impacts later in life, with schooling close to one-year lower, employment chances halved, and earnings one-third lower for ex-child soldiers. Despite this, when addressing the selective wartime displacement, some papers did not find a significant effect on education. Pivovarova and Swee (2015), for example, try to quantify the impact of the Nepalese civil conflict on attainment in education, finding no effect of war intensity on schooling attainment, once unobserved individual heterogeneity is accounted for.⁷⁹

4.3 The Syrian Context

4.3.1 The Syrian Civil Conflict

Supported by good economic growth rates, moderate poverty and inequality figures, low public debt, stable exchange rates, and almost sufficient food security, Syria entered the second decade of the New Millennium with high expectations to achieve the *Millennium Developmental Goals* (MDGs), as well as

⁷⁹ In addition, many papers discussing the micro effects on refugees and IDP have emerged, especially in terms of demographical and health characteristics. Among of which, Verwimp and Van Bavel (2005), in their study of refugees from Rwanda, show that refugee women have higher fertility, but their children have lower probability of survival. They also find that newborn girls tend to suffer more than boys do. This is because more resources are spent in the survival of boys than girls, given extreme economic stress of households.

sustainable rates of economic growth. Nonetheless, these expectations started vanishing in the second half of March 2011 when victims from different parties began to fall, and a new bloody era in Syrian history started.

During the first decade of the New Millennium, macroeconomic figures were improving and there were no obvious economic indicators of the conflict. The average growth rate of GDP during the decade preceding the conflict was 5.1%. Coupled with a decreasing population growth rate, this economic growth pushed the annual per capita income growth to 2.6%. In addition, sources of public revenue became more diverse as Syria's share of the oil revenue fell from 45% to 26% between 2001-2005 and 2006-2010. Public debt, as a percentage of GDP, dwindled from 63% in 2000 to 23% in 2010. Moreover, in its Article IV Staff Report, IMF (2010) praised the achievements of the Syrian government. It complimented the Syrian authorities that implemented "gradual, but wide-ranging reforms" (p. 4), and mentioned that the "impact of the global financial crisis on Syria has been relatively moderate" (p. 14).

Despite this seeming economic well-being, the micro, institutional, and social deadlocks were fueling the fire under the ashes. Some recent reports call the development achieved in Syria during that period 'an imbalanced development' (United Nations Economic and Social Commission for Western Asia -ESCWA, 2017), 'a minimum level development' (Syrian Center of Policy Research- SCPR, 2013), and 'the unhappy development' (Arampatzi et al., 2015). The economic growth achieved was not inclusive, as it did not generate enough job opportunities. According to the high rates of population growth during the 1970s and 1980s, the Syrian economy had to have created around 1.5 million job vacancies to receive the new labour entrants during the 2000s. Instead, the real figures show that just 350 thousand vacancies were provided, meaning that participation rates in the labour force actually decreased.⁸⁰ Moreover, the household budget surveys show that personal income did not grow as fast as the per capita GDP growth rate declared in the *National Accounts*.⁸¹ SCPR (2013) attributes the growth rate reported in the National Accounts to the Iraqi refugee families whose consumption was higher than that of Syrian families' and pushed local demand upward.

Poverty and inequality rates recorded moderate levels, yet they were notably increasing. Around one-third of the people living in Syria in 2007 were consuming less than the upper poverty rate (UPL) compared with 30% in 2004. The ratio of people living under the lower poverty line (LPL) was 12.3% in 2007

⁸⁰ The unemployment rate was around 8% in 2010 (CBS, 2010).

⁸¹ On average, the Syrian households in 2009 consumed 2% less than in 2004 (CBS, 2009).

compared with 11.5% in 2004. These increases had many causes including the waves of drought hitting the area in the years just preceding the conflict. Analyzing 900 years (from 1100 to 2012) of Mediterranean drought variability in the Old World Drought Atlas, Cook et al. (2016) find that the recent 15-year drought in the Levant (1998-2012) is the driest in the record.⁸² According to the IFRC (2010), 60% of Syria's land and 1.3 million people were affected by the drought, with just over 800,000 people having lost their livelihoods, especially in Hassakeh, Deir Azzor, Raqqa, Homs, and Hama. Further, energy subsidy cuts, which took place in May 2008, had a strong negative effect on the people who were just above the poverty line.

The pre-conflict figures of inequality failed to capture or predict the outburst of popular discontent during the last decade. During the period of 1997-2010, the Gini Coefficient ranged between 0.3-0.35, which was lower than in many other MENA countries. However, economic inequality was much higher than that being reported.⁸³ Inequality measures are often based on household surveys that are prone to several well-known shortcomings. Apart from the difficulty of recalling income and wealth information correctly, survey respondents may underreport expenditures or deliberately leave out income and wealth that result from illegal or informal activities (Ianchovichina et al., 2015). In addition, these surveys typically include few individuals at the very top of the income distribution where capturing accurately the *top one percent* is crucial to estimating inequality (Alvaredo, 2011). In the MENA, these difficulties are compounded by the fact that access to household surveys is limited. Therefore, expenditure inequality may be understated due to the fact that data from the richest strata of society is lacking (Atkinson et al., 2011).

In addition, standard vertical inequality, which is between individuals, may not reflect possible social tensions. Instead, horizontal inequality, which refers to inequalities that coincide with identity-based cleavages, is a key interpretation of conflict in a highly fractionalized country (Østby, 2008; Stewart, 2000; Langer, 2004; Stewart et al., 2005) such as Syria. Even though there is no detailed data about the ethnic or sectarian disparity, one can mention information reflecting the inequality that existed in pre-conflict Syria. The regional development was not equal, as educational and health achievements in the north and east of Syria were much lower than their levels in other Syrian areas. In addition, poverty rates were two to three times higher in Hassakeh, Deir Azzor, and Raqqa. Labour force statistics, retrieved from the Labour Force Survey 2010 (CBS, 2010), corroborate this suggested disparity, showing that the

⁸² Kelley et al. (2015) find that the Greater Fertile Crescent Region, including Syria, experienced moderate-to-severe drought from 1998 to 2009, with the winter of 2007/2008 being the driest since records were kept starting in 1931.

⁸³ The grievances, above all, were linked to factors other than economic inequality, such as decline in the overall quality of life, growing corruption, and lack of freedom, among others (Ianchovichina et al., 2015).

ratios of workers working in the public and governmental sectors over the whole labour force were higher in Lattakia (44%), Tartous (49%), and Quneitra (53%) compared with Aleppo (15%), Raqqa (21%), and Idlib (21%).⁸⁴

These reasons, among others, paved the way for a bloody civil conflict exploding in Syria in March 2011. This conflict has huge economic, human, and social costs. The loss of lives due to the conflict remains the most catastrophic visible and direct impact of the ongoing crisis. According to SCPR (2016a), around 11.5% of the population were killed or injured due to the armed conflict up to the end of 2015. Moreover, the country faces human catastrophe reflected in the dramatic drop in life expectancy at birth from 70.5 years in 2010 to an estimated 55.4 years in 2015, and the school-age non-attendance rate projected at 45.2 percent; consequently, the human development index of Syria is estimated to have lost 29.8% of its value in 2015 when compared with 2010.

The economic loss is as huge as the humanitarian and social ones. The accumulated total economic loss up to the end of 2015 is estimated at USD 254.7 billion (SCPR, 2016a). This loss consists of GDP loss (64.1%), damage to capital stock (26.4%), additional government military expenditures (5.7%), armed groups military expenditures (2.3%), and informal production of oil and gas (1.5%). Total economic loss is equivalent to 468% of the GDP of 2010 in constant prices (SCPR, 2016a). A recent report published by the United Nations Economic and Social Commission for Western Asia (ESCWA, 2017) mentions that Syrian GDP contracted by 56% in 2016 compared to 2010. GDP contraction accelerated in 2012 and 2013. Later, the contraction rate slowed down as the local actors, firms and citizens, became familiar with the situation and adapted to it.

Other macroeconomic figures have been deteriorating during the conflict. Due to the contraction of the public revenues and the jump of the expenditures, the budget deficit is soaring. Between the years 2010-2015, public revenue contracted by 66%, while public expenditure increased by 56%. Thus, the overall budget deficit peaked to unprecedented levels of 42% of GDP in 2014. Nonetheless, due to subsidies-rationalization policies followed by the government, this deficit dropped to 28% in 2015. Inflation rates jumped and prices of some key products in 2016 were 5-8 times higher than in March 2011. Moreover, food basket prices are much higher in blocked towns and in neighborhoods that host around one million

⁸⁴ In addition to the abovementioned factors, there are many other internal and external, structural and political factors motivating the current conflict. Population growth, institutional underdevelopment, bad governance, unsuccessful diversity management, widespread culture of violence, the geo-political position of Syria, and regional and international interferences are some of those factors (For further details, please see ESCWA, 2017; WB, 2017; Barrot, 2012).

people (UNOCHA, 2017). The inflation rate in 2015 was 487% in Deir Azzor, while it was 50-60% in Hama, Homs, and Lattakia (WFP, 2015). Furthermore, the Syrian pound had lost around 900% of its external value by the end of 2016. Last, but not least, the unemployment rate jumped from 8% in 2010 to 53% in 2015 (SCPR, 2016a). This rate would be bigger, had the public and government sector decreased its employability. In addition, the economics of violence has been growing, and around 17% of the active population inside Syria in 2014 are involved in illegal activities like pillage, weapons trade, and people trafficking (SCPR, 2016a).

4.3.2 Poverty in Syria during The Conflict

Two institutions have estimated poverty ratios in Syria during the conflict. The first is the Syrian Center for Policy Research (SCPR) that has published several reports and studies about the economic and social consequences of the current crisis since 2012, while the United Nations Economic and Social Commission for Western Asia (ESCWA) is the second entity estimating poverty in Syria. Poverty estimations published by the two institutions show some consistency. According to SCPR (2016a), the overall poverty rate, based on UPL, was 85.2% of residents in 2015, around two and twelve percentage points more than its levels of 2014 and 2013, respectively.⁸⁵ ESCWA (2017) projected the overall poverty rate to be 83.4% of the residents in 2015 and 69% in 2013. The food poverty in 2015 projected by SCPR is 35%, just two percentage points more than that projected by ESCWA. The difference is larger, however, when it comes to the extreme poverty projection. While SCPR (2016a) estimates extreme poverty with 69.3%, it is 73.2% according to ESCWA (2017)'s projections. ESCWA (2017) projects the poverty gap rate, which jumped from 2% in 2010, suggesting that most of the poor were living just under the poverty line, to 16.3% in 2015, 18% in the rural areas and 16.4% in the urban areas. By both accounts, the levels of poverty were deepening during this time. On the other hand, SCPR (2016a) shows that poverty growth in Syrian governorates is positively correlated to the historical pre-conflict poverty rates since the poverty rate has grown more in governorates that were poorer compared to others before the intensification of the conflict.⁸⁶ Thus, people in Raqqa, Idleb, and Deir Azzor were the poorest, with 91.6%, 90.5%, and

⁸⁵ It is worth to mention that the Syrian Center for Policy Research has changed its projections frequently. SCPR (2014) mentioned that the overall poverty rate was 75.4% in 2013. SCPR (2015) mentioned that the overall poverty rate was 64.8% in 2013, while SCPR (2016a) points that this rate was 73.3% in 2013. The same is found for the extreme poverty rate. This shows that projected poverty rates are sensitive to the projection method used.

⁸⁶ The administrative structure of Syria contains 14 governorates (*Mohafazah*) as the main administrative units. A governorate is divided into smaller units called *Mantika*, which, in turn, are divided into smaller units called *Nahiah*.

90.1% of residents falling below the overall poverty line, respectively, while the lowest rates were in Sweida and Lattakia at 77.2% and 79.8%, respectively.⁸⁷

Table 4. 1: Poverty Rates in Syria (2009-2015) According to SCPR and ESCWA Estimations

Reference		2007	2010	2013	2014	2015
SCPR	Overall Poverty	33.6%	na	73.3%	83.5%	85.2%
	Extreme Poverty	12.3%	na	51.6%	66.5%	69.3%
	Food Poverty	Na	0.07%	20%	30%	35.1%
ESCWA	Overall Poverty	33.5%	24.8%	68.9%	na	83.4%
	Extreme Poverty	12.4%	10%	na	na	73.2%
	Food Poverty	1.2%	1.5%	na	na	33%
	Poverty Gap	na	2%	11.9%	na	16.3%

Source: SCPR (2016a) and ESCWA (2017).

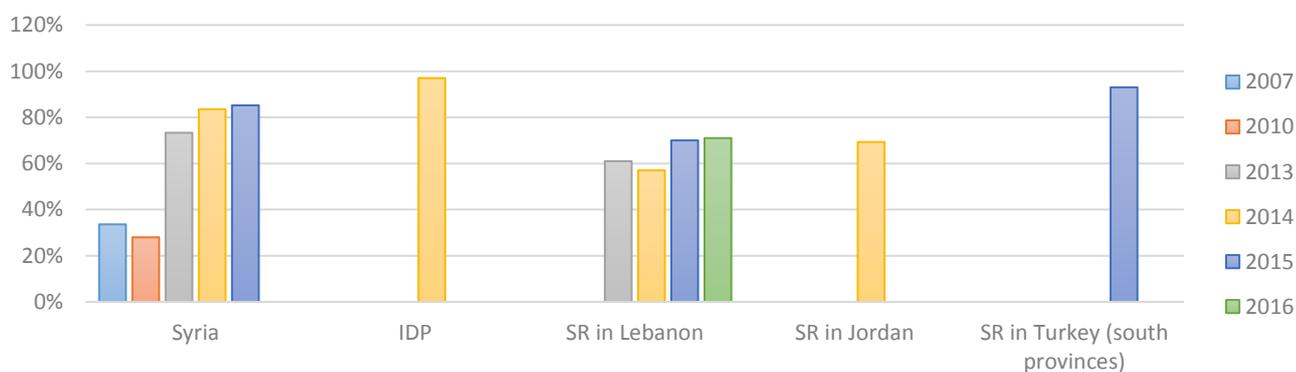
Notes: ESCWA is the United Nations Economic and Social Commission for Western Asia; SCPR is The Syrian Center for Policy Research. Food poverty is defined as the share of the population whose expenditure lies under the Food poverty line; Extreme poverty is defined as the share of the population whose expenditure lies under the lower poverty line; Overall poverty is defined as the share of the population whose expenditure lies under the upper poverty line. Poverty gap is the average shortfall of the total population from the poverty line. 'na' stands for non-available figures.

Table 4.1 shows that the poverty rates jumped in the second and the third years of the conflict. The overall poverty rate soared from 28% in 2009 to 73.3% in 2013 and to 85.2% in 2015. Since then, the poverty rate has grown since no peaceful solution to the conflict has been found and due to negative adaptation strategies followed by the residents. These coping strategies, in addition, have consequences both in the short and long terms. Around 36% of the families are in debt, 17% sell their own durables, and other families sell their productive assets, houses or lands, or withdraw children from school (SCPR, 2016a). These coping strategies negatively affect the households' livelihoods, and very often are irreversible, leading to chronic poverty among families that adopt such strategies.

These estimations build on simulation techniques. SCPR's estimations relied on the full sample of the HIES (CBS, 2009) augmented by using the counterfactual methodology through a microsimulation technique in order to project real per capita private consumption growth in the period 2010-2015. Therefore, although it is not explicitly mentioned, SCPR (2016a) follows a microsimulation technique, neutral distribution growth, to estimate the poverty figures. ESCWA (2017), on the other hand, does not clarify the method it follows to project the poverty rates. However, since ESCWA assessed the impact of

⁸⁷ The situation is worse among the refugees living in surrounding countries. According to UNHCR (2018), around 5.2 million Syrian refugees are living in Turkey, Lebanon, Jordan, Egypt, and Iraq. Thanks to the WFP, poverty figures, calculated using similar methodologies, are available. The poverty rate among the Syrian refugees in Lebanon is 71% in 2016 (UNHCR, UNICEF, WFP, 2017), while it was 69.3% among the refugees in Jordan in 2014 (Verme et al., 2016). The figures show, counterintuitively, that, in terms of origin in Syria, Raqqa is the governorate that shows the lowest poverty rate (46%), while Hama is the one with the highest poverty rate (83%) among Syrian refugees living in Jordan. In a survey covering the southern provinces of Hatay, Kilis, Gaziantep and Sanliurfa, hosting almost half of the Syrian refugees in Turkey, WFP (2016) found that 19% and 93% of the refugees are below the FPL and the UPL, respectively, in 2015.

the conflict on the Syrian economy using computational general equilibrium (CGE) models (Al-Dardari and Bchir, 2014), we assume that ESCWA (2017) relied on that method when estimating poverty within the conflict. The models build on a disaggregated social accounting matrix (SAM) of Syria prepared by ESCWA in 2007, and updated based on the World Bank’s 2006 Input-Output table, which focuses on the energy sector, and on the SAM put together in 2008 by UNDP, which focuses on agriculture and food processing. The models also extract updated information from other sources, including the National Accounts, the government budget, the balance of payments, as well as agricultural statistics and the annual statistical abstract. We find, therefore, that while SCPR used static models, so they failed to account for distributive effects, ESCWA explored distributive effects for the economic sectors, but not for households. Our essay, thereby, uses dynamic models that take into account different sorts of shocks, so as to follow the distributive effects of the conflict on families according to their residential locations.



Source: WFP (2016); UNHCR, UNICEF, WFP (2017); Verme et al. (2016); and SCPR (2016a).

Notes: IDP stands for the internally displaced people; SR stands for Syrian refugees.

Figure 4. 1: Overall Poverty Rates among Different Syrian Sub-Groups over Different Years.

4.4 The Empirical Study

We divide the empirical section into two main parts. The first part addresses the pre-conflict situation, considered as the baseline, while the second part examines the current climate within the conflict. Needless to say, the second part is more challenging. The pre-conflict Syrian society has changed hugely and has been torn into different societies, i.e., non-movers, IDP, refugees, and immigrants. As is clarified in Figure E.1., 50% of the Syrians are staying in their pre-conflict residence, while 22% are IDP inside Syria, 60% of whom are living in their home governorates (SCPR, 2016b). Around a quarter of Syrians are now living outside of Syria, either as refugees, immigrants, or asylum seekers. These movements are not exogenous and depend on different pre-conflict characteristics including the geographical residence, the demographic, educational, welfare, and occupational characteristics, and the political and sectarian

backgrounds, as well as within-conflict intensity, level of security, and humanitarian and economic losses. Consequently, each of these societies has its characteristics, its poverty profile, and poverty correlates that might be different from others'. Furthermore, one can divide those societies into heterogeneous sub-societies, so the refugees living in countries surrounding Syria being different from those living in Europe. In addition, the refugees living out of camps are distinguishable from those living in camps, and residents who are living in relatively peaceful areas are different from those living in conflict zones.

4.4.1 Data Used

We rely mainly on a sample derived from the household income and expenditure survey (HIES) that took place in 2009. This sample includes 2,627 households living in the fourteen governorates. Due to accessibility constraints of raw data in Syria, it is impossible now to have the full data of the HIES 2009.⁸⁸ Thus, we use this sample to investigate the poverty figures and profiles in the pre-conflict time. Further, we use macroeconomic projections published by the Syrian Center for Policy Research (2013, 2014, 2015, 2016a, 2016b), the United Nations Economic and Social Commission for Western Asia (2017), World Bank (2017), United Nations Office for the Coordination of Humanitarian Affairs (2017) and other INGOs to simulate poverty figures and profiles for those staying inside Syria during the conflict.

Although the Syrian government founded the Directorate of Statistics in 1949, few detailed household-data are available for the last century. The Central Bureau of Statistics started doing the HIES in 1996, and since that time four HIESs have been undertaken.⁸⁹ The last HIES took place in 2009, two years before the current conflict occurred. It includes 28,080 respondent households from 750 clusters around Syria, with full demographical and economic information about the household and its individuals. The household is defined according to the HIES as those including either one person living alone or a group of people, not necessarily related, living at the same address with common housekeeping, sharing at least one meal per day or sharing a living or sitting room. Appendix F presents the questionnaire used in the HIES 2009 along with some guidelines defining the people to whom the questions are posed.

In order to make sure that our sub-sample represents well the full sample of the HIES 2009, we compare the average household consumption in the governorates extracted from the sub-sample with those mentioned in the webpage of the Central Bureau of Statistics (CBS), which are based on the full sample

⁸⁸ When receiving the sample, we were told from officers in CBS that this is a representative sample of the population surveyed.

⁸⁹ Based on the HIES 2003/2004 and the HIES 2006/2007, UNDP published two consecutive reports of poverty in Syria (El-Laithy and Abu-Ismael, 2005; Abu-Ismael et al., 2011).

(CBS, 2018a). Table 4.2 shows that, in 10 out of 14 governorates, the confidence intervals of the average household consumption of the sub-sample contain the corresponding average of the full sample. In addition, the most populated governorates, Damascus and Aleppo, are among those ten governorates. Thus, one can say that, although it contains just around 10% of the original sample, our sub-sample is an adequate representation of the full sample of the HIES 2009.

Table 4. 2: Comparing The Total Consumption of The Average Household Between The Survey Sample and The Available Sub-Sample in The Syrian Governorates (SP).

Governorate	The Full Sample	The Sub-Sample		
		Mean	Standard Deviation	Confidence Interval
Damascus	40196	38216.15	1834.12	34604.18 - 41828.11
Aleppo	29994	28977.57	726.692	27549.93 - 30405.22
Rif Damascus ⁹⁰	32498	28129.85	831.957	26492.06 - 29767.64
Homs	29548	25618.22	850.062	23941.73 - 27294.72
Hama	27890	31085.21	3209.95	24759.79 - 37410.63
Lattakia	34296	37772.43	2387.43	33056.56 - 42488.3
Idleb	24890	25228.89	1448.94	22367.77 - 28090.01
Hassakeh	28200	24381.12	1265.23	21879.52 - 26882.72
Deir Azzor	24297	25949.26	1539.48	22900.39 - 28998.13
Tartous	34771	34717.3	2438.98	29897.58 - 39537.03
Raqqa	26522	29010.29	1217.32	26600.06 - 31420.51
Daraa	32217	34901.86	2550.03	29864.04 - 39939.68
Sweida	28370	24768.68	1446.29	21905.35 - 27632
Quneitra	31765	35667.11	4851.62	25758.77 - 45575.45
Syria	30826	30187.59	487.052	29232.55 - 31142.64

Source: CBS (2018a) and the HIES (CBS, 2009).

Notes: The full sample includes 28,080 respondent households surveyed in the household income and expenditure survey that took place in 2009. The sub-sample contains 2,627 households surveyed in the HIES 2009. 'SP' stands for Syrian Pounds; USD 1 = SP 50 in 2009.

4.4.2 Methods Used and The Results

Although the chapter mainly depends on one dataset, we build our estimation for 2009 and projection for 2015 using different techniques. The technique used to derive the pre-conflict figures is the same one used in previous poverty studies for Syria (El-Laithy and Abu-Ismael, 2005, Abu-Ismael et al., 2011). Therefore, the essay follows the *Basic Needs approach* to compute poverty lines. With this approach, the poverty line is set as the cost in each sector and at each date of a normative basic needs bundle of goods. For developing countries, the most important component of the basic needs poverty line is generally the food expenditure necessary to attain some recommended food energy intake. Thus, the food bundle is typically chosen to be sufficient to reach the predetermined caloric requirement, with a

⁹⁰ The Governorate of Damascus was divided in 1972 into two governorates: the Governorate of Damascus City, and the Governorate of Rif Damascus. Rif means rural side, but this does not mean that Rif Damascus Governorate does not include cities.

composition that is consistent with the consumption behavior of the poor. This bundle is then evaluated using prices prevailing in each region and at each date.

Next, we assess the welfare status of every household. The chapter uses expenditure instead of income as a welfare measure. This is because consumption is not wholly represented or totally constrained by income, and Syrian households used to spend twice their incomes (CBS, 2009). Moreover, whereas poor households are likely to be purchasing and consuming only a narrow range of goods and services, their incomes may well be derived from a variety of sources, many of which are seasonal in nature or difficult to measure. Expenditure is, therefore, a better indicator of long-term living standards than current income, since consumption tends towards smooth variability and fluctuations in income streams. In addition, surveyors may be more willing to reveal their consumption patterns rather than their income.⁹¹

Estimating within-conflict figures of poverty is more demanding; we measure poverty while the situation on the ground is changing rapidly. In addition, on-spot micro-data is needed for an analysis such as this. Unfortunately, due to the security situation in Syria, it is hard nowadays to collect these micro data. Moreover, it is difficult to obtain these data, when available, due to a lack of transparency among public institutions and INGOs. Thus, the current chapter uses alternative means of estimating the current poverty profile of Syrians still living in Syria.

Concretely, we use microsimulation techniques to nowcast the poverty figures in Syria. Later, the chapter develops a simple dynamic microsimulation model that is consistent with the Syrian context⁴ by linking macro projections with pre-crisis household data. Using microsimulation techniques based on representative individual-level data enables us to take the interactions between household circumstances, changing policies, and the macroeconomic situation into account (Immervoll et al., 2006; Bourguignon et al., 2008).

Microsimulation-based models have been developed and applied in different fields, mainly in developed countries. EUROMOD is the most familiar static microsimulation model. It simulates individual and household tax liabilities and benefit entitlements according to the policy rules in place in each EU member state (Sutherland and Figari, 2013). Some authors used this model to evaluate the impact of tax-benefit public policies (Callan et al., 2011; Matsaganis et al., 2008; Navicke et al., 2014). Other famous microsimulation models are PENSIM2, a dynamic microsimulation pension model that dynamically

⁹¹ Although the expenditure index is much better than the income one, we should not ignore the shortcomings of the former. A family, for example, may consume more in winter than in other seasons. The HIES 2009, nevertheless, overcomes this question by filling the HIES questionnaire over the full year.

simulates pension income for the next 50 years in the United Kingdom; CORSIM, a longitudinal, dynamic microsimulation model applied in Canada; and TRIM, a static microsimulation transfer income model, applied by the U.S. Department of Health and Human Services. The former studies used the models to trace the impact of changes in tax-benefit policies on aggregate outcomes, including income poverty.⁹² However, very few studies apply this approach in underdeveloped countries, with Habib et al. (2010), who use it for the ex-ante analysis of the poverty and distributive impacts of the global crisis in Bangladesh, being among the exceptions.

Habib et al. (2010) develop a simple microsimulation model that focuses on labour markets and migration as transmission mechanisms and allows for two types of shocks: shocks to labour income, modeled as shocks in employment, earnings, or both; and those to non-labour income, modeled as shocks to remittances. They first model labour force status using a multinomial logit model to estimate the parameters of the model as a function of household, individual, and job characteristics, as well as the individual-level probability of remaining in a particular state or changing to a different one. Then they model the earnings and non-labour income with a focus on international remittances. Next, relying on these models, the authors reassign the workers into a new status.⁹³ This simulation exercise depends on the information on aggregate projected changes in output, employment, and remittances. The new labour status leads to a new labour income. Later, they simulate changes in other sources of non-labour income including remittances. Finally, the authors aggregate the new information on a household level to generate income and consumption distribution and conclude overall poverty and inequality rates.

Our investigation is different from Habib et al. (2010). While their study has explored the effect of an economic crisis, which might not strongly affect the parameters of models, derived with real baseline data and used to reassign the baseline labour and incomes into the projected ones, we run our investigation in a time of conflict. Bloody civil conflicts strongly affect the demographical and labour characteristics of the population and the dynamics through which these characteristics interact, requiring that we follow different transitional criteria as shown below. In addition, our model accounts for the demographical changes, which were missed in Habib et al. (2010).

⁹² In addition, this approach was used to build future scenarios in the UK in order to predict child poverty in 2020 (Brewer et al., 2011) and look at the medium-term effects of the recession up to 2016 (Brewer et al., 2013). Keane et al. (2013) use this technique to nowcast the policy effects of the crisis in Ireland.

⁹³ The authors clarify the flows between employment and non-employment as follows: If the employment rate is increasing, non-employed individuals with the lowest predicted probability of being unemployed will be reassigned. If the employment rate is declining, employed individuals with the highest probability of being non-employed will be reassigned. Reassignments will continue up to the point where the change in the employment rate at the micro level matches the change at the macro level.

4.4.2.1 Pre-Conflict Poverty Rate

We start with the baseline survey, the HIES 2009, to derive the pre-conflict poverty rates and poverty correlates. As mentioned earlier, just 10% of the HIES data is available. This subsample, moreover, lacks the quantities of food consumed by each decile of households in 2009. Information about quantities is key to calculate the food poverty line (FPL), which is the minimum amount of money an average household needs to purchase a basic-needs food bundle and nothing more. Therefore, a different means of arriving at the FPLs must be used.

As a starting point, we use the reference food baskets, derived from the HIES 2003/2004. El-Laithy and Abu-Ismaïl (2005) reported two food baskets, one is for the urban areas and the other is for the rural ones. We compute the weights of the ten items included in the basket,⁹⁴ and then we derive adjusted food-CPIs for 2009,⁹⁵ using the following equation:

$$\text{Adjusted Food } CPI_{G,U/R,2009} = \frac{\sum_{i=1}^n W_i \cdot CPI_{i,G,U/R,2009}}{\sum_{i=1}^n W_{i,U/R}} \quad (4.1),$$

where W_i is the relative weight of the food item i in the urban or rural reference food basket mentioned in Table C.1; $CPI_{i,G,U/R,2009}$ is the consumer price index of 2009 for the food item i in the governorate G in an U urban/ R rural area; G stands for governorate; and U/R stands for Urban/Rural.

Next, we multiply this index by FPL_{2007} , which was computed by Abu-Ismaïl et al. (2011) using the HIES 2006/2007, in order to determine 2009's FPL, as the following equation shows:

$$\text{Food Poverty Line}_{G,U/R,2009} = \text{Food Poverty Line}_{G,U/R,2007} \times \text{Adjusted Food } CPI_{G,U/R,2009} \quad (4.2).$$

It is worth mentioning that we extend our analysis to include the fourteen Syrian governorates, instead of the four regions mentioned in the previous poverty reports of Syria. We calculate the adjusted food-CPI for each governorate, and since CPIs are not available separately for urban and rural areas, we use the general governorate CPI for both. Next, we multiply each of these adjusted food-CPIs by its regional FPL

⁹⁴ El-Laithy and Abu-Ismaïl (2005) mention 12 items, but CBS publishes the CPI for 10.

⁹⁵ Although it was easier to multiply the FPL 2006/2007 by the general food-CPI, it is more precise to multiply it by an adjusted food-CPI that is weighted by the relative importance of the food items included in the reference basket.

of 2006/2007, since these FPLs are available just for the four regions.⁹⁶ The third column in Table 4.3 presents the FPLs in the Syrian governorates in 2009.

The second step is to estimate the lower poverty line, which is basically the FPL augmented by an allowance for expenditure on essential non-food goods. The latter is determined based on expenditures by households who have to forego food consumption to allow for non-food expenditures that are deemed indispensable. We estimate the non-food allowance by identifying the share of non-food expenditure for households whose total expenditure is equivalent to the FPL. Any household that spends less than the LPL is considered extremely poor. Therefore, the food poor group counts as a subset of the extremely poor.

Finally, for a more inclusive poverty measure, we construct the upper poverty line by enlarging the non-food component to include a more reasonable minimum required level of non-food expenditures. We estimate the UPL by augmenting the FPL with the non-food expenditure of households whose food expenditure is equivalent to the food poverty line. Overall poverty in this report thus refers to the share of the population whose mean expenditure lies below the UPL. Table C.6 shows in more details the computation of the estimations.

Comparing Table 4.1 and Table 4.3 shows that the percentage of people living under the LPL increased from 12.3% in 2007 to 14.85% in 2009, while the percentage of people living under the UPL decreased from 33.6% in 2007 to 29.4% in 2009.⁹⁷ Rural areas are poorer than the urban areas using both poverty lines. 17.36% and 30.22% of the rural people live under the lower and the upper poverty lines, respectively, while 13% and 28.78% of the urban people live under those lines, respectively. Hama, Deir Azzor, and Daraa are the governorates hosting the poorest rural areas, while Hassakeh holds the poorest urban area. These figures are reasonable due to the drought waves that hit the eastern area and the following displacement movement towards the south part of Syria (WB, 2017). The majority of impoverished rural people in Hassakeh moved to some rural areas in Daraa, the governorate where the civil movement started in March 2011.⁹⁸

⁹⁶ It is known that the number of calories required per day varies between people according to their age, gender and economic activity. Thus, it is better to derive the specific household FPLs by multiplying the caloric cost with the number of calories required for household members. Nevertheless, we use just the governorate poverty lines. This is because we just want to present an overview of the changes taking place in poverty ratios.

⁹⁷ It is worth mentioning that the poverty figures of 2009 obtained from ESCWA (2017) are lower than the poverty rates obtained here. We can say that our estimates are more rational since they are relevant to the weather and cost crises taking place between 2007 and 2009.

⁹⁸ Although it is interesting to explore the poverty changes on a governorate level, we could not do it, because we did not find the poverty figures in the Syrian governorates for 2007.

Table 4. 3: Poverty Lines and Poverty Rates For 2009

Governorate	U/R	FPL (SP)	LPL (SP)	UPL (SP)	Food Poverty (%)	Extreme Poverty (%)	Overall Poverty (%)
Damascus	Urban	1960.84	3573.16	4470.21	0.39	9.38	17.58
Rif Damascus	Urban	1914.51	3171.92	3998.78	1.04	13.02	27.08
	Rural	1832.10	3007.00	3880.37	0	18.82	37.65
Homs	Urban	1886.05	2951.00	4199.79	3.08	15.38	40
	Rural	1829.41	2827.78	3170.66	2.08	19.8	26.04
Hama	Urban	1918.57	2797.91	3977.33	1.04	5.21	31.25
	Rural	1857.81	2842.90	3527.82	8	27	49
Tartous	Urban	2149.96	2752.46	5223.17	1.92	1.92	13.46
	Rural	2233.52	3530.40	4483.81	2.06	17.53	28.87
Lattakia	Urban	2115.05	3166.35	4651.56	1.08	4.3	12.9
	Rural	2191.82	3599.22	4901.60	0	18.75	32.81
Idleb	Urban	1975.43	3003.67	3928.70	3.17	20.63	38.1
	Rural	1509.06	2320.68	2657.35	1	21.78	27.72
Aleppo	Urban	1991.37	2923.67	3910.23	3.87	14	27.98
	Rural	1519.74	2306.41	2769.19	1.11	11.11	22.22
Raqqa	Urban	1981.96	3050.30	3504.83	0	15	25
	Rural	1503.40	2263.01	2638.38	3.28	8.2	16.4
Deir Azzor	Urban	1963.79	2837.25	3958.37	6.35	15.87	49.21
	Rural	1487.03	2207.36	2651.87	7.27	25.45	41.82
Hassakeh	Urban	1961.56	2861.33	3781.99	13.33	28.33	56.67
	Rural	1495.06	2017.59	2127.01	3.75	13.75	17.5
Sweida	Urban	1969.90	3495.22	4496.92	5.08	18.64	40.68
	Rural	1880.13	3023.88	3971.03	1.59	11.11	30.16
Daraa	Urban	1967.81	2771.94	3341.08	5.45	20	29.09
	Rural	1883.10	2760.25	3739.56	10.1	22.22	45.45
Quneitra	Rural	1875.87	2155.49	2767.69	0	3.23	6.45
	Urban				2.84	13	28.78
Syria	Rural				3.15	17.36	30.22
	Total				2.97	14.85	29.39

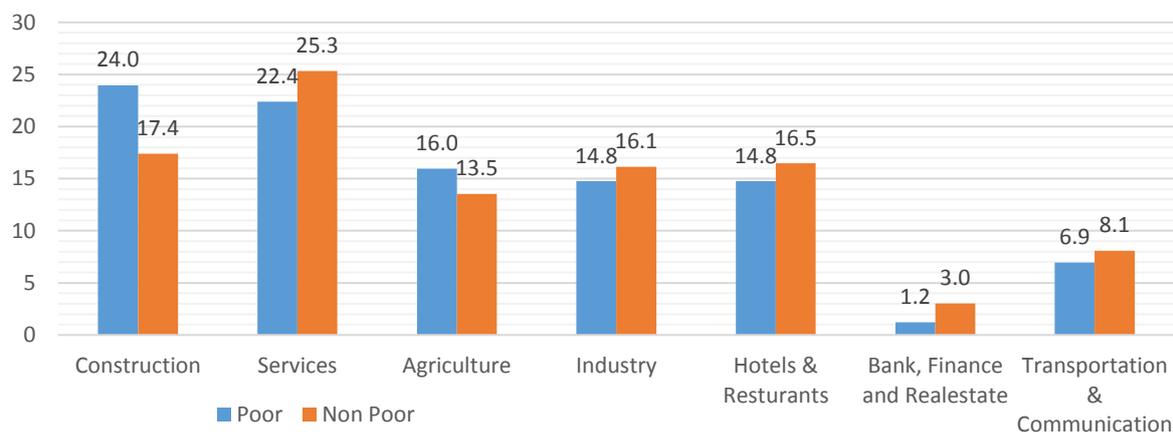
Source: Author's computations based on the HIES (CBS, 2009).

Notes: Food Poverty Line (FPL) is the cost of acquiring enough food for adequate nutrition per day; Lower Poverty Line (LPL) is the FPL augmented by the non-food expenditure for households whose total expenditure is equivalent to the FPL; Upper Poverty Line (UPL) is the FPL augmented by the non-food expenditure of households whose food expenditure is equivalent to the food poverty line. Food poverty is defined as the share of the population whose expenditure lies under the Food poverty line; Extreme poverty is defined as the share of the population whose expenditure lies under the lower poverty line; Overall poverty is defined as the share of the population whose expenditure lies under the upper poverty line. 'SP' stands for Syrian Pound; USD 1 = SP 50 in 2009.

