H i C N **H**ouseholds **i**n **C**onflict **N**etwork

The Institute of Development Studies - at the University of Sussex - Falmer - Brighton - BN1 9RE
www.hicn.org

The Economic Costs of Civil War: Synthetic Counterfactual Evidence and the Effects of Ethnic Fractionalization[1]

Stefano Costalli[2], Luigi Moretti[3] and Costantino Pischedda[4]

HiCN Working Paper 184

October 2014

Abstract: There is a consensus that civil wars entail enormous economic costs, but we lack reliable estimates, due to the endogenous relationship between violence and socio-economic conditions. This paper measures the economic consequences of civil wars with the synthetic control method. This allows us to identify appropriate counterfactuals for assessing the national-level economic impact of civil war in a sample of 20 countries. We find that the average annual loss of GDP per capita is 17.5 percent. Moreover, we use our estimates of annual losses to study the determinants of war destructiveness, focusing on the effects of ethnic heterogeneity. Building on an emerging literature on the relationships between ethnicity, trust, economic outcomes, and conflict, we argue that civil war erodes interethnic trust and highly fractionalized societies pay an especially high "price", as they rely heavily on interethnic business relations. We find a consistent positive effect of ethnic fractionalization economic war-induced loss.

[1] We would like to thank participants at the Conflict Research Society Conference (University of Essex, 2013), the Midwest Political Science Association 72nd Annual Conference (Chicago, 2014), and the European Political Science Association Conference (Edinburgh, 2014) for comments on previous drafts of the paper. The usual disclaimer applies.
[2] Stefano Costalli, Department of Government, University of Essex, Wivenhoe Park, Colchester, CO43SQ, United Kingdom. E-mail: scosta@essex.ac.uk
[3] Luigi Moretti, Department of Economics and Management, Univeristy of Padova, via del Santo 33, 35123 Padova, Italy. E-mail: luigi.moretti@unipd.it
[4] Costantino Pischedda, Department of Political Science, Columbia University, 420 W. 118th St. International Affairs Building, room 734, New York, NY 10027, US. E-mail: cp2417@columbia.edu

1. Introduction

Observers, participants, and victims generally agree that civil wars entail enormous human and economic costs. However, we lack reliable estimates of these costs, due to measurement and aggregation challenges as well as the complexity of the nexus between political violence and socio-economic conditions. With this paper we aim to advance our understanding of the economic consequences of civil wars by employing the synthetic counterfactual method. This method allows us to identify appropriate counterfactuals for assessing the economic impact of civil war in a sample of war-torn countries, thus tackling the endogenous relationship between economic development and civil war. We find that, on average, the annual loss of GDP per capita associated with civil war is 17.5 percent for the 20 countries in our sample (the average war duration is 9.5 years). In addition, we study the determinants of this economic loss, focusing in particular on the effects of ethnic heterogeneity. Building on an emerging literature on the relationships between ethnicity, trust, economic outcomes, and violent conflict, we argue that civil war erodes interethnic trust and that highly fractionalized societies pay an especially high economic price, as they rely heavily on interethnic business relations. We find that ethnic fractionalization has a consistent positive effect on war's destructiveness.

Ours is not a mere exercise in causal inference virtuosism: reliably assessing the economic costs of civil conflict is important for policy. As Macartan Humphreys (2003: 8) pointed out, accurately "[c]alculating the economic costs of war is necessary to determine the relative economic benefits of investing in war avoidance rather than in post-conflict operation."[5] In addition, reliable costs estimates are necessary for analyses of the determinants of the impact of civil war, an example of which we present in the second part of this paper; these analyses can in turn help devise effective policies for post-conflict recovery.

The rest of the paper is structured as follows. Section 2 presents the motivation for our research by discussing the limits of the existing empirical literature on the economic impact of civil war. Section 3 describes our empirical method for assessing the economic costs of civil war, details its advantages vis-à-vis other approaches, and introduces our findings. Section 4 presents our

[5] Policymakers have repeatedly expressed interest in obtaining accurate analyses of the development impact of armed conflict. For an early attempt by World Bank's analysts to provide the organization with estimates of the costs of civil war, see World Bank 2003.

theoretical argument about the impact of ethnic fractionalization on civil war-induced economic loss and reports the corresponding regression results. Section 5 concludes.

2. Measuring the Economic Costs of Civil War

War is about killing people and breaking things (Betts, 1994: 30). It is thus unsurprising that civil wars entail significant economic costs. At the most basic level, internal armed violence leads to the depletion of a country's stock of productive factors – labor, human and physical capital – through the killing, maiming, and displacing of individuals as well as the destruction of infrastructure, productive equipment, and household assets (e.g., cattle). Moreover, public resources are diverted from productive activities and social services to war fighting; financial and human capital flee the conflict-ridden country; opportunism and distrust increase as individuals experience violence and time horizons shorten; and a shift occurs away from war-vulnerable economic activities (e.g., construction, finance, and manufacturing) towards activities that are less vulnerable but also less productive, such as subsistence agriculture (Collier, 1999; Koubi, 2005; World Bank, 2003; Chen, Loayza, & Reynal-Querol, 2008; Gates, Hegre, Nygard, & Strand, 2012).

While the observation that civil wars entail major economic costs is not controversial, reliably estimating those costs has proven very challenging due to omitted variable and reverse causality problems. As Blattman & Miguel (2010: 39) point out, "assessing the economic consequences of civil war is complicated by a central identification problem: war-torn countries are different than peaceful ones", thus some unobserved factors could be driving both economic performance and armed conflict. Moreover, economic development and civil conflict are linked in a circular relationship: internal conflict negatively affects the economy and poor economic conditions in turn increase the risk of civil war (Fearon & Laitin, 2003; Miguel, Satyanath, & Sergenti, 2004; Collier & Sambanis, 2005; Hegre & Sambanis, 2006). Thus, war-time economic decline could reflect the deteriorating economic situation that contributed to bring about conflict, in addition to being its consequence. Put differently, assessing the costs of civil war requires identifying a valid

counterfactual – i.e., persuasively answering the difficult question of what a country's GDP per capita would have been had it not experienced armed conflict.[6]

The existing literature, although it offers important contributions, does not satisfactorily address the challenges involved in finding appropriate counterfactuals. Quantitative works on the economic effects of civil conflict typically use panel data econometrics, often relying on country fixed effects (Collier, 1999; Hoeffler & Reynal-Querol, 2003; Cerra & Saxena, 2008; and Gates et al., 2012). The study by Chen, Loayza, & Reynal-Querol (2008) represents an exception as it uses an event-study methodology to compare countries' prewar and wartime growth performance as well as to juxtapose war-torn countries' growth trajectories with those of neighbors and peaceful developing countries. Case study analyses tend to adopt a similar approach, comparing pre- and wartime economic conditions or conflict-affected countries' growth trajectories with neighbors' and regional averages (see, for example, the eight case studies in Stewart, FitzGerald and Associates, 2001). However, these are not necessarily appropriate counterfactuals as the assumption that, in the absence of armed conflict, a country's economy would have performed as in the past or similarly to a peaceful neighbor's may not be warranted.

Some micro-level empirical studies creatively tackle the endogeneity of the conflict-development relationship. For example, Miguel & Roland (2011) analyze the long-term impact of US bombing in Vietnam on living standards and human capital in the country, using a district's distance from the arbitrarily settled North-South border as an instrument for bombing intensity. However, as Blattman & Miguel (2010: 41) observe, the limitation of sub-national studies lies in their inability to credibly estimate the aggregate national economic impact of armed conflict. In particular, these studies may underestimate the country-wide effects of civil war, if even largely peaceful areas are also adversely affected by war-related disruptions.

In order to provide credible country-level counterfactuals, we use the synthetic control method (or synthetic counterfactual), which allows us to create data-driven counterfactuals for a large number of case studies within a unified statistical framework. Abadie and Gardeazabal (2003) first applied this methodology to study the economic effects of terrorism in the Basque country,

[6] Gates et al. (2012: 1715) and Smith (2014) stress the importance of, and the challenges involved in, finding valid counterfactuals to assess the developmental impact of civil conflict.

while Dorsett (2013) recently used it to investigate the economic impact of terrorism in Northern Ireland in the 1970s and 1980s.[7]

The basic idea of this technique is to construct a synthetic (i.e., artificial) match for each treated unit (in our case, a war-torn country) by combining units in the "control group" (countries at peace) in such a way that the synthetic country mimic as closely as possible (typically more accurately than any real-world country) the behavior of the country of interest before the onset of civil war. Once it is established that the outcome variable of interest (in our case, income per capita) behaves similarly for the country under examination and its synthetic match over an extended period of time before the intervention (civil war), a discrepancy in the paths of this variable after the onset of civil conflict is interpreted as caused by it.

This method can deal with omitted variable bias by accounting for the presence of time-varying unobservable confounders in the treatment and control groups, while panel analyses with fixed effects and difference-in-differences can account only for confounders that are time invariant or share a common trend, respectively (Billmeier & Nannicini, 2013). The synthetic counterfactual can also address the reverse causality objection that an underlying trend of economic decline in the country under examination could be causing both the economic loss that we observe during the conflict and the conflict itself. A good pre-treatment fit would account for any such trend, thus ensuring that the difference in the outcome of interest in the treatment-period can be attributed to the conflict.[8] An additional benefit of the synthetic control method, as Abadie, Diamond & Hainmueller (2012) point out, is that it contributes to create the bridge between qualitative and quantitative methods advocated by several scholars (Tarrow, 1995, 2010; Lieberman, 2005; Gerring, 2007). The method allows us to employ a comparative case study research design, conducive to a more detailed description and analysis of the differences between the cases of interest and the

[7] The synthetic control method has also been employed for impact evaluation of phenomena unrelated to violent conflict: transition from democracy to autocracy (Nannicini & Ricciuti 2014); anti-tobacco regulation (Abadie et al., 2012); Germany's reunification (Abadie et al., 2014), economic liberalizations (Billmeier & Nannicini, 2013); political connections (Acemoglu et al., 2013); and EU membership (Campos, Coricelli, & Moretti, 2014a and 2014b).

[8] A different problem of reverse causality would arise if the armed conflict were triggered by the anticipation of future economic decline. As long as these expectations are not captured by the unobservable heterogeneity included in the model, this would bias the findings of the synthetic control approach (Billmeier & Nannicini, 2013). However, this kind of dynamic is not supported by theoretical arguments linking economic conditions and civil conflict, according to which actually manifested (rather than anticipated) poor economic performance increases conflict risk by weakening state capacity and/or decreasing the opportunity cost of fighting for individuals.

comparison units than regression analysis, while preserving the benefit of precise numerical results that can be compared across cases.

Before we proceed to our analysis two caveats are in order. First, our focus on the economic consequences of civil war is not intended to downplay the severity of its social and human costs. We look at economic costs because the available data are relatively comprehensive and they pose less serious measurement and aggregation challenges than non-economic costs.[9] Second, it should be noted that we focus on economic costs *during* armed conflict, not in its aftermath.[10]

3. Synthetic Counterfactuals

3.1 Methodological Issues

As noted, the first aim of this paper is to assess the costs of civil war by constructing a counterfactual of the path of the GDP per capita for each of the conflict-ridden countries in our sample (i.e., an estimate of the country's GDP per capita in the years in which the conflict took place, had the conflict not occurred). As with other methodologies for impact evaluation, the synthetic control method that we employ compares the outcome of a treated country against that of a control unit. The control unit is called "synthetic" because it is a weighted combination of a

[9] For a discussion of difficulties of measuring and aggregating non-economic costs of armed conflict, see Smith, 2014. Examples of studies of the non-economic impact of civil conflict include: Ammons, 1996 (on infant mortality); Ghobarah, Huth, & Russett, 2003 (on mortality and disability); Soares, 2006 (on life expectancy); Plümper & Neumayer, 2006 (on the gender gap in life expectancy); Iqbal, 2006 (on public health); Lai & Thyne, 2007 (on education); Welsch, 2008 (on happiness); and Gates et al., 2012 (on progress towards the United Nations' Millennium Development Goals).

[10] An alternative research design assessing the costs of armed conflict both during its course and in its aftermath would incur in a problem of double treatment. The treated country would first be subjected to conflict (the first treatment) and then to post-conflict peace (the second treatment). As a consequence, the control group would need to include countries that were not at war in T_1 (the period of conflict for the country of interest) but were at war in T_2 (the period of post-conflict peace). This requirement would drastically reduce the number of countries that can be included in the donor pool, making it virtually impossible to conduct the analysis. Broadly speaking, the existing studies on post-conflict economic dynamics fall in one of two categories. The "war renewal" school of thought, in line with neoclassical models of economic growth, points out that armed conflict (both between and within states) tends to usher in an era of fast growth, due to post-war technological innovation, rapid capital replenishment and the weakening of rent-seeking special interests (the classic references are Organski & Kugler, 1977, 1980, and Olson, 1982; see also Przeworski et al., 2000). The "war ruin" school, by contrast, finds that economic recovery takes a long time and the adverse effects of civil conflict are persistent, in particular in the form of large military budgets, a significant risk of relapse into war, uninterrupted capital flight and a high incidence of infectious diseases (see, for example, Kank & Meernik, 2005; Collier 2007).

sample of donor countries, which are not exposed to the treatment.[11] Taking into account a set of predictors of the outcome variable, the weights assigned to each country in the donor pool are chosen so that the pre-treatment evolution of the outcome variable in the treated country is approximately equal to its synthetic match. As Abadie, Diamond & Heinmueller (2010) show, if there are no appreciable differences in the pre-treatment evolution of the outcome variable between the treated unit and the synthetic control, and the pre-treatment period is sufficiently long compared to the treatment period, the outcome for the synthetic country in the treatment period represents an unbiased estimation of the counterfactual for the treated country, and thus the difference between the outcome variable of the treated unit and that of the synthetic control in the treatment period is an unbiased estimation of the treatment effect.

Following Imbens and Wooldridge (2009), the synthetic control method can be formally described as follows. Let $U_i = U$ indicate the treated country that is affected by a given treatment at time T_0, and $U_i = 0, \ldots, U_i - 1$ indicate the donor countries that are not affected by the treatment. The researcher observes the outcome of the treated country before and after the treatment and so the outcome of the donor countries, but she does not observe the outcome of the treated country in the absence of the treatment. An estimate of the outcome for the treated country in the time after the treatment, had the treatment not occurred, can be obtained through a weighted average of period T (with $T>T_0$) outcomes for the U donor countries,

$$\widehat{\mathbb{E}}[Y_i(0)|T_i = T, U_i = U] = \sum_{u=0}^{U-1} \lambda_u \cdot \bar{Y}_{uT}$$

where λ_u indicates the weights satisfying the conditions $\sum_{u=0}^{U-1} \lambda_u = 1$, and $\lambda_u \geq 0$. As noted, the weights λ_u are chosen to minimize the difference between the treatment country and the weighted average of the control group before the treatment, explicitly:

[11] The pool of donor countries is the set of potential controls for each treated unit, i.e., the group of countries used to construct the artificial match through a process of weighted combination (Abadie, Diamond, & Heinmueller, 2010: 494).

$$\left\| \begin{matrix} \bar{Y}_{U0} \sum_{u=0}^{U-1} \lambda_u \cdot \bar{Y}_{u0} \\ \vdots \\ \bar{Y}_{U,T-1} - \sum_{u=0}^{U-1} \lambda_u \cdot \bar{Y}_{u,T-1} \end{matrix} \right\|$$

where $\|\cdot\|$ indicates a measure of distance. Keeping in mind the idea that the future path of the synthetic country, consisting of the λ-weighted average of all the donor countries, mimics the path that would have been observed in the treated country in the absence of the treatment, the researcher can add group-level covariates to the criterion to determine the weights.

As mentioned, our treatment is the occurrence of civil war, while the preceding years of peace are our pre-treatment period. The years between the beginning and the end of the war are the focus of our analysis – the treatment period. We followed straightforward and transparent criteria for selection of countries that experienced an internal conflict between 1970 and 2008 with the objective of ensuring a good fit of the outcome path prior to treatment and thus obtain reliable counterfactuals (Abadie, Diamond, & Heinmueller, 2010:495). First, data availability constrains our sample both because our methodology requires a sufficiently long pre-treatment period and because war-years are notoriously affected by problems of missing data. Other things being equal, a good fit for a longer pre-treatment period makes the researcher more confident about the post-treatment projection of the synthetic unit's outcome. Thus, if a war lasts more than 10 years, we impose the requirement that the pre-treatment GDP series be at least as long as the treatment-period series. For wars that last less than 10 years, instead, we require a pre-treatment period of at least 10 years.[12] Second, in order to examine the effects of the treatment over time, we require at least 3 years of treatment period for each case (i.e., we include only conflicts that last at least 3 years). Third, as very poor countries display extremely volatile paths of GDP per capita over time, making it more difficult to construct good synthetic counterfactuals, we require a minimum average GDP per capita of $2 Purchasing Power Parity (PPP) per day in the pre-treatment period for each treated

[12] Note that we apply these criteria with some flexibility, allowing for a two-year "grace period" around the thresholds, in order not to lose interesting cases that almost matched the criteria. We require the pre-treatment analysis to start after 1960 to reduce the number of missing values and thus ensure a larger number of countries in the control sample.

country.[13] Fourth, the treated country must not have been involved in an international war in the five years before the outbreak of the civil conflict.[14]

Our pool of donor countries includes countries that did not experience civil or international war during the period of analysis and for which macroeconomic data from the Penn World Tables are available.[15] The inclusion of a large number of countries in the donor pool ensures the transparency of our analysis and keeps the choice of the weights to be assigned to the donor countries as much data-driven as possible.[16]

The Penn World Tables (version 7.0) are our main source for economic data. We use GDP per capita in PPP as the outcome variable and, following Nannicini & Billmeier (2013), we use its lagged values (year by year) from the beginning of the pre-treatment period to the year before the treatment as outcome predictors. We also include, among the covariates, the pre-treatment average of the investment share, trade openness, and population growth rates (all from the Penn World Tables) and, as measure of education, the secondary school enrollment (% gross) from the World Development Indicators. As previously described, these variables enter the algorithm for the choice of the weights to be assigned to each donor country (see Abadie, Diamond, & Heinmueller, 2010).[17] Our variable identifying the period of civil war comes from the Kalyvas & Balcells' (2010) dataset, which is an expanded and modified version of Nicholas Sambanis' (2001) dataset.

As noted, the main advantage of the synthetic control method is that it allows us to conduct more credible counterfactual analysis than by simply comparing pre- and post-treatment outcomes or arbitrarily choosing a set of countries as control group. The method addresses endogeneity concerns associated with time-varying unobservable confounders, while panel analyses with fixed effects and difference-in-differences can only account for time invariant or parallel-trend

[13] Due to similar concerns of substantial GDP volatility, we exclude countries that experienced dramatic currency devaluations.

[14] We do not exclude from the treated group countries that experienced international conflict during the treatment period, as long as long as the interstate conflict did not last more than one year and caused less than 1,000 battle-related deaths (Gleditsch et al., 2002). The rationale for this coding decision is to maximize the size of our treatment group by including cases in which international conflict is likely to have had a minor impact compared to the civil war.

[15] We require countries to have no missing for the GDP series in the whole period of analysis and have at least one observation of each of the covariate series in the pre-treatment period.

[16] Another rationale for a large donor pool, not limited to neighboring countries, is that while countries from the same region tend to share many economic and social features with the treated one, they may also be affected by the treatment through processes of conflict diffusion/contagion.

[17] Our results are robust to different sets of growth predictors (e.g., the GDP share of industry and agriculture, population density) (results available upon request).

unobservables (Billmeier & Nannicini, 2013). Unlike other statistical tools for program evaluation (including most forms of matching techniques), our method enables us to assess the dynamic effects of the treatment, namely to appreciate the evolution of the economic effects of civil war year by year, instead of simply focusing on an average treatment effect. Moreover, the synthetic counterfactual sidesteps challenges involved in case selection for qualitative analysis by providing a systematic way to choose comparison units and allowing us to assess the costs of civil war for all cases that meet our data requirements. Relatedly, the method enables an analysis of a large number of cases thus assuaging concerns about generalizability. It also precludes the extreme counterfactuals produced when researchers extrapolate the estimated effects of their statistical models outside the support of the data (King & Zeng, 2006).

Finally, two potential sources of attenuation bias for our estimates should be noted. First, some form of war anticipation effect may occur by which economic agents adjust to their expectation of conflict outbreak by making decisions that negatively affect the economy before fighting erupts (e.g., they disinvest or withhold savings). These anticipated negative consequences can be logically attributed to the subsequent eruption of conflict but would not be captured as a treatment effect in the analysis. For this reason our estimated effects are likely to be an underestimation of the actual effect. Second, if the neighboring countries take positive weights in the construction of the synthetic counterfactual and the GDP per capita of these countries is negatively affected by spillover effects (Murdoch & Sandler, 2002, 2004), our results are likely to underestimate the negative effect of the war on the treated country.[18]

To tackle the latter problem, and more generally to address concerns that our estimates may be driven by the specific composition of our sample of donor countries, we adopt a robustness check also used by Campos, Coricelli, & Moretti (2014b). By construction, the weights assigned to each donor country and the resulting counterfactuals are influenced by the composition of the donor sample; as previously noted, we decided to include in it as many countries as possible rather than arbitrarily picking and choosing. However, to ensure that our results are not driven by the inclusion of specific countries experiencing an economic shock unrelated to the war in the treated country, we

[18] Note that we could also overestimate the negative effects of the war if a negative shock on the economy occurred at the same time as the civil war (or preceded it but produced effects with a lag during the war).

perform the following test: for each treated country, we iteratively re-estimate the synthetic counterfactual using a large number (one hundred) of alternative donor samples; each alternative donor sample randomly selects 50 percent of the countries used for the main analysis. This exercise allows us to compare our main estimates with a large number of estimates based on random samples: if our main estimates are not outliers compared to those obtained with the random donor samples, our confidence in the findings is strengthened.

3.2 Findings

As Table 1 shows, on average, the annual loss of GDP per capita in PPP terms associated with civil war is 17.5 percent for the 20 countries in our sample (the average war duration is 9.5 years).[19] This estimate is in the same ballpark as Paul Collier's (1999: 175-176) oft-cited finding that a 15-year civil war would reduce a country's GDP per capita by about 30 percent on average. Collier also finds that civil wars tend to reduce annual economic growth by 2.2 percent, which is roughly comparable to our corresponding estimate of about 1.5 percent (this value is calculated as the average across countries of the average annual gap in GDP growth between the actual country and its synthetic match).[20]

Figure 1 shows that the economic effects of civil war vary substantially across cases. This heterogeneity is not surprising, but our case study approach allows us to reveal it, unlike cross-sectional and panel regression analyses. Most cases display a sharp drop in GDP per capita early in the civil war, but some diverge from this pattern.[21]

[19] This is the average of the 20 countries' average annual economic losses, calculated as the percentage ratio between the actual GDP per capita and its synthetic counterfactual. For instance, in Table 1, the 16 percent figure for Ivory Coast indicates that on average during that civil war the GDP per capita was 16 percent lower than the synthetic match.

[20] See Table A.2 in the Appendix for the weights assigned to the countries in the donor sample and for the predictor balance obtained in the construction of each synthetic counterfactual.

[21] Figures 1 and 2 report two vertical lines, indicating, respectively, the beginning (January 1) and the end (December 31) of the first year of civil war; any point to their right corresponds to a period of war.

Table 1: Impact of war on GDP per capita

Country	Percentage effect
Cote d'Ivoire	-16.135
Congo, Republic of	-0.397
Djibouti	-27.898
Algeria	-2.979
Egypt	-1.775
Haiti	-13.350
Kenya	-3.217
Liberia	-73.950
Nigeria	-6.461
Nicaragua	-22.417
Nepal	-14.175
Peru	-14.058
Rwanda	-14.402
Senegal	-2.821
Sierra Leone	-24.221
El Salvador	-21.522
Somalia	-51.895
Thailand	-5.124
Turkey	-1.587
Uganda	-31.731
AVERAGE	-17.506

Notes: The table reports by country the percentage difference between the actual GDP per capita serie and the synthetic GDP per capita serie averaged during the treatment-period.

Figure 1: Real GDP per capita and its synthetic counterfactual

Note: Each graph plots two series. The continuous line represents the actual GDP per capita level for each of the 20 war-torn countries in our sample, while the dashed line is its synthetic counterfactual. The two vertical lines indicate, respectively, the beginning and the end of the first year of war; all years to the right of the first vertical line correspond to periods of war.