Figure E.2 and Columns (2) and (3) of Table 4.10 show a clear difference in demographical characteristics between poor and non-poor households. Intuitively, poor households are bigger and younger than non-poor ones. On average, the poor household contains 7.5 members, while the non-poor household contains 5.2 members. Around 60% of poor people live in families of eight members at least, and just 5% of them live with families of four members at most. The corresponding rates for non-poor people are 27% and 24.5%, respectively. The age structure of poor and non-poor families shows that the

formers are younger than the latter. Around 47% of the people living in poor families are less than 15 years old, while 36% of non-poor people are under 15. Old people (60 years old and more) are 3.8% of poor people, while they are 6.75% of non-poor people. Counterintuitively, households headed by females are more among non-poor families (10.15%) compared to poor families (7.93%).

As expected, the employment rate among poor households is 37.2%, three percentage points lower than that of non-poor. In addition, around 57.9% of the working-age people in poor families are out of the labour force, while this rate is 55.4% in non-poor families. Compared with non-poor workers, poor workers are less involved in the public sector and more involved in individual private enterprises, which are widely contained by the informal sector. In addition, and as expected, poor workers are more concentrated in the agricultural and construction sectors as it is demonstrated in Figure 4.2.



Source: Author's computations based on the HIES (CBS, 2009).

Notes: Poor people here are those who belong to households whose consumptions are less than the lower poverty line.

Figure 4. 2: Comparing The Poor and non-Poor Workers due to Their Working Sectors in 2009.

The gap is clearer when it comes to educational attainment. 60.5% of people living in poor families do not obtain any certificate, while this rate decreases to 46.9% among those living in non-poor families. University degree and secondary school certificate holders are six-fold and two-fold higher, respectively, between people living in non-poor families compared with those living in poor families. The situation is the same regarding the educational attainment of the heads of the households; 16.8% of non-poor households are headed by at least a secondary school certificate-holder, while 6% among poor families are. Therefore, similar to what was found regarding the poverty correlates of 2004 and 2007, the educational characteristics are the strongest associations with the welfare status in 2009.

4.4.2.2. Within-Conflict Poverty Rates

As mentioned earlier, the pre-conflict Syrian community turned into sub-communities. The biggest sub-community is that of the non-movers', i.e., the Syrian people who are staying in their homes, followed by the IDP's community, who are around 6 million people. Refugees make up around 5 million people, three million of whom are staying in Turkey, while around 1.2 million are staying in Lebanon. Those two countries also receive around 50% of the Syrian immigrants (SCPR, 2016b). Consequently, estimating the current poverty rates, in general, requires the inclusion of the rates and profiles in these sub-communities. Fortunately, entities working in the field have published poverty and vulnerability reports of refugees (UNHCR, UNICEF, WFP, 2017; WFP, 2016; Verme et al., 2016). Thus, the current chapter focuses fully on estimating the poverty rates and profiles of the people still living inside Syria, the non-movers' and IDP's sub-communities, and our empirics build on microsimulation.

Microsimulation models are of great benefit for us since they are used to bridge the year's delay concerning poverty statistics by using the so-called *nowcasting method* (Navicke et al., 2014; Bourguignon and Spadaro, 2006). Nowcasting refers to the estimation of current indicators using past data combined with other information including the latest available macroeconomic statistics (Navicke et al., 2014). Caruso et al. (2017) classify the microsimulation methods into a bottom-up approach, that simulates the performance of each agent in the economy to nowcast poverty, and a top-down approach, that uses welfare estimates to explain the performance of poverty at an aggregate level over time.⁹⁹

The simplest top-down method is the Elasticity Method. The elasticity method involves using historical trends of output and poverty to determine the responsiveness of poverty rates to output growth, which is then combined with macroeconomic projections to estimate the impacts of future reduced growth on poverty (Habib et al., 2010). This method is consistent with Kraay, who mentioned that the projection of poverty headcount is nothing else but “non-linear functions of underlying changes in average income and measures of income inequality” (2006, 200). The simplest version of this method consists of the ratio between the percent change in the poverty headcount and the percent change of an output measure, GDP per capita, in two moments over time, as follows:

$$E_{t,t-1} = \frac{\Delta P_0/P_{0,t-1}}{\Delta Y/Y_{t-1}} \quad (4.3),$$

⁹⁹ It is worth to mention that Caruso et al (2017) test three commonly used poverty nowcasting methods and ranks their performance by comparing country-specific and regional poverty nowcasts with actual poverty estimates for a following period. The validation results show that the two bottom-up approaches perform relatively better than the top-down approach.

where $\Delta P_0/P_{0,t-1}$ is the change in the poverty headcount, and $\Delta Y/Y_{t-1}$ is the change in the output measure. Poverty is estimated in $t + 1$ as follows:

$$P_{t+1} = P_t \left(1 + \frac{\Delta Y}{Y_t} E_{t+1,t} \right) \quad (4.4).$$

We look for the elasticity, $E_{t+1,t}$, but it is not available in Syria for 2015, so we follow Habib et al. (2010) and assume that the elasticity, $E_{t,t-1}$, has a unique non-stochastic value over time for any poverty measure. Poverty, P_0 , in the period $t + 1$, thereby, can be projected as follows:

$$P_{t+1} \approx P_t \left(1 + \frac{\Delta Y}{Y_t} E_{t,t-1} \right) \quad (4.5).$$

Besides its simplicity and easy application, this method performs well for poverty forecasting in cross-country settings (Bourguignon, 2003; Misselhorn and Klasen, 2008; Yoshida et al., 2014). However, the elasticity may change greatly over time, as the relationship between growth and poverty tends to decrease in relevance when poverty decreases and, therefore, it may not work properly when forecasting poverty rates in long periods of time (Yoshida et al., 2014). In addition, it produces only aggregated—as opposed to household or individual level—poverty extrapolations (Caruso et al., 2017).

These drawbacks are clear-cut in the Syrian context. The last comprehensive study of poverty in Syria used data of 2003/2004 and 2006/2007 (Abu-Ismaïl et al., 2011), so the growth elasticity available is one decade earlier and different from the elasticity during the current conflict, as the dynamics of poverty, growth, and inequality are changing. Thus, the *informational error*, the error resulting from the difference between the growth elasticities of poverty over time, is non-negligible. Furthermore, since there are no up-dated inequality figures in Syria, we are going to depend on the growth elasticity of poverty. This raises the probability of making an inaccurate nowcasting, as the poverty change is more sensitive to inequality changes than to growth changes.¹⁰⁰ Nevertheless, we apply this approach to provide a first insight into the pattern of poverty in the course of conflict and compare the results with those mentioned in other sources.

Abu-Ismaïl et al. (2011) compute the growth elasticities for the four regions of Syria, and each region has two growth elasticities: one is for the urban areas, and the other is for the rural areas. Table 4.4 shows that, while the growth elasticity of poverty in Syria as a whole is quite high (-3), implying that a 1% increase in per capita income is associated with a 3% decrease in the poverty rate, the responsiveness of poverty reduction to any given growth rate varies across regions. Poverty in the urban Southern Region is more

¹⁰⁰ Kakwani (1993) finds similar results. Nevertheless, Dollar and Kraay (2002), Datt and Ravallion (1992), and Kraay (2006) find different results for a large set of countries where the average income growth is the main and the most important driver of poverty reduction.

responsive to growth compared to other regions (-5.1), while the growth elasticity was the smallest in the rural North-Eastern Region (-2.7), where poverty rates are the highest, indicating the growth was not a sufficient way to fight poverty in the poorest area in Syria. Furthermore, we assume that the growth elasticity has a unique non-stochastic value over time, so we will use the growth elasticities of 2007, which are potentially similar to those of 2009 since the lag period is just two years.¹⁰¹

Table 4. 4: Growth and Inequality Elasticities of Poverty in Syria

Urban/Rural		Growth Elasticity 2007	Distributional Elasticity 2007
Urban	South	-5.731	4.295
	North Eastern	-3.301	3.752
	Central	-5.145	5.82
	Coastal	-4.648	7.544
Rural	South	-3.093	3.25
	North Eastern	-2.709	1.947
	Central	-4.873	5.586
	Coastal	-4.071	4.96
All Syria		-2.911	3.046

Source: Abu-Ismaïl et al. (2011).

Notes: *South* includes the governorates of Damascus, Rif Damascus, Sweida, Daraa, and Qunietra. *North Eastern* includes the governorates of Aleppo, Idleb, Raqqa, Hassakeh, and Deir Azzor. *Coastal* includes the governorates of Lattakia and Tartous. *Central* includes the governorates of Homs and Hama.

Applying this approach requires using the estimations of SCPR (2016a) indicating that GDP per capita in 2015 has contracted by 60% of its 2009 level. Table C.7 introduces the computations, while Table 4.5 presents the results. The first panel of Table 4.5 shows that 40.8% of Syrians are extremely poor, while 80.7% are living under the UPL in 2015. The projected overall poverty figure is similar to estimations published by some INGOs. Sadly, and since we do not have figures about the economic shrinkage at the governorate level, the chapter does not apply this method for individual governorates.¹⁰²

Another drawback of this method is that it hugely relies on the estimated economic contractions to nowcast the current figures of poverty. Any small change would shift our poverty estimations. The chapter used the estimations provided by SCPR (2016a), which build on sector analysis. These estimations are similar to those provided by WB (2017) and ESCWA (2017). Below, we avoid the estimation sensitivity, attributed to differences in GDP contraction's estimations, by using the third microsimulation technique when nowcasting poverty, since that technique does not rely directly on estimations of economic losses.

¹⁰¹ It is worth to mention that the growth elasticity of poverty in Syria is larger than in other countries; the average in LDCs ranges between 0.75 and 1.7 (Lenagala and Ram, 2010). Discussing this elasticity, however, is beyond the concept of this essay.

¹⁰² Assuming that the economic loss is the same across the Syrian governorates leads to irrational results as we get poverty rates higher than 100% in some governorates.

Table 4. 5: Estimated Poverty Rates of 2015 Based on The Elasticity Methods

(1) Poverty Rates 2009	
Extreme Poverty Rate 2009 (%)	14.85
Overall Poverty Rate 2009 (%)	29.39
(2) Growth Elasticity Method	
Growth Elasticity of Poverty 2004-2007	-2.911
GDP pc Contraction 2009-2015 (%)	-59.92
Extreme Poverty Rate 2015 (%)	40.788
Overall Poverty Rate 2015 (%)	80.72
(3) Inequality Elasticity Method	
Gini Coefficient 2009	0.354
Inequality Elasticity of Poverty 2004-2007	3.046
Extreme Poverty Rate 2015 (%)	17.28
Overall Poverty Rate 2015 (%)	34.2
(4) The Combined Effect	
Extreme Poverty Rate 2015 (%)	47.46
Overall Poverty Rate 2015 (%)	93.93

Source: Author's computations based on Abu-Ismaïl et al. (2011) and SCPR (2016a).

Notes: Extreme poverty is defined as the share of the population whose expenditure lies under the lower poverty line; Overall poverty is defined as the share of the population whose expenditure lies under the upper poverty line. Gini coefficient is a standard measure of Inequality; it lies in the interval 0, perfect equality, and 1, perfect inequality. The growth elasticity approach is based on Equation (4.3) and Equation (4.5). Poverty rates of 2009 in Panel (1) are computed and reported in Table 4.3. Growth elasticity and distribution elasticity in Panels (2) and (3) are extracted from Abu-Ismaïl et al. (2011). GDP contraction in Panel (2) is imported from SCPR (2016a). Gini Coefficient in Panel (3) is estimated by the author following Bircan et al. (2017). Table C.7 presents the numerical process.

We step forward and include the effect of income distribution changes. Violent conflict is likely to affect different segments of society to varying degrees; this raises the question of the distributional effects of conflict. Bircan et al. (2017) review the channels through which the civil conflict affects inequality in a war-torn society. Low-income segments of a society are more likely to suffer than high-income segments, since most of the hostilities take place in poor neighborhoods, and the violent conflict destroys the functioning of markets. This is most pronounced in war-affected countries, where the primary sector is still dominant and the majority of households are engaged in agriculture; farmers often lose their access to markets and the ability to sell their products (Bozzoli and Brück, 2009; Bozzoli et al., 2016; Deininger, 2003; McKay and Loveridge, 2005). In addition, with labour markets in the formal sector being affected, job opportunities and wages are likely to fall, pushing more people into the informal sector that shows earning depression. Similarly, the impact of conflict on investment is exacerbated for the poor, who often have few assets that can be collateralized (Tsiddon, 1992). By creating a more unequal distribution of assets, violent conflict leaves a greater number of individuals credit-constrained. As a result, effective educational and social interventions may be hampered, and credit constraints can translate into intergenerational persistence of income inequalities (Deininger and Olinto, 1999). Moreover, a cut in the public expenditure on education and health, which is done to fund the excessive military expenditure,

leads to narrowed opportunities for schooling combined with a degradation in public health services. This increases human capital inequality, which is likely to be amplified the longer and more intense a conflict is.

To obtain the change in inequality, we first derive the pre-conflict Gini coefficient in the Syrian governorates, and then we rely on Bircan et al. (2017) who concluded that inequality, on average, increases during the course of violent conflict by around 1.9 Gini points. We found an overall Gini coefficient of 35.6%, indicating a middle level of inequality in Syria in 2009. This inequality was two percentage points greater in urban areas than in rural areas, which is consistent with Kuznets (1955). The lowest equality found was in the cities located in Rif Damascus and in the rural areas of Homs, while the lowest inequality was in cities located in Raqqa and the rural areas of Hassakeh. Following Bircan et al. (2017), we infer that the Gini coefficient changes by 5.37%.

Table 4.4 presents the income distribution elasticity of poverty in 2007. It shows that the distribution elasticity is slightly larger than the growth elasticity, and it peaks in the urban coastal area, so that a 1% increase in the Gini Coefficient is associated with a 7.5% increase in the poverty rate there. Using the income distribution elasticities of poverty of 2007, we find that poverty changes less compared with the previous result, so the extreme poverty rate is 17.3%, and the overall poverty rate is 34.2% in 2015, as is shown in the third panel of Table 4.5. Coupling the results obtained from both elasticity methods, the last panel of Table 4.5, the combined effect, shows that the extreme poverty rate becomes 47.5% and the overall poverty rate becomes 94%.

Moving to the bottom-up approach, one can use the microdata. The Neutral Distribution Growth (NDG) is one of the techniques of this approach. It assumes that all households' incomes, or expenditures, are affected by the same aggregate factor—generally GDP per capita growth—from the period $t - n$ to the period t . Thus, the new welfare indicator is given in the following model:

$$\tilde{Y}_{ig}^t = Y_i^{t-n} (1 + r_g^{t,t-n}) \quad (4.6),$$

for household i , where $r_g^{t,t-n}$ stands for the growth rate of the aggregate factor, g , between years $t - n$ and t . $P(\tilde{Y}_{ig}^t)$ is the corresponding poverty rate.¹⁰³

¹⁰³ Caruso et al. (2017) mentioned that the aggregate factor encompasses more economic elements than the household welfare indicator does, so its growth rate is usually different from the household welfare growth rate. Thus, they add an adjustment factor, λ , which accounts for the difference between the aggregate factor and the per capita household welfare growth. This adjustment factor is known as *pass-through*. Consequently, Equation (4.6) becomes $Y_i^{t-n} (1 + \lambda r_g^{t,t-n})$.

This approach assumes that the household welfare variable grows at the same rate in a specific society, as follows: $\frac{(Y_i^t - Y_i^{t-n})}{Y_i^{t-n}} = \frac{(Y_j^t - Y_j^{t-n})}{Y_j^{t-n}}$, for all households ($i \neq j$). This assumption is strong and unrealistic in our case, since Syrian households have been affected differently by the current conflict, as the intensity of conflict varies between the Syrian governorates and provinces.

We use per capita household expenditures as a measure of the household welfare indicator, Y_i . On the other hand, per capita GDP is the most familiar aggregate factor that is intensively used in the literature. Nevertheless, poverty figures are not strongly correlated with GDP in non-developed countries, where the fruits of economic growth are not proportionally distributed. Thus, per capita private consumption is a better proxy in our case. Estimations from SCPR (2016a) show that private consumption is less affected than the GDP. Per capita private consumption decreased in 2015 by 57.2% from its 2009's level, while per capita GDP decreased by around 60%. We rescale the expenditure of all households in the sample and compute their new expenditures in 2015, contracting by 57.2%. Comparing the last rows in Tables 4.3 and 4.6 shows that the food poverty rate, extreme poverty rate, and overall poverty rate jump from 2.97%, 14.9% and 29.5% in 2009 to 40.96%, 70.38%, and 82.83% in 2015, respectively. Since we assume static inequality, the governorates have the same order of poverty dominance as in 2009. It is worth mentioning that the extreme poverty rates are more than 90% in some places, like the rural areas of Hama and Latakia and the urban areas of Homs, Idleb, Deir Azzor, and Hassakeh.

The gap in characteristics between the poor and non-poor is changing in a systematic way. Table C.8 shows that the characteristics of the poor get closer to those of the pre-conflict non-poor, while the characteristics of the non-poor are improving. Put differently, the averages of within-conflict poor are improving. It is clear that these changes are not due to improvements done, either in quality-enhancing policies, or in living conditions of the poor, but because the poverty pool expands to include non-poor people closer to the poverty line, while the pool of non-poor people shrinks and becomes more dependent on very rich people's characteristics.

Take, for example, the family size, which decreased from 7.5 in 2009 to 6.2 persons per poor household, while the non-poor family became smaller with around four persons per household. Moreover, poor households are staying more in apartments than in *dars* (traditional houses). In terms of education, the poor become less illiterate and get more qualifications. From the employment perspective, more poor work in the public sector rather than in the private sector. In addition, more poor people are now working rather than being out of the labour force, and less poor are working in agriculture or construction sectors.

Table 4. 6: Estimated Poverty Rates of 2015 Based on The Neutral Distribution Growth Method (%)

Governorate	U/R	Food Poverty	Extreme Poverty	Overall Poverty
Damascus	Urban	19.14	60.94	73.44
Rif Damascus	Urban	33.85	71.88	86.46
	Rural	43.53	75.29	87.06
Homs	Urban	42.31	76.15	90
	Rural	43.75	77.08	84.38
Hama	Urban	41.67	62.5	80.21
	Rural	67	92	94
Tartous	Urban	13.46	26.92	69.23
	Rural	43.33	75.26	82.47
Lattakia	Urban	13.98	46.24	66.67
	Rural	35.94	71.88	95.31
Idleb	Urban	49.21	80.95	92.06
	Rural	52.48	76.24	83.17
Aleppo	Urban	36.9	64.88	80.36
	Rural	43.33	71.67	85
Raqqa	Urban	45	83.33	88.33
	Rural	39.34	72.13	78.69
Deir Azzor	Urban	58.73	80.95	90.48
	Rural	56.36	78.18	81.82
Hassakeh	Urban	73.33	86.67	96.67
	Rural	57.5	71.25	76.25
Sweida	Urban	42.37	79.66	86.44
	Rural	36.5	66.67	82.54
Daraa	Urban	47.27	70.91	72.73
	Rural	51.52	71.72	87.88
Quneitra	Rural	51.61	61.29	74.19
	Urban	35.48	67.19	81.39
Syria	Rural	47.93	74.73	84.89
	total	40.96	70.38	82.83

Source: Author's computations using Equation (4.6).

Notes: Food poverty is defined as the share of the population whose expenditure lies under the Food poverty line; Extreme poverty is defined as the share of the population whose expenditure lies under the lower poverty line; Overall poverty is defined as the share of the population whose expenditure lies under the upper poverty line. NDG stands for the Neutral Distribution Growth Method to nowcast poverty.

It is clear that our results are not as empirically sharp as would be desirable. This is because this method assumes static inequality, which is a strong assumption that may bias the results in exercises involving long-run predictions and shocks such as this, while households are affected differently, and so $r_g^{t,t-n}$ are different along the deciles and the locations of residence, as mentioned earlier. In order to overcome this constraint, some authors developed new techniques. Edward (2006) and Edward and Sumner (2013) disaggregate the country's population into proportionally-augmented bands of welfare aggregates in order to relax the assumption of static distribution. Chandy et al. (2013) assume different inequality scenarios by shifting the proportion of economic growth from the top 10 percent to the bottom 40

(Chandy et al., 2013). Caruso et al (2017) use an amended method of NDG, *the Quintile Growth Contribution Method*. Their approach attempts to capture the heterogeneity of growth across individuals or households, by assuming that quantile-specific contributions to growth during a known-data period remain similar during the unknown-data period. This assumption is an extension of the ‘share of incremental income’ definition of pro-poor growth studied by White and Anderson (2001).¹⁰⁴

4.4.3 Dynamic Modelling

All the previous-mentioned approaches are considered static models that do not fit our case. Due to grand-scale changes taking place in Syria since the beginning of the civil conflict, it is better to follow dynamic models that capture changes in demographic and occupational characteristics. Thus, our model first simulates the changes in the demographical conditions of every family in the sample. These changes are based on aggregate figures extracted from other sources and affect the structure of the households in terms of size, age, and gender. Based on the demographical changes, we simulate the changes in labour status and, in turn, income figures of individuals, and combine them with the changes in the non-labour income of their households.¹⁰⁵ We finally compare the new income figures with the counterpart poverty lines to infer the poverty changes.

Normally applying a dynamic model is not recommended, unless the time lag between the data available and the required outcome is long, i.e., 10 years at least. This is because those models are labourious to construct, difficult to validate, and can have problems with internal consistency (Navicke et al., 2014). However, due to the large effects of the Syrian conflict on the different factors affecting the poverty ratio, the current chapter is going to use a dynamic micro-simulation model that combines macroeconomic projections with pre-crisis micro-data from the last HIES done in Syria to predict income and consumption at the individual and household levels.

4.4.3.1 Shocks

The model focuses on different shocks that affect the poverty status of households: demographical shock, labour shock, and price shock. Shocks can be positive or negative depending on the trends outlined by

¹⁰⁴ According to Caruso et al. (2017), two main assumptions are required to apply *the Quintile Growth Contribution Method*. First, the method assumes that people with similar welfare aggregates in one period will perform similarly in the next period. That is, we expect that, after ranking the population by quantiles based on welfare, two households within the same quantile in period t will belong to the same quantile in period $t + 1$. Second, the method assumes that the economy performs today as it did in the past. Thus, this method does not fit our case.

¹⁰⁵ These factors interact with each other and may lead to behavioural responses. However, we will not dig further in these interactions, as we want to keep the simulation model as simple as possible, and our knowledge of the determinants of human behaviour is far from being complete.

the macroeconomic projections (Habib et al. 2010). However, it is difficult to find a positive shock in the Syrian context.

Table 4. 7: Estimated Poverty Lines of 2015 (SP)

Governorate	U/R	FPL	LPL	UPL	Percentage Change Comparing with 2009
Damascus	Urban	6062.9	11048.16	13821.82	209.20%
Rif Damascus	Urban	6079.26	10072	12697.58	217.54%
	Rural	5820.93	9553.79	12328.66	217.72%
Homs	Urban	5875.94	9193.75	13084.33	211.55%
	Rural	5748.04	8884.94	9962.29	214.20%
Hama	Urban	5870.65	8561.32	12170.25	205.99%
	Rural	5768.07	8826.55	10953.06	210.48%
Tartous	Urban	6530.75	8360.91	15865.99	203.76%
	Rural	6869.13	10857.69	13789.86	207.55%
Lattakia	Urban	6785.71	10158.56	14923.55	220.83%
	Rural	7122.55	11696.08	15928.28	224.96%
Idleb	Urban	6512.37	9902.13	12951.68	229.67%
	Rural	5002.32	7692.71	8808.75	231.49%
Aleppo	Urban	6707.86	9848.28	13171.45	236.85%
	Rural	5132.79	7789.71	9352.70	237.74%
Raqqqa	Urban	7776	11967.49	13750.8	292.34%
	Rural	5920.74	8912.25	10390.59	293.82%
Deir Azzor	Urban	7873.29	11375.18	15869.97	300.92%
	Rural	5993.8	8897.25	10688.95	303.07%
Hassakeh	Urban	6178.07	9011.95	11911.64	214.96%
	Rural	4731.06	6384.56	6730.83	216.45%
Sweida	Urban	6415.8	11383.62	14646.09	225.69%
	Rural	6179.14	9938.17	13051.03	228.66%
Daraa	Urban	6629.40	9338.45	11255.83	236.89%
	Rural	6354.77	9314.85	12619.66	237.46%
Quneitra	Urban	6059.61	6962.88	8940.49	223.03%
	Rural	5767.25	6626.93	8509.13	207.5%

Source: Author's computations based on CBS (2018b), El-Laithy and Abu-Ismaïl (2005), and Abu-Ismaïl et al (2011).

Notes: Food Poverty Line (FPL) is the cost of acquiring enough food for adequate nutrition per day; Lower Poverty Line (LPL) is the FPL augmented by the non-food expenditure for households whose total expenditure is equivalent to the FPL; Upper Poverty Line (UPL) is the FPL augmented by the non-food expenditure of households whose food expenditure is equivalent to the food poverty line. 'SP' stands for Syrian Pound; USD 1 = SP 300 in 2015.

The price shock stems from big changes in prices, and it affects the poverty lines. We follow the same methodology of setting the poverty lines of 2009, simply extending it to include the conflict years, and we rely on Table C.4 to apply the equation mentioned in Item (5) of Appendix D to compute the FPLs. We use the price index of May 2015, since it was the last month when CBS estimated this index for the fourteen governorates. Setting 2005 as the base year (=100), the food poverty lines jump by 478% in Damascus and 515% in Aleppo. Places where ISIS controls the majority of the territories, Raqqqa and Deir Azzor, witness the highest increase in food prices, 679% and 665%, respectively. Comparing Tables C.4

and C.5, it is notable that the Adjusted-Food CPI exceeds the CPI, meaning that real levels of the poverty lines increase. Next, we use the same percentage combination of food/non-food items that was used in 2009 to construct the lower and upper poverty lines, as Item (6) of Appendix D shows. Table 4.7 presents the poverty lines in the Syrian governorates in 2015, while Table C.9 clarifies more the computations. It looks from Table 4.7 that the percentage changes in poverty lines range between 200-240% in the majority of the governorates, except Deir Azzor and Raqqa where the poverty lines jumped threefold.

Demographical shocks are modeled through changes in the birth, death, and movement rates. These changes affect the labour status and income received by a given person or family. In addition, they affect the marriage and fertility behaviors. It is important, thereby, to know the figures of these demographical changes and pick the people who were killed, injured, or ran away. We use figures mentioned in the Forced Dispersion Report (SCPR, 2016b) that contains, in detail, the number of immigrants and refugees who ran away from their own governorates to other places. In addition, it contains the home/host-IDP-governorates matrix. These numbers date back to 2014 and therefore, depending on the aggregate figures of 2015, we use the governorate-based percentages found in 2014 to compute the governorate-level figures of 2015 as follows:

$$X_{g,2015} = X_{S,2015} \cdot \frac{X_{g,2014}}{X_{S,2014}} \quad (4.7),$$

where $X_{g,2015}$ stands for the figure/rate of the governorate g in 2015; $X_{S,2015}$ stands for that figure/rate of Syria in 2015; $X_{S,2014}$ is the figure/rate of Syria in 2014; $X_{g,2014}$ stands for that figure/rate of the governorate g in 2014. We import the national figures/rates of 2015 from different entities including the UNOCHA, UNHCR, WB, SCPR, and IOM.

The demographical changes are taking place on either individual or household levels. For the sake of simplicity, we consider asking for a safe shelter a family event and we, therefore, choose families, not individuals, as units moving to other places. This assumption holds a strong drawback. One of the male adults may stay home to participate in the hostilities or to take care of the house and other family assets. On the other hand, it is rational to say that individuals, and not the whole household, unless it was a single-member family, were killed due to the current conflict; however, losing one member may strongly affect the whole household, especially if the victim was a breadwinner, so his/her death cuts the household's income.

We start by discounting the households who have become refugees and immigrants as they no longer reside in Syria. Then, the model randomly chooses the households running away to other governorates,

i.e., IDP, based on the percentages provided by SCPR (2016b). Next, the model picks those displaced households to their host places based on the IDP matrix that is presented in Table C.10. Figures indicate that around 62% of the IDP settle within their home governorates. This percentage is higher in Daraa, Sweida, Latakia, Rif Damascus, Aleppo, Idleb, and Hassakeh, and it is attributed to a number of factors, including the fact that moving to other areas within the governorate is much easier and relatively less dangerous than moving outside of the governorate. Moreover, the relations of kinship, friendship, and work are often stronger between residents from the same governorate which adds to the desire of the majority to remain in their areas of origin, in the hope of returning at the earliest possible opportunity, as is declared by 62% of the IDP (SCPR, 2016b).

Next, we choose the individuals killed depending on death figures extracted from SCPR (2016b). It is worth mentioning that most of the victims are men aged between 15 and 29 years, since they are more involved in hostilities. In addition, the number of people that died in Syria due to the breakdown of the health-system is greater than those killed due to direct fatalities from the fighting (WB, 2017). The destruction of the existing health infrastructure has led to a deterioration of health status across the country, and the 'secondary death toll' is even higher than those killed by bombs and firearms (Baker, 2014). As for people who died naturally, we randomly choose them depending on the natural death rate that existed in Syria before the conflict, 0.44%,¹⁰⁶ bearing in mind the age-specific mortality rates, calculated by SCPR (2016b). Thus, the model sets death rates of one per thousand, 3 per thousand, 20 per thousand, and 170 per thousand for people whose age is between 6-40, 41-60, 61-80, and more than 80 years old, respectively. The children's (under 5 years old) death rate is 21.4 per thousand live children, similar to that of 2009 (CBS, 2009). The maternal mortality rate is set to be zero due to practical reasons.¹⁰⁷ Next, we change the ages of the people still alive, so that they are six years older in 2015 than in 2009.

Even though they were strongly affected by the conflict, birth rates are still high in Syria. Table 4.8 shows that the birth rate was ranging between 3.5-3.9% during the first decade of the New Millennium. It declined to less than 2.5% in 2015. SCPR (2016b) provides us with the crude birth rates of the fourteen governorates just in 2014, so we use governorate-based crude birth rates in 2014, while we use the

¹⁰⁶ While CBS announced that the natural death rate in Syria was 0.38% in 2010, SCPR (2016b) recalculated some significant demographic indicators, including mortality rate, for the period prior to the crisis, and it found that the natural mortality rate was 0.44% in 2010. Thus, our model sets the death rate at 0.44%.

¹⁰⁷ Since maternal mortality rate was 68 deaths/100,000 live births, we need to pick just one woman who gave a birth during the six years of 2010-2015, and this a time and effort consuming, so nullifying the rate will not affect our results.

national rate in the other years.¹⁰⁸ Next, we compute infant mortality based on its pre-conflict rate, which was 18 deaths per 1000 life-births (CBS, 2009).

Table 4. 8: Birth, Mortality, and Natural Increase Rates 2010-2015 (%)

The Rate	2010	2011	2012	2013	2014	2015
Crude Birth Rate	3.88	3.60	3.33	3.07	2.85	2.48
Crude Mortality Rate	0.44	0.55	0.75	0.98	1.10	1.08
Natural Increase Rate	3.44	3.05	2.58	2.09	1.75	1.40

Source: SCPR (2016b).

Notes: The crude birth rate is the number of live births occurring among the population of a given geographical area during a given year, per 100 mid-year total population of the given geographical area during the same year. The crude mortality rate is the total number of deaths to residents in a specified geographic area divided by the total population for the same geographic area for a specified period. Natural increase rate is the difference between the two previous rates.

In addition, we use other simplifying assumptions: there are no new twins, no more than one new baby per family a year, no new families, and the divorce rate is null. The last two assumptions are strong, since marriage and divorce rates are affected by crises. Foster (1993), Jayaraman et al. (2009) and Heuveline and Poch (2006),¹⁰⁹ among others, find a civil conflict effect on marriage delay.¹¹⁰ Finally, the gender balance is met between the new babies, but in case of an odd number of new babies, the male babies will be one more than the female ones.

It is worth mentioning also here that movement-based changes tend to affect mortality, but not birth rates. Since IDP use the health facilities of their host governorates, their mortality rate is converging on the host community's level, although IDP tend to bring their health and nutritional habits with them. IDP, on the other hand, maintain their social habits such as those surrounding fertility and other social habits dominated in their homes, but tend to shift in favor of the host community's norms the longer they stay there.¹¹¹ Since around three-quarters of the IDP have been living for less than three years in their host communities in 2015, one can say that their birth decision is still following the trend of their home governorates.

In addition, the disruption effect, an explanation for why the fertility rate declines during wartime, is invalid in our context. The disruption effect normally results from spousal separation. This separation is ignored

¹⁰⁸ We created new individuals in the individual file, then we distribute those new born among the existed households, and no household has more than one new baby in a given year.

¹⁰⁹ In the context of Cambodia, Heuveline and Poch (2006) sought to assess the impact of the policy of the Khmers Rouges to organize en masse marriage ceremonies and "sweeping away the fundamental bases of Cambodian society" such as private land ownership, religious ceremonies and kinship responsibilities" (2006, 99).

¹¹⁰ Conflict affects the educational attainment and the location of residence, which, according to Mensch (2005), significantly affect the first marriage. Moreover, it is reasonable to argue that the positive impact of education may be more pronounced in countries where age at first marriage and age at first birth are relatively low.

¹¹¹ Although a few scholars have investigated the fertility of IDP, one can draw conclusions from the literature discussing the effect of country of origin on the fertility behaviour of the immigrants. Most of those studies took place in developed countries: US (Kahn, 1988), Australia (Abbasi-Shavazi and McDonald, 2000, 2002), France (Garson and Tribalat et al., 1991), and Sweden (Andersson, 2004). The majority of papers related find a process of 'assimilation' in the fertility behaviour of immigrant families, so their fertility levels change from levels similar to those of their countries of origin to levels similar to that of the population of the country of destination. This result, however, was dominated just in cases where families have been living a long time in the host communities.

by our model, since we consider displacement as a whole-family event and so the couple stays together in our model. Furthermore, although host communities, which are mostly urban, offer IDP new opportunities, such as education and labour force participation, which raise the costs of childbearing, and offer them better access to family planning, the socio-economic exclusion of the newcomers may be further reinforced by their spatial insulation in camps or other designated areas. This exclusion hampers IDP's interactions with local residents and the reproductive information and services available to them. Both socioeconomic exclusion and spatial separation can heighten the sense of temporariness of current status and circumstances among IDP, thus discouraging them from adjusting their reproductive aspirations and preferences. Moreover, the economic circumstances of Syria nowadays do not offer sufficient job vacancies that would lead IDP to integrate with their host societies.

The transition criterion is essential in our simulation. It depends on selecting the observations, which transit from one status to another (life→ death; non-moved→ IDP, refugee, or immigrant), randomly. The probability of selection is equal to the relative changes within age-gender-governorate strata, which are concluded from the available reports. Another way to find a transition criterion stems from econometric models estimated for modeling survival and labour market transitions (Habib et al., 2010). However, this way does not fit the Syrian context, since it imposes the structural relationship and transitional probabilities estimated based on the data from a previous period, which is different from the current ones.¹¹²

Income shocks are modeled through taking into account the changes of employment status and labour/non-labour income resources. Many Syrians have become unemployed, as the unemployment rate jumped to 53% in 2015. Others changed their labour sector, while just a few get benefits from the economics of conflict.¹¹³ In addition, there is a huge change in the income structure of Syrians, since many depend on assistance granted by INGOs working in Syria and remittances sent from relatives living abroad.

Modeling the income shocks requires detailed and updated demographic and sectoral information. Micromodels usually reassign labour force in both directions, so some workers become unemployed, while some of the unemployed find jobs. Moreover, some workers change their fields (sector, economic activity, or occupation). Nonetheless, due to data constraints, and in order to make the model as simple

¹¹² Even though some scholars find that a multivariate econometric estimation of the probability of each individual labour market transition might provide a better prediction than the strata-based approach (Salgado et al., 2014; Avram et al., 2011), we apply the second approach, since the first does not fit the conflict time.

¹¹³ ESCWA (2017) and SCPR (2016a) briefly describe the economics of conflict in Syria.

as possible, we will assume that the changes are taking place just in one direction and concern only those who flow from employment to unemployment. In addition, no worker changes her work sector, and no new job vacancies have appeared. Our model tries to reach the current level of unemployment that is 53% in 2015.

We divide the pre-conflict workers according to their employment sector. Next, we calculate the sectoral employment changes, shrinkage percentage of the number of workers in each sector, as presented in Table C.11. We find that the industrial sector was the most affected, losing 97% of its workers.¹¹⁴ Therefore, the model randomly chooses the new unemployed based on the percentage of shrinkage within each sector. They are considered job losers and added to the old unemployed. Other groups that are classified as job losers are those who became immigrants, refugees, or passed away. It is worth mentioning here that all public-sector employees are still in their jobs, unless they became refugees or immigrants or passed away. This assumption is anti-poor, since the poor are less involved in the public sector, according to the poverty profile of 2009.

We lack figures that show the employment rate among the IDP. Thus, and based on the literature review and some proxy figures, we estimate the unemployment rate among IDP, which gives 20-25 percentage points more than the average. Using data of IDP during the Bosnian War, Kondylis (2010) shows that displacement is associated to a fall in work by 16 to 29 percentage points and to an increase in unemployment by 19 to 22 percentage points, compared with those who stayed in their places. She argues that the results for Bosnian men suggest that the magnitude of the negative effect of displacement on work is decreasing over time, and becoming insignificant in nine years after the real end of the conflict. She attributes these results to three main explanations: the informality of the labour market there, the loss of network access caused by displacement, and the employment disruption because of displacement. The three reasons tend to be true in the Syrian context. However, these figures appeared in a post-conflict time, not within the conflict, so we can argue that those figures are larger for Syrian IDP in 2015. Consequently, the model considers 75% of the IDP who used to work before as people that have lost jobs. This rate is 23 percentage points more than the average unemployment rate in 2015. Finally, we would like to mention that the old workers, i.e., those whose current age is over 64, become out of the labour force in our model.