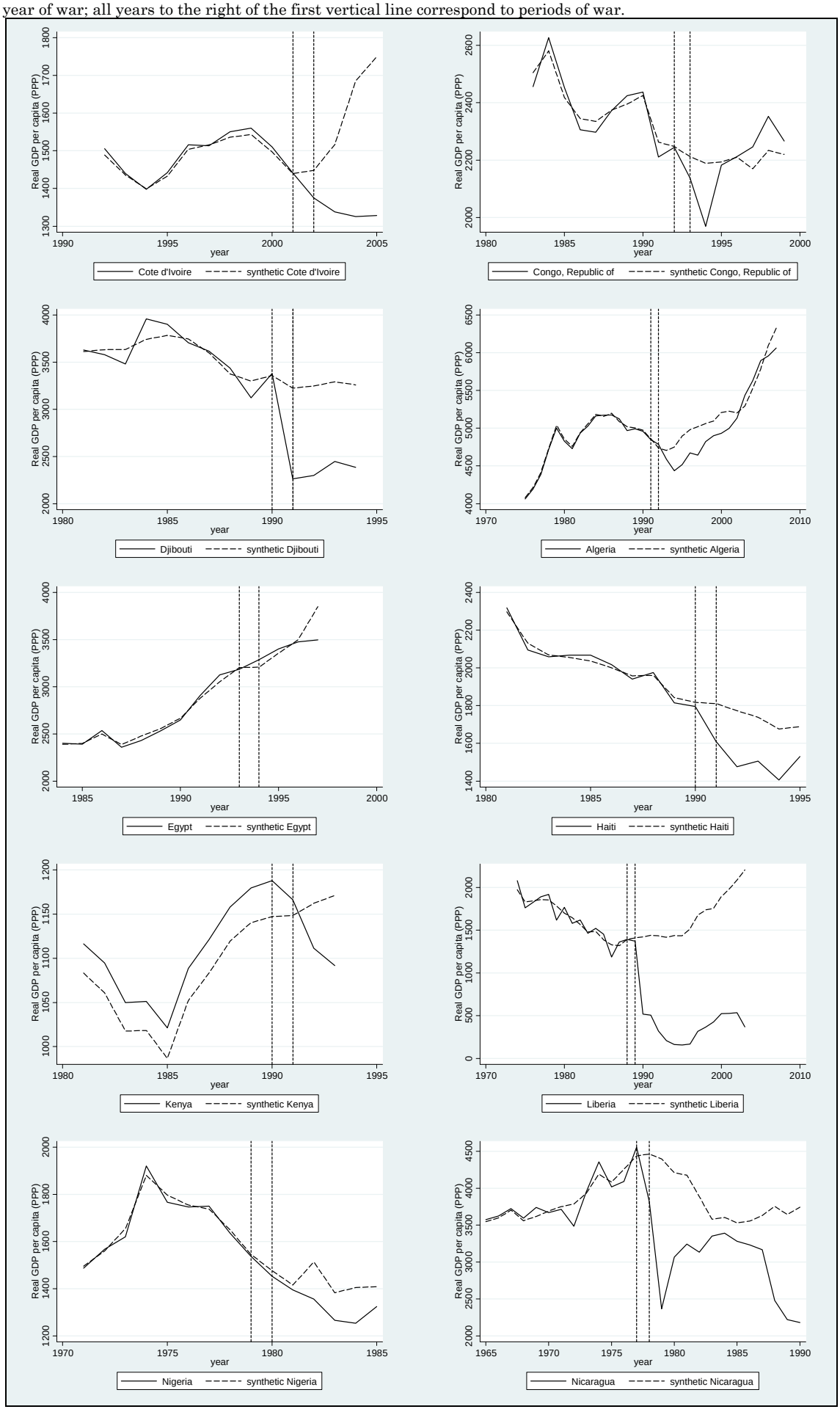
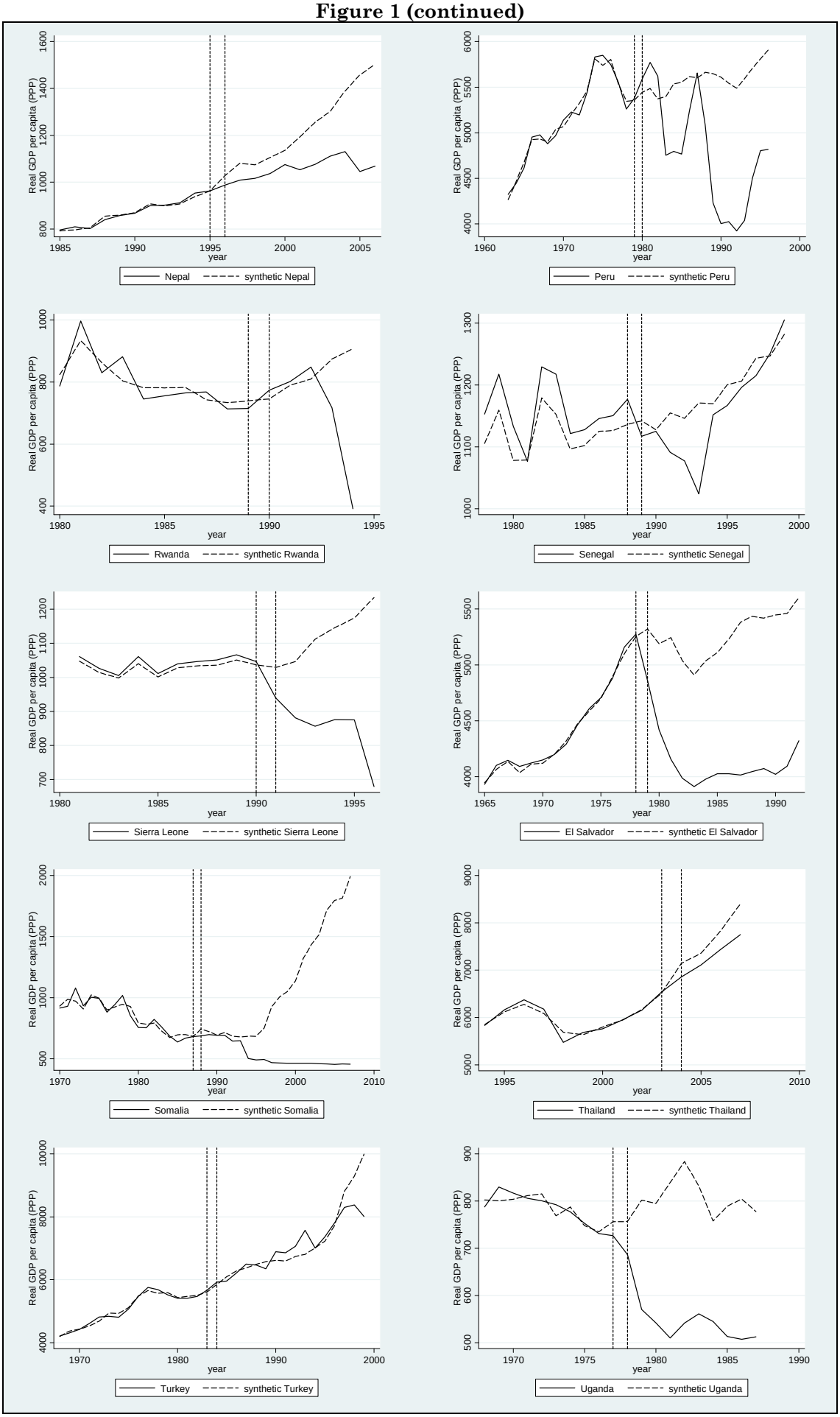


Figure 1 (continued)



In the case of Turkey, there is no evidence of an appreciable economic loss until 1997-1998 (when we observe a loss of about 5 and 10 percent of GDP per capita, respectively). The overall limited economic impact may be due to the fact that the violence mostly affected the Kurdish southeast of the country, while the losses of the last two years of conflict may be due to the significant escalation of government counterinsurgency operations from the mid-1990s, causing the depopulation of many Kurdish villages (Marcus 2007).[22] Rwanda displays a somewhat similar pattern, with no discernible economic loss in the first two years of the war (when the intermittent, low-level fighting was limited to the north of the country) followed by a very sharp downturn in 1993 and 1994 (when a major rebel offensive and the genocide occurred) (Jones 2001: 28-38).[23]

Also noteworthy are the cases of the Republic of Congo and Kenya. As Figure 2 shows, our estimates of the GDP loss for these two countries (the black lines) are clearly above most of the estimates of the loss based on alternative random samples (the gray lines), which suggests that with the full control sample we are likely underestimating the real economic loss caused by those civil wars. Figure 2 also shows that in most of the other cases our baseline estimates are in line with the estimations obtained using random donor samples, which suggests that we can be confident that our main estimations are not driven by the specific composition of the donor sample.[24]

[22] In their synthetic counterfactual analysis of the effects of the civil war in Turkey's southeastern provinces, Bilgel and Karahasan (2013) also found the largest gap in GDP per capita in the years 1997-1998.

[23] In Egypt too a low-level Islamist insurgency is not associated with an appreciable economic loss until two major terrorist attacks on tourist sites in 1997, which were followed by a major contraction of Egypt's tourism industry (Gerges 2000: 608-609).

[24] Note that as a further robustness check, we follow Campos, Coricelli, & Moretti (2014a, 2014b) and conduct difference-in-difference tests for the actual and synthetic series of each country so as to be able to make statements about the level of statistical significance of their differential. Results are available in Appendix, Table A.1.

Figure 2: Real GDP per capita and its synthetic counterfactuals (using random control samples)

Note: The black line represents the difference between the actual GDP per capita levels of the country in question and its synthetic counterfactual obtained in figure 1. The grey lines represent the difference between the actual GDP per capita of the country in question and its synthetic counterfactual obtained using different donor samples randomly chosen. Each donor sample includes 50% of the countries belonging to the donor sample in Figure 1.

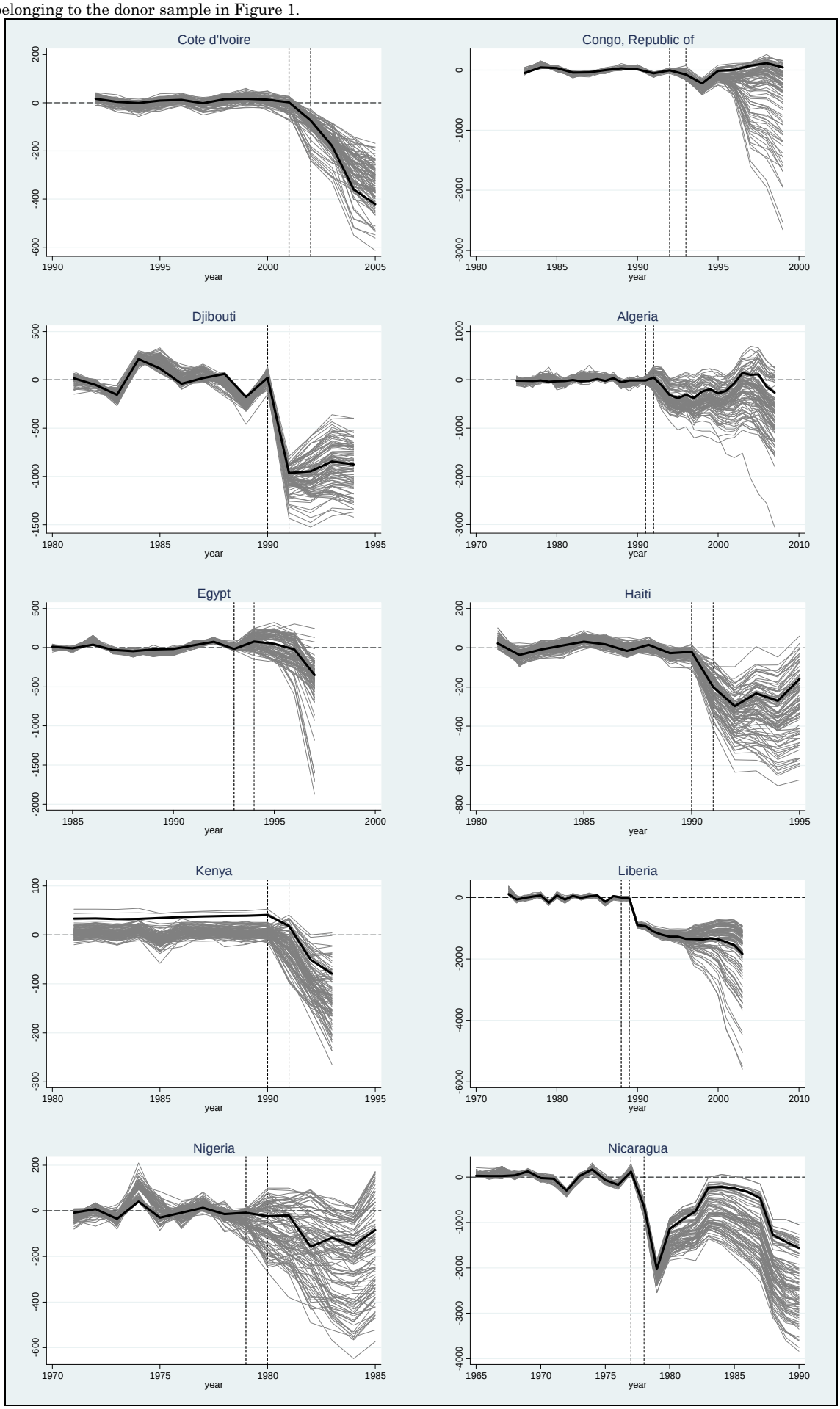
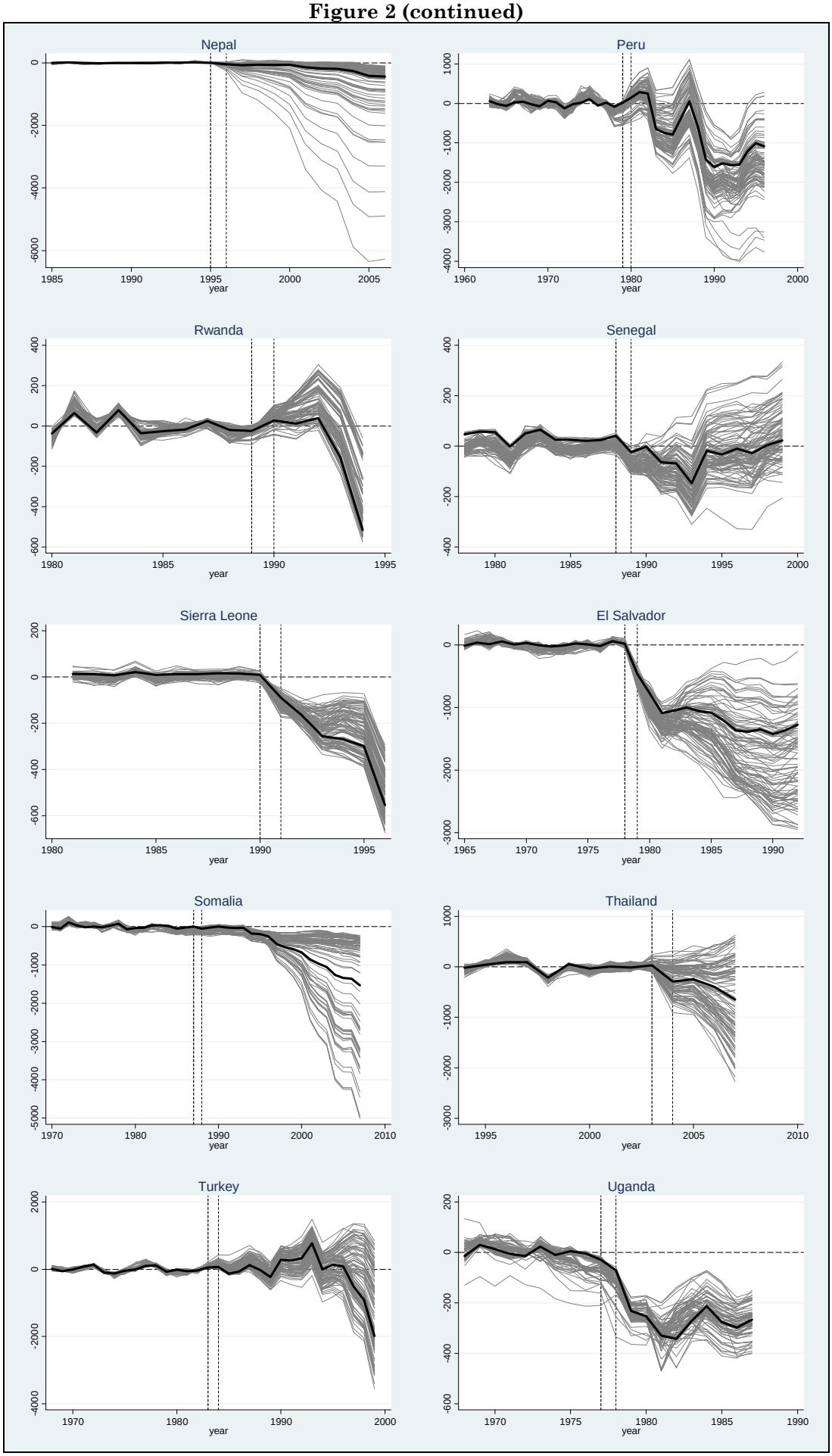


Figure 2 (continued)



4. Ethnic Heterogeneity and the Economic Costs of Civil War

Having estimated the loss of GDP per capita due to armed conflict in our sample of countries, we turn to the analysis of its determinants, focusing in particular on the role of ethnic heterogeneity. Weaving together a series of recent findings, we argue that civil war erodes interethnic trust and that highly fractionalized societies pay an especially high economic price, as on average they rely heavily on interethnic business relations, which violence tends to undermine. We provide supporting evidence through a series of panel regressions with the percentage difference between actual GDP per capita and the GDP per capita of the synthetic counterfactual of a given country x in a given war-year t as our dependent variable.

4.1 The argument

The literature on the relationships between ethnicity, trust, economic outcomes, and violent conflict has made important strides in recent years, but several crucial debates remain open. A body of works explores the relationship between ethnic heterogeneity and several socio-economic outcomes, typically finding that heterogeneity has a negative impact on the quality of policies and institutions (La Porta et al., 1999), public goods provision (e.g. Miguel & Gugerty, 2005), participation in social activities and trust (Alesina & La Ferrara, 2000, 2002), and economic growth (Alesina et al., 2003; Montalvo & Reynal-Querol, 2005). A second strand of literature finds that social capital and trust have positive effects on economic outcomes such as growth (Zak & Knack, 2001; Beugelsdijk, de Groot, & Van Schaik, 2004; Algan & Cahuc, 2010), financial development and trade (Guiso, Sapienza, & Zingales, 2004, 2009).

A burgeoning third line of research looks at the effects of violent conflict on pro-social behavior, but reaches disparate conclusions. Some micro-level studies on the behavioral legacies of conflict report enhanced pro-social behavior of individuals after violence. Bellows & Miguel (2009) find that people more affected by the war in Sierra Leone display higher levels of social and political involvement. Similarly, Blattman (2009) documents higher levels of political activism among abductees of the Lord's Resistance Army than in the general population of northern Uganda. Voors et al. (2012) report that members of communities exposed to higher levels of violence in Burundi

exhibit more altruistic behavior, while Gilligan, Pasquale, & Samii (2013) find higher levels of social cohesion and trust in Nepalese communities more affected by the civil war. By contrast, some studies support the conventional wisdom that violence undermines social cohesion and trust while increasing the salience of ethnic identities. Rohner, Thoenig, & Zilibotti (2013a) find that individuals in locales more exposed to violence in Uganda subsequently exhibit lower levels of generalized trust and stronger ethnic identities. Becchetti, Conzo, & Romeo (2014) report lower trustworthiness among individuals most affected by electoral violence in Kenya in 2007. Consistently, Cassar, Grosjean, & Witt (2013) find that victims of civil war violence in Tajikistan display lower trust, trustworthiness, and willingness to enter into market transactions as well as stronger kinship ties. However, the same individuals also participate at higher rates in community and religious associations.

The long-standing observation (Portes, 1998) that there exist different types of social capital, with distinct implications for social outcomes, goes a long way in explaining the literature's contradictory findings on the relationship between conflict and pro-social behavior. The experience of violence may both erode generalized trust and enhance social and political participation, as the two are distinct phenomena. Generalized trust amounts to willingness to cooperate with strangers despite the risk of exploitation, while socio-political involvement may well occur within friendship, kingship or ethnic networks and may entail distrust, exclusion and discrimination of outsiders. Moreover, some of the divergent findings could be explained by the fact that the effects of conflict on pro-social behavior are likely to depend on a country's ethnic structure (relevant for answering the question: trust toward whom?), the main cleavage of conflict, and the patterns of violence (does the conflict pit ethnic group X against group Y? Are members of X mostly targeted by ethic-others?). Violence may increase victims' interethnic distrust and harden identities while enhancing in-group trust, with an ambiguous net impact on a country's overall stock of trust. Consistently, Bauer et al. (2014) find that in Georgia and Sierra Leone greater exposure to war spurred long-lasting egalitarian motivations among children and young adults towards one's in-group, but not out-groups. Similarly, Dercon & Gutiérrez-Romero (2012) report that victims of electoral violence in

Kenya display reduced trust towards members of other ethnic groups but not towards co-ethnics.[25]

Taking stock of these various findings, we posit that armed conflict affects the economy through its differential impact on intra- and interethnic trust. Generalized trust is a fundamental ingredient for a functioning economic system. Much economic exchange occurs in a context of asymmetric information about the reliability of one's anonymous counterparts. Trust enables economic agents to operate more efficiently (for example, by invoicing for goods that they have delivered) and reduces the need to devote resources to monitoring and protection against exploitation. Consistently with Dercon & Gutiérrez-Romero's (2012) and Bauer et al.'s (2014) findings, we expect civil war to erode interethnic trust, while leaving intra-ethnic trust unaltered or even bolstering it. Violent conflict can thus be seen as exacerbating the observed tendency for individuals to cooperate and reciprocate cooperation more frequently when dealing with coethnics than ethnic-others (Glaeser et al., 2000; Habyarimana et al., 2007). Domestic trade is likely to be an important mechanism through which war-induced mistrust affects the economy, due to its trust-sensitive nature and its immediate impact on the economic system (Rohner, Thoenig, & Zilibotti, 2013b).[26] Trust is especially important for trade in the absence of effective legal enforcement, a likely scenario during civil war. In addition, mistrust could affect economic performance by undermining public good provision, in particular when it relies heavily on individual contribution – a common occurrence when state capacity is low.

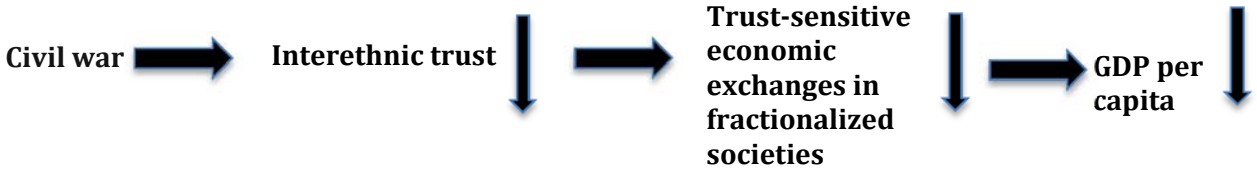
We expect the negative economic effects of civil war to be more pronounced the more ethnically heterogeneous a country is. In highly fractionalized countries (i.e., characterized by the presence of many, small ethnic groups), a large number of economic exchanges would naturally occur between ethnic-others, but risk being encumbered or even deterred by conflict-induced mistrust. Economic inefficiency is bound to be high when markets look like small and isolated

[25] See also Shayo & Zussman (2011), who find that Israeli Arab and Jewish judges' in-group bias is positively associated with the intensity of terrorism in the vicinity of the court.

[26] Colletta & Cullen (2000) report persistently lower levels of Hutu-Tutsi trade compared to before the genocide; Guiso, Sapienza, & Zingales (2009) and Glick & Taylor (2010) show that interstate war has a strong and long-lasting suppressive effect on bilateral international trade. Rohner, Thoening, & Zilibotti (2013b) propose a theory by which interethnic trade requires specific human capital investment by two ethnic communities (e.g., learning the other group's language or customs, maintaining an interethnic social network), so that each group will invest only if it trusts the other to do the same. Trust may also affect trade through the mechanism of trade credit (Fishman & Love, 2003).

"ethnic islands," even if there are high levels of intra-ethnic trust.[27] Figure 3 below summarizes the logic of the argument with a flow diagram.

Figure 3: Ethnic fractionalization and GDP loss



Among the existing studies, Rohner, Thoenig, & Zilibotti's (2013a) most closely resembles our analysis of the impact of ethnic heterogeneity on the economic costs of armed conflict, but there are important differences. The authors analyze the effects of war in Uganda on post-conflict light intensity at night observed from a satellite (a proxy for GDP per capita) and find that violence negatively affects light intensity in ethnically fractionalized areas, but not in homogenous ones. Our analysis relies on a panel of 20 countries, thus allowing us to assess the determinants of civil war across different cases and over time, whereas Rohner, Thoenig & Zilibotti (2013a) conduct a cross-sectional analysis of Uganda's counties. Moreover, we use a direct measure of the dependent variable (the loss of GDP per capita), rather than light intensity as a proxy of GDP, which, as Rohner, Thoening, & Zilibotti (2013a) note, is less than ideal.

4.2 Methodology and data

Our dependent variable for this part of the analysis is the percentage loss of GDP per capita calculated with the synthetic control method. In the basic specification, our independent variable of interest is the measure of ethnic fractionalization (*Ethnic Fract.*) drawn from Reynal-Querol's (2002) dataset.[28]

[27] On the distinction between interethnic and intra-ethnic networks, see Varshney 2001.