¹¹⁴ In order to find the percentage contraction in the employment rate of each sector, we use different databases. The pre-conflict data of 2009 are from CBS (2010), while the labour market data of 2015 are from WB (2017). Thus, there might be a sort of inconsistency when comparing between pre and within-conflict data.

Next, we calculate the number of people who lost their jobs up to 2015 in every household, and we nullify their pre-conflict job-income. Job-generated income was around 70% of the total income during the pre-conflict time (CBS, 2009), so losing jobs affects this percentage of the households' income. Next, we amend the job-income based on salaries increase. Our calculations find that salaries increased by 107% between 2009 and 2015.¹¹⁵

As stated previously, our welfare index relies on consumption rather than income. Therefore, this analysis must locate a means of converting income losses into consumption levels. Habib et al. (2010) assumed that the household-level consumption-to-income ratio remains unchanged between the base and the projected years. This way is adequate when reassigning labour between sectors, so it is irrelevant to follow it here since we essentially find just the income losses. Furthermore, we do not account for dissaving, which results as consumption shrinks less than income. Our simulation drops dissaving for three reasons: first, pre-conflict saving for poor people were negligible; second, we assume that the major part of saving has already been consumed in the second and the third years of the conflict, 2013 and 2014; third, one of the means for households to save pre-conflict was to invest in property which, since the conflict, has become more difficult to access if it is not completely de-valued. Consequently, we compute the new household expenditure for whole families by subtracting the income lost from pre-conflict expenditure.¹¹⁶

4.4.3.2 Results

Panel (2) of Table 4.9 shows the results of this scenario –we call it Scenario A. Poverty rates have been falling to disastrous levels that Syrians faced only during WWI, a period called *Safar Barlik*.¹¹⁷ Around 86% of the Syrian residents are living under the lower poverty line, and the situation is worse in Deir Azzor, where around 95% of the population are living under the LPL, while the lowest poverty rate is found in Quneitra, Sweida, Damascus, Latakia, and Tartous, which are relatively safer. As for the overall poverty rate, the last column in Panel (2) of Table 4.9 shows that 93.1% of the Syrian people are living under the UPL, while some areas are almost completely populated by poor people; their poverty rates being more than 99%.

¹¹⁵ This figure is divided into (i) salary increase between 2009-2011, obtained from the LFS (CBS, 2010), and (ii) the salary increase during the conflict, obtained from ESCWA (2017).

¹¹⁶ To avoid any problem, we assume that the households, whose consumption is negative, borrow exactly the sufficient sum of money, so their consumption equals to zero.

¹¹⁷ Although there are no poverty figures describing the situation during *Safar Barlik*, historians agree that the famine that befell Syria, during the First World War, is considered among the greatest tragedies in the region's modern history. Its death toll in Syria, which included at WWI what were the Ottoman provinces of Syria, Aleppo, Beirut, the districts of Mount Lebanon, and Jerusalem, estimates as high as 500,000 by the end of 1918, out of a population estimated between 3.13 and 4.37 million. That amounts to a civilian death rate of 11–16 per cent, some 10–15 times greater than most of the major European powers in the conflict (Foster, 2015).

This result is catastrophic, but incomplete. Therefore, another scenario emerges — we call it *Scenario B*. We might also suggest that the negative effects of income loss are being lessened by other income sources which work to alter structural contributions in comparison with the pre-conflict situation. It is prior to say that now a greater percentage of Syrian families are receiving financial assistance from either Syrian NGOs, or international organizations. Since assistance is flowing from different entities and in different forms (food, NFI, shelter, winter kit, and cash), it is difficult to know who is getting subsidies and the size of these subsidies. We can, however, and depending on UNOCH monthly reports (2018), estimate the average size of the nonfood items (NFI) provided to the beneficiaries and its value. In addition, we compute the percentage of families receiving these items (64% of the beneficiaries are IDP) based on these monthly reports. Table C.12 shows that households staying in Aleppo and Quneitra are receiving more NFI than non-movers in other governorates, while those living in Raqqa and Deir Azzor, places under ISIS control and therefore no easily accessible, are receiving less NFI subsidies. This indicates that assistance is not reaching the neediest governorates. On the other hand, the NFI coverage is larger in Rif Damascus and Homs. Reviewing the items included in the NFI basket, one can estimate that each NFI costs around 1500 SP, which equals USD 5.

Some families are relying on remittances sent by their relatives living in rich countries in the Gulf, Europe, or the American continent. A growing body of literature has shown that the diaspora often support family or friends living at home (Ahmed, 2000; Carling et al., 2012; Díaz-Briquets and Pérez-López, 1997; Horst, 2008; Lindley, 2009). In order to include remittances as a source of income for Syrians living inside Syria, we look for two key points: the first is the value of remittances sent to them, and the second is the distribution of these remittances among them, based on their demographical and socio-economic characteristics. This is not an easy task, since we lack data on either point.

As for the first point, the World Development Indicators dataset provides information about remittances sent to Syria up to 2010, a year before the conflict occurrence, and it shows that the value of remittances to Syria doubled from USD 800 million in 2006 to USD1.6 billion in 2010. Further, IFAD (2017) mentions that remittances sent to Syria in 2016 are USD1.623 billion, an amount that is somewhat similar to the pre-conflict number. This slight increase, nonetheless, is inconsistent with the literature.

Unlike the effects of other sorts of catastrophes, those produced by civil conflict are hard to document due to data constraints. Thus, just a few papers investigate the trend of remittances during the conflict. Those papers have some common findings. First, unlike other forms of capital inflow, remittances are countercyclical, so they help smooth household consumption during the conflict (Koczan, 2016; Fagen

and Bump, 2006; Styan, 2007; Fransen and Mazzucato, 2014). Secondly, these remittances grow in the conflict time. Carling et al. (2012) find that ongoing conflict in the country of origin exerts an upward pressure on remittance-sending.

The second point here regards the distribution of the remittances. We know nothing about the distribution of these remittances according to the residence location or welfare status of the receiving families, but it is obvious that these remittances are not equally distributed, so the key question here is if that distribution is pro-poor? The literature does not provide a conclusive answer. Adams (2011) and Mazzucato et al. (2008) find that remittances do not accrue to the poorest of the poor, so they will not reach the most disadvantaged households, because they generally do not have the resources to send an individual abroad. Furthermore, Nyberg-Sørensen et al. (2002) and Adams (2011) find that those who receive remittances in a conflict-affected setting are very often primarily the wealthier households.

Another evidence, nevertheless, highlights the insurance or consumption-smoothing function of remittances by showing that remittances are invested in daily needs (Kabki et al., 2004; Mazzucato, 2009) or food expenditures (Rosenzweig and Stark, 1989), so it is not in favor of the rich. Duval and Wolff (2016) find that remittances significantly improve the living standard of recipient households in Kosovo, especially for the most vulnerable households.

Coupled with insufficient current data about total remittances and its distribution, the aforementioned inconclusiveness presents a difficulty for our model. Moreover, things are more challenging in the Syrian context where people living abroad are intensively heterogeneous, so immigrants are different from the refugees who are living in different conditions based on the country of current residence and have different characteristics. Added to that, Carling et al. (2012) show that ties to the country of origin increase the desire to remit, a result that interacts with our earlier assumption that looking for a safe shelter is a family event. To avoid these puzzling and contradictory issues, this chapter chooses to concentrate only on pre-conflict data imported from the HIES 2009.

Table C.13 shows that around 5% of Syrian households received remittances in 2009. This percentage is above the mean for the three richest deciles and is almost twofold for the richest decile. Furthermore, remittances range from USD 4 to 11 per month for the first seven deciles, while they are more than USD 32 for the richest decile. Hence, we can easily infer that the remittances mostly benefit rich people, and are therefore indicative of a widening inequality.

Table 4. 9: Comparison between The Estimated Poverty Figures of 2009 and The Ones Given by Scenarios A and B of 2015 (%)

Governorate	U/R	(1) Poverty Rates Estimated for 2009			(2) Poverty Rates of 2015 Using The Microsimulation Model –Scenario A			(3) Poverty Rates of 2015 Using The Microsimulation Model – Scenario B			Extreme Poverty Change 2009-2015
		Food Poverty	Extreme Poverty	Overall Poverty	Food Poverty	Extreme Poverty	Overall Poverty	Food Poverty	Extreme Poverty	Overall Poverty	
Damascus	Urban	0.39	9.38	17.58	44.11	79.9	88.72	26.96	67.64	80.39	621.11%
	Rif	1.04	13.02	27.08	68.25	91	95.76	45.5	81.48	92.59	525.81%
Damascus	Rural	0	18.82	37.65	54.54	81.81	93.18	40.91	72.72	90.91	286.40%
	Urban	3.08	15.38	40	64.2	82.1	90.52	44.2	71.57	86.31	365.34%
	Rural	2.08	19.8	26.04	66.03	88.68	92.45	54.7	83	86.79	319.19%
	Urban	1.04	5.21	31.25	69.23	82.69	95.2	43.26	65.38	83.65	1154.89%
	Rural	8	27	49	79.74	96.2	97.46	68.35	93.67	96.2	246.93%
	Urban	1.92	1.92	13.46	43.93	62.12	89.4	18.18	33.33	74.24	1635.94%
	Rural	2.06	17.53	28.87	61.17	90.58	95.29	48.23	82.35	89.41	369.77%
	Urban	1.08	4.3	12.9	50	75.92	89.81	38.9	65.74	85.18	1428.84%
	Rural	0	18.75	32.81	63.15	85.96	98.24	52.6	84.21	98.24	349.12%
	Urban	3.17	20.63	38.1	80	92	98.66	60	85.33	97.33	313.62%
	Rural	1	21.78	27.72	60.4	85.4	87.5	47.9	77.08	83.33	253.90%
	Urban	3.87	14	27.98	67	88	95.27	48.92	75.96	88.84	442.57%
	Rural	1.11	11.11	22.22	64.51	87.1	90.32	52.68	80.64	86.02	625.83%
	Urban	0	15	25	75	93.18	95.45	65.91	88.63	90.91	490.87%
	Rural	3.28	8.2	16.4	82.85	88.57	97.14	68.57	82.85	88.57	910.37%
	Urban	6.35	15.87	49.21	88.1	95.52	97	68.65	89.55	95.52	464.27%
	Rural	7.27	25.45	41.82	90.47	95.23	95.23	85.71	90.47	90.47	255.48%
	Urban	13.33	28.33	56.67	85	96.6	100	78.33	93.33	100	229.44%
	Rural	3.75	13.75	17.5	77.7	88.9	88.9	62.22	80	80	481.82%
	Urban	5.08	18.64	40.68	53	80.3	86.36	40.91	65.15	77.27	249.52%
	Rural	1.59	11.11	30.16	59	77.05	93.44	45.9	62.29	81.96	460.67%
	Urban	5.45	20	29.09	73.9	86.95	91.3	56.52	80.43	84.78	302.15%
	Rural	10.1	22.22	45.45	89.28	96.4	100	67.85	89.28	96.42	301.80%
	Rural	0	3.23	6.45	88.23	88.23	88.23	70.58	70.59	82.35	2085.45%
	Urban	2.84	13	28.78	63.32	84.52	92.81	45.19	73.15	86.79	462.69%
	Rural	3.15	17.36	30.22	69.43	88.36	93.74	56.91	81.22	88.79	367.86%
	Total	2.97	14.85	29.39	65.37	85.8	93.12	49.12	75.85	87.46	410.77%

Source: Author's computations.

Notes: Food poverty is defined as the share of the population whose expenditure lies under the Food poverty line; Extreme poverty is defined as the share of the population whose expenditure lies under the lower poverty line; Overall poverty is defined as the share of the population whose expenditure lies under the upper poverty line. Scenario A is the microsimulation model of the current essay without updating other sources of income. Scenario B is similar to Scenario A, but it adds updated assistances and remittances as other sources of income.

Our model assumes that families who used to receive remittances in 2009 are still receiving them. The values of these remittances jumped due to the Syrian Pound depreciation, and by 2015 Syrian Pound had lost around 600% of its pre-conflict value.¹¹⁸

¹¹⁸ Households may receive other sources of income. They may win income by selling their durables, using their savings, or borrowing money. These income sources were just around 3% of the pre-conflict total income (CBS, 2009), but their contributions have jumped. As for savings, one can use the National

Panel (3) of Table 4.9 presents the simulation results of the second scenario, *Scenario B*. The second column of this panel shows that 75.85% of the residents are extremely poor. This rate is the highest in Deir Azzor, Hassakeh, and Raqqa, where at least 86% of people are extremely poor, while it is the lowest in Tartous, where around half of the families are living under the LPL. This percentage is not high in other safe governorates, Lattakia, Sweida, Quneitra, and the Capital. Map 4.1 depicts the results. As for overall poverty, 87.5% of residents are living under the UPL, and this rate jumps to 94% in Deir Azzor.



Source: Panel 3 of Table 4.9.

Map 4. 1: The Extreme Poverty Rates in the Governorates.

Adding other sources slows down the overall poverty growth by around six percentage points. The effect is higher in terms of food poverty. This shows the magnitude of the effect that both international organizations and diaspora have in making life inside Syria affordable for many. However, the two sources have different distributional effects; while poor people receive fewer remittances, assistance might be targeted more towards them, especially when it is distributed through local partners who work in the field.

Account estimations available in SCPR (2016a) to infer that households are relying heavily on their past savings. Overall, total consumption accounted for 112.6% of GDP in 2015, indicating a significant and unsustainable drawdown on domestic savings, with domestic savings accounting for minus 12.6% of the GDP. When the former sources are insufficient, households may ask for money. Around 36% of the Syrian households have borrowed money. Those families usually are from the lower middle class. Nonetheless, we mention nothing about those sources in our model, due to data constraints, as well as to keep our model simple.

Table 4.10 shows a part of Syria's poverty profile of 2015. An average household still living inside Syria has more members than before, and as usual, poor households are bigger than the non-poor ones by two people. Although the growth rate of population has declined, our assumption that there are no new households brings more people to the same existing households. In addition, poor families have more children and adults but the same number of elders. Like the pre-conflict situation, households headed by women are more among the non-poor families, but the gap is bigger, so women are head in around 18% of non-poor households. The age structure is older in general with the same gap between both groups.

As for labour characteristics of these groups: half of the non-poor are out of the labour force, while 60% of the poor are. The employment rate among the poor is 19.3%, 6.5 percentage points lower than among the non-poor, where the employment rate is 25.77%. Most of the non-poor workers, 60%, are working in institutions, either a public office, or a private firm, so 80% of them being paid employees, while the 58% of poor workers are working for individuals. It is notable that a greater percentage of poor workers are now employers or self-employed. We find also that most of the employed poor, in fact 57%, work in restaurants and the agricultural sector. On the other hand, while the heads of households are the main breadwinners in poor households, more heads of non-poor households are out of the labour force. However, the unemployment rate for poor household heads is 4 percentage points higher than for non-poor households.

Table 4. 10: Comparison of Poor vs. non-Poor Characteristics 2009-2015

Characteristics	Real Data 2009		Estimated Data Using The Microsimulation Model 2015 – Scenario B	
	Poor	non-Poor	Poor	non-Poor
Demographical Characteristics				
Household Size	7.45	5.23	7.66	5.73
Female-Headed Households (%)	7.93	10.15	10	17.8
Number of Children Less Than 15 Years Old	3.79	2.7	2.6	1.4
Number of Family Members Whose Ages are Between 15-64	3.8	3.19	4.8	3.9
Number of Elders Whose Ages are 65 Years Old and More	1.25	1.27	0.332	0.335
Age Structure (%)				
0-4	15.1	13.16	9.52	9.64
05-09	14.62	10.89	12.59	8.78
10-14	17.09	12.04	11.69	6.98
15 - 19	10.98	10.87	11.9	8.74
20-24	8.34	10.07	10.3	9.77
25-29	6.76	8.48	8	9.98
30-34	5.56	6.38	7.37	8.27
35-39	5.63	5.69	5.68	6.26
40-44	5.28	5.21	5.14	4.63

45-49	2.78	4.25	4.79	6.17
50-54	2.68	3.7	3.3	5.31
55-59	1.34	2.5	2.78	4.84
60-64	1.3	2.37	1.71	3.08
65+	2.54	4.38	5.23	7.54
Dwelling Characteristics				
Households Living in an Apartment (%)	20.97	43.65		
Households Living in a Dar (%)	74.68	53.26		
Households Living in a Dwelling Appropriate for Living (%)	69.82	71.91		
Households Living in a Dwelling Inappropriate for Living (%)	20.2	11.18		
Conflict Victims				
Number of Victims			0.054	0.054
Number of Job Losers			0.697	0.754
IDP Households (%)			22.65	22.7
Educational Characteristics				
The Head of The household has a University Degree (%)	2.05	7.87		
The Head of The Household has a Secondary School (%)	4.1	8.9		
The head of The Household is Illiterate (%)	19.44	15.25		
Individuals who are Illiterate (%)	15.48	12.96		
Individuals who Can Read & Write (%)	45.03	33.96		
Individuals who have a University Degree (%)	0.61	3.71		
Individuals who have a Secondary School (%)	4.73	9.02		
Employment Characteristics				
Individuals Working in The Public Sector (% of The Total Workers)	22.05	28.79	12.1	23.8
Individuals Working in The Private Sector- Individual (% of The Total Workers)	37.85	31.75	57.6	36
Individuals Working in The Private Sector- Company (% of The Total Workers)	39.41	38.04	28.1	34.4
The Worker is The Employer (% of The Total Workers)	2.95	6.52	6.19	4.45
Worker is a Self-Employer (% of The Total Workers)	21.35	21.16	25.06	13.1
Worker is a Paid Employee (% of The Total Workers)	71.01	67.09	63.1	79.1
Worker is a Paid Employee in a Family Business (% of The Total Workers)	0.35	1.13	0.8	1.25
Worker is an Unpaid Employee in a Family Business (% of The Total Workers)	4.34	3.93	4.7	1.95
Employment (% of The Working Age Population)	37.16	40.17	19.3	25.77
Out of The Labour Force (% of The Working Age Population)	57.87	55.39	59.6	51.3
Unemployment (% of The Working Age Population)	4.97	4.44	21.2	22.95
Unemployment Period (Months)	18.6	22.7		
The Head of The Household is Out of The Labour Forces (%)	20	22.8	30.4	35.8
The Head of The Household is Employment (%)	77.69	75.99	35.9	34.4
The Head of The Household is Unemployment (%)	2.31	1.21	33.6	29.8
Work Sector (% of Total Workers)				
Construction	23.96	17.4	17.05	7.4
Services	22.4	25.32	2.11	4.76
Agriculture	15.97	13.54	22.9	10.05
Industry	14.76	16.14	15.75	23.3
Hotels & Restaurants	14.76	16.47	33.3	39.7
Bank, Finance and Real-estate	1.22	3.03	0.5	1.06
Transportation & Communication	6.94	8.09	8.44	13.8

Source: Author's computations.

Notes: Poor are the overall poor, i.e., those whose consumption is lower than the lower poverty line. Scenario B is the microsimulation model of the current essay and it adds updated assistances and remittances as other sources of income. Some cells are empty, because we lack the data needed to project the figures.

Due again to a lack of data, this model misses out several other important characteristics. Our model does not account for dwelling and educational data, essentially associated with pre-conflict poverty. Therefore, within our model, people move between welfare statuses without changing their educational characteristics or accommodation type. This renders our interpretations of the education-poverty nexus and the accommodation-poverty nexus invalid.

4.4.3.3 Discussion

Although the results show interesting findings regarding poverty status in Syria in 2015, we should discuss them cautiously, since we rely on many assumptions, some of which are strong, in order to simplify our model. Nonetheless, these results may be utilized as a base from which rudimentary projections of current poverty can be formed and from which future research can be done.

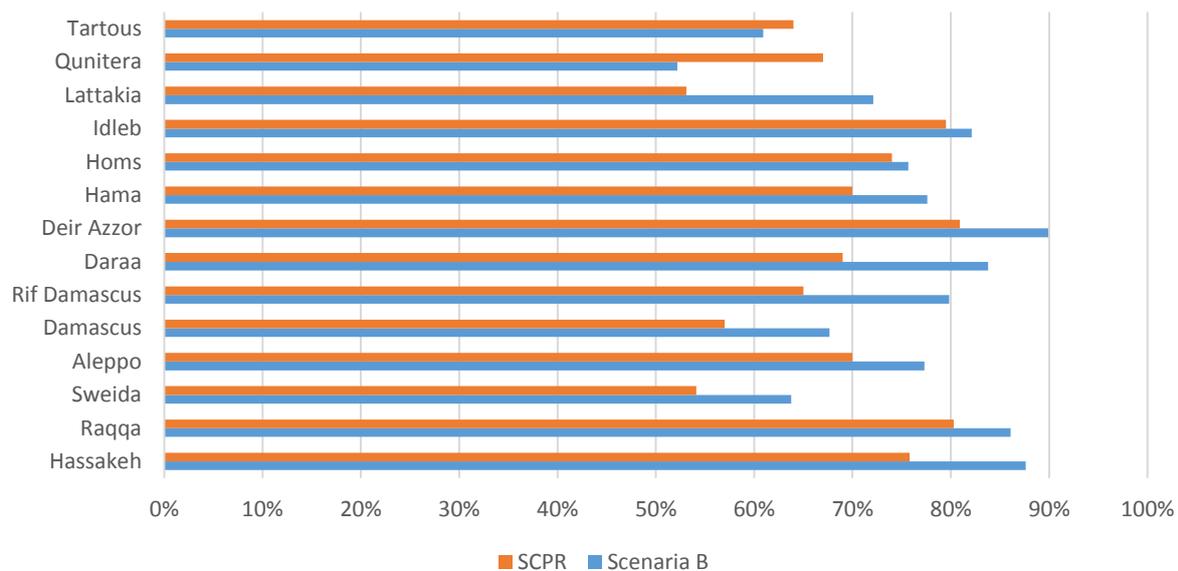
The different microsimulation methods used in this essay show that poverty rates have jumped to levels that Syrians faced only during the tragic days of *Safar Barlik*, exactly a century ago. Around half of the families living in Syria are starving, meaning that they are living under the food poverty lines. The percentage is higher for families living under the lower poverty lines, as three-quarters of families are extremely poor, while 87% are overall poor.

Our results are, to some extent, similar to those found in other reports. Our findings are more consistent with SCPR's overall poverty rate, 85.4%, which is just 2 percentage points less than the results gained from Scenario B, while we are more consistent with ESCWA's extreme poverty rate, 72.3%, which is 2.5 percentage points less than ours. Nevertheless, we argue that many more Syrians are living under the FPL than was found in SCPR (2016a) and ESCWA (2017), the difference being 14 and 16 percentage points higher, respectively.

These similarities in results are due, in a part, to the similar inputs used in these different simulation exercises. The main inputs are the raw data of the HIES 2009, which are fully available for the other entities. However, the techniques used to process the data are different, and this leads to different outputs, particularly in terms of food poverty. Differences shrink when we approach the boundaries, which is 100% in our case, hence we did not touch the difference in terms of extreme and overall poverty rates, while we find it when it came to the food poverty rates.

Figure 4.3 compares the governorate extreme poverty rates in SCPR (2016a) and Scenario B. Some differences appear, and these differences stem from considering distributive effects in our investigation.

First, Quneitra and Tartous are less poor in Scenario B than in SCPR. The difference, indeed, is greater in the case of Quneitra, where poverty is 67% in SCPR, while it is 15 percentage points less in our simulation. Other governorates, on the other hand, are poorer in Scenario B, with a difference jumping to 19 percentage points in Lattakia and 15 percentage points in Daraa and Rif Damascus. The results are similar in both investigations for Idleb and Homs.



Sources: The figure is based on Table C.14.

Notes: SCPR is the Syrian Center for Policy Research. Scenario B is the microsimulation model of the current essay including the assistance and remittances as other sources of income.

Figure 4.3: Comparing the Extreme Poverty Rates on Governorate-Level between SCPR (2016a) and Our Results (Scenario B).

The increase of poverty shown in this study is mainly due to job-income cuts and price boosts, while other income sources, remittances and transfers, help Syrians to stay on the subsistence level to some extent. It is obvious that each source of income has different distributive effects. However, while assistance granted by NGOs are pro-IDP, who tend to be poorer, data constraints prevent us from empirically analyzing the distributive effects of the remittances. Pre-conflict data and rational expectations, nevertheless, imply that richer people receive more remittances.

Unsurprisingly, poverty rates are higher in rural areas, and this is similar to the pre-conflict situation. This disparity is higher for food poverty (11 percentage points), and is lower for overall poverty (2 percentage points). However, Sweida is an exception here, as its urban areas are slightly poorer than the rural areas. It is worth mentioning that, despite the fact that it hosts many IDP and is surrounded by conflict zones, Sweida is the least poor governorate. Poverty is less in the Capital, Damascus, and the least in Urban Tartous, where just one-third of the families are living under the LPL. Although there were bloody clashes

in Baniyas City, 40 km north of Tartous City, in May 2013, Tartous, which hosts the Russian military zone, is the safest governorate in Syria.

Out-of-government-control areas, those controlled by different rebel groups in 2015, are suffering the most. The highest poverty rates are found in the rural areas of Hama, Daraa, and Latakia, and the urban areas of Idleb, where opposition to the regime has greater influence. Raqqa and Deir Azzor, governorates where ISIS controlled most of the land, and Hassakeh, where lands and cities controlled by different groups including ISIS, Kurdish troops and the government, are the poorest. Nonetheless, one should here consider the possibility of reverse causality, as these three governorates were the poorest ones before the conflict, and they have faced more hostilities that have, no doubt, boosted poverty in these areas. Thus, and for further research, it is better to complete the descriptive statistics with an identification strategy that explores the causal inference of the poverty-conflict nexus.

Quneitra, a governorate experiencing bloody clashes, might be exceptional. The results show a lower level of poverty in this area which could have several explanations. One, the governorate witnessed direct face-to-face clashes, but not heavy artillery shelling or airstrikes, the most destructive forms of conflict. This is because it is adjacent to *Golan Heights*, occupied 50 years ago by Israel, so the truce agreement, signed between Syrian and Israel in 1974, prevents the Syrian government from using heavy shelling on rebellious groups in this area. Another explanation is that our sample includes a small number of families living just in the rural areas there. The last explanation is that the extreme poverty rate in the rural areas of Quneitra was very low before the conflict, and this helps keep poverty lower than in other places affected.

The last column of Table 4.9 shows that the effect of the conflict on the poverty rate varies between the different Syrian governorates. The extreme poverty rate grows by 410% nationwide, while it grew 16-fold in the urban areas of Tartous. This may come as a surprise since Tartous showed less violence. Tartous, however, had the lowest pre-conflict poverty rate, and it has imported poor IDP from other governorates suffering from intensive conflict. The rural areas of Quneitra and the urban areas of Hama show a big jump in poverty rates, while the whole governorate of Raqqa, which is under the full control of ISIS, is the poorest. This is not just due to ISIS control, but also to the intense airstrikes of different parties, including the Syrian and Russian armies and the US-led coalition, that started by the third quarter of 2014 destroying the infrastructure and economic networks of the area. This, no doubt, led to a positive selection of refugees from this governorate, as proven in Verme et al. (2016), meaning that its towns remain

inhabited with just poor people who lack the resources to move. Besides this, INGO could not access assistances to Raqqa due to the impossibility of connecting with ISIS officers. The least impoverished places are the urban areas in Sweida and Hassekh. There are various reasons for this; while the cities of Sweida have enjoyed peace resulting in a stable environment and, in turn, less poverty, the cities of Hassakeh hosted a high percentage of pre-conflict poor. For this reason cities there showed less change.¹¹⁹

It is difficult to compare the poverty profile of 2015 with that of 2009. This is because many changes have taken place, which are not considered in our model. Dwelling characteristics, for example, have been greatly changing due to high levels of displacement. Swathes of accommodation having been destroyed in the conflict. Using remote sensing techniques, WB (2017) shows that around one-third of the houses were partially or totally damaged, and this damage varies between the governorates, with Deir Azzor hosting the biggest share of damaged houses as a percentage of total pre-conflict houses.¹²⁰ In addition, we know almost nothing about educational characteristics, the main correlates of poverty in pre-conflict Syria, since we did not consider the changes in the educational attainment and the educational characteristics of the different communities. Therefore, we have investigated the changes in the poverty profile using just the information available.

Although the figures show that household size has increased, this conclusion is not accurate. Since the model assumes no new families, it adds the new babies to their existing households, while in fact most of the new babies are born within new households. The size gap shrinks, but poor families are still bigger than non-poor ones. On the other hand, the poor sub-community have become older compared with the pre-conflict structure, yet it is still younger than the non-poor sub-community. This is because more non-young pre-conflict individuals are now belonging to poor families.

Employment status is changing in favor of unemployment and out of the labour force. While the unemployment rate among poor is less than among non-poor, this trend is reversed among household heads, with 33.6% among poor heads, 4 percentage points higher than among non-poor ones. Employment rates are higher between non-poor individuals and heads, while the majority of working-age poor are out of the labour force. In addition, the percentage gap of employers turns in favor of the poor, meaning that many employers have become poor themselves, which is a proxy for the labour

¹¹⁹ Furthermore, it is important to mention that poverty rates were going to decline had there been no conflict. Thus, one can say that the conflict effects on poverty are much bigger than the effects shown here.

¹²⁰ According to WB (2017), 42% of the houses in Deir Azzor were damaged.

demobilization in the private formal sector. The last fact is supported by a higher percentage of self-workers, a common pattern of the informal labour among poor workers. Finally, the majority of poor workers are working in restaurants and the agricultural sector, switching from construction and the service sectors, which were dominant before the conflict.

Gender roles are also changing in Syria. Women are becoming more involved in the economy of their families and society in general. Although it is not explicitly shown in Table 4.10, it is safe to say that the gender ratio is now in favor of women, and this is clearer for women between 15 and 39. When looking at the new percentage of households headed by women, we find that it is increasing among both poor and non-poor households by three and eight percentage points, respectively. This implies a sort of change in the gender role, so women have a stronger position and influence on the household and community levels. This may pave the way for greater participation of women in the public life and, in turn, for introducing real changes. Thus, conflict may be a good opportunity to change the gender roles, as explained by Goldin (2006), and the economic empowerment of women may lead to political and social empowerment.

Surprisingly, victimization figures are very similar between both income groups. Around 22.65% of poor households are IDP forced to run away from their houses, while 22.7% of non-poor households are IDP. Every poor family has 0.7 members who lost their jobs, while non-poor household includes 0.75 members who lost their jobs. In addition, the conflict's victims are the same between both households. Again, some doubts emerge as to the relevance of this finding, since the model has picked the individuals and families randomly without fully considering their characteristics, economic or otherwise.

4.5 Conclusion

Economic growth is a key element in avoiding relapsing to a new conflict in post-conflict countries. However, economic growth is insufficient to sustain peace, unless it is inclusive, meaning that it benefits the vulnerable segments of the society as both contributors and beneficiaries. Thus, poverty measurement and profile are essential inputs when setting the inclusive growth plan of a rebuilding strategy. Different methods are available to measure poverty, but all of them require up-to-date data, and this is unavailable for the majority of war-torn countries seeking to break the conflict trap.

Therefore, the alternative used here is to nowcast poverty using available past data. Nowcasting poverty requires using microsimulation techniques based on representative individual-level data. This technique enables the interactions between household circumstances, changing policies, and the macroeconomic situation to be taken into account. Although frequently used in advanced countries, microsimulation models are rarely used in developing economies. Therefore, the current chapter introduces a simple contribution to measure the current poverty levels in a country engulfed by a bloody civil conflict by nowcasting poverty in Syria based on pre-conflict data.

Using a sample of the Household Income and Expenditure Survey implemented in 2009, two years before the conflict erupted, the chapter follows different microsimulation techniques to estimate Syria's poverty profile in 2015. These different techniques show that poverty within conflict is consistent with what recent reports about Syria have shown that the overall poverty rates have been jumping to unprecedented levels. This big increase is mainly due to job-income cuts and to the price boosts, while other income sources, for example, remittances and transfers, help Syrians to stay on the subsistence level.

The essay goes beyond the abovementioned reports. While the previous reports consider only the price shocks, this essay includes also the demographic, labour, and income shocks. It, thus, traces the distributive effects of the conflict, and brings practical benefits to target poverty. Not surprisingly, poverty is disproportionately distributed across the Syrian territories. The governorates that have seen more destructive and bloodier fights suffer higher poverty rates, while those enjoying safer atmospheres show smaller degradation in living conditions. One, nonetheless, should consider the possibility of reverse causality, since the pre-conflict poorest areas have faced more hostilities and, in turn, are clearly more impoverished.

The chapter introduces a tool for the interim government and INGOs, not just to set a baseline for the *ex-ante* evaluation of poverty and inequality alleviation projects, but also in terms of public spending priorities. The Interim government will be highly indebted when the peace starts. Thus, it is more efficient to follow targeting methods based on geographical distribution of poverty and several individual characteristics of the poor.

Based on the disproportional diffusion of poverty in Syria, a targeting method that promotes balanced regional development is an efficient way to choose how much each place should receive. Thus, more funds should flow into the poorer areas: rural Deir Azzor and Hama, and urban Hassakeh. In addition,

the interim government should grant special attention to Raqqa, as it was almost totally destroyed due to ISIS control and to the heavy airstrike attacks by different parties.

Although it requires additional and deeper research, individual-assessment targeting is an advisable approach when setting plans and procedures promoting inclusive growth. This targeting method relies on poverty profiles, partially mentioned here, focusing on the demographical, social and economic characteristics of individuals. However, and since this method is time and effort consuming, it is better to follow a combination of targeting methods including geographic and individual-assessment ones. The recent essay provides useful information for the first method, but little information regarding the second method. Thus, we recommend future research to focus on developing a more detailed poverty profile of people living in Syria.

Moreover, the findings of the chapter are a starting point for Syrian NGOs when distributing assistance. Coupled with more investigation, these NGOs can use the findings to classify their beneficiaries according to the size and the kind of the assistance granted. In-kind assistance might be more efficient for several categories of people. Building materials, for example, are a source of long-term, productive assistance that supports IDP to move back their homes.

Furthermore, the information found in this chapter can help these NGOs when introducing modes of conditionality in their charitable programs. Material poverty reduction is not a goal per se, but it is a medium-term output necessary to reach the final outcome, inclusive growth and comprehensive development. It is, therefore, essential to turn charitable efforts into developmental ones. Conditioning cash transfers on educational and health actions are clear examples of such developmental efforts. In a scheme such as this, families would be eligible for cash assistance from health centers or schools, once they have allowed their child to be tested by doctors, or have enrolled their child in school.¹²¹

The chapter concludes a very important finding that regards women empowerment. The interim government and the Syrian civil society should exploit the demographical change to encourage long-term shifts in Syrian gender relations. As shown, more women are becoming heads of their households, and many of them have moved into the labour market. A new legal framework sustains this change by enacting new laws protecting women in their families and workplaces thus providing them with more independence. Furthermore, women should be well represented in the public arena, and a quota is

¹²¹ The pre-conflict Syrian government introduced this conditionality when it founded the National Social Aid Fund in January 2011, but the activities of this Fund were not fully implemented due to the conflict occurrence.

introduced not just in the Parliament or the Cabinet, but also in other public and private positions such as boards of directors or the judicial system.

Although the chapter shows valuable conclusions, it is very important not to ignore its caveats and to do our best to overcome them. We should keep in mind that a model is just a model and it cannot present the real world precisely. Wachter (1987) argues that we do not link the operation of the world when we simulate, but we do a likeness of some sets of our own ideas concerning the operation of the world. Moreover, assumptions used here to simplify the construction of a model may be unrealistic in a way that invalidates the results obtained. Our model builds on assumptions regarding the non-existence of new families and the breakdown of families. Thus, depending on econometric or strata criteria, future research may develop a model where, for example, people with certain characteristics have a higher probability of starting a family, while others are more likely to get divorced. In addition, it is better to expand the sorting method (Bekkering, 1995) and apply different ratios and percentages in governorates for labour reassignment, so that people living in the most-affected governorates have a higher probability of losing their jobs. The same could be used when assigning people into non-movers, immigrants, refugees, and IDP, since the characteristics of immigrants tend to be different from those of refugees, who are, in turn, different from IDP and non-movers. This requires, however, using information, which is currently unavailable.

We should not also forget that these results are for 2015. As mentioned before, we are limited here to introduce a nowcasting methodology to measure the poverty rates when the conflict is over in Syria. The results, thereby, might be hugely different when the civil conflict terminates. Given that circumstance, we would then redo the microsimulation exercise based on an updated aggregate outcome data and set the figures found as the baseline used for an *ex-ante* evaluation of different poverty reduction programs.

Finally, since our model builds on various assumptions that cover so many dimensions, it is plausible to change some of these assumptions, so we draw different scenarios. This helps the decision makers, either in the interim government or in INGOs, to compare between different policy programs and prioritize them. We recommend the development of an interactive interface where it is possible for analysts to switch assumptions within the model in order to measure the effects on the results. Developing such an interface requires building on other interfaces based on microsimulation models. EUROMOD is a good example that the developers can start from.

Chapter 5

5 Conclusion

This thesis consists of three independent essays on economic growth in post-civil conflict countries. The empirical analyses moved from a large dataset of developing countries in the first essay to a case study of Syria in the third essay. In addition, different concepts and technical methods have been used in the thesis.

The first essay, Chapter II, investigates the effects of decentralization on economic growth in developing countries emerging from civil conflicts. To find suggestive conclusions, we consider two forms of decentralization: political and fiscal. Thus, Chapter II uses two equations alongside various techniques. Additionally, the essay investigates further several technical and conceptual issues regarding the definition of the post-conflict period. It, therefore, clarifies the two main issues concerning this period: the timing of the termination of conflict and the post-conflict period.

The essay does not capture statistically significant effects of political decentralization on economic growth. This suggests that, either no real political decentralization exists, or, when it exists, it is ineffective in those countries that adopt. Both reasons reflect the superficial, nominal political decentralization implemented by autocratic regimes. This finding supports the distinction made between the genuine *de facto* decentralization and an official *de jure* one.

We find, on the other hand, that fiscal decentralization slows down the rate of economic growth. On average, if the *expenditure decentralization index*, which is the average share of local expenditure as a percentage of the overall expenditures, goes up by a percentage point, the growth rate of GDP decreases by about 0.024 percentage points. This is consistent with the findings of other scholars who have warned about the dangers of decentralization that stem mainly from opportunistic behavior at the local level.

Expanding fiscal decentralization in places where institutional mechanisms to control different forms of corruption are absent, which is the case in the post-conflict environment, facilitates and encourages the spread of local corruption.

Going beyond the usual statistical methods, the chapter uses other techniques to investigate further eventual effects of political decentralization. The descriptive statistics indicate that implementing political decentralization is associated with economic growth which is one percentage point higher, compared with an average post-conflict country that does not undertake any form of political decentralization. However, another technique, the graphical depiction, alerts us not to take for granted this effect suggested by the descriptive statistics. It illustrates intensified fluctuations of economic growth which occur in the short period after the conflict terminates.

These fluctuations are due to the fact that locals, investors, and the international community become optimistic by the end of the conflict phase when the factions reach an agreement including some kind of self-rule, and this motivates the prosperity of economic life. Suddenly however, residual tensions can lead to a sense that peace is imperfect and capital flight from a PCC. Thus, in these situations, economic growth is prone to fluctuate. Next, security spreads and stabilizes the economy. This is because a conflict relapse is less probable in the period following the first post-conflict year, and this sense of security then supports a business-friendly environment.

Overall, Chapter II presents two takeaways. The first is at the local level, and it calls for well-developed institutions that control practices leading to corruption before granting fiscal discretion to local authorities. Although it is key to start a democratization process in these countries, it is more important, and ranked with higher priority, to build strong and effective local institutions. These strong local institutions require strong central institutions that cooperate with international organizations and civil society to build local capacities and gradually transfer power to the localities.

The second takeaway pertains to the national level and it calls for a real democratic transition, including granting the local people more political power to decide upon their own issues. Political decentralization, thus, is not only about legal actions mentioned in the peace agreement; it is about power sharing between the fighting parties. It is, therefore, not only a question of the decentralization of policy implementation, but also of decision-making.

The order by which the two abovementioned takeaways are implemented is important. Institutional building is a priority, and no efficient decentralization appears without strong national and local institutions. Thus, Chapter II is in favor of Paris (2004)'s call for 'institutionalization before liberalization'.

Without following these two recommendations, we think that moving to more decentralized systems in countries emerging from civil conflicts will either be ineffective, or, in worse cases, may lead to higher levels of corruption. However, some may find that these two conclusions are contradictory. Thus, in order to make the conclusion clearer, we call for a democratic centralized state in countries emerging from civil conflicts. The localities cannot recover alone, unless supported by the central government. Moreover, peace lacks sustainability, unless democracy spreads, so political conflicts substitute military ones.

Finally, and in order to reach conclusive, not just suggestive, findings, the chapter presents several recommendations for future research. The chapter is based on a small dataset to trace a probable small effect and therefore insignificant results emerge. The inclusion of more observations may solve this problem. This does not mean to loosen the criterion identifying the post-conflict period. A key option is not to look only at the official peace agreements, but to study the unofficial peace arrangements for each case individually. The chapter also recommends that investigators review the fiscal records of post-conflict countries to seek out an index that properly reflects fiscal decentralization.

The second essay, Chapter III, narrows the geographical scope of the dataset and concentrates on the Middle East and North Africa region. The chapter also explores a monetary variable, which is understudied and underused in the MENA region. Concretely, it traces the short-to-medium run effects of real exchange rate volatility on economic growth in countries located in the MENA, some of which have emerged from civil conflicts.

The chapter presents an in-depth geographical, historical, and political review of the Middle East and North Africa. Due to its strategic geographical position, the MENA region has witnessed many events whose consequences went beyond its borders. Moreover, this region has experienced frequent civil conflicts leading to a permanent atmosphere of instability, which in turn influences the economic outcomes and growth of not only the region, but of the world also. One, for example, can easily notice two abnormal shocks in graphs depicting world economic growth: one appeared due to the 1973's *Yom Kippur War*, and the other arose due to the 1979's *Iranian Revolution*. Both of these events serve as examples of shocks in MENA region countries which have had global impact.

Next, the chapter explains the civil conflicts from a regional perspective. Indeed, analyzing the civil conflicts in the MENA region without looking beyond national borders is insufficient as the region is strongly connected politically, demographically, culturally, and economically. The artificial countries created during European Colonialism share the same history, culture, values, and alphabet. The majority of the region's territories were controlled over time by different powers that ruled by the name of one ideology which was Islam. Moreover, these artificial countries host different ethnic and religious groups, as well as tribes and families. These groups, on the other hand, were divided between adjacent countries. This created socially and culturally incomplete entities, where people in one country are annexed to their counterparts in other countries. Hence, a motivation and a tool to intervene in neighboring countries arose. Furthermore, current economic ties, especially employment, support social roots and further link people of different MENA countries.

Due to the small and unbalanced panel dataset we use, Chapter III follows different technical strategies, in order to obtain suggestive empirical findings. Thus, the chapter first explores the descriptive statistics, and then implements dynamic and static econometric frameworks including System-GMM, fixed effects, and the bias-corrected least squares dummy variable model, in addition to another technique recently proposed for dynamic panels: the iterative bootstrap-based bias correction for the fixed effects estimator.

Descriptively, the chapter finds that the MENA region shows high fluctuations in the economic indicators such as economic performance, prices, and the exchange rates in the peaceful time. These fluctuations are seen to peak in the conflict cycle, making the mission harder for the researchers and affecting the robustness of any conclusions found.

Moreover, we find that the high fluctuations of exchange rates in the region have a meaningful economic effect. A percentage point increase in the volatility of the exchange rate decreases the economic growth rate by 0.05 to 0.12 percentage points during peacetime. We find, furthermore, two distinctive trends of effects during the conflict cycle: an enhancing effect in the beginning and a hampering effect later on. Since we find a negative time-effect on growth during the first phase of peace, by tracing the unconditional path of economic growth, we attribute the counterintuitive positive effect of exchange rate volatility to data noise, which is higher when the conflict terminates. We can also attribute this positive association to other variables affecting the dependent and the main independent variables. A large inflow of capital arises in the first peaceful year and leads to a higher economic growth and higher volatility of exchange rates, simultaneously. Accordingly, we conclude that the relevant negative effect of exchange rate volatility

in the peaceful years indicates the real effect of volatility, while the positive effect, when the conflict terminates and in the immediate first post-conflict year, is confounded by data noise and, to a smaller extent, to spurious associations.

The chapter looks at other indirect channels through which exchange rate volatility affects growth. We find that foreign direct investment robustly enhances economic growth, while trade openness has negative effects which, however, carry smaller statistical significance. Inflation is another significant channel that negatively affects economic performance.

Next, the chapter digs further and tries to avoid the aggregation problem that appears as a result of analyzing a dataset consisting of different countries. Thus, we split the data into three groups according to demographical characteristics and availability of natural resources. We apply the same regression for three different groups: Group 1, Resource Rich–Labour Abundant, includes Algeria, Iran, Iraq, Syria, Turkey, Sudan and Yemen; Group 2, Resource Poor–Labour Abundant, includes Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, Israel, Mauritania, and Somalia; and Group 3, Resource Rich–Labour Importing, includes the Gulf countries and Libya.

By splitting, we find that the negative effect of the exchange rate volatility in peacetime is clear in the more populated countries, Groups 1 and 2, whereas the magnitude of the negative effect is much larger in Group 2, while it is not clear in the rich MENA countries in Group 3. Indeed, we find a positive effect in Group 3, indicating a degree of association between the volatilities of oil prices, a key determinant of economic growth in those countries, and exchange rate volatility there. However, this splitting makes it more difficult to tracing the effect of exchange rate volatility during the conflict cycle. In addition to the high noisiness our data suffers from, the three sub-datasets are now smaller. Thus, we do not go beyond our previous finding that exchange rate volatility negatively affects economic performance in different periods.

Chapter III closes with a few recommendations for the interim MENA governments and the international organizations working in post-conflict countries. First of all, efforts to improve a post-conflict economy and to sustain peace are crucial since peace per se is not enough. The findings are in favor of the conflict trap hypothesis, refuting an immediate rebound effect in post-conflict MENA countries. Thus, it is advisable for the post-conflict interim governments to promote economic growth through fiscal and monetary policies and reform programs.

Therefore, the academics and the professionals in the region have to pay more attention to monetary policy, which is currently not considered as effective as fiscal policy. This calls for a deep analysis undertaken by the local and the regional monetary authorities. Moreover, and in order to limit the ineffectiveness of monetary policy in the post-conflict period, the interim government, in cooperation with the international monetary authorities, needs to attract local currency to monetary channels specifically, rather than it being spread freely. This requires simple and transparent exchange rate procedures that attract investors and the diaspora alike to use official channels to transfer money.

The chapter points to the importance of controlling the monetary fundamentals that influence exchange rate volatilities. Therefore, it raises a few recommendations regarding the control of inflation and public debt. Adopting inflation targeting and supporting the autonomy of the monetary authorities are key measures to control inflation, while relying on Arabic assistance is a good way to fund the excessive expenditures emerging from rebuilding projects. The chapter calls for the establishment of an Arab Fund for Rebuilding, to be financed by oil-revenues surpluses.

Chapter III warns that the lack of the foreign direct investment may significantly hamper economic performance in the MENA. Foreign direct investment is more important post-conflict after people have spent their savings as this means that local savings are insufficient for the investments needed. Therefore, the interim government should look for means to attract international investors. This includes opening commercial attaches to the embassies and focusing on the investors that may have connections with the country; investors from the MENA region are highly likely to invest.

The chapter finds that the fixed exchange rate regime benefits the poor MENA countries, most of which have suffered at least one civil conflict, while it does not benefit the rich countries. While it is better to adopt a flexible exchange rate regime due to its capacity to strengthen the monetary authorities in peaceful countries, especially in the long-term, this flexible regime may increase short and medium-term exchange rate volatility, impacting negatively on economic growth in a crisis period. Therefore, a semi-fixed regime could be a good choice for an interim government when the conflict terminates. We recommend that a limited flexibility regime, which may decrease the volatility, be implemented from the third post-conflict year onwards. Furthermore, it is advisable that the interim government works with the Central Bank to move gradually into a flexible regime that maintains the long-term stability of the exchange rate.

Before moving to the conclusion of the next chapter, we raise two key points inferred from Chapter III. Alleviating exchange rate volatility is essential in promoting economic growth in the MENA region. This is true during the peaceful, conflict, and post-conflict periods. Notwithstanding different tools and procedures a country may follow, a strong and real economic base is essential for stabilizing the exchange rate. This requires a strong industrial base, as well as developed institutions. Based on rental and natural resources, the MENA economies and their tools, including the exchange rate, permanently suffer from instability. Thus, the authorities in most MENA countries have to build real institutionalized states and a real industrial base. Otherwise, the economies of the MENA will be still artificial, just like these countries.

The other key point highlighted by Chapter III is that, when investigating the MENA region, one should have in mind that it is a part of the Third World. Having a mainly Muslim population does not distinguish the region from other parts of the world as it shares contextual attributes with other developing nations. Looking deeply at other conflicts in other regions of the world, for example Sub-Saharan Africa, South Asia, the Balkans, and Latin America, one can find many general similarities among reasons and consequences of civil conflicts. On the other hand, scholars should not ignore the specific characteristics of the individual MENA countries. Case studies are more informative than world and regional studies. Therefore, Chapter IV closely investigates the current case of the Syrian conflict.

The Third essay, Chapter IV, studies the case of Syria. Unlike the two previous chapters, Chapter IV adopts an alternative definition of economic growth: inclusive economic growth, a term that has recently gained popularity in the development literature. This concept fits war-torn Syria when setting a rebuilding strategy. This strategy has to avoid reproducing the same sort of growth that led to conflict or, at the very least, did nothing to prevent it. Setting an inclusive growth strategy relies on comprehensive and updated information about the poverty profile in a given country. Therefore, this chapter develops a method that estimates the poverty figures and profiles when the conflict terminates and thereby introduces a methodological contribution in this field.

Chapter IV first computes the pre-conflict poverty figures and profiles, not just on a nationwide, but on a governorate-base, in 2009, two years before the current conflict erupted. We follow the same approach of poverty estimation, the Basic Needs Approach, which was used in the two previous reports of poverty in Syria from 2004 and 2007. The chapter finds that extreme poverty, measured as the percentage of the population living under the lower poverty line, increased from 12.3% in 2007 to 14.9% in 2009, while overall poverty, the percentage of people living under the upper poverty line, decreased from 33.6% in

2007 to 29.4% in 2009. Breaking the national figures down to the governorate level, we conclude that Hama, Deir Azzor, and Daraa are the governorates which contain the poorest rural areas, while Hassakeh holds the poorest urban areas. Our findings seem reasonable, given the waves of drought that took place in the eastern zone, which was the hardstone over the last 80 years. These waves forced a large percentage of people to move to other places, especially to the southern parts of Syria such as the governorate of Daraa, where the civil movement started in March 2011. Further, Chapter IV shows that the poverty profile of 2009 is consistent with the theory and is similar to the previous profiles.

Chapter IV uses the pre-conflict data and couples it with macro projections to nowcast the poverty figures and profiles within a year of conflict; 2015. The chapter uses two static techniques and one dynamic to do this. The dynamic model accounts for redistributive effects in addition to the overall effects, by linking macro projections with pre-crisis household data. To the best of our knowledge, this is the first essay that nowcasts poverty in a war-torn country based on a dynamic microsimulation model.

Setting different assumptions regarding changes in prices, demographic and employment status, the model regenerates a new dataset with different characteristics. These assumptions build on real data, outcome projections, and a literature review investigating similar cases. The model generates new income and consumption figures for the families still living in Syria in 2015, and compares them with their counterpart governorate poverty lines.

The model follows two different scenarios. *Scenario A* nowcasts new income for the sample of households staying in Syria. The changes of new income in this scenario are based solely on changes within job-generating income. Scenario A concludes that poverty rates have been jumping to disastrous levels and that 86% of Syrian residents are living under the lower poverty line. While the poverty rate is higher in Deir Azzor, where around 95% of the population are living under the lower poverty line, the lowest extreme poverty rate is found in Quneitra, Sweida, Damascus, Lattakia, and Tartous, which are relatively less dangerous. As for the overall poverty rate, the results of *Scenario A* show that 93% of Syrian people are living under the upper poverty line, and some areas in Daraa and Hassakeh host just poor people with poverty rates more than 99%.

Scenario B extends the scope of income measurements to include changes in transfers and remittances. While we provide the model with sufficient information regarding the assistance granted by different international organizations to Syrian families, we know almost nothing about the updated information on

remittances sent to residents. Thus, we follow the figures of remittances provided by the last survey of 2009. *Scenario B* concludes that accounting for changes in other sources of income slows down the overall poverty growth by around six percentage points, and that the effect is higher in terms of the food poverty. This shows the magnitude of the contribution that both international organizations and the diaspora have in making life inside Syria affordable for many. Overall, the new scenario shows that about 76% of residents are extremely poor. Out-of-government-control areas, those controlled by different rebellious groups in 2015, such as Deir Azzorare, Hassakeh, and Raqqa have the highest poverty rates, where at least 86% of people are extremely poor, whereas we find the lowest poverty rate in Tartous, where around half of the families are living under the lower poverty line. This percentage is also lower in other safe governorates, Lattakia, Sweida, Quneitra, and the Capital. As for overall poverty, 87.5% of residents are living under the upper poverty line, and this rate jumps to 94% in Deir Azzor.

The results of this essay are consistent with what other poverty reports find regarding the overall and extreme poverty rates. Differences, however, exists in terms of food poverty. These similarities stem from inputs used which were similar, the raw data of the household income and expenditures survey that was conducted in 2009, while the differences result from the techniques used. Differences shrink when we approach the boundaries, which is 100% in our case, hence we did not touch the difference in terms of extreme and overall poverty rates, while we felt it when it came to the food poverty rates.

Furthermore, the essay goes beyond these reports. While these reports account just for price shocks, our study also includes demographic, labour, and income shocks. It, thus, traces the distributional effects, as well as the overall effects, of the conflict, and offers practical solutions to target poverty. Not surprisingly, poverty is disproportionally distributed across the Syrian territories. The governorates that have seen more destructive and bloodier fights suffer higher poverty rates, while those enjoying safer atmospheres show a lesser deterioration in living conditions.

Furthermore, Chapter IV presented Syria's poverty profile for 2015. It infers that the demographical profile of poverty in Syria did not change dramatically compared to its pre-conflict profile. The size gap shrinks, but poor families are still bigger than non-poor ones. The poor sub-community became older compared with its pre-conflict structure, yet it is still younger than the non-poor sub-community. On the other hand, employment status is changing in favor of unemployment and out of the labour force. While the unemployment rate among the poor is less than among the non-poor, it is the reverse among the household heads, with 33.6% poor heads being unemployed, 4 percentage points higher than non-poor

heads. Employment rates are higher between non-poor individuals and heads, while the majority of working-age poor are out of the labour force. In addition, the percentage gap of employers shifts in favor of the poor, meaning that many employers have become poor. This is an indication of labour demobilization in the private formal sector. The last fact is supported by a higher percentage of self-employed, a common pattern of the informal labour among poor workers. Finally, the majority of poor workers are working in restaurants and agriculture sectors, whereas the majority used to work in the construction and service sectors.

The chapter finds evidence of changing gender roles. We find that the new percentage of households headed by women is increasing among both poor and non-poor households by three and eight percentage points, respectively. This implies some kind of shift in gender roles in that women are taking up a stronger position and influence on the household and community. Women are becoming more involved in the economy of their families and societies. This may pave the way for greater participation of women in the public life and, in turn, be the catalyst for real changes.

The findings of this final essay introduce a tool for the interim government and international organizations to prioritize public spending through targeting. We provide key data for geographical and individual assessment targeting methods. Geographical targeting requires allocating more efforts and money to the poorer areas such as rural Deir Azzor and Hama, and urban Hassakeh. In addition, the interim government should grant special attention to the Raqqa Governorate. The chapter recommends combining this method with individual-assessment targeting that relies on poverty profiles, partially explored in the chapter, focusing on demographical, social, and economic characteristics of families, particularly their heads.

In addition, Syrian non-governmental organizations may benefit from the findings of this chapter when distributing assistance. Coupled with more investigation, these organizations can use the findings to classify their beneficiaries according to the size and the kind of the assistance granted. Furthermore, these organizations may introduce a sort of conditionality, based on information provided in this chapter, to their charitable programs. Eradicating poverty requires a focus on the human poverty concept so that the cash assistance provided by non-governmental organizations can work towards the improvement of educational and health status of the children in the poor families. Eligible families may receive cash assistance, as soon as their children get the vaccinations in the health center or pass a school grade.

The chapter concludes by warning not to take the results exactly as they are, since the model is incomplete and builds on simplifying assumptions that might be unrealistic in a way that biases the results obtained. Further, Chapter IV added some technical recommendations to improve the model, depending on econometric methods when setting the transitional criteria or using sorting methods. The final recommendation of Chapter IV is to develop an interactive interface where it is possible for analysts to change different assumptions and see how this affects the results. This facilitates changing some assumptions and helps the decision makers to compare between different programs and prioritize them as is appropriate.

To summarize, the current thesis contributes to the growing post-conflict literature. It finds that standard econometric methods may not bring about conclusive results. Indeed, it may be sufficient in the field to look for findings that are just indicative and not necessarily conclusive. Furthermore, aggregation studies seldom show clear conclusions. Thus, for future research, it is important to focus on individual cases of countries that have emerged out of civil conflicts or investigating countries with very homogeneous demographic, economic, and social conditions and characteristics. In addition, we suggest that future research explores previously unforeseen factors that may have distinct importance to determine post-conflict economic growth and peace sustainability. These factors are institutional and cultural and are therefore difficult to measure. Nevertheless, this is an avenue worth-taking. Authentic and genuine research is about knocking new and unfamiliar doors rather than entering similar already-discovered houses.

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Appendices to Chapter Two

Appendix A

Table A. 1: The Full and The Short Samples of Political Decentralization

COUNTRY	LAST YEAR OF CONFLICT	FIRST YEAR OF PEACE	GDP PC GROWTH (%)	GDP PC GROWTH-AVERAGE (FULL PEACE PERIOD)	SERIAL NUMBER OF THIS WAR IN THE COUNTRY	CONFLICT YEARS	PRE-WAR YEAR	WAR TIME COMBINED	PEACE TIME	PEACE PERIOD (YEARS)	SUSTAINABLE POLITICAL DECENTRALIZATION	THREE CONSECUTIVE YEARS OF PEACE
ANGOLA	1995	1996	8.03	3.98	1	21	1974	1975-1995	1996-1997	2		
ANGOLA	2002	2003	1.58	6.09	2	5	1997	1998-2002	2003-2014	12	1	1
ARGENTINA	1977	1978	-5.90	1.31	1	4	1973	1974-1977	1978-2014	37		1
AZERBAIJAN	1994	1995	-12.81	0.30	1	3	1991	1992-1994	1995-1996	2		
AZERBAIJAN	1998	1999	6.46	10.05	2	2	1996	1997-1998	1999-2005	7		1
BANGLADESH	1991	1992	3.09	3.67	1	17	1974	1975-1991	1992-2014	23	1	1
BOLIVIA	1967	1968	-13.93	0.80	1	1	1966	1967	1968-2014	47		1
BOSNIA	1995	1996	92.36	10.63	1	4	1991	1992-1995	1996-2014	19	1	1
BURUNDI	2006	2007	1.14	1.26	1	13	1993	1994-2006	2007	1		
BURUNDI	2008	2009	-0.11	0.64	2	1	2007	2008	2009-2014	6		1
CAMBODIA	1975	1976		3.15	1	9	1966	1967-1975	1976-1977	2		
CAMBODIA	1998	1999	9.22	6.28	2	21	1977	1978-1998	1999-2014	16		1
CAMEROON	1961	1962	0.84	0.87	1	2	1960	1961	1962-1983	22		1
CHAD	1972	1973	-10.55	-1.59	1	7	1965	1966-1972	1973-1975	3		1
CHAD	1984	1985	18.50	2.09	2	9	1975	1976-1984	1985-1986	2		
CHAD	1987	1988	11.84	0.60	3	2	1985	1986-1987	1988	1		
CHAD	1994	1995	-2.07	1.76	4	6	1988	1989-1994	1995-1996	2		
CHAD	2003	2004	28.72	7.06	5	7	1996	1997-2003	2004-2005	2		
CHAD	2010	2011	-3.19	2.04	6	6	2004	2005-2010	2011-2014	4		1
CONGO, DEM. REP.	1965	1966	3.83	0.03	1	2	1963	1964-1965	1966	1		
CONGO, DEM. REP.	1967	1968	1.38	-1.33	2	1	1966	1967	1968-1976	9		1
CONGO, DEM. REP.	1978	1979	-2.34	-4.82	3	2	1976	1977-1978	1979-1995	17		1

CONGO, DEM. REP.	2001	2002	-0.13	2.29	4	6	1995	1996-2001	2002-2005	4		1
CONGO, DEM. REP.	2008	2009	-0.42	3.55	5	3	2005	2006-2008	2009-2014	6		1
CONGO, REP.	1999	2000	4.90	2.84	1	3	1996	1997-1999	2000-2001	2		
CONGO, REP.	2002	2003	-1.45	1.85	2	1	2001	2002	2003-2014	12		1
CROATIA	1995	1996	10.00	2.58	1	1	1994	1995	1996-2014	19	1	1
CUBA	1960	1961		2.55	1	2	1956*	1957-1958	1959-2014	55		
EL SALVADOR	1991	1992	6.14	2.40	1	13	1978	1979-1991	1992-2014	23		1
ETHIOPIA	2013	2014	7.21	7.21	1	50	1963	1964-2013	2014	1		
GEORGIA	1993	1994	-9.49	5.51	1	2	1991	1992-1993	1994-2014	21	1	1
GUATEMALA	1995	1996	0.48	1.25	1	30	1965	1966-1995	1996-2014	19		1
INDIA	1960	1961	1.68	1.66	1	4	1955*	1956-1959	1960-1961	2		
INDIA	1971	1972	-2.82	3.47	2	10	1961	1962-1971	1972-1981	10		1
INDIA	2010	2011	5.23	5.16	3	29	1981	1982-2010	2011-2014	4		1
INDONESIA	1961	1962	-0.75	3.37	1	4	1960	1961	1962-1974	13		1
INDONESIA	1988	1989	7.11	3.48	2	13	1975	1976-1988	1989-1996	8		1
INDONESIA	2005	2006	4.12	4.35	3	9	1996	1997-2005	2006-2014	9	1	1
IRAN	1968	1969	9.93	-0.13	1	2	1966	1967-1968	1969-1978	10		1
IRAN	1988	1989	2.88	6.83	2	9	1979	1980-1988	1989	1		
IRAN	1990	1991	10.40	2.44	3	1	1989	1990	1991-1992	2		
IRAN	1997	1998	0.82	1.63	4	2	1995	1996-1997	1998	1		
IRAN	2001	2002	6.11	3.86	5	3	1998	1999-2001	2002-2004	3		1
IRAN	2011	2012	-7.76	-3.59	6	7	2004	2005-2011	2012-2014	3		1
IRAQ	1970	1971	1.90	4.57	1	9	1961	1962-1970	1971-1972	2		
IRAQ	1996	1997	17.50	5.30	2	24	1972	1973-1996	1997-2002	6		1
ISRAEL	1996	1997	1.31	1.74	1	47	1949	1950-1996	1997-1999	3	1	1
ISRAEL	2012	2013	1.34	1.08	2	13	1999	2000-2012	2013-2014	2		
LAOS	1961	1962			1	3	1958*	1959-1961	1962-1963	2		
LAOS	1973	1974		1.63	2	10	1963	1964-1973	1974-1988	15		1
LAOS	1990	1991	1.35	4.88	3	2	1988	1989-1990	1991-2014	14		1
LEBANON	1960	1961			1	1	1957*	1958	1959-1974	16		1
LEBANON	1976	1977			2	2	1974	1975-1976	1977-1981	5		1

LEBANON	1986	1987		-8.66	3	5	1981	1982-1986	1987-1988	2	
LEBANON	1990	1991	35.72	3.48	4	2	1988	1989-1990	1991-2014	14	1
LIBERIA	2003	2004	0.67	3.05	1	4	1998	1999-2002	2003-2014	12	1
MAURITANIA	1978	1979	1.83	0.63	1	3	1975	1976-1978	1979-2014	36	1
MOROCCO	1989	1990	0.88	2.51	1	15	1974	1975-1989	1990-2014	25	1
MOZAMBIQUE	1992	1993	4.45	4.22	1	15	1977	1978-1992	1993-2014	22	1
MYANMAR	2011	2012		7.35	1	63	1948*	1949-2011	2012	1	
MYANMAR	2013	2014	7.58	7.58	2	1	2012	2013	2014	1	
NEPAL	2006	2007	2.34	3.40	1	11	1995	1996-2006	2007-2014	8	1
NICARAGUA	1979	1980	1.63	-3.15	1	3	1976	1977-1979	1980-1981	2	
NICARAGUA	1990	1991	-2.36	1.88	2	9	1981	1982-1990	1991-2014	14	1
NIGERIA	1970	1971	11.61	1.29	1	4	1966	1967-1970	1971-2010	40	1
PAKISTAN	1971	1972	-1.90	1.16	1	1	1970	1971	1972-1974	3	1
PAKISTAN	1977	1978	4.73	2.37	2	3	1974	1975-1977	1978-2003	26	1
PAKISTAN	2004	2005	5.50	1.95	3	1	2003	2004	2005	1	
PERU	1999	2000	1.29	4.03	1	18	1981	1982-1999	2000-2006	7	1
PERU	2010	2011	5.07	3.75	2	4	2006	2007-2010	2011-2014	4	1
RWANDA	1994	1995	37.13	8.93	1	5	1989	1990-1994	1995	1	
RWANDA	2002	2003	-0.27	4.84	2	7	1995	1996-2002	2003-2008	6	1
RWANDA	2012	2013	2.22	3.35	3	4	2008	2009-2012	2013-2014	2	
SENEGAL	1998	1999	3.81	2.12	1	2	1996	1997-198	1999	1	
SENEGAL	2001	2002	-1.97	0.94	2	2	1999	2000-2001	2002	1	
SENEGAL	2003	2004	3.04	1.04	3	1	2002	2003	2004-2010	7	1
SENEGAL	2011	2012	0.28	0.43	4	1	2010	2011	2012-2014	3	1
SERBIA	1991	1992		0.25	1	1	1990	1991	1992-1997	6	1
SERBIA	1999	2000	8.10	3.96	2	2	1997	1998-1999	2000-2014	15	1
SIERRA LEONE	2001	2002	20.50	6.05	1	11	1990	1991-2001	2002-2014	13	1
SOMALIA	1996	1997			1	11	1985	1986-1996	1997-2000	4	1
SOMALIA	2002	2003			2	2	2000	2001-2002	2003-2005	3	1
SOUTH AFRICA	1988	1989	0.13	0.64	1	23	1965	1966-1988	1989-2014	26	
VIETNAM	1964	1965		4.83	1	10	1960		1965-2014	50	1

SRI LANKA	1971	1972	-1.73	3.16	1	1	1970	1971	1972-1983	12	1
SRI LANKA	2001	2002	3.28	3.92	2	18	1983	1984-2001	2002	1	
SRI LANKA	2003	2004	4.02	4.81	3	1	2002	2003	2004	1	
SRI LANKA	2009	2010	6.95	7.25	4	5	2004	2005-2009	2010-2014	5	1
SUDAN	1972	1973	-2.41	2.21	1	9	1963	1964-1972	1973-1982	10	1
SYRIA	1982	1983	-2.11	1.10	1	4	1978	1979-1982	1983-2010	18	1
TAJIKISTAN	1998	1999	2.31	5.71	1	7	1991	1992-1998	1999-2009	11	1
TAJIKISTAN	2011	2012	5.10	4.81	2	2	2009	2010-2011	2012-2014	3	1
THAILAND	1982	1983	3.65	4.20	1	9	1973	1974-1982	1983-2002	20	1
TURKEY	2013	2014	1.62	1.62	1	20	1993	1994-2013	2014	1	
UGANDA	1992	1993	4.90	3.97	1	14	1978	1979-1992	1993	1	
UGANDA	2011	2012	1.05	0.72	2	18	1993	1994-2011	2012	1	
YEMEN	1970	1971			1	9	1961	1962-1970	1971-1978	8	1
YEMEN	1982	1983		1.08	2	4	1978	1979-1982	1983-1993	11	1
YEMEN	1994	1995	1.29	0.28	3	1	1993	1994	1995-2008	14	1
ZIMBABWE	1979	1980	10.37	-0.40	1	7	1972	1973-1979	1980-2014	35	1
TIMOR-LESTE	1999	2000	16.66	4.68	2	3	1996	1997-1999	2000-2014	15	1
ERITREA	1992	1993	13.81	1.53	1	29	1963	1964-1992	1993-2014	12	1

Source: UCDP/PRIO dataset and World Development Indicators.

Notes: Since pre-1960 data are not available in the WDI, we use data of 1960 as pre-war data when a cell is indicated with *. Table A.12 describes the variables.

Table A. 2: Descriptive Statistics of the Full Sample of the Fiscal Decentralization

	War Period (Years)	Peace Period (Years)	GDP pc Growth (%)	GDP pc Level (USD)	Expenditure Decentralization	Economic Damage (%)	Secondary School Enrolment (%)	Executive Constraints	Accountability	Ethnic Fractionalization
Mean	7.44	19.87	2.63	1788.34	0.45	6.46	50.23	3.87	-0.63	0.53
SD	7.79	13.56	6.62	2394.3	0.4	32.59	26.9	2.08	0.71	0.242
Min	1	1	-47.72	136.65	0	-66.35	2.06	1	-2.18	0.002
Median	4	16	2.77	830	0.24	0.76	46.3	3	-0.52	0.57
Max	63	50	92.36	24540.58	1	250.86	110.76	7	0.87	0.93

Sources: Author's computations based on Table A.1.

Notes: Means are the averages over the completely post-conflict period for the full post-conflict dataset. SD stands for standard deviation. The GDP per capita is measured with constant 2005 USD. Table A.12 describes the variables.

Table A. 3: Descriptive Statistics of the stricter sample of political decentralization dataset (Four consecutive years of peace)

Political Decentralization	GDP per capita G(%) ¹	War Period (Years)	GDP per capita Level (USD) ³	Economic Damage (%)	Peace Period (Years)	Ethnic Fractionalization ²	Secondary School Enrollment ²	Executive Constraints ²	Voice and Accountability ²
50 Cases of post-Conflict Periods									
Mean	3.07	7.8	1155	16.31	15.04	0.54	42.07	3.54	-0.84
SD	2.68	7.44	1272	48.7	11.09	0.27	24.71	2.1	0.67
Min	-4.366	1	146.8	-66.35	4	0.0023	5.61	1	-1.98
Max	11.46	30	5189	250.9	50	0.91	99.22	7	0.395
11 Cases of post-Conflict Periods with No Forms of Political Decentralization									
Mean	3.99	7.27	1530	-3.36	17	0.53	57.56	4.9	-0.26
SD	2.93	8.59	2013	29.42	7.79	0.21	29.59	1.5	0.46
Min	-.4045	1	212	-65.28	7	0.045	18.41	3	-1.26
Max	10.63	29	7264	19.77	35	0.8	89.23	7	0.30
61 Cases of post-Conflict Periods with at Least One Arrangement of Political Decentralization									
Mean	3.25	7.71	1233	13.38	15.39	0.53	44.71	3.79	-0.68
SD	2.73	7.59	1442	46.62	10.54	0.26	25.88	2.04	0.67
Min	-4.37	1	146.8	-66.35	4	0.0023	5.61	1	-1.98
Max	11.46	30	7264	250.9	50	0.91	99.22	7	0.4

Sources: Author's computations based on Table A.1.

Notes: ¹ means that the value mentioned is an average for the whole PC period. ² means that the value mentioned is an average for the first two years in the PC period. ³ means that the value mentioned is for the first year in the PC period. ⁴ means that the value mentioned is an average for the last three years in the pre-conflict period. ⁵ means that the value mentioned is for the last year in the pre-conflict period. The GDP per capita is measured with constant 2005 USD. Table A.12 describes the variables.

Table A. 4: Economic Growth Averages during The Conflict Circle between The two Groups of Countries

Sustainable PD	Pre Conflict -3	Pre Conflict -2	Pre Conflict -1	Pre Peace -5	Pre Peace -4	Pre Peace -3	Pre Peace -2	Pre Peace -1	Peace 1	Peace 2	Peace 3	Peace 4	Peace 5	Peace 6
No	-1.5	2.9	3.4	2.01	1.99	1.01	1.12	2.65	3.07	3.67	3.32	3.02	2.44	2.94
With	1.5	1.6	1	0.5	0.1	-1.57	-6.8	0.21	13.97	10.14	4.7	4.46	4.48	3.67

Source: Author's computations based on Table A.1.

Notes: Pre conflict indicates the peaceful period before the conflict erupts. Pre peace indicates conflict years before the peace comes. Peace indicates the peaceful post-conflict period. Table A.12 describes the variables.

Table A. 5: Robustness Check for Political Decentralization Equation

Dependent variable: The annualized difference in the log of per capita GDP between the end of the conflict and the end of the PC period

Variables	Model PD5	Model PD6	Model PD7	Model PD8	Model PD9	Model PD10	Model PD11	Model PD12
Log of Initial GDP pc		-0.00755** (0.00365)		-0.0104 (0.0106)		-0.00781* (0.00398)	0.000624 (0.00248)	-0.00758** (0.00362)
Log of Capital Formation		0.0286 (0.0184)		-0.00162 (0.0802)		0.0290 (0.0197)		0.0289 (0.0198)
Log of Public Consumption		-0.00852 (0.00625)		-0.0221 (0.0307)		-0.00895 (0.00692)		-0.00875 (0.00736)
Population Growth		-0.00828*** (0.00253)		0.0147 (0.0521)		-0.00806*** (0.00247)		-0.00833*** (0.00258)
Executive Constraints		-0.00142 (0.00183)		-0.0106 (0.0197)		-0.00144 (0.00186)		-0.00136 (0.00196)
Secondary School Enrollment		0.000320** (0.000137)		0.000969 (0.00140)		0.000330** (0.000141)		0.000321** (0.000144)
Trade Openness		0.000170 (0.000102)		0.000279 (0.000339)		0.000170 (0.000104)		0.000176 (0.000119)
Political Decentralization	0.00849 (0.00845)	-0.00221 (0.00430)	0.0684 (0.0421)	0.158 (0.348)	0.00871 (0.00839)	-0.00185 (0.00418)	-0.000973 (0.00802)	-0.00215 (0.00451)
Economic Damage		6.49e-05 (9.02e-05)		0.000422 (0.000856)		6.68e-05 (8.95e-05)		6.47e-05 (9.29e-05)
Ethnic Fractionalization		-0.0142 (0.0170)		-0.0733 (0.149)		-0.0131 (0.0211)		-0.0145 (0.0169)
War Recurrence Risk					0.000931 (0.00247)	-0.000539 (0.00254)		
Communism Collapse							0.0244*** (0.00736)	-0.000852 (0.00770)
Obs.	57	32	57	32	57	32	53	32
R-squared	0.018	0.636			0.019	0.636	0.205	0.636
RMSE	0.025	0.017	0.034	0.051	0.026	0.017	0.023	0.017

Source: Authors' computations based on regressing Equation (2.2).**Notes:** The regressions build on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. The R^2 reported is the within- R^2 . Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. Table A.12 describes the variables.