[28] We are fully aware of the theoretical critiques of indexes of ethnic fractionalization (Laitin & Posner, 2001; Posner, 2004; Chandra & Wilkinson, 2008). The absence of a tight match between the theoretical concepts of interest and measures of ethnic heterogeneity, which plagues several studies, does not apply to our analysis as we offer a theoretical argument directly linking heterogeneity and growth, rather than advancing generic claims about the effects of "ethnicity" (Chandra & Wilkinson, 2008). The fact that indexes of ethnic fractionalization are time-invariant while, in reality, ethnic structures change over time is potentially more problematic. In practice, however, this results in a measurement error of our independent variable, which entails an attenuation bias in our estimates. Relatedly, constructivist scholars have pointed out that existing measures of fractionalization miss the fact that there are multiple dimensions of ethnic identity in all countries (which implies that polities may have different levels of fractionalization on different dimensions) and that the relative salience of various cleavages may vary over time. This is a valid concern, but, again, it

We also include a set of control variables corresponding to factors that are likely to affect the economic effects of civil war. We control for the severity of violence as measured by the number of victims (in log form, *log(Deaths)*) in each year of war (Lacina & Gleditsch, 2005) and for the duration of the conflict (*Years at war*) (Gleditsch et al. 2002; Themnér & Wallensteen, 2012), as severity and duration are likely correlated with war's destructiveness. Moreover, we control for different institutional frameworks, which could influence the economic costs of civil war. We use the *Polity2* index (Polity IV, 2012) as a measure of democracy. Given that previous studies found non-linear relationships between level of democracy and conflict (Hegre et al., 2001) as well as between regime type and growth (Papaioannou & Siourounis, 2008), we include the squared value of Polity2. We also add a dummy for ethnic civil wars (*Ethnic war*) (Kalyvas and Balcells, 2010), to capture the potential distinct impact on the economy of wars fought along ethnic lines. Finally, we control for different technologies of warfare, using Kalyvas & Balcells' (2010) typologies of "conventional," "irregular," and "symmetric non-conventional" civil wars.

We run all our models with panel-corrected standard errors (Beck & Katz, 1995) with Prais-Winsten transformation for panel-specific AR1 autocorrelation and decade fixed effects. In some model specifications, we also add the one-year lagged value of the dependent variable (*Lag. Percentage gap*) to control for inertia and country-fixed effects to pick up time-invariant country-specific features, and thus reduce concerns of omitted variable bias.

In the fixed-effects models, we do not include the single term of the fractionalization index, since it would not be identified due to its perfect collinearity with the country dummies; instead, we focus on the interaction between the affected country's ethnic heterogeneity and the intensity of the civil war, here proxied by the (log of the) number of deaths in each year of the war. This approach allows us to conduct a more nuanced test of our argument by examining the specific channels through which violence erodes interethnic trust and thus affects the economy. Interethnic trust decreases as the conflict becomes more intense and more and more individuals are (directly or indirectly) exposed to violence. Thus we expect fractionalization to have a larger impact the more

---

should lead to an attenuation bias in our results. In any case, David Posner's measure of ethnic fractionalization in Africa (Politically Relevant Ethnic Groups. PREG), which was developed taking into account these constructivist insights, suggests that the measurement error in existing measures of fractionalization may not be pervasive: Posner, in fact, records only eight changes in his measure of fractionalization for the 42 African countries that he coded over a period of four decades.

intense the war, which should be reflected in the negative coefficient for the corresponding interaction term.

4.3 Main Findings

Table 2 reports our panel data analysis of the effects of ethnic fractionalization on the economic costs of civil war. In Model 1, the negative coefficient of the ethnic fractionalization variable is consistent with our hypothesis that highly heterogeneous countries tend to experience more severe economic losses during civil war. Our results show that, everything else held equal, an increase of a standard deviation of the ethnic fractionalization variable is associated with an increase of the GDP loss caused by the civil war of about 35% relative to the mean value. We find the same substantive result in Model 2, after controlling for war intensity (*log(Deaths)*,

The negative and statistically significant coefficient of the interaction term between fractionalization and the severity of civil war, in Model 3, also supports our theoretical expectations about the mechanisms linking civil war to economic loss: the negative effects of fractionalization grow stronger as the number of victims increases. Estimation results indicate that an increase of a standard deviation in the fractionalization index is associated with a loss of GDP 4 percentage points larger for countries with a level of ethnic fractionalization at the 75th percentile of the variable's distribution than for countries with a level of ethnic fractionalization at the 25th percentile (Model 3). This is about 20% of the average decrease of GDP created by the civil war.

These results on the effect of ethnic fractionalization are robust to the inclusion of lagged values of the dependent variable (Models 4 to 6), country-fixed effects (Model 7), and both additional sets of controls (Model 8).

Moving to the control variables, it is worth noting that in all models the level of democracy is linked to the economic costs of civil war through a "U-shaped" relationship. Our analysis shows that the institutional context exerts a clear influence on the economic costs of civil war, even though the mechanisms behind this relationship need further investigation. Countries in intermediate positions on the Polity scale tend to experience larger losses of wealth than pure autocracies and full-fledged democracies.

Table 2. Explaining the impact of the war

	Dependent: Percentage gap between actual and synthetic series							
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ethnic Fract.	-0.281***	-0.261***	0.243	-0.068***	-0.064**	0.246*		
	(0.092)	(0.083)	(0.181)	(0.025)	(0.029)	(0.140)		
Ethnic Fract.*(log)Deaths			-0.063***			-0.042**	-0.074**	-0.091***
			(0.021)			(0.017)	(0.030)	(0.020)
Polity2	-0.042***	-0.040***	-0.037***	-0.014***	-0.019***	-0.023***	-0.041***	-0.023***
	(0.010)	(0.011)	(0.011)	(0.004)	(0.005)	(0.006)	(0.009)	(0.008)
Polity2, squared	0.002***	0.002***	0.002***	0.001***	0.001***	0.001***	0.002***	0.001***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(log) Deaths		-0.013*	0.022**		-0.007	0.018***	0.030**	0.036***
		(0.007)	(0.011)		(0.004)	(0.007)	(0.013)	(0.008)
Years at war	-0.022***	-0.018***	-0.019***	-0.003*	0.000	-0.000	-0.018***	-0.009***
	(0.003)	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)
Ethnic war	-0.048	-0.050	-0.022	-0.002	-0.001	0.000		
	(0.036)	(0.040)	(0.039)	(0.012)	(0.012)	(0.015)		
Lag. Percentage gap				0.794***	0.831***	0.823***		0.671***
				(0.055)	(0.072)	(0.068)		(0.080)
War technology dummy	X	X	X	X	X	X		
Decade dummy	X	X	X	X	X	X	X	X
Country dummy							X	X
Observations	189	152	152	169	136	136	152	136
R-squared	0.398	0.495	0.544	0.936	0.922	0.926	0.747	0.948
Number of countries	20	18	18	20	17	17	18	17
Mean outcome	-0.200	-0.184	-0.184	-0.218	-0.199	-0.199	-0.184	-0.199
Mean Ethnic Fract.	0.538	0.514	0.514	0.534	0.515	0.515	0.514	0.515
SD Ethnic Fract.	0.276	0.270	0.270	0.274	0.268	0.268	0.270	0.268
+ SD Ethnic Fract.	-0.0775	-0.0705		-0.0187	-0.0171			
+ SD Ethnic Fract. at:								
25° perc. Deaths			-0.0409			-0.00457	-0.147	-0.178
50° perc. Deaths			-0.0615			-0.0182	-0.171	-0.207
75° perc. Deaths			-0.0815			-0.0314	-0.195	-0.236

Panel corrected standard errors in parenthesis.
Inference: *** p<0.01, ** p<0.05, * p<0.1.
See pages 15 and16 for variables' description.

4.4 Additional evidence

Table 3 reports the results of additional tests to explore the robustness of our findings on the effect of ethnic fractionalization on the scale of war-induced GDP loss. First, we interact the ethnic fractionalization variable with two other variables: civil war duration and the ethnic civil war dummy. We expect these interaction terms to be negative. Given that it may take time for individuals to fully abandon interethnic economic networks as alternative networks of economic exchange may need to be built, ethnic fractionalization should have a stronger impact over time. Moreover, interethnic distrust should be especially high when civil war pits ethnic groups against each other as individuals experience violence at the hands of ethnic-others, and thus ethnic fractionalization should have a larger negative impact in civil wars fought along ethnic lines. Our regressions results in Models 1 and 2 confirm our expectations, as the interactions between fractionalization and duration and between fractionalization and ethnic war are significant and

negative.

As an additional robustness check, we also run the same tests using ethnic polarization (*Ethnic Pol.*) instead of ethnic fractionalization. In ethnically polarized countries (i.e., with an ethnic structure that approaches a bimodal distribution), we should not expect the same effects as in ethnically fractionalized countries. In fact, in polarized countries, conflict-induced interethnic distrust could be (more than) compensated by enhanced intra-ethnic trust, as the probability of economic exchange with coethnics is be higher than for fractionalized countries, and conflict could bolster intra-ethnic trust. We are thus agnostic as to the direction of the effect of polarization on economic loss. We do, however, expect any negative economic impact of polarization to be smaller than that of fractionalization, as the ethnically-bounded markets that emerge during wartime would be larger and the corresponding loss of efficiency lower. Our regressions results in Model 3 and 4 indicate that the coefficients of the index of ethnic polarization are not statistically significant in our baseline models; the same holds for the coefficient of the interaction terms between ethnic polarization and our measure of conflict intensity (the number of deaths), civil war duration, and the ethnic war dummy (Models 5-7). These negative findings about ethnic polarization support our conjecture that the economic costs of civil war are relate to the size of the country's ethnic groups. When the country-wide market breaks down into many small islands, the economic consequences are particularly harsh, while ethnic heterogeneity does not create additional economic problems to conflict-ridden countries when ethnic communities are relatively large.

Table 3. Explaining the impact of the war: further evidence

	Dependent: Percentage gap between actual and synthetic series						
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ethnic Fract.	-0.021	0.010					
	(0.126)	(0.072)					
Ethnic Fract.*Years at war	-0.036**						
	(0.015)						
Ethnic Fract.*Ethnic war		-0.361**					
		(0.141)					
Ethnic Pol.			0.128	0.106	-0.265	0.105	0.160
			(0.100)	(0.091)	(0.342)	(0.169)	(0.110)
Ethnic Pol.*(log)Deaths					0.048		
					(0.043)		
Ethnic Pol.*Years at war						0.003	
						(0.017)	
Ethnic Pol.*Ethnic war							0.135
							(0.187)
Polity2	-0.045***	-0.041***	-0.045***	-0.041***	-0.042***	-0.045***	-0.043***
	(0.009)	(0.009)	(0.008)	(0.010)	(0.010)	(0.009)	(0.009)
Polity2, squared	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(log) Deaths				-0.015*	-0.039*		
				(0.008)	(0.022)		
Years at war	-0.003	-0.019***	-0.021***	-0.022***	-0.022***	-0.023**	-0.023***
	(0.009)	(0.003)	(0.003)	(0.004)	(0.003)	(0.009)	(0.003)
Ethnic war	-0.029	0.174**	-0.019	-0.024	-0.030	-0.020	-0.084
	(0.043)	(0.077)	(0.018)	(0.033)	(0.031)	(0.017)	(0.090)
War technology dummy	X	X	X	X	X	X	X
Decade dummy	X	X	X	X	X	X	X
Observations	189	189	185	148	148	185	185
R-squared	0.455	0.428	0.447	0.462	0.480	0.450	0.456
Number of countries	20	20	19	17	17	19	19
Mean outcome	-0.200	-0.200	-0.199	-0.182	-0.182	-0.199	-0.199
Mean Ethnic Fract.	0.538	0.538					
SD Ethnic Fract.	0.276	0.276					
Mean Ethnic Pol.			0.519	0.523	0.523	0.519	0.519
SD Ethnic Pol.			0.174	0.174	0.174	0.174	0.174

Panel corrected standard errors in parenthesis.
Inference: *** p<0.01, ** p<0.05, * p<0.1.
See pages 15 and16 for variables' description

5. Conclusion

Civil wars kill, main, and destroy on a large scale. While this basic assertion is beyond dispute, reliably estimating the economic costs of civil war has been challenging due to omitted variable and reverse causality problems. As war-torn countries are inherently different from peaceful ones and civil war violence is both a cause and a consequence of dismal economic conditions, comparisons between conflict-ridden countries and peaceful neighbors (or countries at comparable levels of development) and between pre-war and wartime economic performance are not necessarily useful. By adopting the synthetic control method, we explicitly address the counterfactual question of what a country's GDP per capita would have been had it not experienced armed conflict. This method allows us to construct artificial comparison units for each war-torn country and thus obtain more

reliable counterfactuals than any real-world country. The synthetic control enables us to analyze a considerable number of cases with consistent criteria and statistical rigor, while also paying attention to the heterogeneity of war's impact in each case.

In the second part of the paper, we use our estimates of GDP loss to explore the determinants of the significant variation in war's destructiveness across the 20 countries in the sample. We focus on the consequences of ethnic heterogeneity. Building on recent findings on the relationships between ethnicity, trust, economic outcomes, and violent conflict, we argue that civil war erodes interethnic trust and that highly fractionalized societies experience especially serious losses, as they rely heavily on interethnic business relations. Civil wars exact a heavy toll on all affected countries, but for some the economic effects are especially dire. A nuanced understanding of this variation and its causes, to which we contribute with this paper, represents an important stepping stone to effective conflict prevention and post-conflict development policies.

References

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. 2010. "Synthetic Control Methods for Comparative Case Studies: Estimating the Effects of California's Tobacco Control Program." *Journal of the American Statistical Association* 105(490): 493-505.

Abadie, Abadie and Javier Gardeazabal. 2003. "The Economic Costs of Conflict: A Case Study of the Basque Country." *American Economic Review* 93(1): 112-132.

Ammons, Lila. 1996. "Consequences of War on African Countries' Social and Economic Development." *African Studies Review* 39(1): 67–82.

Bauer, Michael et al. 2014. "War's Enduring Effects on the Development of Egalitarian Motivations and In-group Biases." *Psychological Science* 25(1): 47-57.

Beck, Nathaniel and Jonathan N. Katz. 1995. "What To Do (and Not to Do) with Time-Series Cross-Section Data." *American Political Science Review* 89(3): 634-647.

Becchetti, Leonardo, Pierluigi Conzo, and Alessandro Romeo. 2014. "Violence, Trust, and Trustworthiness: Evidence from a Nairobi Slum." *Oxford Economic Papers* 66(1): 283-305.

Bellows, John and Edward Miguel. 2009. "War and Local Collective Action in Sierra Leone." *Journal of Public Economics* 93 (11-12): 144-157.

Betts, Richard K. 1994. "The Delusion of Impartial Intervention." *Foreign Affairs* 73(6): 20-33.

Billmeier, Andreas and Tommaso Nannicini. 2013. "Assessing Economic Liberalization Episodes: A Synthetic Control Approach." *Review of Economics and Statistics* 95(3): 983-1001.

Blattman, Christopher. 2009. "From Violence to Voting: War and Political Participation in Uganda." *American Political Science Review* 103(2): 231-247.

Blattman, Christopher and Edward Miguel. 2010. "Civil War." *Journal of Economic Literature* 48(1): 3-57.

Campos, Nauro, Fabrizio Coricelli, and Luigi Moretti. 2014a. "Economic Growth and Political Integration: Estimating the Benefits from Membership in the European Union Using the Synthetic Counterfactuals Methods." CEPR Discussion Paper No. 9968, CEPR London.

Campos, Nauro, Fabrizio Coricelli, and Luigi Moretti. 2014b. "On the Non-Economic Determinants of the Economic Integration Benefits: Synthetic Counterfactual Evidence from Regional Data from the 1995 Scandinavian Enlargement of the European Union," mimeo.

Cassar, Alessandra, Pauline Grosjean, and Sam Whitt. 2013. "Legacies of Violence: Trust and Market Development." *Journal of Economic Growth* 18(3): 285-318.

Cerra Valerie and Sweta C. Saxena. 2008. "Growth Dynamics: The Myth of Economic Recovery." *American Economic Review* 98(1): 439-457.

Chandra, Kanchan and Steven Wilkinson. 2008. "Measuring the Effect of 'Ethnicity'." *Comparative Political Studies* 41(4-5): 515-563.

Chen, Siyan, Norman V. Loayza and Marta Reynal-Querol. 2008. "The Aftermath of Civil War." *The World Bank Economic Review* 22(1): 63-85.

Colletta, Nat J. and Michelle L. Cullen. 2000. *Violent Conflict and the Transformation of Social Capital: Lessons from Cambodia, Rwanda, Guatemala, and Somalia, Conflict Prevention and Post-Conflict Reconstruction* World Bank, Washington DC.

Collier, Paul. 1999. "On the Economic Consequences of Civil War." *Oxford Economic Papers* 51: 168-183.

Collier, Paul. 2007. *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It*. Oxford, Oxford University Press.

Dercon, Stefan and Roxana Gutierrez-Romero. 2012. "Triggers and Characteristics of the 2007 Kenyan Electoral Violence." *World Development* 40(4): 731-744.

Dorsett, Richard. 2013. "The Effect of the Troubles on GDP in Northern Ireland." *European Journal of Political Economy* 29(1): 119-133.

Fearon, James and David Laitin. 2003. "Ethnicity, Insurgency and Civil War." *American Political Science Review* 97(1): 75-90.

Gates, Scott et al. 2012. "Development Consequences of Armed Conflict." *World Development* 40(9): 1713-1722.

Gerring, John. 2007. *Case Study Research: Principles and Practices*. Cambridge, MA, Cambridge University Press.

Ghobarah, Hazem Adam, Paul Huth, & Bruce Russett. 2004. "The Post-war Public Health Effects of Civil Conflict." *Social Science and Medicine* 59(4): 869–884.

Glaeser, Edward. et al. 2000. "Measuring Trust." *Quarterly Journal of Economics* 115(3): 811-846.

Gilligan, Michael J., Benjamin J. Pasquale, and Cyrus Samii. 2013. "Civil War and Social Cohesion: Lab-in-the-field Evidence from Nepal." *American Journal of Political Science* 58(3): 604-619.

Gleditsch, Nils Petter et al. 2002. "Armed Conflict 1946–2001: A New Dataset." *Journal of Peace Research* 39(5): 615–637.

Guiso, Lugi, Paola Sapienza, and Luigi Zingales. 2004. "Does Local Financial Development Matter?" *Quarterly Journal of Economics* 119(3): 929-969.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2009. "Cultural Biases in Economic Exchanges?" *Quarterly Journal of Economics* 124(3): 1095-1131.

Habyarimana, James et al. "Why Does Ethnic Diversity Undermine Public Goods Provision?" *American Political Science Review* 101(4): 711-725.

Hegre, Håvard et al. 2001. "Toward a Democratic Civil Peace? Democracy, Political Change, and Civil War, 1816-1992." *American Political Science Review* 95(1): 33-48.

Hegre, Håvard and Nicholas Sambanis. 2006. "Sensitivity Analysis of Empirical Results on Civil War Onset." *Journal of Conflict Resolution* 50(4): 508-535.

Humphreys, Macartan. 2003. "Economics and Violent Conflict," available at: http://www2.unicef.org/socialpolicy/files/Economics_and_Violent_Conflict.pdf.

Imbens, Guido W. and Jeffrey M. Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." *Journal of Economic Literature* 47(1): 5-86.

Iqbal, Zaryab. 2010. *War and the Health of Nations*. Stanford, CA, Stanford University Press.

Kalyvas, Stathis and Laia Balcells. 2010. "International System and Technologies of Rebellion: How the End of the Cold War Shaped Internal Conflict." *American Political Science Review* 104(3): 415-429.

King, Gary and Laungche Zeng. 2006. "The Dangers of Extreme Counterfactuals." *Political Analysis* 14(2): 131-159.

Kang, Seonjou and James Meernik. 2005. "Civil War Destruction and the Prospects for Economic Growth." *The Journal of Politics* 67(1): 88-109.

Koubi, Vally. 2005. "War and Economic Performance." *Journal of Peace Research* 42(1): 67-82.

Lacina, Bethany and Nils Petter Gleditsch. 2005. "Monitoring Trends in Global Combat: A New Dataset of Battle Deaths." *European Journal of Population* 21(2-3): 145-166.

Lai, Brian and Clayton Thyne. 2007. "The Effect of Civil War on Education." J*ournal of Peace Research*, 44(3): 277–292.

Lieberman, Evan S. 2005. "Nested Analysis as a Mixed-Method Strategy for Comparative Research." *American Political Science Review* 99(3): 435-52.

Marcus, Aliza. 2007. *Blood and Belief. The PKK and the Kurdish Fight for Independence*. New York, New York University Press.

Miguel, Edward and Gerard Roland. 2011. "The Long-run Impact of Bombing in Vietnam." *Journal of Development Economics* 96(1): 1-15.

Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict." *Journal of Political Economy* 112(4): 725-753.

Montalvo Jose M. and Marta Reynal-Querol. 2005. "Ethnic Polarization, Potential Conflict, and Civil Wars." *American Economic Review* 95(3): 796-816.

Murdoch, James C. and Todd Sandler. 2002. "Economic Growth, Civil Wars and Spatial Spillovers." *Journal of Conflict Resolution* 46(1): 91-110.

Murdoch, James C. and Todd Sandler. 2004. "Civil Wars and Economic Growth: Spatial Dispersion." *American Journal of Political Science* 48(1): 138-151.

Olson, Mancur. 1982. *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. New Haven,Yale University Press,

Organski, A. F. K, and Jacek Kugler. 1977. "The Costs of Major Wars: The Phoenix Factor." *American Political Science Review* 71(4): 1347-1366.

Organski, A. F. K, and Jacek Kugler. 1980. *The War Ledger*. Chicago, Chicago University Press.

Papaioannou, Elias and Gregorios Siourounis. 2008. "Democratization and Growth." *Economic Journal* 118(532): 1520-1551.

Portes, Alejandro. 1998. "Social Capital: Its Origins and Applications in Modern Sociology." *Annual Review of Sociology* 24: 1-24.

Posner, Daniel. N. 2004. "Measuring Ethnic Fractionalization in Africa." *American Journal of Political Science*, Vol. 48 (4): 849–863.

Plümper, Thomas and Eric Neumayer, 2006. "The Unequal Burden of War: The Effect of Armed Conflict on the Gender Gap in Life Expectancy." *International Organization* 60(3): 723-754.

Przeworski, Adam et al. 2000. *Democracy and Development: Political Institutions and Well-being in the World, 1950-1990*. New York, Cambridge University Press.

Reynal-Querol, Marta. 2002. "Ethnicity, Political Systems, and Civil Wars." *Journal of Conflict Resolution* 46(1): 29-54.

Rohner, Dominic, Mathias Thoenig, and Fabrizio Zilibotti. 2013a. "Seeds of Distrust: Conflict in Uganda." *Journal of Economic Growth* 18(3): 217-252.

Rohner, Dominic, Mathias Thoenig, and Fabrizio Zilibotti. 2013b. "War Signals: A Theory of Trade, Trust and Conflict." *Review of Economic Studies* 80 (3): 1114-1147.

Smith, Ron P. 2014. "The Economic Costs of Military Conflict." *Journal of Peace Research* 51(2): 245-256.

Soares, Rodrigo R. 2006. "The Welfare Cost of Violence across Countries." *Journal of Health Economics* 25(5): 821–846.

Stewart Frances, Valpy FitzGerald, and Associates. 2001. *War and Underdevelopment*. New York, Oxford University Press.

Tarrow, Sidney. 1995. "Bridging the Quantitative-Qualitative Divide in Political Science." *American Political Science Review* 89(2): 471-474.

Themnér, Lotta and Peter Wallensteen. 2012. "Armed Conflicts, 1946-2011." *Journal of Peace Research* 49(4): 565-575.

Varshney, Ashutosh. 2001. "Ethnic Conflict and Civil Society." *World Politics* 53(3): 362-398.

Voors, Maarten J. et al. 2012. "Violent Conflict and Behavior: A Field Experiment in Burundi." *American Economic Review* 102(2): 941-964.

Welsch, Heinz. 2008. "The Social Cost of Civil Conflict: Evidence from Surveys of Happiness." *Kyklos* 61(2): 320–340.

World Bank. 2003. *Breaking the Conflict Trap: Civil War and Development Policy*. New York, Oxford University Press.