Table A. 6: Robustness Check of Political Decentralization Equation- A Binary Dependent Variable

Dependent Variable: A binary variable that equals 1 when post-conflict economic growth is more than pre-conflict economic growth, otherwise 0

Variables	Model PD13	Model PD14
Log of Initial GDP pc		-3.465** (1.564)
Log of Capital Formation		0.000164 (2.808)
Log of Public Consumption		4.935* (2.654)
Log of Population Growth		-1.523* (0.820)
Executive Constraints		0.0212 (0.289)
Secondary School Enrollment		0.0201 (0.0353)
Trade Openness		0.0306 (0.0366)
Political Decentralization	-1.061 (0.740)	-2.453 (2.368)
Economic Damage		0.0229 (0.0212)
Ethnic Fractionalization		11.14 (7.343)
Observations	61	32
Log Likelihood	-41.062	-11.582
Pseudo R-squared	0.027	0.47
Akaike's Information Criterion	86.12	45.16
Bayesian Information Criterion	90.34	61.29
Hosmer-Lemeshow Test	0.00	4.15

Source: Authors' computations based on regressing Equation (2.2).

Notes: The regressions build on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. Models PD13 and PD14 are logit regression models. We estimate the models using the maximum likelihood estimator. Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. Table A.12 describes the variables.

Table A. 7: Robustness Check of Political Decentralization Equation

Dependent Variable: The annualized difference in the log of per worker GDP between the end of the conflict and the end of the PC period

Variables	Model PD15	Model PD16
Log of Initial GDP pc		-0.00256 (0.00422)
Log of Capital Formation		0.0338* (0.0152)
Log of Public Consumption		-0.0163* (0.00657)
Log of Population Growth		-0.0122** (0.00318)
Executive Constraints		-0.00341 (0.00180)
Secondary School Enrollment		-1.23e-05 (0.000228)
Trade Openness		0.000233 (0.000117)
Political Decentralization	0.00772 (0.0114)	-0.0149 (0.00993)
Economic Damage		-7.62e-05 (7.00e-05)
Ethnic Fractionalization		0.0307* (0.0142)
Obs.	37	16
R-squared	0.015	0.945
RMSE	0.027	0.009

Source: Authors' computations based on regressing Equation (2.2).

Notes: The regressions build on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. The R^2 reported is the within- R^2 . Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. Table A.12 describes the variables.

Table A. 8: Robustness Check of Fiscal Decentralization Equation

Dependent variable: The difference in the log of per capita GDP in two consecutive years

Variables	Model FD6	Model FD7	Model FD8	Model FD9	Model FD10	Model FD11
Log of Capital Formation		0.0576** (0.0246)		0.0496** (0.0167)	0.0935*** (0.0234)	0.0608*** (0.0147)
Log of Public Consumption		-0.0458*** (0.00879)		-0.0417 (0.0310)	-0.0308* (0.0148)	-0.0261 (0.0259)
Population Growth		-1.756*** (0.401)		-2.042* (0.977)	-0.173 (0.535)	-2.779*** (0.853)
D. Executive Constraints		0.00464 (0.00401)		0.000388 (0.00361)	-0.00943 (0.0159)	0.00406 (0.00723)
D. Secondary School Enrolment		0.00142 (0.00242)			0.00107 (0.00131)	0.000912 (0.00157)
Trade Openness		-0.000472 (0.000622)		-0.000127 (0.000243)	0.000491 (0.000500)	-0.000703** (0.000343)
Fiscal Decentralization	-0.0150 (0.0142)	-0.0351** (0.0162)	-0.0150 (0.0144)	-0.0293** (0.00960)		-0.0485** (0.0218)
Communism Collapse			-8.33e-05 (0.00522)	-0.00715 (0.00643)		
Vertical Fiscal Imbalance					-0.00770 (0.00437)	
Ethnic Fractionalization						0.0801 (0.0810)
Economic Damage						-3.16e-05 (0.000531)
Obs.	162	116	162	127	63	101
R-squared	0.011	0.291	0.011	0.219	0.508	
Number of Wars	17	16	17	14	10	14
F-Test for Joint Significant of Fixed Effects	14.27***	36.41***	13.77***	503.49***	15415.84***	
RMSE	0.033	0.03	0.033	0.03	0.018	
Sigma_μ						0.035
Sigma_ε						0.029
Rho						0.59

Source: Authors' computations based on regressing Equation (2.6).

Notes: The regressions build on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. The R^2 reported is the within- R^2 . Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. We estimate Model FD11 using Hausman-Taylor estimator, with expenditure decentralization, economic damage, population growth, and executive constraints are treated as endogenous variables. D. means that we use the first differences for this variable. Table A.12 describes the variables.

Table A. 9: Robustness Check of Fiscal Decentralization Equation- A Binary Dependent Variable

Dependent Variable: A binary variable that equals 1 when post-conflict economic growth is more than pre-conflict economic growth, otherwise 0		
Variables	Model FD12	Model FD13
Log of Initial GDP pc		-1.816 (12.13)
Log of Capital Formation		1.111 (3.466)
Log of Public Consumption		-0.718 (3.635)
Population Growth		-7.022 (61.20)
D. Executive Constraints		0.392 (0.301)
Trade Openness		-0.0109 (0.0268)
Fiscal Decentralization	0.0464 (0.467)	-0.412 (4.708)
Obs.	170	141
Number of Wars	19	16
Wald χ^2	0.89	2.48

Source: Authors' computations based on regressing Equation (2.6).

Notes: The regressions build on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. Models FD12 and FD13 are logit fixed effects models. We estimate the models using the population-averaged estimator. We calculate robust standard errors using a bootstrap method with 500 and 200 replications in models FD12 and FD13, respectively. Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. D. means that we use the first differences for this variable. Table A.12 describes the variables.

Table A. 10: Robustness Check of Fiscal Decentralization Equation

Dependent Variable: The difference in the log of per worker GDP in two consecutive years		
Variables	Model FD14	Model FD15
Log of Capital Formation		0.0766** (0.0244)
Log of Public Consumption		0.0438 (0.0262)
Log of Population Growth		-4.044** (1.374)
D. Executive Constraints		-0.00653* (0.00339)
D. Secondary School Enrolment		0.00136 (0.00280)
Trade Openness		-0.000382 (0.00108)
Fiscal Decentralization	-0.0303** (0.0123)	-0.0507** (0.0214)
Obs.	113	70
R-squared	0.058	0.349
Number of Wars	12	10
F-Test for Joint significant of Fixed Effects	32.55***	6608.26***
RMSE	0.034	0.033

Source: Authors' computations based on regressing Equation (2.6).

Notes: The regressions build on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. The R^2 reported is the within- R^2 . Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. D. means that we use the first differences for this variable. Table A.12 describes the variables.

Table A. 11: Between and Within Components of the Standard Deviation of Our Data

Variables		Mean	SD
Log of Economic Growth pc	Overall	0.025	0.055
	Between		0.026
	Within		0.049
Log of Economic Level pc	Overall	6.9	0.99
	Between		1.033
	Within		0.206
Log of Capital Formation	Overall	2.985	0.426
	Between		0.332
	Within		0.305
Log of Public Consumption	Overall	2.540	0.537
	Between		0.469
	Within		0.264
Log of Population Growth	Overall	0.0198	0.011
	Between		0.011
	Within		0.006
Executive Constraints	Overall	0.015	0.557
	Between		0.146
	Within		0.549
Trade Openness	Overall	66.285	32.779
	Between		29.689
	Within		17.307
Economic Damage	Overall	6.445	32.444
	Between		44.159
	Within		0
Secondary School Enrolment	Overall	1.293	2.270
	Between		1.234

	Within		2.126
Expenditure Decentralization	Overall		0.398
	Between	0.445	0.358
	Within		0.227
Ethnic Fractionalization	Overall		0.247
	Between	0.524	0.252
	Within		2.23E-16

Source: Authors' computations.

Notes: SD stands for standard deviations. The analysis builds on an annual unbalanced panel covering 61 cases of post-civil conflict periods in 47 countries and spanning between 1960 and 2014. *Overall* stands for the overall deviation; *Between* stands for deviation between countries; *Within* stands for the overtime deviation within countries. Table A.12 describes the variables.

Table A. 12: Definitions and Sources of the Variables Used

Variables	Description	Unit	Source/ Based on
Per capita GDP Growth in Political Decentralization Equation	The difference in the log of per capita GDP between the end of the conflict and the end of the PC period.	% Annual	World Bank / WDI
Per capita GDP Growth in Fiscal Decentralization Equation	The difference in the log of per capita GDP in two consecutive years	% Annual	World Bank / WDI
Economic Recovery in Models PD13, PD14, FD12, and FD13	A binary variable that equals 1 when post-conflict economic growth is more than pre-conflict economic growth, otherwise 0	0/1	World Bank / WDI
Per employee GDP growth in Models PD15 and PD16	The difference in the log of per worker GDP between the end of the conflict and the end of the PC period.	% Annual	World Bank / WDI
Per employee GDP growth in Models FD14 and FD15	The difference in the log of per worker GDP in two consecutive years	% Annual	World Bank / WDI
Log of Initial GDP pc	The logarithmic value of per capita GDP in the first peaceful year	constant 2005 USD	World Bank / WDI
Political Decentralization	A dummy variable taking a unitary value if the peace agreement involves at least one form of decentralization	0/1	Uppsala Conflict Data Program/ Peace Agreement Dataset
Sustainable Political Decentralization	A dummy variable taking a unitary value if the peace agreement involves at least one form of decentralization and the agreement sustains.	0/1	Uppsala Conflict Data Program/ Peace Agreement Dataset

Log of Capital Formation	The logarithmic Value of the gross fixed capital formation as a percentage of GDP.	% of GDP	World Bank / WDI
Log of Public Consumption	The logarithmic Value of the governmental current expenditure as a percentage of GDP.	% of GDP	World Bank / WDI
Population Growth in Political Decentralization Equation	The difference in the log of the population between the end of the conflict and the end of the PC period.	% Annual	World Bank / WDI
Population Growth in Fiscal Decentralization Equation	The difference in the log of the population in two consecutive years	% Annual	World Bank / WDI
Executive Constraints	The extent of institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivises. Values are expressed in a 7-category scale, ranging from unlimited authority to executive parity or subordination.	1 to 7	Polity IV dataset
Voice and Accountability	The extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and free media.	-2.5 to 2.5	World Bank / World Governance Indicator
Secondary School Enrolment	The ratio of total secondary enrolment, regardless of age, to the population of the age group that officially corresponds to that level of education.	%	World Bank / WDI
Trade Openness	The ratio of exports and imports (in the local currency) to GDP (in the local currency).	%	World Bank / WDI
Ethnic Fractionalization	Ethnic fractionalization is measured by the ethnolinguistic fractionalization index. It measures the probability that two randomly drawn individuals from a given country do not belong to the same group. It ranges between 0 and 1.	0 to 1	Alesina et al. (2003)
Economic Damage	The simple GDP change between the beginning and the end of a conflict	% of the pre-conflict GDP	World Bank / WDI
Expenditure Decentralization Index	It represents the average share of the local expenditures as a percentage of the overall expenditures in a specific country.	%	World Bank / WDI
Vertical Fiscal Imbalances	It describes the variance between a central government's revenue and expenditures against those of regional governments.	%	World Bank / WDI
Communism Collapse	A time dummy variable that equals 1 for the years of 1990 and onwards, otherwise 0.	0/1	
War Recurrence Risk	The number of civil conflicts a specific PCC has faced when the PC period starts.	0 to 10	UCDP/PRI0

Appendices to Chapter Three

Appendix B

Table B. 1: Exchange Rate Regimes for The MENA Countries

Country	Year	ERR	Country	Year	ERR	Country	Year	ERR	Country	Year	ERR
Algeria	1970-1991	1	Israel	1990	2	Mauritania	1995-1996	4	Sudan	2003	3
Algeria	1992-2015	3	Israel	1991-2001	3	Mauritania	1997-2003	3	Sudan	2004-2015	1
Bahrain	2002-2015	1	Israel	2002-2003	2	Mauritania	2004	1	Syria	1970-2003	1
Djibouti	2002-2015	1	Israel	2004-2015	1	Mauritania	2005-2007	2	Syria	2004-2010	4
Egypt	1970-1990	1	Jordan	1970-2003	1	Mauritania	2008-2015	1	Syria	2011-2015	na
Egypt	1991-2001	3	Jordan	2003-2015	4	Morocco	1970-1972	1	Tunisia	1970-1985	1
Egypt	2002	1	Kuwait	1970-1992	1	Morocco	1973-1986	3	Tunisia	1986-2001	3
Egypt	2003-2015	3	Kuwait	1993-1994	4	Morocco	1987	1	Tunisia	2002-2015	2
Iran	1970-1991	1	Kuwait	1995-1999	3	Morocco	1988-1989	3	Tunisia	2004	na
Iran	1971 and 1981	na	Kuwait	2000-2003	1	Morocco	1990-2003	1	Turkey	1970-1979	1
Iran	1992-1994	4	Kuwait	2004-2015	4	Morocco	2004-2009	na	Turkey	1980-1999	3
Iran	1995-1997	3	Lebanon	1970-1997	4	Morocco	2010-2015	1	Turkey	2000-2003	4
Iran	1998-2001	1	Lebanon	1980-1981	na	Oman	2002-2003	1	Turkey	2004	na
Iran	2002-2015	3	Lebanon	1998-2015	1	Oman	2004-2015	4	Turkey	2005-2015	3
Iraq	1970-2001	1	Libya	1970-2003	1	Qatar	2002-2015	1	UAE	2002-2006	1
Iraq	1978-1979 and 1981	na	Libya	2004	4	Saudi Arabia	1970-1974	1	UAE	2007-2015	3
Iraq	2002-2015	3	Libya	2005-2015	3	Saudi Arabia	1975-1997	2	Somalia	2002-2003	4
Israel	1970-1976	1	Mauritania	1970-1986	1	Saudi Arabia	1998-2003	1	Somalia	2004	1
Israel	1977-1984	4	Mauritania	1987-1991	3	Saudi Arabia	2004-2015	3	Somalia	2005-2015	1
Israel	1985-1989	1	Mauritania	1992-1994	1	Sudan	2002	2	Yemen	2002-2003	4

Source: International Monetary Fund.

Notes: The classification codes are: ∅, no separate legal tender; √, Pre-announced peg or currency board arrangement; ∓, Pre-announced horizontal band that is narrower than or equal to +/-2%; 4, De facto peg. 'na' stands for non-available data.

Table B. 2: Violence Event in The MENA 1960-2016

Country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989																										
Algeria	IC	IC	IC	IC		M																																																		
Egypt			IC			IC								M																																										
Iraq				M					M						IC					IC																																				
Iran														IC					CC	CC+	CC+	CC+	CC+	IC	IC	IC+S	IC+	IC	IC	S																										
Israel	S	S	S	S	S	S	S	S+IC	S	S+IC	S+IC	S	S	S+IC	S+IC	S	S	S	S+IC				IC	IC	IC				CC	CC	CC																									
Jordan								IC	IC		CC			IC																																										
Kuwait																																																								
Lebanon								IC								CC	Libya										M									IC	IC	IC	IC	IC+S	IC	IC	IC+S	IC+	IC	S	S									
Mauritania																IC	IC	IC	IC+C	M	M				M					IC																										
Morocco				IC												IC	IC	IC	IC+C	IC+	IC+	IC+	IC+	IC	IC	IC+	IC+	IC	IC	IC																										
Oman											CC	C	C	CC	C	CC																																								
Qatar																																																								
Saudi Arabia																																																								
Sudan					CC	CC	CC	CC	CC	CC+	CC	C	C				M							CC	Syria		M		M	M		M	IC			M			IC						CC	CC	CC	CC+	IC	IC	IC	S	S	S	S	S
Tunisia		IC																																																						
Turkey	M											M									M																																			
UAE																																																								

Yemen			CC+I C+M	IC +C C	IC +C C	IC +C C	IC +C C	IC+C C+M	IC +C C	IC+C C+M	IC +C C	IC	IC	IC + M	IC	M	M	CC+ M	CC+ M	CC	CC					M			
Somalia	IC				IC					M			IC												IC	CC	IC +C C	CC	CC
Djibouti																													
Bahrain																													

Table B.2: Continued

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Algeria			CC+ M	CC	CC	CC	CC	CC	CC	CC	CC	C C	C C															
Egypt				CC	CC	CC	CC	CC	CC													CC	CC	CC +M	CC			
Iraq	IC +S	CC +IC +S	S	S	S	S	IC +S	S	S	S	S	S	S	CC+ IC+S			CC	CC										
Iran	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	CC+ S	S	S	S	S	S	S	S	
Israel	C C	CC	CC	CC			IC										IC											
Jordan																												
Kuwait	IC	IC																										
Lebanon	C C						IC										IC		CC									
Libya	S	S	S	S	S	S	S	S	S	S												IC+ CC	CC	CC	CC	CC	CC	
Mauritania	IC	IC														M			M									
Morocco																												
Oman																												
Qatar						M																						
Saudi Arabia																							CC					

Sudan	C C	CC	CC		CC	CC +S	CC+ S	CC +S	CC+ S	CC +S	C C+	C C+	CC+ S	C C+	S	S	S	S	S	S	S	S	S	S	
Syria													S	S	S	S	S	S	S	CC+ S	CC+ S	CC +S	CC +S	CC+ S	
Tunisia																									
Turkey			CC	CC	CC	CC	CC	CC+I C	CC	CC															
UAE																									
Yemen				CC																CC	CC	CC	CC +S	CC+ IC+S	IC
Somalia	C C	CC +M	CC	CC	CC	CC	CC				C C	C C			CC	CC	CC								
Djibouti		CC	CC	CC	CC							C C C												IC	
Bahrain																				CC					

Sources: UCDP, MEPV, and a historical review by the authors.

Notes: The table shows the events a country faced in a specific year. CC stands for civil conflict; IC stands for international conflict; S stands for International Sanctions, M stands for a military coup. IC stands for intensive civil conflict.

Table B. 3: Descriptive Statistics of The Database

Status	Variables	GDP pc Growth (%)	GDP pc	FDI (%)	Executive Constraints	ERV (%)	Inflation (%)	Savings (%)	Secondary School Enrollment (%)
Conflict	Observations	99	94	86	95	108	83	84	67
	Mean	-0.09	2742.86	0.31	3.1	0.036	21.7	16.17	49
	SD	14.43	3348.86	3.3	2.3	0.093	26.2	15.27	26.66
Conflict Termination	Observations	23	22	20	21	26	19	20	13
	Mean	-1.63	4004.96	2	2.7	0.06	29.4	14.36	58.2
	SD	17.49	4998	3.54	1.9	0.14	46.67	26	31.7
PC1	Observations	23	22	21	21	26	19	20	14
	Mean	7.71	4231.2	1.997	2.7	0.039	22.37	14.267	51.5
	SD	13.17	5167.48	3.86	1.85	0.107	29.5	23.98	28.95

PC2	Observations	24	23	23	21	27	21	20	17
	Mean	2.54	4289.37	1.7	2.76	0.036	27.54	14.19	59.756
	SD	7.54	5412.2	2.47	1.92	0.06	48.77	19.567	33
PC3	Observations	23	22	21	23	27	20	19	16
	Mean	1.64	4360.3	1.17	3	0.025	37.19	16.26	55.72
	SD	4.7	5662.4	2.05	1.95	0.023	98.69	18.85	35.32
PC4	Observations	21	20	20	21	24	17	19	11
	Mean	0.36	3137	1.27	3.14	0.027	41.03	15.2	58.37
	SD	5.37	4131.6	2.14	1.98	0.035	94.78	18	25
PC5	Observations	21	21	19	21	24	18	19	15
	Mean	2.7	3124.8	1.336	3.19	0.018	13.42	16.56	47.78
	SD	3.8	4135.2	2.26	1.96	0.014	17.017	17	27.4
Peace	Observations	712	678	630	882	539	667	677	565
	Mean	2.22	9488.7	2.1	2.5	0.02	9.7	23.67	58.58
	SD	10.17	14614.9	4.16	1.8	0.037	23.25	18.92	29.16
Total	Observations	946	909	840	1105	801	864	878	718
	Mean	1.98	7945.83	1.83	2.6	0.025	13.33	21.8	57.28
	SD	10.7	13082	3.9	1.85	0.058	32.335	19.11	29.16

Sources: Author's computations based on WDI.

Notes: The figures represent the annualized means over the period. *Conflict* stands for the years when the conflict was active except the last year of it; *Conflict Termination* stands for the year when the conflict terminates; *PC1* stands for the first post-conflict year; *PC2* stands for the second post-conflict year; *PC3* stands for the third post-conflict year; *PC4* stands for the fourth post-conflict year; *PC5* stands for the fifth post-conflict year; *Peace* stands for the peaceful years either in countries that have faced civil conflicts, or in countries that have not. SD stands for standard deviation. Table B.13 presents a description of the variables used.

Table B. 4: Skewness Figures for The Statistics Included in The Model

Variables	Skewness
FDI	3.127
ODA	2.863
Financial Trust	2.3
Inflation	8.1
Central Government Debt	0.668
Government Consumption	1.65
GDP pc	2.9
GDP pc Growth	6.4
Natural Resources Rents	0.74
Savings	0.2
Secondary School Enrollment	-0.09
Exchange Rate Volatility	9.65
Financial Development	0.18
Population Growth	1.88
Trade Openness	0.87
Executive Constraints	1.2

Source: Authors' computations based on the database used.

Notes: Skewness Test is a measure of the asymmetry of the probability distribution of a real-valued random variable about its mean. Table B.13 presents a description of the variables used.

Table B. 5: The Annual Exchange Rate Volatilities

Country	Source	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Bahrain	REER	na	0.0240	0.0206																				
Djibouti	REER	na	0.0243	0.0202																				
Algeria	REER	na	0.0874	0.0165																				
Egypt	REER	na	0.0317	0.0221																				
Iraq	NEER	0.0005	0.0083	0.0051	0.0227	0.0207	0.0171	0.0079	0.0062	0.0174	0.0110	0.0215	0.0259	0.0257	0.0124	0.0227	0.0295	0.0153	0.0208	0.0219	0.0230	0.0159	na	na
Iran	NEER	0.0028	0.0059	0.0099	0.0206	0.0177	0.0125	0.0050	0.0064	0.0163	0.0092	0.0164	0.0089	0.0061	0.0042	0.0084	0.0100	0.0043	0.0040	0.0043	0.0050	0.0036	0.0089	0.0086
Israel	REER	0.0108	0.0526	0.0220	0.0190	0.0645	0.0176	0.0140	0.0930	0.0165	0.0168	0.0194	0.0264	0.0091	0.0336	0.0193	0.0301	0.0129	0.0191	0.0053	0.0241	0.0083	0.0230	0.0147
Jordan	NEER	0.0026	0.0043	0.0083	0.0106	0.0127	0.0037	0.0042	0.0044	0.0078	0.0040	0.0060	0.0093	0.0043	0.0030	0.0070	0.0080	0.0034	0.0055	0.0486	0.0251	0.0103	0.0245	0.0144
Kuwait	REER	na	0.0186																					
Lebanon	BdL	0.0048	0.0073	0.0098	0.0327	0.0135	0.0186	0.0583	0.0135	0.0156	0.0242	0.0114	0.0239	0.0496	0.0245	0.0526	0.1288	0.1582	0.1911	0.0938	0.0748	0.1608	0.0925	0.1317
Libya	REER	na	0.0111	0.0293																				
Mauritania	NEER	0.0016	0.0087	0.0052	0.0177	0.0097	0.0090	0.0068	0.0081	0.0160	0.0080	0.0172	0.0152	0.0226	0.0050	0.0234	0.0332	0.0089	0.0097	0.0035	0.0122	0.0049	0.0248	0.0619
Morocco	NEER	0.0016	0.0087	0.0052	0.0177	0.0097	0.0090	0.0068	0.0081	0.0160	0.0080	0.0172	0.0152	0.0226	0.0050	0.0234	0.0332	0.0089	0.0097	0.0035	0.0122	0.0049	0.0248	0.0619
Oman	NEER	0.0012	0.0135	0.0058	0.0182	0.0159	0.0116	0.0052	0.0061	0.0159	0.0099	0.0176	0.0182	0.0183	0.0097	0.0165	0.0227	0.0332	0.0171	0.0173	0.0167	0.0141	0.0209	0.0225
Qatar	NEER	0.0009	0.0126	0.0062	0.0165	0.0151	0.0100	0.0056	0.0054	0.0157	0.0104	0.0161	0.0181	0.0176	0.0092	0.0164	0.0221	0.0118	0.0161	0.0169	0.0163	0.0131	0.0186	0.0196
Saudi Arabia	NEER	na	0.0217	0.0256																				
Sudan	NEER	0.0038	0.0044	0.0093	0.0210	0.0162	0.0129	0.0061	0.0057	0.0391	0.0426	0.0177	0.1471	0.0811	0.0094	0.0181	0.1741	0.0120	0.1672	0.0179	0.0178	0.0138	0.9280	0.6565
Syria	BdL	na	0.0103	0.0249	0.0299	0.0288	0.0193	0.0231	0.0236	0.0575	0.1223	0.0543	0.1363	0.0463	0.0159	0.0189	0.0598							
Tunisia	REER	na	0.0069	0.0088																				
Turkey	REER	0.1124	0.0209	0.0135	0.0287	0.0232	0.0141	0.0198	0.0238	0.0824	0.0417	0.1162	0.0196	0.0153	0.0068	0.0305	0.0229	0.0308	0.0221	0.0237	0.0208	0.0194	0.0130	0.0279
United Arab Emirates	NEER	0.0014	0.0122	0.0068	0.0172	0.0166	0.0116	0.0078	0.0082	0.0159	0.0081	0.0159	0.0184	0.0169	0.0089	0.0167	0.0227	0.0116	0.0160	0.0167	0.0165	0.0128	0.0218	0.0204
Yemen	NEER	na	0.0127	0.0268	0.0932																			
Somalia	OANDA	na																						

Table B.5: Continued

Country	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bahrain	0.0140	0.0101	0.0144	0.0087	0.0151	0.0154	0.0107	0.0152	0.0113	0.0127	0.0145	0.0130	0.0117	0.0137	0.0116	0.0263	0.0157	0.0197	0.0198	0.0103	0.0111	0.0101	0.0109	0.0121
Djibouti	0.0144	0.0107	0.0131	0.0063	0.0183	0.0233	0.0116	0.0164	0.0157	0.0144	0.0157	0.0143	0.0121	0.0138	0.0115	0.0302	0.0186	0.0277	0.0167	0.0143	0.0123	0.0104	0.0166	0.0110
Algeria	0.0620	0.083	0.0226	0.0126	0.0171	0.0181	0.0134	0.0142	0.0117	0.0131	0.0345	0.0241	0.0151	0.0106	0.0150	0.0377	0.0220	0.0239	0.0075	0.0142	0.0171	0.0121	0.0183	0.0103
Egypt	0.0183	0.0131	0.0197	0.0081	0.0156	0.0167	0.0120	0.0219	0.0321	0.0130	0.0472	0.0170	0.0203	0.0160	0.0123	0.0239	0.0129	0.0188	0.0187	0.0125	0.0208	0.0148	0.0188	0.0397
Iraq	na	0.2903	0.0518	0.0168	0.0164	0.0270	0.0340	0.0188	0.0285	0.0175	0.0157	0.0120	0.0105	0.0216	0.0159									
Iran	0.6331	0.0147	0.1254	0.0078	0.0217	0.0204	0.1169	0.0186	0.0163	0.4103	0.0155	0.0144	0.0119	0.0139	0.0132	0.0193	0.0256	0.0261	0.0164	0.0333	0.1394	0.0111	0.0176	0.0125
Israel	0.0087	0.0082	0.0082	0.0115	0.0123	0.0309	0.0187	0.0128	0.0167	0.0194	0.0190	0.0090	0.0058	0.0123	0.0168	0.0246	0.0145	0.0129	0.0179	0.0120	0.0076	0.0097	0.0120	0.0078
Jordan	0.0097	0.0061	0.0073	0.0067	0.0153	0.0170	0.0098	0.0148	0.0131	0.0116	0.0151	0.0139	0.0104	0.0115	0.0106	0.0263	0.0159	0.0209	0.0138	0.0124	0.0090	0.0098	0.0132	0.0102
Kuwait	0.0103	0.0114	0.0139	0.0058	0.0132	0.0164	0.0114	0.0107	0.0153	0.0100	0.0119	0.0153	0.0114	0.0139	0.0122	0.0237	0.0126	0.0146	0.0085	0.0104	0.0054	0.0078	0.0113	0.0093
Lebanon	0.0129	0.0009	0.0008	0.0006	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Libya	0.0294	0.0706	0.0106	0.0028	0.0116	0.0088	0.0068	0.0199	0.0484	0.2107	0.0520	0.0194	0.0252	0.0103	0.0203	0.0173	0.0143	0.0171	0.0290	0.0153	0.0123	0.0100	0.0093	0.0112
Mauritania	0.0290	0.0213	0.0183	0.0089	0.0245	0.0298	0.0128	0.0161	0.0161	0.0129	0.0173	0.0154	0.0138	0.0132	0.0159	0.0258	0.0175	0.0256	0.0139	0.0148	0.0363	0.0169	0.0286	0.0301
Morocco	0.0290	0.0213	0.0183	0.0089	0.0245	0.0298	0.0128	0.0161	0.0161	0.0129	0.0173	0.0154	0.0138	0.0132	0.0159	0.0258	0.0175	0.0256	0.0139	0.0148	0.0363	0.0169	0.0286	0.0301
Oman	0.0154	0.0101	0.0160	0.0066	0.0157	0.0190	0.0111	0.0137	0.0124	0.0135	0.0150	0.0141	0.0107	0.0126	0.0104	0.0234	0.0154	0.0193	0.0119	0.0099	0.0097	0.0104	0.0119	0.0091
Qatar	0.0134	0.0101	0.0134	0.0065	0.0160	0.0183	0.0106	0.0142	0.0123	0.0135	0.0152	0.0141	0.0108	0.0124	0.0102	0.0248	0.0156	0.0201	0.0126	0.0103	0.0094	0.0098	0.0126	0.0099
Saudi Arabia	0.0102	0.0089	0.0160	0.0052	0.0155	0.0195	0.0106	0.0126	0.0125	0.0126	0.0143	0.0135	0.0115	0.0128	0.0095	0.0232	0.0150	0.0189	0.0117	0.0104	0.0090	0.0101	0.0112	0.0149
Sudan	0.0617	0.2172	0.0928	0.0602	0.0218	0.0304	0.0474	0.0156	0.0148	0.0130	0.0125	0.0134	0.0125	0.0141	0.0146	0.0221	0.0207	0.0301	0.0313	0.1331	0.0537	0.0157	0.0304	0.0316
Syria	0.0636	0.0001	0.0001	0.0001	0.0182	0.0077	0.0289	0.1072	0.0062	0.0002	0.0000	0.0000	0.0000	0.0142	0.0000	0.0000	0.0000	0.0162	0.0103	0.0961	0.0531	0.0221	0.0296	0.0042
Tunisia	0.0121	0.0061	0.0070	0.0036	0.0044	0.0040	0.0043	0.0050	0.0049	0.0046	0.0077	0.0073	0.0054	0.0056	0.0067	0.0085	0.0074	0.0070	0.0068	0.0047	0.0095	0.0132	0.0126	0.0172
Turkey	0.0146	0.0935	0.0237	0.0126	0.0129	0.0143	0.0072	0.0124	0.0905	0.0659	0.0378	0.0352	0.0213	0.0442	0.0172	0.0484	0.0210	0.0207	0.0247	0.0159	0.0160	0.0255	0.0341	0.0242
United Arab Emirates	0.0138	0.0095	0.0135	0.0065	0.0166	0.0194	0.0102	0.0144	0.0130	0.0129	0.0152	0.0141	0.0108	0.0122	0.0102	0.0258	0.0162	0.0207	0.0136	0.0117	0.0092	0.0097	0.0127	0.0103
Yemen	0.0143	0.2396	0.5534	0.2359	0.0395	0.0328	0.0222	0.0135	0.0233	0.0139	0.0209	0.0188	0.0097	0.0119	0.0108	0.0279	0.0180	0.0325	0.0111	0.0132	0.0091	0.0099	0.0134	0.0586
Somalia	na	na	0.0000	0.0000	0.0000	0.0000	0.0024	0.0066	0.0006	0.0013	0.0016	0.0191	0.0625	0.0285	0.0138	0.0065	0.0070	0.0092	0.0049	0.0031	0.0165	0.0174	0.0160	0.0132

Source: Authors' computations based on BRUEGEL, Banque du Liban, and OANDA (2017).

Notes: 'na' stands for non-available data. REER means that the calculations are based on the real effective exchange rates imported from the database of BRUEGEL Center in Belgium; NEER means that the calculations are based on the nominal effective exchange rates imported from the database of BRUEGEL Center in Belgium. BdL means that the calculations are based on the real exchange rates imported from the database of Banque du Liban, located in Beirut; OANDA means that the calculations are based on the real exchange rates imported from the OANDA website. The calculations are done as follows: we first transform the value of the exchange rate, $x_{i,m}$ mentioned in the database into the logarithmic one, $X_{i,m} = \log x_{i,m}$. Then we find the month differences, $D_{i,m} = X_{i,m} - X_{i,m-1}$. Finally, we find the standard deviation for the twelve differences on a yearly base, $SD(D_{i,1}|D_{i,2}, \dots, |D_{i,12})$.