Online Appendix

The Economic Costs of Civil War:
Synthetic Counterfactual Evidence and the Effects of Ethnic Fractionalization

Stefano Costalli, Luigi Moretti , & Costantino Pischedda

This version: September 2014

Table A.1: Difference-in-differences estimates

Country	DID	SE	Obs.	R-squared
Algeria	-139.384	(212.824)	66	0.141
Congo, Republic of	-2.848	(68.420)	34	0.472
Cote d'Ivoire	-266.576***	(70.852)	28	0.552
Djibouti	-910.881***	(106.069)	28	0.859
Egypt	-62.444	(194.308)	28	0.655
El Salvador	-1,147.685***	(181.234)	56	0.628
Haiti	-230.263***	(77.057)	30	0.741
Kenya	-73.272**	(32.859)	26	0.268
Liberia	-1,223.870***	(134.280)	60	0.812
Nepal	-175.100***	(56.903)	44	0.731
Nicaragua	-860.876***	(208.554)	52	0.517
Nigeria	-87.603	(73.154)	30	0.654
Peru	-781.947***	(218.906)	68	0.287
Rwanda	-116.191	(89.978)	30	0.142
Senegal	-70.855**	(33.714)	44	0.170
Sierra Leone	-284.902***	(47.797)	32	0.758
Somalia	-569.646***	(112.940)	76	0.412
Thailand	-396.345	(347.514)	28	0.807
Turkey	-111.398	(404.067)	64	0.622
Uganda	-254.251***	(25.362)	40	0.883

Notes: These results assess the statistical significance of the differences between the average difference pre-treatment (between the actual country and its synthetic) and the average difference post-treatment (between the actual country and its synthetic) estimated by the synthetic counterfactuals in Figure 1. Results are presented for each country and for GDP per capita. Robust standard errors are reported. Inference: *** p<0.01; ** p<0.05; * p<0.1

Tables A.2: Control weights and predictor balance

Cote d'Ivoire

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	.055	MEX	0	GDPpc(1992)	1505.771	1488.954
ARE	0	MHL	0	GDPpc(1993)	1439.699	1435.911
ARG	0	MKD	0	GDPpc(1994)	1397.681	1399.256
ATG	0	MLT	0	GDPpc(1995)	1442.017	1432.637
AUS	0	MNG	0	GDPpc(1996)	1515.846	1504.091
AUT	0	MRT	0	GDPpc(1997)	1513.257	1515.658
BEL	0	MUS	0	GDPpc(1998)	1550.614	1536.186
BEN	0	MWI	.453	GDPpc(1999)	1560.374	1543.34
BFA	0	MYS	0	GDPpc(2000)	1510.221	1497.281
BGR	0	NAM	0	GDPpc(2001)	1441.779	1439.657
BHR	0	NER	0	Investment share	6.802798	23.1163
BHS	0	NIC	0	Trade openess	70.45266	49.58978
BLZ	0	NLD	0	Population growth	.0287492	.0225471
BMU	0	NOR	0	Sec. education	24.31298	28.88405
BOL	0	NZL	0			
BRB	0	OMN	0			
BRN	0	PAN	0			
BTN	0	PLW	.005			
BWA	0	POL	0			
CAN	0	PRT	0			
CHE	0	PRY	0			
CHL	0	QAT	.002			
CHN	0	ROM	0			
COM	0	SLB	.107			
CPV	0	SUR	.004			
CRI	0	SVK	0			
CUB	0	SVN	0			
CYP	0	SWE	0			
CZE	0	SWZ	0			
DMA	0	SYC	0			
DNK	0	SYR	0			
DOM	0	TGO	.139			
ESP	0	TON	0			
EST	0	TTO	0			
FIN	0	TUN	0			
FJI	0	TZA	0			
FRA	0	URY	0			
GAB	0	USA	0			
GBR	0	UZB	0			
GER	0	VCT	0			
GHA	0	VEN	0			
GIN	0	VNM	0			
GMB	0	VUT	0			
GNQ	0	WSM	0			
GRC	0	ZAF	0			
GRD	0	ZMB	.191			
GUY	0	ZWE	.006			
HKG	0					
HND	0					
HUN	0					
IRL	0					
IRN	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KHM	0					
KIR	0					
KNA	0					
KOR	0					
KWT	0					
LAO	0					
LBN	0					
LCA	.036					
LSO	0					
LUX	0					
MAC	0					
MAR	0					
MDV	0					

Congo, Republic of

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	.08	OMN	0	GDPpc(1983)	2455.813	2504.345
ARG	0	POL	0	GDPpc(1984)	2626.26	2580.688
ATG	0	PRT	0	GDPpc(1985)	2453.708	2418.557
AUT	0	PRY	0	GDPpc(1986)	2305.488	2344.789
BEL	0	ROM	0	GDPpc(1987)	2297.333	2334.582
BEN	0	SLB	.25	GDPpc(1988)	2372.869	2374.126
BGR	0	STP	0	GDPpc(1989)	2424.545	2395.303
BHR	.033	SUR	0	GDPpc(1990)	2436.986	2425.04
BHS	0	SWE	0	GDPpc(1991)	2211.011	2262.498
BLZ	0	SWZ	0	GDPpc(1992)	2244.317	2247.344
BRA	0	SYC	0	Investment share	15.27874	29.01697
BRB	0	SYR	0	Trade openess	108.6187	70.39448
BRN	0	TGO	0	Population growth	.0310631	.0296861
BTN	0	TON	0	Sec. education	60.4071	45.13544
BWA	0	TTO	0			
CAN	0	TUN	0			
CHE	0	TZA	0			
CHL	0	URY	0			
CIV	0	USA	0			
COM	.3	VCT	0			
CPV	0	VEN	0			
CRI	0	VUT	0			
CUB	.01	WSM	0			
CYP	0	ZAF	0			
DMA	0	ZMB	0			
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GBR	0					
GER	0					
GHA	.146					
GIN	0					
GMB	0					
GNQ	0					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KIR	0					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	.181					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	0					
NLD	0					
NOR	0					
NZL	0					

Djibouti

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	MWI	0	GDPpc(1981)	3628.8	3613.974
AUT	0	MYS	0	GDPpc(1982)	3579.59	3632.916
BEL	0	NER	0	GDPpc(1983)	3480.335	3635.495
BEN	0	NLD	0	GDPpc(1984)	3959.438	3743.426
BGR	0	NOR	0	GDPpc(1985)	3902.236	3784.181
BHR	0	NPL	0	GDPpc(1986)	3706.779	3747.533
BHS	0	NZL	0	GDPpc(1987)	3617.458	3598.995
BLZ	0	OMN	.019	GDPpc(1988)	3437.241	3375.877
BRA	0	POL	0	GDPpc(1989)	3123.122	3299.882
BRB	0	PRT	0	GDPpc(1990)	3380.863	3359.342
BRN	.008	PRY	0	Investment share	21.57126	24.63232
BTN	0	ROM	0	Trade openess	117.6899	61.23833
BWA	0	SLB	0	Population growth	.0283162	.0277306
CAF	0	STP	0	Sec. education	9.906776	37.8299
CAN	0	SUR	0			
CHE	0	SWE	0			
CHL	0	SWZ	0			
CIV	0	SYC	0			
CMR	.572	SYR	0			
COM	0	TGO	0			
CPV	0	TON	0			
CRI	0	TTO	0			
CUB	0	TUN	0			
CYP	0	TZA	0			
DMA	0	URY	0			
DNK	0	USA	0			
DOM	0	VCT	0			
ECU	0	VEN	0			
ESP	0	VUT	.084			
FIN	0	WSM	0			
FJI	.252	ZAF	0			
FRA	0	ZAR	0			
GAB	0	ZMB	0			
GHA	0					
GIN	0					
GMB	0					
GNB	0					
GNQ	0					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	.066					
JPN	0					
KIR	0					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					

Algeria

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	.022	NZL	0	GDPpc(1975)	4063.1	4078.835
ATG	0	POL	0	GDPpc(1976)	4191.887	4214.45
AUT	0	PRT	0	GDPpc(1977)	4387.751	4411.825
BEL	0	PRY	0	GDPpc(1978)	4717.683	4731.429
BEN	.203	ROM	.09	GDPpc(1979)	5002.731	5040.846
BGR	0	SLB	.079	GDPpc(1980)	4829.273	4858.031
BHR	0	STP	0	GDPpc(1981)	4730.501	4758.454
BHS	.018	SUR	0	GDPpc(1982)	4934.931	4938.773
BLZ	0	SWE	0	GDPpc(1983)	5027.132	5057.834
BMU	0	SWZ	0	GDPpc(1984)	5162.347	5185.105
BOL	0	SYC	0	GDPpc(1985)	5172.298	5157.366
BRA	.053	SYR	0	GDPpc(1986)	5175.26	5197.889
BRB	0	TGO	0	GDPpc(1987)	5124.523	5087.842
BRN	.007	TON	.034	GDPpc(1988)	4968.449	5019.085
BTN	0	TTO	0	GDPpc(1989)	4992.375	5004.369
BWA	0	TUN	0	GDPpc(1990)	4960.421	4974.7
CAN	0	URY	0	GDPpc(1991)	4849.85	4860.697
CHE	0	USA	0	Investment share	44.84699	27.80416
CHL	0	VCT	0	Trade openess	87.22163	65.83968
COM	0	VEN	0	Population growth	.0295685	.0243151
CPV	0	VUT	.215	Sec. education	38.85537	40.12873
CRI	0	WSM	0			
CUB	.069	ZAF	0			
CYP	0	ZMB	0			
DMA	0					
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	.085					
FRA	0					
FSM	0					
GAB	0					
GER	0					
GHA	0					
GIN	0					
GMB	0					
GNQ	.003					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	.018					
ISR	0					
ITA	0					
JAM	0					
JOR	.001					
JPN	0					
KIR	.008					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	.094					
MYS	0					
NER	0					
NLD	0					
NOR	0					

Egypt

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	POL	0	GDPpc(1984)	2401.015	2390.07
ARG	0	PRT	0	GDPpc(1985)	2390.661	2399.882
ATG	0	PRY	0	GDPpc(1986)	2534.541	2498.257
AUS	0	ROM	0	GDPpc(1987)	2358.656	2388.41
AUT	0	SLB	0	GDPpc(1988)	2430.733	2476.867
BEL	0	STP	0	GDPpc(1989)	2533.947	2558.073
BEN	0	SUR	0	GDPpc(1990)	2647.788	2665.184
BGR	0	SWE	0	GDPpc(1991)	2906.936	2878.222
BHR	0	SWZ	0	GDPpc(1992)	3126.854	3052.076
BHS	0	SYC	.042	GDPpc(1993)	3187.127	3203.929
BLZ	0	SYR	0	Investment share	15.9898	34.12315
BRA	0	TGO	0	Trade openess	66.47244	121.5926
BRB	0	TON	0	Population growth	.0200449	.0171429
BRN	0	TTO	0	Sec. education	63.66775	38.67715
BTN	0	TUN	0			
BWA	.013	TZA	0			
CAN	0	URY	0			
CHE	0	USA	0			
CHL	0	VCT	0			
CIV	0	VEN	0			
COM	0	VUT	.198			
CPV	0	WSM	0			
CRI	0	ZAF	0			
CUB	0	ZMB	0			
CYP	0					
DMA	0					
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GBR	0					
GER	0					
GHA	0					
GIN	0					
GMB	0					
GNB	.408					
GNQ	0					
GRC	0					
GRD	0					
GUY	.294					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KIR	0					
KNA	0					
KOR	.045					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	0					
NLD	0					
NOR	0					
NZL	0					
OMN	0					

Haiti

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	PRT	0	GDPpc(1981)	2318.515	2297.054
AUT	0	PRY	0	GDPpc(1982)	2094.598	2131.997
BEL	0	ROM	0	GDPpc(1983)	2059.674	2068.781
BEN	0	SLB	0	GDPpc(1984)	2067.247	2055.84
BGR	0	STP	0	GDPpc(1985)	2067.737	2036.941
BHR	0	SUR	.009	GDPpc(1986)	2017.201	2000.603
BHS	0	SWE	0	GDPpc(1987)	1941.24	1957.894
BLZ	0	SWZ	0	GDPpc(1988)	1975.761	1960.503
BRA	0	SYC	0	GDPpc(1989)	1814.552	1842.509
BRB	0	SYR	.037	GDPpc(1990)	1796.28	1817.669
BRN	.005	TGO	0	Investment share	11.5939	23.96747
BTN	0	TON	0	Trade openess	26.11152	37.29836
BWA	0	TTO	0	Population growth	.0191886	.0370131
CAF	0	TUN	0	Sec. education	15.03809	23.56812
CAN	0	TZA	0			
CHE	0	URY	0			
CHL	0	USA	0			
CIV	0	VCT	0			
COM	0	VEN	0			
CPV	0	VUT	.042			
CRI	0	WSM	0			
CUB	0	ZAF	0			
CYP	0	ZAR	0			
DMA	0	ZMB	.533			
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	0					
GNQ	0					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	.064					
JPN	0					
KIR	0					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	.302					
MYS	0					
NER	0					
NLD	0					
NOR	0					
NPL	0					
NZL	0					
OMN	.008					
POL	0					

Kenya

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	POL	0	GDPpc(1981)	1116.351	1083.252
AUT	0	PRT	0	GDPpc(1982)	1094.629	1060.955
BEL	0	PRY	0	GDPpc(1983)	1049.874	1017.651
BEN	0	ROM	0	GDPpc(1984)	1051.289	1018.347
BGR	0	SLB	0	GDPpc(1985)	1021.329	986.6741
BHR	.002	STP	0	GDPpc(1986)	1088.506	1052.077
BHS	0	SUR	0	GDPpc(1987)	1121.186	1083.492
BLZ	.033	SWE	0	GDPpc(1988)	1158.076	1119.393
BRA	0	SWZ	0	GDPpc(1989)	1179.697	1140.363
BRB	0	SYC	0	GDPpc(1990)	1187.937	1147.276
BRN	0	SYR	0	Investment share	13.83923	23.6468
BTN	.068	TGO	0	Trade openess	39.56682	61.00781
BWA	0	TON	0	Population growth	.0364265	.0282989
CAF	.001	TTO	0	Sec. education	35.17182	16.88701
CAN	0	TUN	0			
CHE	0	TZA	.319			
CHL	0	URY	0			
CIV	0	USA	0			
CMR	0	VCT	0			
COM	0	VEN	0			
CPV	0	VUT	0			
CRI	0	WSM	0			
CUB	0	ZAF	0			
CYP	0	ZAR	0			
DMA	0	ZMB	0			
DNK	0					
DOM	0					
ECU	0					
EGY	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	.039					
GNQ	0					
GRC	0					
GUY	.009					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	.005					
JPN	0					
KIR	.115					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	.35					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	.052					
NLD	0					
NOR	0					
NPL	0					
NZL	0					
OMN	0					