Table B. 6: Annual Economic Growth and Exchange Rate Volatility Data for the MENA Countries that have faced Civil Conflicts

Country	Year	GDP pc Growth	ERV	Conflict Status	Country	Year	GDP pc Growth	ERV	Conflict Status	Country	Year	GDP pc Growth	ERV	Conflict Status
Algeria	1992	-0.55	0.016	Conflict	Egypt	1993	0.87	0.018	Conflict	Iraq	1991	-65.00		Conflict Termination
Algeria	1993	-4.23	0.062	Conflict	Egypt	1994	2.00	0.013	Conflict	Iraq	1992	28.89		PC1
Algeria	1994	-2.91	0.084	Conflict	Egypt	1995	2.70	0.020	Conflict	Iraq	1993	26.50		PC2
Algeria	1995	1.85	0.023	Conflict	Egypt	1996	3.07	0.008	Conflict	Iraq	1994	0.76		PC3
Algeria	1996	2.30	0.013	Conflict	Egypt	1997	3.60	0.016	Conflict	Iraq	1995	-0.97		PC4
Algeria	1997	-0.51	0.017	Conflict	Egypt	1998	2.19	0.017	Conflict Termination	Iraq	1996	7.63		PC5
Algeria	1998	3.54	0.018	Conflict	Egypt	1999	4.22	0.012	PC1	Iraq	2003	-34.89	0.290	Conflict Termination
Algeria	1999	1.76	0.013	Conflict	Egypt	2000	3.48	0.022	PC2	Iraq	2004	50.12	0.052	PC1
Algeria	2000	0.83	0.014	Conflict	Egypt	2001	1.65	0.032	PC3	Iraq	2005	1.71	0.017	PC2
Algeria	2001	3.27	0.012	Conflict	Egypt	2002	0.48	0.013	PC4	Iraq	2006	7.38	0.016	Conflict
Algeria	2002	4.28	0.013	Conflict Termination	Egypt	2003	1.28	0.047	PC5	Iraq	2007	-1.14	0.027	Conflict Termination
Algeria	2003	5.86	0.034	PC1	Egypt	2011	-0.30	0.019	Conflict	Iraq	2008	3.90	0.034	PC1
Algeria	2004	2.96	0.024	PC2	Egypt	2012	-0.04	0.012	Conflict	Iraq	2009	2.96	0.019	PC2
Algeria	2005	4.47	0.015	PC3	Egypt	2013	-0.17	0.021	Conflict	Iraq	2010	2.47	0.029	PC3
Algeria	2006	0.25	0.011	PC4	Egypt	2014	-0.04	0.015	Conflict Termination	Iraq	2011	6.95	0.018	PC4
Algeria	2007	1.85	0.015	PC5	Iran	1978	-10.47	0.016	Conflict	Iraq	2012	9.28	0.016	PC5
Bahrain	2011	-1.39	0.020	Conflict Termination	Iran	1979	-10.31	0.009	Conflict	Israel	1987	5.47	0.019	Conflict
Bahrain	2012	1.45	0.010	PC1	Iran	1980	-16.40	0.016	Conflict	Israel	1988	0.35	0.005	Conflict
Bahrain	2013	4.10	0.011	PC2	Iran	1981	-8.83	0.009	Conflict	Israel	1989	-0.83	0.024	Conflict
Bahrain	2014	3.55	0.010	PC3	Iran	1982	8.50	0.006	Conflict Termination	Israel	1990	3.58	0.008	Conflict
Djibouti	1991	-7.78	0.024	Conflict	Iran	1983	8.09	0.004	PC1	Israel	1991	1.41	0.023	Conflict
Djibouti	1992	-2.63	0.020	Conflict	Iran	1984	-5.51	0.008	PC2	Israel	1992	2.04	0.015	Conflict
Djibouti	1993	-8.40	0.014	Conflict	Iran	1985	-1.95	0.010	PC3	Israel	1993	2.79	0.009	Conflict Termination
Djibouti	1994	-2.56	0.011	Conflict Termination	Iran	1986	-12.71	0.004	PC4	Israel	1994	4.20	0.008	PC1
Djibouti	1995	-5.12	0.013	PC1	Iran	1987	-5.16	0.004	PC5	Israel	1995	18.62	0.008	PC2
Djibouti	1996	-5.84	0.006	PC2	Iran	2009	1.11	0.026	Conflict Termination	Israel	1996	3.06	0.012	PC3
Djibouti	1997	-2.55	0.018	PC3	Iran	2010	5.36	0.026	PC1	Israel	1997	1.31	0.012	PC4
Djibouti	1998	-1.71	0.023	PC4	Iran	2011	2.66	0.016	PC2	Israel	1998	1.97	0.031	PC5
Djibouti	1999	0.40	0.012	Conflict Termination	Iran	2012	-7.76	0.033	PC3	Jordan	1970		0.003	Conflict Termination

Djibouti	2000	-1.24	0.016	PC1	Iran	2013	-3.18	0.139	PC4	Jordan	1971	0.004	PC1
Djibouti	2001	0.45	0.016	PC2	Iran	2014	0.17	0.011	PC5	Jordan	1972	0.008	PC2
Djibouti	2002	1.05	0.014	PC3						Jordan	1973	0.011	PC3
Djibouti	2003	1.67	0.016	PC4						Jordan	1974	0.013	PC4
Djibouti	2004	2.34	0.014	PC5						Jordan	1975	0.004	PC5

Table B.6: Continued

Country	Year	GDP pc Growth	ERV	Conflict Status	Country	Year	GDP pc Growth	ERV	Conflict Status	Country	Year	GDP pc Growth	ERV	Conflict Status
Lebanon	1975		0.019	Conflict	Mauritania	1975	-7.84	0.009	Conflict	Saudi Arabia	2011	7.29	0.012	Conflict Termination
Lebanon	1976		0.058	Conflict	Mauritania	1976	5.45	0.007	Conflict	Saudi Arabia	2012	2.86	0.010	PC1
Lebanon	1977		0.014	Conflict	Mauritania	1977	-4.67	0.008	Conflict	Saudi Arabia	2013	0.27	0.009	PC2
Lebanon	1978		0.016	Conflict	Mauritania	1978	-3.32	0.016	Conflict Termination	Saudi Arabia	2014	1.17	0.010	PC3
Lebanon	1979		0.024	Conflict	Mauritania	1979	1.83	0.008	PC1	Somalia	1986	3.11		Conflict
Lebanon	1980		0.011	Conflict	Mauritania	1980	0.46	0.017	PC2	Somalia	1987	4.14		Conflict
Lebanon	1981		0.024	Conflict	Mauritania	1981	0.53	0.015	PC3	Somalia	1988	-1.81		Conflict
Lebanon	1982		0.050	Conflict	Mauritania	1982	-5.09	0.023	PC4	Somalia	1989	-1.26		Conflict
Lebanon	1983		0.024	Conflict	Mauritania	1983	0.83	0.005	PC5	Somalia	1990	-2.05		Conflict
Lebanon	1984		0.053	Conflict	Morocco	1975	5.20	0.009	Conflict	Somalia	1991			Conflict
Lebanon	1985		0.129	Conflict	Morocco	1976	8.29	0.007	Conflict	Somalia	1992			Conflict
Lebanon	1986		0.158	Conflict	Morocco	1977	3.56	0.008	Conflict	Somalia	1993			Conflict
Lebanon	1987		0.191	Conflict	Morocco	1978	-0.22	0.016	Conflict	Somalia	1994			Conflict
Lebanon	1988		0.094	Conflict	Morocco	1979	2.25	0.008	Conflict	Somalia	1995		0.000	Conflict
Lebanon	1989	-42.62	0.075	Conflict	Morocco	1980	1.13	0.017	Conflict	Somalia	1996		0.000	Conflict Termination
Lebanon	1990	25.30	0.161	Conflict Termination	Morocco	1981	-4.01	0.015	Conflict	Somalia	1997		0.000	PC1
Lebanon	1991	35.72	0.092	PC1	Morocco	1982	7.51	0.023	Conflict	Somalia	1998		0.000	PC2
Lebanon	1992	1.93	0.132	PC2	Morocco	1983	-1.61	0.005	Conflict	Somalia	1999		0.002	PC3
Lebanon	1993	4.08	0.013	PC3	Morocco	1984	3.81	0.023	Conflict	Somalia	2000		0.007	PC4
Lebanon	1994	5.32	0.001	PC4	Morocco	1985	3.03	0.033	Conflict	Somalia	2001		0.001	Conflict
Lebanon	1995	4.47	0.001	PC5	Morocco	1986	7.31	0.009	Conflict	Somalia	2002		0.001	Conflict Termination
Lebanon	2008	8.46	0.000	Conflict Termination	Morocco	1987	-3.27	0.010	Conflict	Somalia	2003		0.002	PC1
Lebanon	2009	8.39	0.000	PC1	Morocco	1988	10.00	0.004	Conflict	Somalia	2004		0.019	PC2
Lebanon	2010	4.13	0.000	PC2	Morocco	1989	0.88	0.012	Conflict Termination	Somalia	2005		0.063	PC3

Lebanon	2011	0.81	0.000	PC3	Morocco	1990	0.88	0.005	PC1	Somalia	2006	0.029	Conflict
Lebanon	2012	1.00	0.000	PC4	Morocco	1991	5.59	0.025	PC2	Somalia	2007	0.014	Conflict
Lebanon	2013	-0.28	0.000	PC5	Morocco	1992	-4.63	0.062	PC3	Somalia	2008	0.007	Conflict Termination
Libya	2011	-62.21	0.029	Conflict	Morocco	1993	-2.70	0.029	PC4	Somalia	2009	0.007	PC1
Libya	2012	104.66	0.015	Conflict	Morocco	1994	9.67	0.021	PC5	Somalia	2010	0.009	PC2
Libya	2013	-13.31	0.012	Conflict	Oman	1970	10.26	0.001	Conflict	Somalia	2011	0.005	PC3
Libya	2014	-23.95	0.010	Conflict	Oman	1971	-2.49	0.013	Conflict	Somalia	2012	0.003	PC4
					Oman	1972	5.95	0.006	Conflict	Somalia	2013	0.016	PC5
					Oman	1973	-17.50	0.018	Conflict				
					Oman	1974	6.87	0.016	Conflict				
					Oman	1975	18.78	0.012	Conflict Termination				
					Oman	1976	14.64	0.005	PC1				
					Oman	1977	-4.20	0.006	PC2				
					Oman	1978	-8.82	0.016	PC3				
					Oman	1979	-1.31	0.010	PC4				
					Oman	1980	0.29	0.018	PC5				

Table B.6: Continued

Country	Year	GDP pc Growth	ERV	Conflict Status	Country	Year	GDP pc Growth	ERV	Conflict Status	Country	Year	GDP pc Growth	ERV	Conflict Status
Sudan	1964	-3.80		Conflict	Syria	1979	0.18	0.025	Conflict	Yemen	1962			Conflict
Sudan	1965	3.84		Conflict	Syria	1980	8.18	0.030	Conflict	Yemen	1963			Conflict
Sudan	1966	-6.27		Conflict	Syria	1981	5.72	0.029	Conflict	Yemen	1964			Conflict
Sudan	1967	-1.45		Conflict	Syria	1982	-1.45	0.019	Conflict Termination	Yemen	1965			Conflict
Sudan	1968	-0.96		Conflict	Syria	1983	-2.11	0.023	PC1	Yemen	1966			Conflict
Sudan	1969	-1.55		Conflict	Syria	1984	-7.35	0.024	PC2	Yemen	1967			Conflict
Sudan	1970	2.82	0.004	Conflict	Syria	1985	2.60	0.057	PC3	Yemen	1968			Conflict
Sudan	1971	-0.77	0.004	Conflict	Syria	1986	-7.99	0.122	PC4	Yemen	1969			Conflict
Sudan	1972	-7.90	0.009	Conflict Termination	Syria	1987	-1.26	0.054	PC5	Yemen	1970			Conflict Termination
Sudan	1973	-2.41	0.021	PC1	Syria	2011		0.010	Conflict	Yemen	1971			PC1
Sudan	1974	8.01	0.016	PC2	Syria	2012		0.096	Conflict	Yemen	1972			PC2
Sudan	1975	12.07	0.013	PC3	Syria	2013		0.053	Conflict	Yemen	1973			PC3
Sudan	1976	12.93	0.006	PC4	Syria	2014		0.022	Conflict	Yemen	1974			PC4

Sudan	1977	2.79	0.006	PC5	Tunisia	2011	-1.69	0.007	Conflict Termination	Yemen	1975			PC5
Sudan	1983	-1.33	0.009	Conflict	Tunisia	2012	3.65	0.005	PC1	Yemen	1979			Conflict
Sudan	1984	-8.02	0.018	Conflict	Tunisia	2013	1.49	0.010	PC2	Yemen	1980			Conflict
Sudan	1985	-9.06	0.174	Conflict	Tunisia	2014		0.013	PC3	Yemen	1981			Conflict
Sudan	1986	2.52	0.012	Conflict	Turkey	1992	3.34	0.028	Conflict	Yemen	1982			Conflict Termination
Sudan	1987	11.28	0.167	Conflict	Turkey	1993	5.95	0.015	Conflict	Yemen	1983			PC1
Sudan	1988	-2.84	0.018	Conflict	Turkey	1994	-6.16	0.094	Conflict	Yemen	1984			PC2
Sudan	1989	6.10	0.018	Conflict	Turkey	1995	6.19	0.024	Conflict	Yemen	1985			PC3
Sudan	1990	-8.09	0.014	Conflict	Turkey	1996	5.70	0.013	Conflict	Yemen	1986			PC4
Sudan	1991	4.32	0.928	Conflict	Turkey	1997	5.90	0.013	Conflict	Yemen	1987			PC5
Sudan	1992	3.26	0.656	Conflict Termination	Turkey	1998	0.72	0.014	Conflict	Yemen	1994	1.73	0.240	Conflict Termination
Sudan	1993	1.25	0.062	PC1	Turkey	1999	-4.84	0.007	Conflict Termination	Yemen	1995	1.29	0.553	PC1
Sudan	1994	-2.16	0.217	PC2	Turkey	2000	5.18	0.012	PC1	Yemen	1996	0.88	0.236	PC2
Sudan	1995	2.78	0.093	Conflict	Turkey	2001	-7.08	0.090	PC2	Yemen	1997	1.92	0.039	PC3
Sudan	1996	2.83	0.060	Conflict	Turkey	2002	4.63	0.066	PC3	Yemen	1998	2.98	0.033	PC4
Sudan	1997	7.43	0.022	Conflict	Turkey	2003	3.78	0.038	PC4	Yemen	1999	0.93	0.022	PC5
Sudan	1998	1.41	0.030	Conflict	Turkey	2004	7.87	0.035	PC5	Yemen	2011	-17.34	0.011	Conflict
Sudan	1999	0.25	0.047	Conflict						Yemen	2012	-0.20	0.013	Conflict
Sudan	2000	3.39	0.016	Conflict						Yemen	2013	1.50	0.009	Conflict
Sudan	2001	3.52	0.015	Conflict						Yemen	2014		0.010	Conflict
Sudan	2002	3.45	0.013	Conflict										
Sudan	2003	4.71	0.012	Conflict										
Sudan	2004	0.96	0.013	Conflict Termination										
Sudan	2005	4.46	0.013	PC1										
Sudan	2006	6.96	0.014	PC2										
Sudan	2007	8.37	0.015	PC3										
Sudan	2008	4.78	0.022	PC4										
Sudan	2009	0.39	0.021	PC5										

Source: World Development Indicators and Authors' computations based on BRUEGEL, Banque du Liban, and OANDA (2017).

Notes: *Conflict* stands for the years when the conflict was active except the last year of it; *Conflict Termination* stands for the year when the conflict terminates; *PC1* stands for the first post-conflict year; *PC2* stands for the second post-conflict year; *PC3* stands for the third post-conflict year; *PC4* stands for the fourth post-conflict year; *PC5* stands for the fifth post-conflict year. Table B.13 presents the definition of the variables.

Table B. 7: Exchange Rate Volatility for Some MENA Countries Emerging from Civil Conflicts

Country	Pre Peace Volatility	PC1 Volatility	PC2 Volatility	PC3 Volatility	PC4 Volatility	PC5 Volatility	Whole Peace Period Volatility
Algeria	0.0058	0.0132	0.0336	0.0279	0.0101	0.0102	0.0218
Iraq 91	0.0279	0.0166	0.0246	0.0154	0.0135	0.0112	0.0181
Iraq 03	0.1447	0.2529	0.0164	0.0179	0.0273	0.0163	0.1139
Iraq 07	0.0164	0.0336	0.0187	0.0287	0.0175	1.3636	0.6106
Jordan	0.0035	0.0043	0.0083	0.0106	0.0127	0.0037	0.0086
Lebanon	0.0070	0.1280	0.0175	0.0006	0.0011	0.0005	0.0629
Morocco	0.0393	0.0081	0.0072	0.0092	0.0037	0.0045	0.0068
Syria	0.0167	0.0220	0.0519	0.0737	0.1061	0.0794	0.0712
Oman	0.0101	0.0052	0.0061	0.0159	0.0099	0.0176	0.0122
Yemen	0.3170	0.5534	0.2253	0.0679	0.0427	0.0222	0.2629
Sudan	0.0103	0.0043	0.0245	0.0105	0.0123	0.0061	0.0137
Somalia 96				0.0024	0.0066	0.0006	0.0033
Somalia 02	0.0001	0.0016	0.0173	0.0657	0.0350	0.0135	0.0389
Mauritania	0.0219	0.0080	0.0172	0.0152	0.0226	0.0050	0.0147
Tunisia	0.0057	0.0068	0.0047	0.0112	0.0146	0.0102	0.0100
Egypt	0.0089	0.0175	0.0326				0.0273
Bahrain	0.0221	0.0080	0.0126	0.0079	0.0111	0.0099	0.0107

Source: Authors' computations based on Table B.6.

Notes: *Pre peace* stands for the six month period of conflict just before the peace comes; *PC1* stands for the first post-conflict year; *PC2* stands for the second post-conflict year; *PC3* stands for the third post-conflict year; *PC4* stands for the fourth post-conflict year; *PC5* stands for the fifth post-conflict year. Iraq 91 means the civil conflict occurring in Iraq in 1991. Iraq 2003 means the civil violence taking place by the beginning of the US/UK invasion in 2003. Iraq 2007 means the sectarian violence taking place in Iraq in 2006/2007. Somalia 96 means the civil conflict in Somalia that terminated in 1996. Somalia 2002 means the civil conflict in Somalia that terminated in 2002. Table B.13 presents the definition of the variables.

Table B. 8: System-GMM Equations using Robust Standard Errors

Dependent Variable: The difference in the log of per capita GDP in two consecutive years

Variables	Model 1	Model 2	Model 3	Model 4
L. Log of Economic Level	-0.00512 (-0.362)	-0.00390 (-0.0578)	-0.0362 (-0.641)	0.924 (0.498)
Exchange Rate Volatility	0.116 (0.269)	-1.606 (-0.256)	-1.536 (-0.566)	-14.93 (-0.493)
D. Trade Openness			0.00469 (0.696)	
D. Secondary School Enrollment			-0.00353 (-0.754)	
Government Consumption			0.0145 -0.00739	
D. Financial Trust			(-1.536)	
Civil Conflict × Log ERV	-0.510 (-0.731)	1.559 (0.224)	18.50 (1.213)	1.902 (0.190)
Conflict Termination × Log ERV	-0.0344 (-0.0851)	1.102 (0.136)	0	9.275 (0.445)
Post Conflict1 × Log ERV	-0.0163 (-0.0260)	0.845 (0.150)	9.813 (0.186)	-968.0 (-0.513)
Post Conflict2 × Log ERV	-0.263 (-0.601)	-1.818 (-0.215)	-21.83 (-1.711)	83.01 (0.509)
Post Conflict3 × Log ERV	-0.409 (-0.612)	-0.853 (-0.0342)	-14.87 (-1.149)	-211.8 (-0.528)
Post Conflict4 × Log ERV	-0.941* (-1.859)	-2.251 (-0.161)	5.497 (0.581)	-48.26 (-0.556)
Post Conflict5 × Log ERV	-0.137 (-0.219)	58.88 (0.203)	-0.902 (-0.105)	334.5 (0.497)
Civil Conflict		-0.0414 (-0.196)	-0.460 (-0.889)	-2.651 (-0.499)
Peace Onset		-0.00414 (-0.0136)	0.290 (0.582)	-2.883 (-0.479)
Post Conflict1		0.0218 (0.0973)	0.0851 (0.0953)	22.74 (0.513)

Post Conflict2		0.112 (0.280)	0.830* (2.089)	-10.23 (-0.508)
Post Conflict3		0.0220 (0.0344)	0.799 (1.407)	11.04 (0.528)
Post Conflict4		0.0624 (0.164)	0.0465 (0.110)	12.95 (0.518)
Post Conflict5		-1.183 (-0.197)	0.164 (0.475)	-4.130 (-0.506)
Executive Constraints				-0.306 (-0.519)
Log of FDI			-0.00739	-0.330 (-0.487)
Log of Inflation				0.00846 (0.382)
Population Growth				-27.75 (-0.508)
Obs.	649	649	345	428
Number of countries	22	22	20	21
Hansen, p-Value	1.000	1.000	1.000	1.000
Arellano-Bond AR (1), p-value	0.158	0.760	0.153	.
Arellano-Bond AR (2), p-value	0.215	0.473	0.531	0.807
Number of instruments	55	75	92	98

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. Constants and time dummies, which are groups of years, are not shown for brevity. Robust standard errors in parentheses. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. D. means that we use the first differences of this variable. System-GMM regressions treat explanatory variables as endogenous except for lagged GDP pc, while time groups are considered as strictly exogenous variable. System-GMM regressions collapse the instrument matrix and use lags from period $t - 2$ to $t - 5$. In the case of two-step GMM, the Windmeijer (2005) finite sample correction for standard errors is employed. Hansen Test is used for testing over-identifying restrictions in the model. Arellano-Bond AR (1) examines the hypothesis that the error terms in first differences are not serially correlated. Arellano-Bond AR (2) examines the hypothesis that the error terms are not serially correlated. Table B.13 presents a description of the variables used.

Table B. 9: Iterative Bootstrap-based Bias Correction for The Fixed Effects Estimation

Dependent Variable: The difference in the log of per capita GDP in two consecutive years													
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
L. Economic Growth	-0.112 (0.180)	-0.114 (0.200)	-0.129 (0.200)	-0.136 (0.203)	-0.233 (0.191)	0.112 (0.0904)	0.0632 (0.115)	-0.0783 (0.139)	0.159** (0.0648)	-0.00989 (0.147)	-0.251 (0.220)	-0.134 (0.182)	0.0905 (0.104)
Exchange Rate Volatility	-	0.0216	-0.0449	-0.0497	-0.0632	0.0274	-0.0504	-0.107	-0.0612	-0.0491	-0.0501	-0.0776	-0.0722
Population Growth	0.00653 (0.0690)	(0.110)	(0.103)	(0.0917)	(0.135)	(0.213)	(0.120)	(0.143)	(0.103)	(0.0860)	(0.121)	(0.128)	(0.0980)
Civil Conflict × Log ERV		-0.0814 (1.059)	0.0521 (1.363)	0.0627 (1.457)	0.0528 (2.271)	-0.190 (1.423)	0.0748 (0.519)	0.113 (1.437)	0.0950 (0.477)	-0.465 (0.386)	0.0596 (1.226)	0.0875 (2.632)	-0.405 (0.518)
Conflict Termination × Log ERV		0.0199 (0.328)	0.0729 (0.453)	0.0910 (0.571)	0.104 (0.705)	-2.044 (8.686)	0.108 (1.002)	0.176 (0.616)	0.0432 (1.894)	-1.505 (2.692)	0.123 (0.680)	0.124 (0.908)	-1.558 (2.189)
Post Conflict1 × Log ERV		0.0779 (0.810)	0.0760 (1.211)	0.0936 (1.220)	0.0745 (1.561)	-0.593 (5.101)	0.0477 (1.541)	0.0751 (0.596)	0.0380 (1.026)	4.425 (2.803)	0.0686 (1.355)	0.0960 (1.120)	-0.275 (1.293)
Post Conflict2 × Log ERV		-0.152 (0.217)	-0.136 (0.382)	-0.106 (0.281)	-0.163 (0.410)	-2.021 (10.53)	-0.148 (0.324)	-0.208 (0.911)	-0.0916 (0.570)	-0.419 (0.985)	-0.144 (0.817)	-0.0970 (0.285)	-0.297 (1.043)
Post Conflict3 × Log ERV		-0.386 (0.599)	-0.676 (1.028)	-0.692 (0.755)	-0.740 (0.755)	-0.243 (7.770)	-0.275 (0.840)	-0.759 (0.682)	-0.0592 (0.754)	-0.284 (0.893)	-1.125 (0.766)	-0.967 (3.132)	-0.127 (1.091)
Post Conflict4 × Log ERV		-0.543 (0.422)	-0.349 (0.556)	-0.398 (0.682)	-0.452 (1.402)	-0.781 (0.738)	-0.539 (1.219)	-0.686 (0.507)	-0.190 (0.490)	-0.457 (0.533)	-0.456 (0.899)	-0.272 (1.025)	-0.462 (0.365)
Civil Conflict		0.0144 (0.475)	0.328 (0.933)	0.263 (0.844)	0.132 (1.014)	-0.595 (15.94)	0.377 (0.821)	-0.173 (1.145)	0.269 (0.916)	-0.507 (0.961)	-0.0441 (1.673)	0.831 (1.148)	-0.497 (0.650)
Peace Onset			-0.0368* (0.0193)	-0.0358 (0.0236)	-0.0307 (0.0332)	0.00345 (0.0196)	-0.0166 (0.0149)	-0.0336 (0.0214)	-0.0130 (0.0107)	0.00937 (0.00848)	-0.0284 (0.0243)	-0.0276 (0.0365)	0.0106 (0.00955)
Post Conflict 1			-	-0.00820 (0.00855)	-0.0251 (0.0175)	0.0336 (0.0191)	-0.00422 (0.0159)	-0.00496 (0.0144)	0.00537 (0.0324)	0.0148 (0.0456)	-0.0228 (0.0170)	-0.00479 (0.0218)	0.0198 (0.0410)
Post Conflict 2			0.0138 (0.0270)	0.0143 (0.0269)	0.0171 (0.0323)	0.0269 (0.0644)	0.0310 (0.0297)	0.00661 (0.0141)	0.0111 (0.0167)	-0.0400 (0.0363)	0.0113 (0.0266)	0.0204 (0.0251)	0.0158 (0.0200)
Post Conflict 3			-	-0.00306 (0.00283)	-0.000472 (0.0193)	0.0377 (0.0177)	-0.0110 (0.0216)	-0.00793 (0.0315)	-0.00938 (0.0209)	0.00188 (0.0253)	0.00758 (0.0242)	0.000951 (0.0192)	0.000668 (0.0257)
Post Conflict 4			0.00441 (0.0292)	0.00533 (0.0249)	0.0143 (0.0289)	-0.0143 (0.135)	0.000863 (0.0292)	0.0131 (0.0218)	-0.0120 (0.0198)	-0.00994 (0.0253)	0.0273 (0.0345)	0.0150 (0.0535)	-0.00806 (0.0261)
Post Conflict 5			-0.0186 (0.0279)	-0.0154 (0.0261)	-0.0131 (0.0411)	-0.00151 (0.0197)	-0.00666 (0.0326)	0.00797 (0.0190)	-0.0219 (0.0211)	-0.00777 (0.0127)	-0.00587 (0.0388)	-0.0171 (0.0277)	-0.00389 (0.00931)
			-0.0178 (0.0218)	-0.0156 (0.0214)	-0.0130 (0.0297)	0.0301 (0.337)	-0.00899 (0.0194)	-1.44e-06 (0.0240)	-0.00509 (0.0225)	0.0201 (0.0189)	-0.00555 (0.0435)	-0.0235 (0.0223)	0.0243 (0.0151)

Table B. 10: Bias Corrected Least Square Dummy Variables Estimation

Dependent Variable: The difference in the log of per capita GDP in two consecutive years

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
L. Economic Growth	-	-	-0.164***	-0.170***	-0.192***	0.114	0.0562	-0.0601*	0.223***	-0.227***	-0.244***	-0.172***	0.133
	0.151***	0.153***											
	(0.0427)	(0.0424)	(0.0424)	(0.0423)	(0.0422)	(0.0834)	(0.0383)	(0.0355)	(0.0504)	(0.0758)	(0.0420)	(0.0422)	(0.224)
Exchange Rate Volatility	-0.00325	0.0156	-0.0436	-0.0487	-0.0545	-0.0768	-0.0480	-0.107	-0.0576	-0.0503	-0.0458	-0.0636	-0.0563
	(0.0480)	(0.0805)	(0.0891)	(0.0891)	(0.0900)	(0.236)	(0.0675)	(0.0703)	(0.185)	(0.229)	(0.0868)	(0.0951)	(0.388)
Civil Conflict × Log ERV		-0.0759	0.0486	0.0600	0.0484	-0.627	0.0740	0.110	0.112	0.292	0.0507	0.0681	-0.814
		(0.111)	(0.123)	(0.123)	(0.119)	(0.710)	(0.0871)	(0.0973)	(0.407)	(0.736)	(0.119)	(0.132)	(3.257)
Conflict Termination × Log ERV		0.0210	0.0840	0.104	0.0815	-1.866	0.103	0.172	0.0581	0.120	0.116	0.113	-0.930
		(0.125)	(0.133)	(0.133)	(0.138)	(5.925)	(0.111)	(0.114)	(0.317)	(0.420)	(0.145)	(0.143)	(9.785)
Post Conflict1 × Log ERV		0.124	0.0783	0.0968	0.0490	6.353	0.0491	0.0711	0.0347	2.396	0.0623	0.0943	-0.0168
		(0.137)	(0.159)	(0.158)	(0.157)	(3.943)	(0.124)	(0.145)	(0.210)	(4.874)	(0.157)	(0.169)	(14.91)
Post Conflict2 × Log ERV		-0.140	-0.132	-0.0993	-0.146	-1.572	-0.139	-0.207	-0.0912	-0.353	-0.146	-0.101	-1.446
		(0.227)	(0.272)	(0.273)	(0.240)	(2.554)	(0.176)	(0.196)	(0.293)	(0.934)	(0.290)	(0.294)	(9.783)
Post Conflict3 × Log ERV		-0.418	-0.664	-0.675	-0.541	-0.157	-0.240	-0.687	-0.270	-0.979	-1.115	-0.979	-0.134
		(0.607)	(0.887)	(0.886)	(0.963)	(1.170)	(0.649)	(0.842)	(0.685)	(1.139)	(0.937)	(0.935)	(11.95)
Post Conflict4 × Log ERV		-0.546	-0.401	-0.451	-0.481	-0.697	-0.490	-0.691*	-0.349	-0.625	-0.472	-0.537	-0.744***
		(0.388)	(0.450)	(0.453)	(0.726)	(0.702)	(0.536)	(0.403)	(0.551)	(2.824)	(0.499)	(0.470)	(0.0556)
Post Conflict5 × Log ERV		0.00722	0.176	0.109	0.137	-0.475	0.436	-0.0201	0.226	-0.785	0.00173	-0.0523	-0.337***
		(0.778)	(1.310)	(1.311)	(1.534)	(1.490)	(0.985)	(0.978)	(0.974)	(2.466)	(1.382)	(1.413)	(0.0941)
Civil Conflict			-0.032***	-0.031***	-0.0303***	0.00372	-0.0171**	-0.0336***	-0.0134	-0.0149	-0.0275**	-0.0244**	0.00557
			(0.00904)	(0.00899)	(0.0103)	(0.0174)	(0.00834)	(0.00893)	(0.0107)	(0.0200)	(0.0114)	(0.0103)	(0.167)
Peace Onset			-0.0116	-0.0113	-0.0120	0.0234	-0.00277	-0.00343	-0.00276	-0.0153	-0.0218	-0.00497	0.0155
			(0.0183)	(0.0183)	(0.0177)	(0.0738)	(0.0137)	(0.0164)	(0.0180)	(0.0255)	(0.0214)	(0.0196)	(0.108)
Post Conflict 1			0.0269	0.0271	0.0264	-0.0718	0.0322**	0.00490	0.00979	-0.0212	0.0143	0.0283	0.0199
			(0.0193)	(0.0193)	(0.0181)	(0.0500)	(0.0139)	(0.0151)	(0.0149)	(0.0649)	(0.0219)	(0.0203)	(0.182)
Post Conflict 2			-0.000141	-0.000355	-0.00301	0.0250	-0.0114	-0.0102	-0.00402	0.00458	0.00750	0.000330	0.0253
			(0.0185)	(0.0185)	(0.0189)	(0.0433)	(0.0143)	(0.0141)	(0.0190)	(0.0344)	(0.0242)	(0.0193)	(0.0675)
Post Conflict 3			0.00500	0.00581	0.00265	-0.0136	-0.000668	0.00942	0.000543	0.0156	0.0276	0.0140	-0.0138
			(0.0283)	(0.0283)	(0.0316)	(0.0420)	(0.0246)	(0.0261)	(0.0240)	(0.0433)	(0.0321)	(0.0296)	(0.0652)
Post Conflict 4			-0.0130	-0.00979	-0.0121	-0.00201	-0.00979	0.00707	-0.00782	0.00319	-0.00615	-0.00959	-0.00518
			(0.0215)	(0.0217)	(0.0257)	(0.0419)	(0.0187)	(0.0216)	(0.0217)	(0.0640)	(0.0315)	(0.0229)	(0)

Post Conflict 5	-0.0114	-0.00900	-0.0130	0.0274	-0.0119	-0.00479	-	0.0207	-0.00859	-0.00833	0.0187		
	(0.0329)	(0.0331)	(0.0360)	(0.0445)	(0.0284)	(0.0238)	0.000802	(0.0793)	(0.0415)	(0.0348)	(0)		
Population Growth		-0.577***									0.0566		
		(0.201)									(0.366)		
D. Trade Openness			0.000489										
			(0.000355)										
D. Secondary School Enrollment				0.00272**							0.00165		
				(0.00113)							(0.00219)		
Government Consumption					-0.000241								
					(0.000467)								
D. Financial Trust						-					-0.00108*		
						0.00460***					(0.000622)		
						(0.000284)							
Executive Constraints							-						
							0.000859						
							(0.00308)						
Log of FDI								0.00409			0.00563		
								(0.00417)			(0.0101)		
Inflation									-0.000141				
									(0.000126)				
International Conflict										-	0.00522		
										0.0390***			
										(0.0135)	(0.0218)		
International Sanction										0.0134			
										(0.0152)			
Military Coup										-0.00559			
										(0.0215)			
Obs.	649	649	649	649	575	419	570	616	622	557	543	648	353
Number of Countries	22	22	22	22	22	22	22	22	21	21	21	22	21

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. This estimator was developed by Bruno (2005) initiated with the Anderson-Hsiao estimator and standard errors obtained through 100 bootstrap iterations. We use AH estimator as an instrument for the first-differenced model with no intercept. Robust standard errors are in parentheses and are clustered based on the countries. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. D. means that we use the first differences of this variable. Table B.13 presents a description of the variables used.

Table B. 11: Robustness Checks- Adding a Variable of The Exchange Rate Regime

Dependent Variable: The difference in the log of per capita GDP in two consecutive years

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
L. Log Economic level	-0.0652* (0.0324)	-0.0421** (0.0171)	-0.0427** (0.0176)	-0.0504** (0.0205)	-0.0418* (0.0217)
Exchange Rate Volatility	-0.0571 (0.0546)	-0.124*** (0.0426)	-0.123** (0.0428)	-0.0911** (0.0407)	-0.0661 (0.0398)
D. Trade Openness		-0.000545* (0.000259)	-0.000562** (0.000253)	-0.000445* (0.000244)	-0.000340 (0.000304)
D. Secondary School Enrollment		0.000354 (0.000765)	0.000398 (0.000805)	0.000270 (0.000808)	0.000932 (0.000902)
Government Consumption					-9.01e-05 (0.000813)
D. Financial Trust		-0.000981** (0.000431)	-0.00100** (0.000444)	-0.00102** (0.000430)	-0.000913* (0.000449)
Executive Constraints					0.000766 (0.00215)
Log of FDI		0.00708** (0.00247)	0.00704** (0.00258)	0.00613** (0.00278)	0.00633** (0.00275)
Inflation		-0.000101 (5.98e-05)	-0.000101 (6.46e-05)	-0.000111** (4.59e-05)	-4.69e-05 (4.24e-05)
population Growth		-0.256 (0.168)	-0.252 (0.170)	-0.285 (0.181)	-0.195 (0.169)
Exchange Rate Regime	0.00873 (0.00728)	0.00722 (0.00501)	0.00724 (0.00540)	0.0107* (0.00519)	0.00927 (0.00546)
International Conflict				-0.00507 (0.00784)	-0.00985 (0.0109)
International Sanction				-0.0318*** (0.00896)	-0.0249** (0.00903)
Military Coup				-0.0192 (0.0159)	-0.0202 (0.0177)
Civil Conflict			-0.00318 (0.00437)	-0.00519 (0.00445)	0.0147 (0.0119)
Peace Onset			-0.0107	-0.0127	-0.00366

Post Conflict 1			(0.0103)	(0.00944)	(0.0222)
			0.0130	0.0107	-0.00748
			(0.00991)	(0.00924)	(0.00798)
Post Conflict 2			0.00894	0.0114	0.0742***
			(0.0246)	(0.0226)	(0.0255)
Post Conflict 3			0.00531	0.00739	0.0325**
			(0.0128)	(0.0139)	(0.0138)
Post Conflict 4			-0.0257	-0.0215	0.00837
			(0.0174)	(0.0136)	(0.0131)
Post Conflict 5			0.00298	0.00691	0.0310
			(0.0171)	(0.0148)	(0.0384)
Civil Conflict × Log ERV					-0.720**
					(0.323)
Conflict Termination × Log ERV					-0.0515
					(1.449)
Post Conflict1 × Log ERV					1.585***
					(0.270)
Post Conflict2 × Log ERV					-2.028***
					(0.457)
Post Conflict3 × Log ERV					-0.648
					(0.644)
Post Conflict4 × Log ERV					-0.728***
					(0.102)
Post Conflict5 × Log ERV					-0.641
					(0.804)
RMSE	0.075	0.036	0.036	0.036	0.035
F-Test for Joint Significant of Fixed Effects	793.30***	944.01***	1.0e+08***	81619.06***	76272.66***
Obs.	508	271	271	270	268
R-squared	0.035	0.140	0.157	0.183	0.240
Number of Countries	22	18	18	18	18

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. Standard errors are in parentheses and are clustered by country. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. D. means that we use the first differences of this variable. Table B.13 presents a description of the variables used.

Table B. 12: Robustness Check- Classifying the MENA Countries into Three Groups, Fixed-effects Regressions

Dependent Variable: The difference in the log of per capita GDP in two consecutive years

Variables	Panel 1			Panel 2			Panel 3		
	Group one	Group Two	Group Three	Group one	Group Two	Group Three	Group one	Group Two	Group Three
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
L. Log Economic level	-0.0253 (0.0194)	-0.0271** (0.00976)	-0.192 (0.148)	-0.0524 (0.0354)	-0.0424* (0.0195)	0.00195 (0.108)	-0.0616 (0.0401)	-0.0515* (0.0265)	0.00195 (0.108)
Exchange Rate Volatility	0.00318 (0.0281)	-0.309 (0.364)	-0.750*** (0.194)	-0.0937* (0.0433)	-0.667*** (0.170)	2.338*** (0.297)	-0.0698 (0.0533)	-0.358 (0.252)	2.338*** (0.297)
Exchange Rate Regime				-0.00158 (0.0207)	0.00779* (0.00321)	0.0279*** (0.00260)	-0.000862 (0.0186)	0.00333 (0.00576)	0.0279*** (0.00260)
Population Growth				-1.011 (0.882)	0.131 (0.728)	-0.620** (0.202)	-2.072* (0.876)	0.00443 (0.669)	-0.620** (0.202)
D. Secondary School Enrollment				0.00138 (0.00164)	0.00237 (0.00223)	-0.00168** (0.000566)	0.00130 (0.00177)	0.00253 (0.00212)	-0.00168** (0.000566)
D. Financial Trust				-0.00246 (0.00131)	-0.000660 (0.000407)	-0.000845 (0.000430)	-0.00224 (0.00135)	-0.000624 (0.000428)	-0.000845 (0.000430)
Log of FDI				0.00458 (0.00375)	0.00777 (0.00451)	0.00857 (0.00680)	0.00384 (0.00370)	0.00780 (0.00492)	0.00857 (0.00680)
Inflation				-0.000492 (0.000356)	-6.26e-05* (2.91e-05)	0.00123 (0.000642)	-0.000398 (0.000420)	-6.85e-05* (3.16e-05)	0.00123 (0.000642)
International Sanction							-0.0363*** (0.00839)	-0.0235** (0.00878)	
Civil Conflict × Log ERV	-0.0146 (0.0234)	-0.848* (0.419)	-17.43** (5.955)	-0.00243 (0.347)	-0.646 (0.336)		-0.519 (0.386)	-0.360* (0.173)	
Conflict Termination × Log ERV	0.00979 (0.0231)	1.219** (0.420)	1.031 (2.840)	-0.0125 (0.886)	-2.114*** (0.483)	-1.290*** (0.232)	1.916 (3.249)	-1.988 (3.438)	
Post Conflict1 × Log ERV	0.0709 (0.106)	2.723*** (0.692)	2.203 (2.518)	0.939** (0.323)	-0.521 (1.406)		1.223* (0.592)	12.12*** (3.063)	
Post Conflict2 × Log ERV	-0.161 (0.109)	0.195 (0.393)	-1.348 (4.693)	-0.779*** (0.0876)	1.801 (1.184)		-1.102** (0.367)	-7.254*** (1.669)	
Post Conflict3 × Log ERV	0.159 (0.363)	-0.736* (0.348)	-5.071 (5.344)	-0.122 (0.462)	-0.474 (0.298)		0.378 (0.868)	-1.441*** (0.233)	
Post Conflict4 × Log ERV	-0.375	-1.391**	-12.96*	-0.719***	-1.556***		-0.606**	-3.362***	

Post Conflict5 × Log ERV	(0.219) 0.194 (0.588)	(0.400) 0.393 (0.502)	(6.518) -6.183 (3.717)	(0.137) -0.630 (0.492)	(0.202) 0.966* (0.489)		(0.199) -0.389 (1.192)	(0.455) -1.247 (0.675)	
Civil Conflict							0.0197 (0.0186)	-0.00667 (0.0101)	
Peace Onset							-0.0335 (0.0763)	0.00185 (0.0366)	-0.0256*** (0.00461)
Post Conflict 1							-0.00214 (0.0225)	-0.0843** (0.0271)	
Post Conflict 2							0.0238 (0.0152)	0.188*** (0.0208)	
Post Conflict 3							-0.0115 (0.0483)	0.0317*** (0.00816)	
Post Conflict 4							0.0119 (0.0107)	0.0361*** (0.00926)	
Post Conflict 5							0.0112 (0.0663)	0.0771** (0.0262)	
RMSE	0.066	0.039	0.095	0.038	0.034	0.034	0.038	0.033	0.034
F-Test for Joint Significant of Fixed Effects	3694.68***	6780.18***	1244.13***	271.66***	13330.73***	129.81***	8.89***	1553.90***	129.81***
Obs.	232	246	171	101	145	36	100	145	36
R-squared	0.020	0.210	0.297	0.283	0.229	0.356	0.329	0.327	0.356
Number of Countries	7	8	7	6	7	6	6	7	6

Notes: The regressions build on an annual unbalanced panel covering 22 MENA countries and spanning between 1970 and 2014. Robust standard errors are in parentheses and are clustered based on the countries. ***, **, * indicate significance at the 1, 5, and 10%, respectively. L. means that we use the first lagged value for this variable. D. means that we use the first differences of this variable. The MENA countries are classified into three groups: Group One, The Resource Rich–Labour Abundant group, includes Algeria, Iran, Iraq, Syria, Turkey, Sudan and Yemen. Group Two, The Resource Poor–Labour Abundant group, includes Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, Israel, Mauritania, and Somalia. Group Three, The Resource Rich–Labour Importing group, includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates, and Libya. Models 5 and 8 drop Lebanon due to insufficient data. Models 6 and 9 drop United Arab Emirates due to insufficient data. Table B.13 presents a description of the variables used.

Table B. 13: Definitions and Sources of the Variables Used

Variable	Description	Unit	Source/ Based on
Per capita GDP Growth	The difference in the log of per capita GDP in two consecutive years	% Annual	World Bank / WDI
GDP pc	per capita Gross Domestic Product	constant 2005 USD	World Bank / WDI
Exchange Rate Volatility	The annual standard deviation of the monthly differences of the logarithmic ER values.		BRUEGEL, Banque du Liban, OANDA
Log Economic Level	The logarithmic value of per capita GDP	constant 2005 USD	World Bank / WDI
Inflation	Inflation, as measured by the consumer price index, reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services. The Laspeyres formula is generally used.	%	World Bank / WDI
Log Public Consumption	The logarithmic Value of the governmental current expenditure as a percentage of GDP.	% of GDP	World Bank / WDI
Financial Trust	The ratio of M2, liquid liabilities, to GDP	% of GDP	World Bank / WDI
Population Growth	The difference in the log of population in two consecutive years	%	World Bank / WDI
Executive Constraints	The extent of institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities.	A 7-category scale	Polity IV dataset
ODA	Net official developmental assistance received	% of central government expense	World Bank / WDI
Secondary School Enrolment	Ratio of total secondary enrollment, regardless of age, to the population of the age group that officially corresponds to that level of education.	%	World Bank / WDI
Trade Openness	Ratio of exports and imports (in local currency) to GDP (in local currency).	% of GDP	World Bank / WDI
Financial Development	claims on other sectors (not governmental) of the domestic economy	% of GDP	World Bank / WDI
Public Debt	Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities.	% of GDP	World Bank / WDI
Natural Resources	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	% of GDP	World Bank / WDI
Exchange Rate Regime	A dummy variable whose value is 0 when the country follows a fixed regime, and 1 otherwise		IMF
Gross Domestic Saving	Gross domestic savings are calculated as GDP less total consumption expenditure.	% of GDP	World Bank / WDI

Military Coup	A dummy variable that is equal to one if the country faced a military coup in a specific year.
International Sanctions	A dummy variable that is equal to one if the country suffered international sanctions, posed by either the UN or the USA, in a specific year.
An International Conflict	A dummy variable that is equal to one if the country was involved in an international or regional conflict in a specific year,
Civil Conflict	A dummy variable that equals one if the country faces a civil conflict in a specific year.
Conflict Termination	A dummy variable that equals one if the country faces a civil conflict termination in a specific year.
Post Conflict 1	A dummy variable that equals one if it is the first post-conflict year in a specific country.
Post Conflict 2	A dummy variable that equals one if it is the second post-conflict year in a specific country.
Post Conflict 3	A dummy variable that equals one if it is the third post-conflict year in a specific country.
Post Conflict 4	A dummy variable that equals one if it is the fourth post-conflict year in a specific country.
Post Conflict 5	A dummy variable that equals one if it is the fifth post-conflict year in a specific country.
Group 1	A dummy variable that equals one if the observation is in a peaceful year before 1980.
Group 2	A dummy variable that equals one if the observation is in a peaceful year between 1980 and 1989.
Group 3	A dummy variable that equals one if the observation is in a peaceful year between 1990 and 1999.
Group 4	A dummy variable that equals one if the observation is in a peaceful year between 2000 and 2009.
Group 5	A dummy variable that equals one if the observation is in a peaceful year between 2010 and 2014.
Group 6	Identical to the variable of civil conflict
Group 7	Identical to the variable of conflict termination
Group 8	Identical to the variable of post conflict 1
Group 9	Identical to the variable of post conflict 2

UCDP, MEPV, and a historical review by the authors

Group 10

Identical to the variable of post conflict 3

Group 11

Identical to the variable of post conflict 4

Group 12

Identical to the variable of post conflict 5

Appendices to Chapter Four

Appendix C

Table C. 1: Quantities and Calories Generated by The Reference Food Bundle

	Rural			Urban		
	Daily Caloric Intake	Quantity in KG	% of Total Calories	Daily Caloric Intake	Quantity in KG	% of Total Calories
Cereals and Starches	1094.07	0.6972	47.36	1041.1	0.606	49.57
Pulses	40.15	0.017	1.74	47.33	0.0182	2.25
Meat and Poultry	89.9	0.0666	3.89	87.19	0.0571	4.15
Fish	6.78	0.0134	0.29	8.72	0.0121	0.42
Eggs	23.62	0.3516	1.02	26.11	0.3521	1.24
Milk & Milk products	147.54	0.1888	6.29	138.83	0.1485	6.66
Oil and Butters	335.94	0.06	14.54	257.04	0.0416	12.24
Vegetables	171.37	0.6892	7.42	170.29	0.6375	8.11
Fruit	47.27	0.1451	2.05	52.95	0.1468	2.52
Sugar	296.22	0.1208	12.82	176.72	0.0674	8.42
others	50.87	0.0291	2.2	85.86	0.023	4.09
Drinks	6.27	0.0276	0.27	6.94	0.0259	0.33

Source: El-Laithy and Abu-Ismael (2005).

Notes: The food bundle is typically chosen to be sufficient to reach the predetermined caloric requirement, 2400 calories per day, with a composition that is consistent with the consumption behavior of the poor. This bundle is then evaluated using prices prevailing in each region and at each date.

Table C. 2: General and Food consumer Prices Index of Syria by Governorates in 2007 (2005=100)

	Damascus	Rif Damascus	Homs	Hama	Tartous	Lattakia	Idleb	Aleppo	Raqqa	Deir Azzor	Hasakeh	Sweida	Daraa	Quneitra	Syria
CPI	116.45	115.44	115.89	114.17	113.99	113.52	112.83	115.72	114.66	116.74	115.4	114.95	116.3	113.54	114.97
Food	126.3	122.82	122.92	121	125.39	122.81	119.4	121.77	124.24	124.79	123.72	123.75	122.95	120.54	123.03
Bread & Cereals	113.69	112.11	112.63	111.67	111.61	109.01	108.77	110.86	113.64	116.4	112.95	113.68	110.71	111.63	112.1
Meat	121.05	121.1	123.84	126.61	135.2	126.89	121.72	124.65	128.2	125.41	131.24	126.7	132.18	118.23	125.93
Fisheries & sea food	125.37	113.26	109.31	101.57	115.04	117.38	113.69	105.57	107.77	104.71	108.21	111.36	108.76	119.42	111.53
Yogurt, Cheese, Eggs	132.47	128.79	130.57	127.08	130.99	125.72	124.85	133.99	136.52	133.69	136.03	133.76	130.97	131.69	131.22
Fats & oils	121.35	117.91	111.11	111.08	105.76	119.91	106.48	110.23	107.49	114.2	111.63	113.7	108.16	117.14	112.58
Fruits	138.02	134.23	129.54	131.96	125.81	121.48	126.52	126.22	140.45	136.36	137.56	127.26	138.98	130.96	131.81
Dry legumes & Vegetables	130.89	126.98	134.09	128.47	138.67	132.05	130.9	126.77	131.53	133.54	125.87	133.96	127.27	121.69	130.19
Sugar, Jam, Honey, chocolate, sweet	134.39	121.43	121.68	121.06	120.11	116.8	116.57	124.52	139.02	131.21	125.09	121.03	124.94	126.94	124.63
Food products	113.76	112.33	112.08	117.38	119.12	121.07	117.62	120.11	120.9	111.54	119.33	116.29	117.05	111.52	116.44
Non - Alcoholic Beverages	111.1	106.95	108.39	109.27	106.07	107.41	112.05	113.42	113.52	113.6	110.78	112.37	113.84	117.77	111.18

Source: CBS (2018b).

Notes: CPI stands for consumer price index.

Table C. 3: General and Food consumer Prices Index of Syria by Governorates in 2009 (2005=100)

	Damascus	Rif Damascus	Homs	Hama	Tartous	Lattakia	Idleb	Aleppo	Raqqa	Deir Azzor	Hasakeh	Sweida	Daraa	Quneitra	Syria
CPI	133.53	123.96	134.7	139.26	138.04	132.96	135.68	140.3	142.59	143.89	138.66	141.16	142.53	140.97	137.73
Food	150.66	139.95	145.16	148.1	155.33	151.02	144.17	151.91	149.91	154	151.74	148.1	147.23	144.25	148.68
Bread & Cereals	158.71	154.75	164.01	163.22	158.8	151.67	158.16	160.58	166.85	165.96	156.8	159.85	156.74	155.13	159.37
Meat	159	146.72	157.67	170.95	169.82	162.85	162.63	175.85	164.77	157.46	160.89	147.27	167.68	146.93	160.75
Fisheries & sea food	131.53	123.75	110.52	110.56	161.59	127.03	116.53	110.08	113.83	108.26	117.82	119	117.97	123.2	120.83
Yogurt, Cheese, Eggs	167.54	154.65	154.31	162.3	167.74	160.54	154.62	172.57	177.39	160.14	173.31	162.03	155.12	164.36	163.33

Fats & oils	143.39	139.31	129.57	135.7	126.32	140.87	125.39	134.56	134.02	142.63	137.67	137.02	137.57	142.46	136.18
Fruits	156.03	139.01	138.81	146.81	152.72	153.46	139.73	138.01	164.93	166.69	152.02	153.55	148.47	148.8	149.93
Dry legumes & Vegetables	136.43	119.94	135.23	131.39	155.22	146.45	132.56	124.69	127.57	141.91	139.94	142.86	127.55	119.59	134.38
Sugar, Jam, Honey, chocolate, sweet	152.29	139.77	136.3	131	144.84	134.79	140.74	149.65	146.66	136.73	148.45	140.2	143.26	154.59	142.8
Food products	142.55	132.6	145.38	154.08	152.61	160.65	136.94	149.69	152.65	155.44	156.71	147.63	139.11	130.1	146.87
Non - Alcoholic Beverages	128.72	127.2	130.68	135.31	132.18	130.05	140.03	136.95	144.44	143.62	138.74	132.7	139.6	144.13	136.02

Source: CBS (2018b).

Notes: CPI stands for consumer price index.

Table C. 4: General and Food Consumer Prices Index of Syria by Governorates in 2015 (2005=100)

	Damascus	Rif Damascus	Homs	Hama	Tartous	Lattakia	Idleb	Aleppo	Raqqa	Deir Azzor	Hasakeh	Sweida	Daraa	Quneitra	Syria
CPI	398.22	418.7	415.44	421.55	392.17	377.41	423.8	455.55	529.95	518.33	416.31	423.07	430.77	436.78	430.21
Food	478.16	468.09	482.41	465.86	470.11	486.6	497.57	515.92	682.79	668.35	478.45	513.57	492.76	458.6	500.95
Bread & Cereals	471.64	453.85	458.48	461.59	471.35	482	467.39	509.39	534.85	566.97	468.95	487.73	516.91	462.7	484.5
Meat	423.67	404.85	414.35	381.21	411.4	406.34	369.23	440.63	567.23	546.88	395.67	443.32	444.7	450.82	432.16
Fisheries & sea food	581.77	596.09	470.36	514.56	516.88	607.7	470.42	634	757.05	689.43	406.73	589.83	586.13	572.81	569.45
Yogurt , Cheese , Eggs	527.75	543.83	530.15	515.06	508.17	519.8	532.67	573.15	726.83	785.47	510.4	517.82	535.91	534.61	558.92
Fats & oils	472.98	481.01	506.22	477.48	491.31	486.23	500.73	523.77	609.45	609.4	511.29	515.22	478.44	458.49	505.6
Fruits	583.52	560	676.68	634.02	622.35	661.55	710.02	610.05	885.16	844.44	591.04	675.31	655.45	520.82	616.01
Dry legumes & Vegetables	443.19	434.29	444.2	431.69	388.93	409.82	520.86	503.4	856.8	817.05	502.42	455.98	428.6	392.9	491.46
Sugar, Jam, Honey, chocolate, sweet	487.21	459.95	469.49	508.66	476.24	516.49	513.77	514.27	649.03	635.88	480.31	523.47	510.98	440.49	491.3
Food products	459.05	449.49	442.21	418.53	407.92	429.38	489.52	492.67	583.95	565.92	477.25	471.25	482.1	484.27	472.03
Non - Alcoholic Beverages	479.8	507.81	516.21	472.08	525.95	443.65	495.78	505.44	620.66	604.4	579.73	617.88	498.94	465.65	528.88

Source: CBS (2018b).

Notes: CPI stands for consumer price index.

Table C. 5: The Adjusted-Food Consumer Price Index and The Food Poverty Lines in 2007, 2009, and 2015

Governorate	U/R	The Adjusted Food CPI (%) (2005=100)			Food Poverty Lines (SP)		
		2007	2009	2015	2007	2009	2015
Damascus	Urban	120.6	153.8	475.4	1538.0	1960.8	6062.9
	Rif	117.4	146.1	464.0	1538.0	1914.5	6079.3
Damascus	Rural	117.5	146.1	464.1	1474.0	1832.1	5820.9
	Urban	117.7	151.7	472.7	1463.0	1886.1	5875.9
Homs	Rural	117.6	150.7	473.4	1428.0	1829.4	5748.0
	Urban	116.7	153.0	468.1	1463.0	1918.6	5870.7
	Rural	116.5	151.6	470.8	1428.0	1857.8	5768.1
	Urban	117.6	154.0	467.7	1642.0	2150.0	6530.8
Tartous	Rural	117.1	152.7	469.7	1713.0	2233.5	6869.1
	Urban	116.3	149.8	480.6	1642.0	2115.1	6785.7
Lattakia	Rural	116.2	148.6	483.0	1713.0	2191.8	7122.6
	Urban	114.1	148.4	489.1	1519.0	1975.4	6512.4
	Rural	113.7	147.7	489.6	1162.0	1509.1	5002.3
	Urban	116.7	153.0	515.5	1519.0	1991.4	6707.9
Aleppo	Rural	116.7	152.7	515.6	1162.0	1519.7	5132.8
	Urban	120.2	156.9	615.5	1519.0	1982.0	7776.0
	Rural	120.6	156.0	614.4	1162.0	1503.4	5920.7
	Urban	121.1	156.6	627.9	1519.0	1963.8	7873.3
Deir Azzor	Rural	121.4	155.4	626.4	1162.0	1487.0	5993.8
	Urban	118.6	153.1	482.3	1519.0	1961.6	6178.1
Hassakeh	Rural	118.5	152.5	482.6	1162.0	1495.1	4731.1
	Urban	119.0	152.4	496.3	1538.0	1969.9	6415.8
Sweida	Rural	118.8	151.5	498.0	1474.0	1880.1	6179.1
	Urban	116.8	149.4	503.4	1538.0	1967.8	6629.4
Daraa	Rural	116.8	149.4	503.4	1474.0	1883.1	6354.8

Quneitra	Urban	117.0	148.9	461.1	1538.0	1956.7	6059.6
	Rural	117.5	149.5	459.7	1474.0	1875.9	5767.3

Source: Author's computations based on El-Laithy and Abu-Ismael (2005), Abu-Ismael et al. (2011), and CBS (2018b).

Notes: The adjusted-food consumer price index builds on the price indices of ten food items, and is computed in Equation (4.1). Food Poverty Line (FPL) is the cost of acquiring enough food for adequate nutrition – usually 2,400 Calories per person per day. 'SP' stands for Syrian Pound. USD 1 equalled to SP 50 in 2007 and 2009 and to SP 300 in 2015.

Table C. 6: The Calculation of The Lower and Upper Poverty Lines of 2009

Governorate	U/R	FPL	The Decile Whose Expenditure Equals to The Food Poverty Line	Food Expenditure pc in The Decile	Total Expenditure pc in The Decile	Non-Food Expenditure in This Decile	LPL	The Decile Whose Expenditure Equals to The Lower Poverty Line	Food Expenditure pc	Total Expenditure pc	NF Expenditure LPL	UPL
Damascus	Urban	1960.84	2	1091.13	2703.45	1612.32	3573.16	5	2133.87	4643.23	2509.37	4470.21
Rif	Urban	1914.51	1	952.79	2210.2	1257.41	3171.92	4	1898.96	3983.23	2084.27	3998.78
Damascus	Rural	1832.1	1	916.44	2091.34	1174.89	3007	4	1825.55	3873.82	2048.27	3880.37
Homs	Urban	1886.05	1	922.62	1987.57	1064.95	2951	4	1693.52	4007.27	2313.74	4199.79
	Rural	1829.41	1	1178.7	2177.07	998.37	2827.78	3	2008.91	3350.16	1341.25	3170.66
Hama	Urban	1918.57	1	753.9	1633.23	879.33	2797.91	4	1899.22	3957.98	2058.76	3977.33
	Rural	1857.81	1	831.85	1816.94	985.09	2842.9	3	1691.6	3361.6	1670.01	3527.82
Tartous	Urban	2149.96	1	1336.16	1938.66	602.5	2752.46	6	2277.25	5350.46	3073.21	5223.17
	Rural	2233.52	2	1433.9	2730.79	1296.89	3530.4	5	2354.49	4604.79	2250.29	4483.81
Lattakia	Urban	2115.05	1	830.2	1881.49	1051.29	3166.35	5	2086.14	4622.65	2536.5	4651.56
	Rural	2191.82	1	910.69	2318.1	1407.41	3599.22	5	2038.22	4748	2709.78	4901.6
Idleb	Urban	1975.43	1	1033.57	2061.81	1028.24	3003.67	4	1964.61	3917.88	1953.27	3928.7
	Rural	1509.06	1	1174.12	1985.74	811.62	2320.68	2	1661.79	2810.08	1148.29	2657.35
Aleppo	Urban	1991.37	1	1065.49	1997.79	932.3	2923.67	4	1988.3	3907.15	1918.86	3910.23
	Rural	1519.74	1	1345.52	2132.19	786.67	2306.41	2	1588.18	2837.62	1249.45	2769.19
Raqqa	Urban	1981.96	1	1164.1	2232.43	1068.33	3050.3	3	1788.61	3311.48	1522.87	3504.83
	Rural	1503.4	1	1098	1857.61	759.61	2263.01	2	1584.75	2719.74	1134.99	2638.38
Deir Azzor	Urban	1963.79	1	857.56	1731.02	873.46	2837.25	4	1865.03	3859.6	1994.57	3958.37
	Rural	1487.03	1	1121.68	1842.01	720.33	2207.36	2	1590.68	2755.52	1164.84	2651.87
Hassakeh	Urban	1961.56	1	998.83	1898.6	899.77	2861.33	4	2144.12	3964.55	1820.43	3781.99

	Rural	1495.06	1	1385.64	2017.59	522.52	2017.59	1	1385.64	2017.59	631.95	2127.01
Sweida	Urban	1969.9	2	1189.24	2714.55	1525.32	3495.22	5	1943.08	4470.1	2527.02	4496.92
	Rural	1880.13	1	821.4	1965.16	1143.76	3023.88	4	1811.62	3902.53	2090.91	3971.03
Daraa	Urban	1967.81	1	1112.36	1916.49	804.13	2771.94	3	1988.27	3361.54	1373.27	3341.08
	Rural	1883.1	1	791.49	1668.64	877.16	2760.25	4	1999.43	3855.89	1856.46	3739.56
Quneitra	Rural	1875.87	1	1098.67	2155.49	279.62	2155.49	2	2065.83	2957.66	891.83	2767.69

Source: Author's computations based on the HIES (CBS, 2009) and Abu Ismail et al. (2011).

Notes: Food Poverty Line (FPL) is the cost of acquiring enough food for adequate nutrition – usually 2,400 Calories per person per day; Lower Poverty Line (LPL) is the FPL augmented by the non-food expenditure for households whose total expenditure is equivalent to the FPL; Upper Poverty Line (UPL) is the FPL augmented by the non-food expenditure of households whose food expenditure is equivalent to the food poverty line. 'SP' stands for Syrian Pound. USD 1 = SP 50 in 2009.

Table C. 7: Nowcasting Poverty Using Inequality Elasticity Approach

Governorate	U/R	FP2009 (%)	LP2009 (%)	UP2009 (%)	Growth Elasticity of Poverty 2007	Inequality Elasticity of Poverty 2007	LP2015 Using Income Elasticity Approach (%)	UP2015 Using Income Elasticity Approach (%)	Gini Coefficient 2009	LP2015 Using Distribution Elasticity Approach (%)	UP2015 Using Distribution Elasticity Approach (%)	LP2015 Using Growth and Inequality Elasticities Approach (%)	UP2015 Using Growth and Inequality Elasticities Approach (%)
Damascus	Urban	0.39	9.38	17.58	-5.731	4.30	41.63	78.03	0.34	11.54	21.63	51.24	96.03
	Rural	1.04	13.02	27.08	-5.731	4.30	57.79	120.20	0.43	16.02	33.33	71.12	147.92
Damascus	Rural	0	18.82	37.65	-3.093	3.25	53.75	107.52	0.29	22.10	44.22	63.13	126.29
Homs	Urban	3.08	15.38	40	-5.145	5.82	62.86	163.48	0.34	20.19	52.50	82.50	214.57
	Rural	2.08	19.8	26.04	-4.873	5.59	77.69	102.18	0.40	25.74	33.85	101.00	132.83
Hama	Urban	1.04	5.21	31.25	-5.145	5.82	21.29	127.72	0.35	6.84	41.02	27.95	167.64
	Rural	8	27	49	-4.873	5.59	105.94	192.27	0.27	35.10	63.70	137.72	249.94
Tartous	Urban	1.92	1.92	13.46	-4.648	7.54	7.27	51.00	0.33	2.70	18.91	10.22	71.66
	Rural	2.06	17.53	28.87	-4.071	4.96	60.35	99.39	0.28	22.20	36.56	76.42	125.86
Lattakia	Urban	1.08	4.3	12.9	-4.648	7.54	16.29	48.88	0.33	6.04	18.13	22.89	68.68
	Rural	0	18.75	32.81	-4.071	4.96	64.55	112.95	0.33	23.74	41.55	81.74	143.04
Idleb	Urban	3.17	20.63	38.1	-3.301	3.75	61.49	113.56	0.34	24.79	45.78	73.88	136.44
	Rural	1	21.78	27.72	-2.709	1.95	57.18	72.78	0.34	24.06	30.62	63.16	80.39
Aleppo	Urban	3.87	14	27.98	-3.301	3.75	41.73	83.40	0.29	16.82	33.62	50.14	100.20
	Rural	1.11	11.11	22.22	-2.709	1.95	29.17	58.34	0.29	12.27	24.54	32.22	64.44

Raqqa	Urban	0	15	25	-3.301	3.75	44.71	74.52	0.27	18.02	30.04	53.72	89.53
	Rural	3.28	8.2	16.4	-2.709	1.95	21.53	43.06	0.34	9.06	18.11	23.78	47.56
Deir Azzor	Urban	6.35	15.87	49.21	-3.301	3.75	47.30	146.68	0.35	19.07	59.12	56.83	176.23
	Rural	7.27	25.45	41.82	-2.709	1.95	66.82	109.79	0.38	28.11	46.19	73.80	121.27
Hassakeh	Urban	13.33	28.33	56.67	-3.301	3.75	84.44	168.91	0.30	34.04	68.09	101.45	202.94
	Rural	3.75	13.75	17.5	-2.709	1.95	36.10	45.94	0.27	15.19	19.33	39.87	50.75
Sweida	Urban	5.08	18.64	40.68	-5.731	4.30	82.74	180.56	0.34	22.94	50.06	101.82	222.21
	Rural	1.59	11.11	30.16	-3.093	3.25	31.73	86.13	0.31	13.05	35.42	37.27	101.16
Daraa	Urban	5.45	20	29.09	-5.731	4.30	88.77	129.12	0.34	24.61	35.80	109.25	158.90
	Rural	10.1	22.22	45.45	-3.093	3.25	63.46	129.80	0.32	26.10	53.38	74.53	152.45
Quneitra	Rural	0	3.23	6.45	-3.093	3.25	9.22	18.42	0.29	3.79	7.58	10.83	21.63
Syria	Total	2.97	14.85	29.39	-2.911	3.05	40.79	80.72	0.35	17.28	34.20	47.46	93.93

Source: Author's computations based on Abu Ismail et al. (2011).

Notes: Food Poverty Line (FPL) is the cost of acquiring enough food for adequate nutrition – usually 2,400 Calories per person per day; Lower Poverty Line (LPL) is the FPL augmented by the non-food expenditure for households whose total expenditure is equivalent to the FPL; Upper Poverty Line (UPL) is the FPL augmented by the non-food expenditure of households whose food expenditure is equivalent to the food poverty line. Gini coefficient is a standard measure of Inequality; it lies in the interval 0, perfect equality, and 1, perfect inequality. The growth elasticity approach is based on Equation (4.3) and Equation (4.5).

Table C. 8: Comparison of Poor vs. non-Poor Characteristics 2009-2015

Characteristics	Real data 2009		Estimated data using NDG 2015	
	Poor	non-Poor	Poor	non-Poor
Demographical Characteristics				
Household size	7.45	5.23	6.2	4.06
Female Male headed households (%)	7.93	10.15	8.06	14
Number of children less than 15 years old	3.79	2.7	3.07	2.21
Number of family members whose ages are between 15-64	3.8	3.19	3.46	2.84
Number of elders whose ages are 65 years old and more	1.25	1.27	1.26	1.29
Age Structure (%)				
0-4	15.1	13.16	14.74	9.32
05-09	14.62	10.89	12.55	8.31
10-14	17.09	12.04	14.13	9.14
15 - 19	10.98	10.87	11.17	9.9
20-24	8.34	10.07	9.44	10.75
25-29	6.76	8.48	7.95	8.82
30-34	5.56	6.38	6.01	6.96
35-39	5.63	5.69	5.7	5.6
40-44	5.28	5.21	5.03	5.94
45-49	2.78	4.25	3.5	5.6
50-54	2.68	3.7	3	5.28
55-59	1.34	2.5	1.88	3.7
60-64	1.3	2.37	1.72	3.73
65+	2.54	4.38	3.18	7.05
Dwelling Characteristics				
Households living in apartment (%)	20.97	43.65	33.6	56.17
Households living in Dar (%)	74.68	53.26	63.6	39.5
Households living in dwelling appropriate for living (%) ¹²²	69.82	71.91	73.55	67

¹²² Our estimates do not capture the destruction of dwellings. According to World Bank (2017), the conflict has inflicted significant damage to the Syrian physical capital stock, as 7% of the housing stock have been destroyed and 20% partially damaged.

Households living in dwelling inappropriate for living (%)	20.2	11.18	14.28	8.35
Educational Characteristics				
The head of the household has a university degree (%)	2.05	7.87	3.95	14.27
The head of the household has a secondary school (%)	4.1	8.9	7.25	10.41
The head of the household is illiterate (%)	19.44	15.25	16.55	14.27
Individuals who are illiterate (%)	15.48	12.96	13.78	12.37
Individuals who can read & write (%)	45.03	33.96	39.03	26.23
Individuals who have a university degree (%)	0.61	3.71	1.72	7.8
Individuals who have a secondary school diploma (%)	4.73	9.02	7	12.3
Employment Characteristics				
Individuals working in the public sector (% of the total workers)	22.05	28.79	25.23	34.18
Individuals working in the private sector- individual (% of the total workers)	37.85	31.75	34.92	27
Individuals working in the private sector- company (% of the total workers)	39.41	38.04	38.73	37
Worker is the employer (% of the total workers)	2.95	6.52	4.32	10.21
Worker is a self-employer (% of the total workers)	21.35	21.16	21.33	20.83
Worker is a paid employee (% of the total workers)	71.01	67.09	69.17	63.9
Worker is a paid employee in a family business (% of the total workers)	0.35	1.13	0.73	1.72
Worker is an unpaid employee in a family business (% of the total workers)	4.34	3.93	4.36	3.03
Employment (% of the working age population)	37.16	40.17	38.6	42.65
Out of the labour force (% of the working age population)	57.87	55.39	56.7	53.3
Unemployment (% of the working age population)	4.97	4.44	4.7	4.05
Unemployment period (months)	18.6	22.7	21.05	25.48
The head of the household is out of the labour forces (%)	20	22.8	20.44	27
The head of the household is employment (%)	77.69	75.99	78.15	71.72
The head of the household is unemployment (%)	2.31	1.21	1.41	1.29
Work Sector (% of total workers)				
Construction	23.96	17.4	21.45	10.62
Services	22.4	25.32	22.18	31.85
Agriculture	15.97	13.54	14.89	11.43
Industry	14.76	16.14	16.47	14.46
Hotels & Restaurants	14.76	16.47	15.78	17.29

Bank, Finance and Real-estate	1.22	3.03	1.93	4.85
Transportation & Communication	6.94	8.09	7.29	9.5

Source: Author's computations.

Notes: Poor are the overall poor, i.e., those whose consumption is lower than the lower poverty line. NDG is the Neutral Distribution Growth method that uses Equation (4.6).

Table C. 9: Computing The Poverty Lines in 2015 (SP)

Governorate	U/R	FPL 2009	LPL 2009	The Percentage of Food Expenditure from LPL2009	FPL 2015	LPL 2015	UPL 2009	The Percentage of Food Expenditure from UPL2009	UPL2015
Damascus	Urban	1960.84	3573.16	54.88%	6062.90	11048.16	4470.21	43.86%	13821.82
Rif Damascus	Urban	1914.51	3171.92	60.36%	6079.26	10072.00	3998.78	47.88%	12697.58
	Rural	1832.10	3007.00	60.93%	5820.93	9553.79	3880.37	47.21%	12328.66
Homs	Urban	1886.05	2951.00	63.91%	5875.94	9193.75	4199.79	44.91%	13084.33
	Rural	1829.41	2827.78	64.69%	5748.04	8884.94	3170.66	57.70%	9962.29
Hama	Urban	1918.57	2797.91	68.57%	5870.65	8561.32	3977.33	48.24%	12170.25
	Rural	1857.81	2842.90	65.35%	5768.07	8826.55	3527.82	52.66%	10953.06
Tartous	Urban	2149.96	2752.46	78.11%	6530.75	8360.91	5223.17	41.16%	15865.99
	Rural	2233.52	3530.40	63.27%	6869.13	10857.69	4483.81	49.81%	13789.86
Lattakia	Urban	2115.05	3166.35	66.80%	6785.71	10158.56	4651.56	45.47%	14923.55
	Rural	2191.82	3599.22	60.90%	7122.55	11696.08	4901.60	44.72%	15928.28
Idleb	Urban	1975.43	3003.67	65.77%	6512.37	9902.13	3928.70	50.28%	12951.68
	Rural	1509.06	2320.68	65.03%	5002.32	7692.71	2657.35	56.79%	8808.75
Aleppo	Urban	1991.37	2923.67	68.11%	6707.86	9848.28	3910.23	50.93%	13171.45
	Rural	1519.74	2306.41	65.89%	5132.79	7789.71	2769.19	54.88%	9352.70
Raqqa	Urban	1981.96	3050.30	64.98%	7776.00	11967.49	3504.83	56.55%	13750.80
	Rural	1503.40	2263.01	66.43%	5920.74	8912.25	2638.38	56.98%	10390.59
Deir Azzor	Urban	1963.79	2837.25	69.21%	7873.29	11375.18	3958.37	49.61%	15869.97
	Rural	1487.03	2207.36	67.37%	5993.80	8897.25	2651.87	56.07%	10688.95
Hassakeh	Urban	1961.56	2861.33	68.55%	6178.07	9011.95	3781.99	51.87%	11911.64

	Rural	1495.06	2017.59	74.10%	4731.05	6384.55	2127.01	70.29%	6730.83
Sweida	Urban	1969.90	3495.22	56.36%	6415.80	11383.62	4496.92	43.81%	14646.09
	Rural	1880.13	3023.88	62.18%	6179.14	9938.17	3971.03	47.35%	13051.03
Daraa	Urban	1967.81	2771.94	70.99%	6629.40	9338.45	3341.08	58.90%	11255.83
	Rural	1883.10	2760.25	68.22%	6354.77	9314.85	3739.56	50.36%	12619.66
Quneitra	Rural	1875.87	2155.49	87.03%	5767.25	6626.93	2767.69	67.78%	8509.13

Source: Author's computations based mainly on Item (6) in Appendix D.

Notes: Food Poverty Line (FPL) is the cost of acquiring enough food for adequate nutrition – usually 2,400 Calories per person per day; Lower Poverty Line (LPL) is the FPL augmented by the non-food expenditure for households whose total expenditure is equivalent to the FPL; Upper Poverty Line (UPL) is the FPL augmented by the non-food expenditure of households whose food expenditure is equivalent to the food poverty line. 'SP' stands for Syrian Pound. USD 1 equals to SP 50 and to SP 300 in 2009 and 2015, respectively.

Table C. 10: Internally Displaced People Matrix (1000 IDP)

From \ To	Damascus	Rif Damascus	Aleppo	Homs	Hama	Lattakia	Tartous	Idleb	Daraa	Sweida	Quneitra	Deir Azzor	Hassakeh	Raqqa	Total
Damascus	221.7	141.5	0.2	19.9	9.2	18.5	14.6	3.1	13.4	20.2	2.1	14.3	7.9	0	486.6
Rif Damascus	254.1	799.2	0.8	18.9	15.9	26.7	19.4	4.2	4.8	24.2	31.1	6.5	8.4	0	1214.2
Aleppo	21.2	67.8	1017.4	26.2	70.1	168.8	51.6	98.6	0.2	2.5	0	2.5	23.6	29.7	1580.2
Homs	32.9	61	0.2	150.2	104.6	18.2	41	1.8	0.3	0.9	0	5.4	3.3	1	420.8
Hama	0.1	13.7	0	4.1	157.9	4.2	12.6	64.2	0	0	0	0	0.6	0.1	257.5
Lattakia	0	0	0.2	0.1	0.1	23.5	0.1	4.1	0	0.1	0	0	0	0	28.2
Tartous	0	1.1	0	0.3	0	0	1.2	0.9	0	0	0	0	0	0	3.5
Idleb	18.5	27.8	4.6	2.4	34.7	24.9	10.4	282.8	0.4	1.6	0	0.9	0.6	4	413.6
Daraa	13.2	22.7	0	1	3.3	1.4	1.6	0	304	19.5	1.2	0.3	0.1	0	368.3
Sweida	0.7	0	0	0	0	0	0	0	0	2.4	0	0	0	0	3.1
Quneitra	0.9	8.2	0	0	0	0	0	0	7.2	0.1	8.2	0	0	0	24.6
Deir Azzor	12.5	12.2	0	9.4	0.3	1.3	2.5	0	0	0.4	0	156.7	45.7	21.8	262.8
Hassakeh	2.8	5.3	0	0.8	1.9	5.3	6.2	0	0.9	0.6	0	3.1	51.5	0	78.4
Raqqa	6.4	0.3	9.3	7	5.3	9.9	3.8	0.6	0	0.1	0	6.6	6.4	51.1	106.8
Total	585	1160.8	1032.7	240.3	403.3	302.7	165	460.3	331.2	72.6	42.6	196.3	148.1	107.7	5248.6

Source: SCPR (2016b).

Notes: IDP stands for internally displaced people.

Table C. 11: The Number of Workers in 2009 and 2015

Sector	2009		2015		Shrinkage
	Number	Distribution (%)	Number	Distribution (%)	
Building & Construction	809000	16.19%	400000	15.26%	-50.56%
Industry	818000	16.37%	20000	0.76%	-97.56%
Agriculture	758000	15.17%	400000	15.26%	-47.23%
Transportation & Communication	380000	7.60%	200000	7.63%	-47.37%
Trade & Tourism	819000	16.39%	500000	19.07%	-38.95%
Other Services	1412000	28.25%	1100000	41.95%	-22.10%
Total	4998009	100.00%	2622015	100.00%	-47.54%

Source: Numbers of 2009 are based on LFS (CBS, 2010), while the numbers of 2015 are extracted from WB (2017).

Table C. 12: The Percentages and Values of non-Food Items Received by IDP and non-Moved People in 2015

Governorate	Number of non-Moved Resident HHs in our Sample	Number of IDP HHs in our Sample	Percentage of IDP	Percentage of non-Moved	Total NFIs	NFI per HH per Year	NFI per HH per Month (item)	Percentage of HHs Receiving NFI	Percentage of non-Moved HHs Receiving NFI	Percentages of IDP Receiving NFI	NFI Assistance per HH per Month (SP)
Damascus	207	54	26.09%	73.91%	1094708	18.63943	1.553286	14.82%	7.22%	36.37%	2329.929
Aleppo	369	82	22.22%	77.78%	2362944	39.32749	3.277291	8.46%	3.91%	24.35%	4915.936
Rif Damascus	225	95	42.22%	57.78%	2281943	9.142013	0.761834	42.18%	26.28%	63.94%	1142.752
Homs	168	22	13.10%	86.90%	1117485	11.23608	0.93634	36.84%	15.26%	100.00%	2529
Hama	170	38	22.35%	77.65%	909611	19.42689	1.618908	14.15%	6.56%	40.52%	2428.361
Lattakia	144	25	17.36%	82.64%	370177	10.25159	0.854299	12.42%	5.41%	45.80%	1281.448
Idleb	119	43	36.13%	63.87%	75624	6.406765	0.533897	5.18%	2.92%	9.18%	800.8456
Hassakeh	97	14	14.43%	85.57%	400044	14.18368	1.181973	14.74%	6.20%	65.35%	1772.96
Deir Azzor	114	18	15.79%	84.21%	4000	3.66782	0.305652	0.57%	0.24%	2.30%	458.4775
Tartous	137	16	11.68%	88.32%	369155	12.55734	1.046445	13.05%	5.32%	71.53%	1569.668
Raqqa	80	10	12.50%	87.50%	1300	4.703072	0.391923	0.23%	0.09%	1.17%	587.884
Daraa	75	33	44.00%	56.00%	154292	11.69832	0.97486	11.56%	7.43%	16.81%	1462.29
Sweida	121	7	5.79%	94.21%	85360	10.80506	0.900422	7.51%	2.87%	83.06%	1350.633
Quneitra	25	6	24.00%	76.00%	84091	31.10135	2.591779	19.56%	9.26%	52.16%	3887.668

Source: Author's computations based on UNOCHA (2017).

Notes: NFIs stands for non-food items. NFI kits include essential household items such as mattresses, blankets, plastic sheets, containers for water, cooking utensils and hygiene kits. In addition, other items can be added to the kits during times of extra hardship, such as rechargeable fans in very hot weather. IDP stands for internally displaced people.

Table C. 13: The Distribution of Remittances among The Ten Deciles in 2009

Decile	HH Received Remittances (%)	The Distribution of Remittances Received among The Ten Deciles	Average of Remittances (SP)
1	3.82%	7.63%	303
2	5.70%	11.45%	530
3	4.56%	9.16%	380
4	4.18%	8.40%	287
5	3.44%	6.87%	214
6	2.66%	5.34%	205
7	3.80%	7.63%	355
8	6.46%	12.98%	1487
9	5.70%	11.45%	883
10	9.54%	19.08%	1601
Total	4.99%	100.00%	

Source: The HIES (CBS, 2009).

Notes: 'SP' stands for Syrian Pound. USD 1 = SP 300 in 2015.

Table C. 14: Comparison of The Results of The Governorate Extreme Poverty Rates between SCPR and Scenario B

Governorate	Scenario B	SCPR
Hassakeh	88%	76%
Raqqa	86%	80%
Sweida	64%	54%
Aleppo	77%	70%
Damascus	68%	57%
Rif Damascus	80%	65%
Daraa	84%	69%
Deir Azzor	90%	81%
Hama	78%	70%
Homs	76%	74%
Idleb	82%	80%
Lattakia	72%	53%
Quneitra	52%	67%
Tartous	61%	64%

Sources: SCPR (2016a) and author's computations.

Notes: SCPR stands for the Syrian Center for Policy Research. Scenario B is the microsimulation model of the current essay including the assistances and remittances as other sources of income.

Appendix D

(1) Calculating the Food Poverty Lines in 2009:

$$\text{Adjusted Food } CPI_{G,U/R,2009} = \frac{\sum_{i=1}^n W_i \cdot CPI_{i,G,U/R,2009}}{\sum_{i=1}^n W_{i,U/R}},$$

Where W_i is the relative weight of the food item i in the Urban or Rural Reference Food Basket mentioned in Table C.1; $CPI_{i,G,U/R,2009}$ is the CPI of 2009 for the item i in the governorate G in an R rural/ U urban area. It is found in Table C.3; G stands for governorate; and U/R stands for Urban/Rural;

$$\text{Food Poverty Line}_{G,U/R,2009} = \text{Food Poverty Line}_{G,U/R,2007} \cdot \text{Adjusted Food } CPI_{G,U/R,2009}.$$

(2) Nowcasting the poverty rate of 2015 using the elasticity method:

$E_{t,t-1} = \frac{\Delta PO/PO_{t-1}}{\Delta Y/Y_{t-1}}$, where $\Delta PO/PO_{t-1}$ is the change in the poverty headcount, and $\Delta Y/Y_{t-1}$ is the change in the output measure of aggregate welfare. Next, and assuming that the elasticity $E_{t,t-1}$ has a unique non-stochastic value over time for any poverty measure, PO in period $t+1$ can be projected as follows: $P_{t+1} \approx P_t(1 + \frac{\Delta Y}{Y_{t-1}} E_{t,t-1})$.

(3) Nowcasting the poverty rate of 2015 using the neutral distribution growth:

Neutral Distribution Growth assumes that all households' income, or expenditure, are affected by the same aggregate factor—generally GDP per capita growth—from period $t-n$ to period t . Thus, the new welfare indicator is $\tilde{Y}_{ig}^t = Y_i^{t-n}(1 + r_g^{t,t-n})$ for household i , where $r_g^{t,t-n}$ stands for the growth rate of the aggregate factor between year $t-n$ and t . $P(\tilde{Y}_{ig}^t)$ is the corresponding poverty rate.

This way assumes that the household welfare variable grows at the same rate in a specific society, $\frac{(Y_i^t - Y_i^{t-n})}{Y_i^{t-n}} = \frac{(Y_j^t - Y_j^{t-n})}{Y_j^{t-n}}$, for all households ($i \neq j$).

(4) Projections of 2015 based on SCPR (2016b)'s projections of 2014:

$$\text{Population}_{g,2015} = \text{Population}_{S,2015} \cdot \frac{\text{Population}_{g,2014}}{\text{Population}_{S,2014}},$$

where $\text{Population}_{g,2015}$ stands for the population of the governorate g in 2015;

$\text{Population}_{S,2015}$ stands for the population of Syria in 2015, imported from CBS;

$\text{Population}_{S,2014}$ stands for the population of Syria in 2014, imported from SCPR (2016b);

$Population_{g,2014}$ stands for the population of the governorate g in 2014, imported from SCPR (2016b).

$$NMP_{g,2015} = NMP_{S,2015} \cdot \frac{NMP_{g,2014}}{NMP_{S,2014}}, \text{ where}$$

$NMP_{g,2015}$ stands for the non-moved people of the governorate g in 2015;

$NMP_{S,2015}$ stands for the non-moved people of Syria in 2015, imported from SCPR (2016b);

$NMP_{S,2014}$ stands for the non-moved people of Syria in 2014, imported from SCPR (2016b);

$NMP_{g,2014}$ stands for the non-moved people of the governorate g in 2014, imported from SCPR (2016b).

$$Refugees_{g,2015} = Refugees_{S,2015} \cdot \frac{Refugees_{g,2014}}{Refugees_{S,2014}}, \text{ where}$$

$Refugees_{g,2015}$ stands for the refugees of the governorate g in 2015;

$Refugees_{S,2015}$ stands for the total refugees of Syria in 2015, imported from UNHCR¹²³;

$Refugees_{S,2014}$ stands for the total refugees of Syria in 2014, imported from SCPR (2016b);

$Refugees_{g,2014}$ stands for the refugees of the governorate g in 2014, imported from SCPR (2016b).

$$Death_Conflict_{g,m,2015} = Death_Conflict_{S,m,2015} \cdot \frac{Death_Conflict_{g,m,2014}}{Death_Conflict_{S,m,2014}}, \text{ where}$$

$Death_Conflict_{g,m,2015}$ stands for the number of men whose ages are between 15-49 year old killed directly due to hostilities in the governorate g in 2015;

$Death_Conflict_{S,m,2015}$ stands for the total number of men whose ages are between 15-49 year old killed directly due to hostilities in Syria in 2015, imported from SCPR (2016b);

$Death_Conflict_{g,m,2014}$ stands for the number of men whose ages are between 15-49 year old killed directly due to hostilities in the governorate g in 2014, imported from SCPR (2016b);

¹²³ <http://data.unhcr.org/syrianrefugees/regional.php>.

$Death_Conflict_{S,m,2014}$ stands for the number of men whose ages are between 15-49 year old killed directly due to hostilities in Syria in 2014, imported from SCPR (2016b).

$$Death_Conflict_{g,w,2015} = Death_Conflict_{S,w,2015} \cdot \frac{Death_Conflict_{g,w,2014}}{Death_Conflict_{S,w,2014}}, \text{ where}$$

$Death_Conflict_{g,w,2015}$ stands for the number of women and children killed directly due to hostilities in the governorate g in 2015;

$Death_Conflict_{S,w,2015}$ stands for the total number of women and children killed directly due to hostilities in Syria in 2015, imported from SCPR (2016b);

$Death_Conflict_{g,w,2014}$ stands for the number of women and children killed directly due to hostilities in the governorate g in 2014, imported from SCPR (2016b);

$Death_Conflict_{S,w,2014}$ stands for the number of women and children killed directly due to hostilities in Syria in 2014, imported from SCPR (2016b).

Then we divide these numbers, each over the population projection of 2015, so we get their percentages from the total population, and use them in the simulation model.

(5) Calculating the Food Poverty Lines in 2015:

$$Adjusted\ Food\ CPI_{g,U/R,2015} = \frac{\sum_{i=1}^n W_i \cdot CPI_{i,g,U/R,2015}}{\sum_{i=1}^n W_{i,U/R}},$$

where W_i is the relative weight of the food item i in the Urban or Rural Reference Food Basket mentioned in Table C.1; $CPI_{i,g,U/R,2015}$ is the CPI of 2015 for the item i in the governorate g in an R rural/ U urban area. It is found in Table C.4; g stands for governorate; and U/R stands for Urban/Rural;

$$Food\ Poverty\ Line_{g,U/R,2015} = Food\ Poverty\ Line_{g,U/R,2007} \cdot Adjusted\ Food\ CPI_{g,U/R,2015}.$$

(6) Computing the poverty lines of 2015:

$$LPL_{g,U\setminus R,2015} = \frac{FPL_{g,U\setminus R,2015}}{FPL_{g,U\setminus R,2009}/LPL_{g,U\setminus R,2009}}, \text{ where}$$

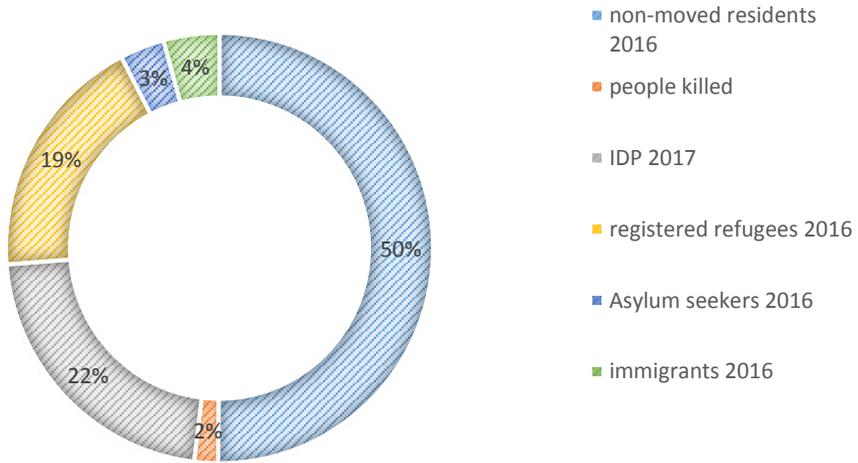
$LPL_{g,U\setminus R,2015}$ stands for the lower poverty line in rural or urban governorate g in 2015.

$FPL_{g,U\setminus R,2015}$ stands for the food poverty line in rural or urban governorate g in 2015.

$LPL_{g,U\setminus R,2009}$ stands for the lower poverty line in rural or urban governorate g in 2009.

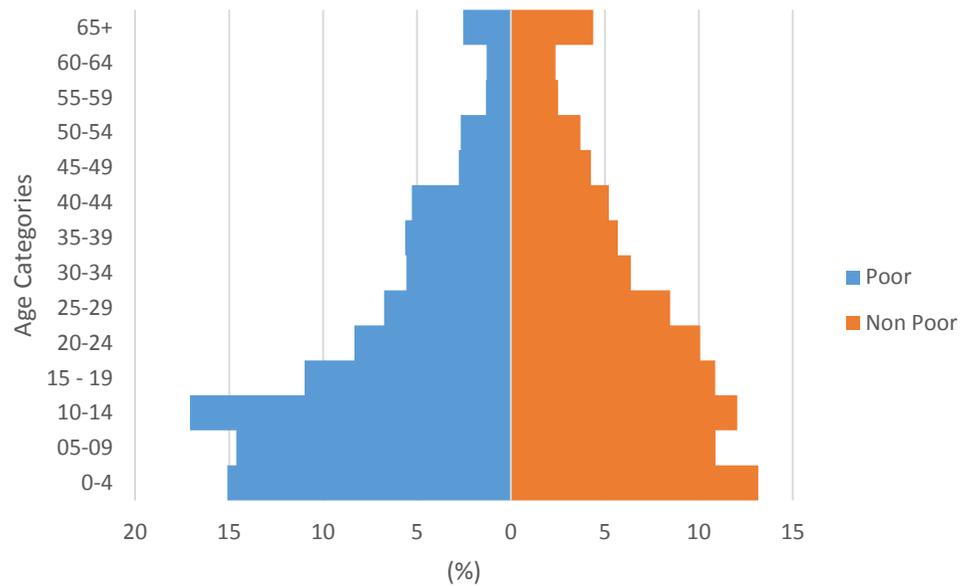
$FPL_{g,U\setminus R,2009}$ stands for the food poverty line in rural or urban governorate g in 2009.

Appendix E



Source: SCPR (2016b).
Notes: IDP stands for internally displaced people.

Figure E. 1: Syrian Subgroups in 2016.



Sources: Statistical Abstract 2010 (CBS, 2011).

Notes: Poor people here are those who belong to households whose consumptions are less than the lower poverty line.

Figure E. 2: Comparing The Age Structure between Poor and non-Poor in Syria in 2009.

Appendix F: The HIES 2009's Questionnaire

CENTRAL BUREAU OF STATISTICS

HOUSEHOLD INCOME AND EXPENDITURE SURVEY IN SYRIA

2009

PART ONE

1: IDENTIFICATION

2: STAFF

AI01	Governorate	_____ __ __
AI02	Mantika	_____ __
AI03	Nahia	_____ __ __
AI04	City/village	_____ __ __ __
AI05	Hay/farm	_____ __ __ __
AI06	Street name	_____
AI07	Household head name	_____
AI08	Cluster serial # within Governorate	__ __ __
AI09	Household Serial # in cluster	__ __ __
AI10	Serial number of questionnaire	__ __ __ __ __
AI11	Telephone number of household	__ __ __ __ __ __ __ __ __

SI01	Supervisor (Name)/Code	_____ __ __
SI02	Interviewer (Name)/Code	_____ __ __
SI03	Editor (Name)/Code	_____ __ __
SI04	Coder (Name)/Code	_____ __ __
SI05	Data-entry operator	_____ __ __
SI06	Editing date (dd - mm)	__ __ __ __
SI07	Coding date (dd - mm)	__ __ __ __
SI08	Data entry date (dd - mm)	__ __ __ __

AI12	Month of survey	_ _ _
AI13	Round of survey	_

3. INTERVIEW STATUS

	VISIT TYPE	First Visit			Re-Visit		
		DATE	TIME	INTERVIEW STATUS	DATE	TIME	INTERVIEW STATUS
		IS01	IS02	IS03	IS04	IS05	IS06
V01	START	_ _ - _ _	_ _ - _ _	_	_ _ - _ _ _ _	_ _ - _ _ _ _	_
V02	FOOD 1	_ _ - _ _	_ _ - _ _	_	_ _ - _ _ _ _	_ _ - _ _ _ _	_
V03	FOOD 2	_ _ - _ _	_ _ - _ _	_	_ _ - _ _ _ _	_ _ - _ _ _ _	_
V04	End of Month	_ _ - _ _	_ _ - _ _	_	_ _ - _ _ _ _	_ _ - _ _ _ _	_

4. Number of Household members

NH03	NH02	NH01
Total	Females	Males

FINAL STATUS

- 1 Completed
- 2 Partly completed
- 3 Refusal
- 4 No contact/ no eligible member at home
- 5 Dwelling is vacant

Section HR: Household Roster

HR01	HR02	HR03	HR04	HR05	HR06	HR07
ID # of person	Name Defined as: name + father's name + grandfather's name Enter the names starting with the household head. (for persons that have stayed or intends to stay with the household for three months period)	What is [...]’s relationship to the household head? 1 Head 2 Spouse 3 Son/daughter 4 Son/daughter of spouse 5 Sibling 6 Sibling of spouse 7 Parent 8 Parent of spouse 9 Son/daughter in law 10 Grandchild 11 Other relative 12 Other relative of spouse 13 Other non-relative 14 Servant	Sex 1 Male 2 Female	How old is [...]? 97 = ≥ 97 yrs 98 = DK 99 = NR If less than 1 year, mark 00 If <15 years → HR07	What is [...]’s marital status? 1 Single, never married 2 Married 3 Divorced 4 Widowed	What is [...]’s nationality? 1 Syrian 2 Palestinian 3 Iraqi 4 Other Arab 5 Asian 6 African 7 European 8 from the Americas
	1	_0_ _1_	_	_	_	_
	2	_ _	_	_	_	_
	3	_ _	_	_	_	_
	4	_ _	_	_	_	_
	5	_ _	_	_	_	_
	6	_ _	_	_	_	_
	7	_ _	_	_	_	_
	8	_ _	_	_	_	_
	9	_ _	_	_	_	_
	10	_ _	_	_	_	_
	11	_ _	_	_	_	_
	12	_ _	_	_	_	_
	13	_ _	_	_	_	_
	14	_ _	_	_	_	_
15	_ _	_	_	_	_	

Section ED: Education

For persons of age 5 years or more							
Ser. No.	ED01	ED02	ED03	ED04	ED05	ED06	ED07
	Is HR05 is 5 years old or more? 1 Yes 2 No If No Go to the Next Person	Has [...] ever been enrolled in any level of education? 1 Yes, currently enrolled 2 Previously enrolled →ED05 3 Never been enrolled→ED06 8 DK→ ED07 9 No Answer→ ED07	In what stage is [...] currently enrolled? 1 Preschool 2 Primary education 3 Academic secondary 4 Vocational secondary 5 Intermediate institute 6 University 7 Post graduate studies 8 DK 9 No Answer	What type of school is [...] attending now? 1 Public 2 Private 8 DK 9 NA	What is the qualification obtained by [...]? 1 Elementary 2 Preparatory 3 Secondary 4 Intermediate 5 University + 6 Didn't obtain any certificate 7 Other: _____ 8 DK 9 NA → Next person	What is the main reason why [...] is not attending school? 1 Not interested 2 Family not interested 3 Helping family economically 4 School not available nearby 5 Disability/ health reason 6 Other reason, specify: _____ 8 DK 9 NA	Can [...] read and understand everyday written material, such as a letter or a newspaper? 1 Yes, easily 2 Yes, with difficulty 3 No 8 DK 9 NA If LAST PERSON, GO to Next Section (LF)
1	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
2	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
3	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
4	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
5	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
6	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
7	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
8	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
9	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
10	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
11	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9

12	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
13	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
14	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9
15	1 2	1 2 8 9	1 2 8 9	__	__	__ __	1 2 3 8 9

Section LF: Labor Force

For persons of age 15 or more									
Ser. No.	LF01	LF02	LF03	LF04	LF05	LF06	LF07	LF08	LF09
	Check HR05, if 15 years of age, or more 1 Yes 2 No → Next person in the household	During the past 7 days, did [...] work for wages or any payment in kind, for at least one hour? 1 Yes → LF06 2 No 8 DK 9 NA	During the past 7 days, did [...] earn any money or profit (including in kind) from self employment? 1 Yes → LF06 2 No 8 DK 9 NA	During the past 7 days, did [...] work for an enterprise or farm belonging to a member of the household, even if not paid? 1 Yes → LF06 2 No 8 DK 9 NA	During the past 7 days, Do you have a permanent/ long term job (even though you did not work in the last 7 days) from which you were temporarily absent? 1 Yes 2 No → LF16 8 DK → LF16 9 NA → LF16	What is your occupation in the MAIN job you are working?	What is the main economic activity of the enterprise you are working on or of your own business?	Is your employer for this job...? READ ALL RESPONSES 1 Government (public sector) 2 Private company or enterprise (private sector) 3 Joint 4 An NGO or humanitarian organization 5 A private individual 8 DK 9 NR	What is the place of work? 1 establishment 2 farm 3 at home 4 other: _____
1	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
2	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
3	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
4	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__

5	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
6	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
7	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
8	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
9	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
10	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
11	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
12	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
13	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
14	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__
15	__	1 2 8 9	1 2 8 9	1 2 8 9	1 2 8 9			__	__

For persons 15 years old or more						
Ser. No.	LF10	LF11	LF12	LF13	LF14	LF15
	In this MAIN job were you....? READ ALL RESPONSES 1 Employer 2 Own account worker 3 Paid (in cash or kind) worker (except in family business) 4 Paid worker in family business 5 Unpaid worker in family business 6 Unpaid trainee 8 DK 9 NA	What is the usual NET monthly income from the main job, including in-kind benefits? SYP	In addition to this job, did [...] have any additional job? 1 Yes 2 No 8 DK 9 NA 2, 8, 9 → Next Person If LAST PERSON, GO to Next Section (SP)	In this second job, is [...]? 1 Employer 2 Own account worker 3 Paid (in cash or kind) worker (except in family business) 4 Paid worker in family business 5 Unpaid worker in family business 6 Unpaid trainee 8 DK 9 NA	Is your employer for this second job...? READ ALL RESPONSES 1 Government (public sector) 2 Private company or enterprise (private sector) 3 Joint venture 4 An NGO or humanitarian organization 5 A private individual 8 DK 9 NA	What is the usual NET monthly income from the second job, including in-kind benefits? → Next Person If LAST PERSON, GO to Next Section (SP)
1	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
2	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
3	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
4	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
5	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
6	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
7	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
8	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
9	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
10	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
11	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
12	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
13	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _
14	_	_ _ _ _ _ _ _ _ _	_	_	_	_ _ _ _ _ _ _ _ _

Section LF: Labor Force

For persons of age 15 or more							
Ser No.	LF16	LF17	LF18	LF19	LF20	LF21	LF22
	During the past 4 weeks, have you tried in any way to find a job or start your own business? 1 Yes → LF19 2 No 8 DK 9 NA	What is the main reason you did not look for a job in the last 4 weeks? 1 Student 2 Housewife 3 In retirement 4 Handicapped 5 Found a job which will start later → Next Section 6 Awaiting recall by employer → Next Section 7 Waiting for busy season → Next Section 8 Do not want to work → Next Section 9 Believe I don't have a chance → Next Section	Did you begin this status less than 12 months ago? 1 Yes → Next person 2 No → Next person 8 DK 9 NA If LAST PERSON, GO to Next Section (SP)	What kind of efforts did you put into finding a job? 1 registered in labour office 2 Through friends and relatives 3 Responded to media ad 4 Contacted employer 5 Contacted by employer 6 Tried to start own business 7 Took part in test for job 8 other, specify: _____	How long have you looked for a job? IN MONTHS If less than 1 month, put 00	If you were offered a job, are you ready to start working within the following 2 weeks? 1 Yes 2 No 8 DK 9 NA	Have you ever worked? 1 yes 2 No
1	__	__	__	__	__	__	__
2	__	__	__	__	__	__	__
3	__	__	__	__	__	__	__
4	__	__	__	__	__	__	__
5	__	__	__	__	__	__	__
6	__	__	__	__	__	__	__
7	__	__	__	__	__	__	__
8	__	__	__	__	__	__	__
9	__	__	__	__	__	__	__
10	__	__	__	__	__	__	__
11	__	__	__	__	__	__	__

12	__	__	__	__	__	__	__
13	__	__	__	__	__	__	__
14	__	__	__	__	__	__	__
15	__	__	__	__	__	__	__

Section SP: Subjective Poverty

SP00	Fill Respondent Serial Number from HR01			__ __
SP01	How satisfied are you with your current financial situation? Interviewer: read answer categories	Fully satisfied Rather satisfied Less than satisfied Not at all satisfied DK NA	1 2 3 4 8 9	__
SP02	Do you feel your financial situation in the last 5 years has...? Interviewer: read answer categories	Fully satisfied Rather satisfied Less than satisfied Not at all satisfied DK NA	1 2 3 4 8 9	__
SP03	What is the minimum monthly household income that you, in your circumstances, consider to be absolutely minimal? That is to say the absolute minimum to provide adequate food, housing and other basic necessities?	DK NA SYP		8 9
SP04	What is your current (take home) monthly income?	DK NA SYP		8 9
SP05	Would you consider the current level of food consumption of your family as: Interviewer: read answer categories	More than adequate Just adequate Less than adequate DK NA	1 2 3 8 9	

SP06	Would you consider the current level of expenditure of your family for food and other basic necessities like clothing and housing as:	More than adequate Just adequate Less than adequate DK NA	1 2 3 8 9	
SP07	What is currently the aspect of your life than concerns you the most? Interviewer: read answer categories	Money Housing Health Education Job security Other (specify) _____ DK NA	1 2 3 4 5 6 8 9	

Social Gender issues:SG

SG01	In general, who in the household decide the type of household expenditure?	Husband wife the couple together The household together Other _____ Not applicable	1 2 3 4 5 6	
SG02	Who decides on food expenditure? (how food expenditure is distributed)	Husband wife The couple together The household together Other Not applicable	1 2 3 4 5 6	
SG03	Who decides on health expenditure?	Husband wife The couple together The household together Other Not applicable	1 2 3 4 5 6	
SG04	Who decides on Education expenditure? (how distributed)	Husband wife The couple together The household together Other Not applicable	1 2 3 4 5 6	

SG05	Who makes decision concerning having kids?	Husband wife The couple together The household together Other Not applicable	1 2 3 4 5 6	
SG06	who makes decision concerning household organization?	Husband wife The couple together The household together Other Not applicable	1 2 3 4 5 6	
SG07	Whom do you give priority for secondary education?	Male children Female children No priorities Not applicable	1 2 3 4	
SG08	Whom do you give priority for University education?	Male children Female children No priorities Not applicable	1 2 3 4	

Section DU: Dwelling Utilities

DU01	Dwelling Type	Apartment Dar (small traditional house) Villa Other: _____	1 2 3 4	__
DU02	What is the major construction material for exterior walls?	Reinforced concrete Bricks of cement Bricks of cement with pillars Stones Clay Wood Other: _____	1 2 3 4 5 6 7	__

DU03	Time of construction of the dwelling	Before 1945 1945-1960 1961-1980 1981-1995 After 1995, specify year: __ __ __ __ DK NR	1 2 3 4 5 8 9	
DU04	What is the condition of the dwelling unit?	Very good condition Appropriate for living Inappropriate for living Under construction	1 2 3 4	__
DU05	What is the area of your dwelling?	Less than 45 Sq. meters 40-69 sq. m 70-99 sq.m 100-130 sq.m More than 130 sq.m	1 2 3 4 5	__
DU06	How many rooms are available in your housing unit?			__ __
DU07	What kind of toilet facility does your household use?	Toilet connected to sewage network Toilet connected to percolation pit Other DK NR	1 2 3 8 9	__
DU08	What is the garbage disposal option available for your dwelling?	Garbage collectors Garbage filled in Nylon bags and thrown in the street Thrown in the street without filling it in to Nylon bags Use container Burned in a farm or special place DK NR	1 2 3 4 5 8 9	__
DU09	Does your dwelling have the following? (MARK ALL THAT APPLY)	Separate kitchen Separate Bath/Shower Balcony/Terrace Attic Garage Elevator	1 2 3 4 5 6	

DU15	What is the estimated market value of your housing unit?	__ __ __ __ __ __ __ DK NR	8 9	
DU16	What is the main source of water used by this household for drinking and other uses?	Piped into residence Piped into building, or yard but not into residence Public tap Well Tank vendor Bottled water Well for collecting rainwater Spring River, channel, dam, pool Other DK NA	1 2 3 4 5 6 7 8 9 10 98 99	__ __ Drinking __ __ Other Uses
DU17	How much are your monthly water expenses? In SYP	Winter Summer		__ __ __ __ __ __ __ __ __ __ __ __
DU18	What source of heating does your household mainly use?	Gasoline Gas Electricity Kerosene Central heating None/no heating Other, specify: _____	1 2 3 4 5 6 7	
DU19	Which is the main source of electricity you use for lighting?	Public network Private generator Other	1 2 3	
DU20	How much was your last electricity bill?	__ __ __ __ __ __ SYP Included in the house rent DK NR	DU22-1 8 9	
DU21	How many months did this payment cover?	__ __		
DU22	What type of energy is used for cooking? MARK ALL THAT APPLY	Gas Kerosene Electricity Coal/wood Other	1 2 3 4 5	__

DU23	How much do you pay in average for one month for gas?	_ _ _ _ _ _ _ _ _ SYP		
DU24	How much was your expenses for heating or lighting in the past 6 months from the following sources?	Firewood Coal Diesel Fuel	Winter _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Summer _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
DU25	Does your household have a phone line inside dwelling?	Yes No		DU28←
DU26	How much was your last telephone bill? Interviewer: in case there are more than one telephone line ask about the total of the last bills paid	_ _ _ _ _ _ _ _ _		SYP
DU27	How many months did this payment cover?	_ _ _		
DU28	How many cell phones are currently used by the household?	_ _ _		
DU29	What is the average monthly expenditure for mobile services used in the household?	_ _ _ _ _ _ _ _ _		SYP
DU30	Does your household own a computer?	Yes No		1 Next Section← 2
DU31	Does this computer have an internet connection?	Yes No		1 Next Section← 2
DU32	Are you satisfied with the quality of this service?	Yes No		1 2
DU33	Do you pay for this internet connection service?	Yes No		1 Next Section← 2
DU34	How much in total did you pay for the internet service in the last month?	_ _ _ _ _ _ _ _ _		SYP

Section DG Durable Good ::

Item No.	Description	Code	Number	How many years ago did you acquire the item? If more than one ask about the latest item.
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DG01	Color TV		__	__ _ _
DG02	Video Player/DVD Player		__	__ _ _
DG03	Tape player/CD player		__	__ _ _
DG04	Camera		__	__ _ _
DG05	Video camera			
DG06	Refrigerator		__	__ _ _
DG07	Freezer		__	__ _ _
DG08	Washing machine		__	__ _ _
DG09	Automatic Washing machine		__	__ _ _
DG10	Dishwasher		__	__ _ _
DG11	gas stove		__	__ _ _
DG12	Electric gas		__	__ _ _
DG13	Microwave		__	__ _ _
DG14	Radiator electric		__	__ _ _
DG15	Generator		__	__ _ _
DG16	Knitting/Sewing machine		__	__ _ _
DG17	Conditioner		__	__ _ _
DG18	Water filter		__	__ _ _
DG19	Computer		__	__ _ _
DG20	Satellite Dish		__	__ _ _
DG21	Bicycle		__	__ _ _
DG22	Motor Cycle/Scooter		__	__ _ _

DG23	Private car		__	__ _ _
DG24	Pick up car		__	__ _ _
DG25	Truck		__	__ _ _

Household Income from Employment: Section HI

HOUSEHOLD INCOME FROM EMPLOYMENT DURING THE LAST 30 DAYS					
Ser. No.	HI01 Type of Employment Income	HI02 Employee 1 Income HR01 __ _ _	HI03 Employee 2 Income HR01 __ _ _	HI04 Employee 3 Income HR01 __ _ _	HI05 Employee 4 Income HR01 __ _ _
EMPLOYMENT BENEFITS RECEIVED IN CASH (money)					
EI01	BASIC WAGE / SALARY	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _
EI02	ALLOWANCES, COMMISSIONS, BONUSES (Gross)	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _
EI03	OVERTIME PAYMENTS (Gross)	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _
EI04	TIPS IN MONEY	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _
EI05	OTHER MONEY BENEFITS (Include severance pay)	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _
VALUE OF EMPLOYMENT BENEFITS RECEIVED IN KIND					
EI06	PRICE DISCOUNTS (Regarded as Rights)	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _	__ _ _ _ _ _ _ _ _

EI07	VALUE OF FREE OR EMPLOYER-PAID HOUSING	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
EI08	VALUE OF CLOTHING SUPPLIED BY EMPLOYER	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
EI09	OTHER IN-KIND BENEFITS (Including Tips made in kind)	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _

Other Income: Section OI

		How much did your household receive from [SOURCE] including the value of any gift or payment in the form of goods?	
TYPE OF INCOME/RECEIPT		LAST 30 Days (01)	LAST 6 months (02)
INCOME FROM INVESTMENT			
OI01	INTEREST (from savings deposits, bonds, loans to others)	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
OI02	DIVIDENDS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
OI03	INCOME FROM PENSIONS AND ANNUITIES	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
OI04	INCOME FROM PROVIDENT FUND PAYMENTS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
OI05	Income from land properties (renting and other)	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
GIFTS ASSISTANCE AND AID			
OI06	CASH GIFTS & ASSISTANCE RECEIVED FROM INDIVIDUALS OR HOUSEHOLDS INSIDE SYRIA	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
OI07	CASH GIFTS & ASSISTANCE RECEIVED FROM INDIVIDUALS OR HOUSEHOLDS OUTSIDE SYRIA	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
OI08	OTHER CASH ASSISTANCE FROM GOVERNMENT ORGANIZATIONS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _

O109	CASH ASSISTANCE FROM NON-GOVERNMENT ORGANIZATIONS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O110	CASH ASSISTANCE FROM CHARITABLE ORGANIZATIONS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _

		How much did your household receive in total from [SOURCE] including the value of any gift or payment in the form of goods?	
TYPE OF INCOME/RECEIPT		LAST 30 Days (01)	LAST 6 months (02)
OTHER RECEIPTS			
O111	ALIMONY	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O112	VALUE OF SCHOLARSHIPS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O113	VALUE OF INHERITANCE RECEIVED	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O114	DOWRY RECEIVED	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O115	INCOME FROM LOTTERY	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O116	RECEIPTS FROM SALE OF PROPERTY	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O117	RECEIPTS FROM SALE OF HOUSEHOLD GOODS / VEHICLES	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O118	PAYMENTS FROM INSURANCE COMPANIES	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O119	COMPENSATION FOR DAMAGES (Other than insurance & Alimony)	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O120	LOANS TAKEN OUT	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O121	INCOME FROM RE-PAID LOANS (Principal only)	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O122	WITHDRAWAL FROM SAVINGS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _
O123	INCOME FROM ROYALTIES, PATENTS, AND COPYRIGHTS	_ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _

0124	OTHER INCOME AND RECEIPTS	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _
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OE12	Inheritance taxes, legacies paid, and capital donations to non profit organizations	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _
OE13	Outlays for other financial transactions	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _

OVERVIEW OF HOUSEHOLD ENTERPRISE OPERATIONS

Many Households or individuals run their own enterprise. By 'enterprise' we mean conducting any kind of self-employment activities like running a shop or other sales business, conducting trade, renting out rooms or property, offering transport services, repair services, farming, raising poultry or livestock, sharecropping arrangements, and professional practices like doctors and lawyers."

In this section we want to ask you and your household members about such activities. The enterprise or activity does not need to be officially registered, and may be even conducted only to give a small supplementary income. We are interested in **any enterprises that have had costs or receipts in the past 30 days and 6 months**. That includes enterprises that are no longer operating, and those which have not started up yet.

Serial Number	EN01	EN02	EN03	EN04	EN05	EN06
	<p>Do you or any of your household member's have an enterprise?</p> <p>1 Yes</p> <p>2 No →END</p>	<p>What type of enterprise is it?</p> <p>After each response, probe more if there are any other enterprise which are not operating or have not started yet?</p> <p>DESCRIPTION</p>	<p>Current status of enterprise?</p> <p>1 Operating</p> <p>2 Not operating</p> <p>3 Not started yet but has costs</p>	<p>Main decision maker for the enterprise.</p> <p>Household member who knows most about enterprise finances</p> <p>WRITE NAME</p>	<p>How is the profit mainly used ?</p> <p>1 Household consumption</p> <p>2 Family savings</p> <p>3 For private purpose</p> <p>4 For reinvestment</p> <p>5 Other purposes</p> <p>6 No profit</p>	<p>Kind of enterprise</p> <p>1 Agricultural</p> <p>2 Non-agricultural →NAE01</p>

1			__		__	__
2			__		__	__
3			__		__	__
4			__		__	__