Liberia

Units weights				Predictor Balance:		
Co_No	**Unit weight**	**Co_No**	**Unit weight**		**Treated**	**Synthetic**
ALB	0	PRT	0	GDPpc(1974)	2078.886	1972.369
ATG	0	PRY	0	GDPpc(1975)	1761.813	1830.786
AUT	0	ROM	0	GDPpc(1976)	1824.555	1840.773
BEL	0	SLB	0	GDPpc(1977)	1890.555	1858.871
BEN	.009	STP	0	GDPpc(1978)	1919.006	1853.826
BGR	0	SUR	0	GDPpc(1979)	1616.406	1784.574
BHR	.017	SWE	0	GDPpc(1980)	1767.26	1699.834
BHS	0	SWZ	0	GDPpc(1981)	1578.622	1645.869
BLZ	0	SYC	0	GDPpc(1982)	1619.058	1565.928
BMU	0	SYR	0	GDPpc(1983)	1464.831	1479.03
BOL	0	TGO	0	GDPpc(1984)	1521.976	1483.755
BRA	0	TON	0	GDPpc(1985)	1453.739	1387.961
BRB	0	TTO	.019	GDPpc(1986)	1186.602	1327.972
BRN	0	TUN	0	GDPpc(1987)	1360.451	1317.868
BTN	0	URY	0	GDPpc(1988)	1391.637	1394.262
BWA	0	USA	0	Investment share	16.61289	25.99507
CAN	0	VCT	0	Trade openess	103.8456	93.1699
CHE	0	VEN	0	Population growth	.0288139	.0267248
CHL	0	VUT	0	Sec. education	19.48054	28.35282
COM	0	WSM	0			
CPV	0	ZMB	.138			
CRI	0					
CUB	0					
DMA	0					
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
FSM	0					
GAB	0					
GHA	.413					
GIN	0					
GMB	0					
GNQ	.03					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KIR	.067					
KNA	0					
KOR	0					
LCA	0					
LSO	.307					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	0					
NLD	0					
NOR	0					
NZL	0					
POL	0					

Nigeria

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	NER	0	GDPpc(1971)	1486.822	1495.639
ATG	0	NLD	0	GDPpc(1972)	1566.985	1559.733
AUT	0	NOR	0	GDPpc(1973)	1620.158	1655.136
BEL	0	NPL	0	GDPpc(1974)	1920.731	1881.066
BEN	.384	NZL	0	GDPpc(1975)	1766.649	1797.09
BGR	0	PAN	0	GDPpc(1976)	1746.573	1754.927
BHR	.002	PNG	0	GDPpc(1977)	1750.716	1737.836
BHS	0	POL	0	GDPpc(1978)	1635.288	1649.296
BMU	0	PRT	0	GDPpc(1979)	1536.37	1544.773
BOL	0	PRY	0	Investment share	9.792099	20.80554
BRA	0	ROM	0	Trade openess	50.26722	85.41605
BRB	0	RWA	0	Population growth	.0300974	.0218574
BRN	0	SEN	0	Sec. education	7.243727	13.67003
BTN	0	SLB	.055			
BWA	0	SLE	0			
CAF	0	STP	0			
CAN	0	SUR	0			
CHE	0	SWE	0			
CHL	0	SWZ	0			
CIV	0	SYC	0			
CMR	0	TGO	0			
COG	0	TON	0			
COM	0	TTO	0			
CPV	0	TUN	0			
CRI	0	URY	0			
CUB	0	USA	0			
DJI	0	VCT	0			
DMA	0	VEN	0			
DNK	0	VUT	0			
DOM	0	WSM	0			
DZA	0	ZMB	0			
ECU	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
FSM	0					
GAB	.014					
GHA	.052					
GIN	0					
GMB	0					
GNB	0					
GNQ	.119					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HTI	0					
HUN	0					
IRL	0					
ISL	0					
ITA	0					
JAM	0					
JPN	0					
KEN	0					
KIR	.085					
KOR	0					
LBR	.273					
LCA	0					
LSO	.016					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					

Nicaragua

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
AUS	0			GDPpc(1965)	3574.971	3545.03
AUT	0			GDPpc(1966)	3621.254	3597.067
BEL	0			GDPpc(1967)	3724.489	3702.724
BEN	0			GDPpc(1968)	3595.866	3559.541
BOL	.428			GDPpc(1969)	3738.25	3617.83
BRA	0			GDPpc(1970)	3669.24	3689.81
BRB	0			GDPpc(1971)	3713.165	3750.559
BWA	0			GDPpc(1972)	3484.16	3784.504
CAF	0			GDPpc(1973)	3953.704	3930.778
CAN	0			GDPpc(1974)	4355.611	4190.044
CHL	.147			GDPpc(1975)	4017.021	4081.577
CIV	0			GDPpc(1976)	4089.93	4260.024
CMR	0			GDPpc(1977)	4554.424	4437.527
COG	0			Investment share	26.53157	17.97865
COM	0			Trade openess	35.66347	54.18706
CPV	0			Population growth	.0320489	.02453
CRI	0			Sec. education	21.5785	32.71418
DNK	0					
DZA	0					
ECU	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	0					
GNQ	0					
GRC	0					
HKG	0					
IRL	0					
ISL	0					
ITA	0					
JAM	0					
JPN	0					
KOR	0					
LSO	.236					
LUX	0					
MDG	0					
MEX	0					
MRT	0					
MUS	0					
MWI	0					
NER	0					
NLD	0					
NOR	0					
NPL	0					
NZL	.002					
PRT	0					
PRY	0					
ROM	0					
SLE	0					
SWE	0					
SYC	0					
TGO	0					
TTO	0					
TUN	0					
URY	0					
USA	0					
VEN	.187					
ZMB	0					

Nepal

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	OMN	0	GDPpc(1985)	795.8372	792.6846
ARG	0	POL	0	GDPpc(1986)	809.2397	796.8321
ATG	0	PRT	0	GDPpc(1987)	801.8925	805.3274
AUS	0	PRY	0	GDPpc(1988)	840.225	855.6049
AUT	0	ROM	0	GDPpc(1989)	858.0273	859.4372
BEL	0	SLB	0	GDPpc(1990)	867.4011	869.6934
BEN	0	STP	0	GDPpc(1991)	899.7219	908.1184
BGR	0	SUR	0	GDPpc(1992)	902.6884	898.7337
BHR	0	SWE	0	GDPpc(1993)	912.3672	907.6026
BHS	0	SWZ	0	GDPpc(1994)	953.8891	938.4556
BLZ	0	SYC	0	GDPpc(1995)	963.2379	963.1803
BRA	0	SYR	0	Investment share	20.48728	22.29985
BRB	0	TGO	0	Trade openess	38.34913	65.30952
BRN	0	TON	0	Population growth	.0279471	.0288892
BTN	0	TTO	0	Sec. education	35.20236	11.62229
BWA	0	TUN	0			
CAN	0	TZA	.347			
CHE	0	URY	0			
CHL	0	USA	0			
COM	0	VCT	0			
CPV	0	VEN	0			
CRI	0	VUT	0			
CUB	0	WSM	0			
CYP	0	ZAF	0			
DMA	0	ZMB	0			
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	.016					
FRA	0					
GAB	0					
GBR	0					
GER	0					
GHA	0					
GIN	0					
GMB	0					
GNQ	.018					
GRC	0					
GRD	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KIR	0					
KNA	0					
KOR	0					
LCA	0					
LSO	.11					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	.011					
MYS	.038					
NER	.459					
NLD	0					
NOR	0					
NZL	0					

Peru

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
AUS	0			GDPpc(1963)	4324.493	4267.999
AUT	0			GDPpc(1964)	4446.286	4464.871
BEL	0			GDPpc(1965)	4613.71	4675.142
BEN	0			GDPpc(1966)	4952.707	4922.876
BOL	.006			GDPpc(1967)	4976.07	4933.121
BRA	0			GDPpc(1968)	4879.709	4901.504
BRB	0			GDPpc(1969)	4967.402	5037.578
BWA	0			GDPpc(1970)	5138.522	5067.726
CAN	0			GDPpc(1971)	5229.338	5200.486
CHE	0			GDPpc(1972)	5196.745	5323.316
CHL	0			GDPpc(1973)	5439.062	5457.851
CIV	0			GDPpc(1974)	5831.431	5810.421
COM	.296			GDPpc(1975)	5849.428	5739.666
CPV	0			GDPpc(1976)	5746.279	5803.949
CRI	0			GDPpc(1977)	5551.501	5531.906
DNK	0			GDPpc(1978)	5260.113	5345.71
ESP	0			GDPpc(1979)	5377.039	5355.368
FIN	0			Investment share	25.91962	23.91941
FJI	0			Trade openess	31.64812	38.63511
FRA	0			Population growth	.0281135	.0241953
GAB	.044			Sec. education	45.85731	26.76208
GHA	0					
GIN	0					
GMB	0					
GNB	0					
GNQ	.046					
GRC	0					
HKG	0					
IRL	0					
ISL	.009					
ITA	0					
JAM	0					
JPN	0					
KOR	0					
LSO	0					
LUX	0					
MDG	0					
MEX	0					
MRT	0					
MUS	0					
MWI	0					
NER	0					
NLD	0					
NOR	0					
NZL	.165					
PRT	0					
PRY	0					
ROM	0					
SWE	.022					
SYC	0					
TGO	0					
TTO	0					
TUN	0					
URY	.028					
USA	0					
VEN	0					
ZMB	.384					

Rwanda

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	NZL	0	GDPpc(1980)	787.1473	823.868
AUT	0	OMN	0	GDPpc(1981)	996.8252	933.3806
BEL	0	POL	0	GDPpc(1982)	830.1523	862.6124
BEN	0	PRT	0	GDPpc(1983)	881.4516	803.969
BGR	0	PRY	0	GDPpc(1984)	745.5372	781.6985
BHR	.001	ROM	0	GDPpc(1985)	755.7939	781.3979
BHS	0	SLB	0	GDPpc(1986)	765.2264	782.5598
BLZ	0	STP	0	GDPpc(1987)	767.7209	742.913
BMU	0	SUR	0	GDPpc(1988)	713.7196	733.5352
BRA	0	SWE	0	GDPpc(1989)	715.1017	739.4582
BRB	0	SWZ	0	Investment share	13.69072	24.19084
BRN	0	SYC	0	Trade openess	81.9501	108.0756
BTN	0	SYR	.001	Population growth	.0317878	.0211953
BWA	0	TGO	0	Sec. education	14.64512	16.24687
CAF	0	TON	.018			
CAN	0	TTO	.014			
CHE	0	TUN	0			
CHL	0	TZA	0			
CIV	0	URY	0			
CMR	0	USA	0			
COM	0	VCT	0			
CPV	0	VEN	0			
CRI	0	VUT	0			
CUB	0	WSM	0			
CYP	0	ZAF	0			
DMA	0	ZAR	0			
DNK	0	ZMB	0			
DOM	0					
ECU	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	.78					
GNQ	0					
GRC	0					
GUY	.079					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KIR	0					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	.107					
NLD	0					
NOR	0					
NPL	0					

Senegal

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	PRY	0	GDPpc(1978)	1152.996	1105.387
ATG	0	SLB	0	GDPpc(1979)	1217.398	1159.65
AUT	0	STP	0	GDPpc(1980)	1133.238	1077.911
BEL	0	SUR	0	GDPpc(1981)	1076.687	1078.659
BEN	.157	SWE	0	GDPpc(1982)	1229.34	1179.034
BGR	0	SWZ	0	GDPpc(1983)	1217.487	1152.585
BHR	0	SYC	0	GDPpc(1984)	1121.548	1096.37
BHS	0	SYR	0	GDPpc(1985)	1127.813	1102.268
BLZ	0	TGO	0	GDPpc(1986)	1145.558	1125.105
BMU	0	TON	.014	GDPpc(1987)	1150.256	1126.258
BRA	0	TTO	0	GDPpc(1988)	1177.145	1136.086
BRB	0	TUN	0	Investment share	11.88237	19.74066
BRN	.001	URY	0	Trade openess	73.80571	61.88248
BTN	.109	USA	0	Population growth	.0322911	.0293614
BWA	0	VCT	0	Sec. education	12.20882	12.22856
CAN	0	VEN	0			
CHE	0	VUT	.042			
CHL	0	WSM	0			
CIV	0	ZMB	0			
COM	0					
CPV	0					
CRI	0					
CUB	0					
CYP	0					
DMA	0					
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	.309					
GNQ	0					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	0					
JPN	0					
KIR	.006					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	.361					
NLD	0					
NOR	0					
NZL	0					
OMN	0					
POL	0					
PRT	0					

Sierra Leone

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	ROM	0	GDPpc(1981)	1061.054	1047.731
AUT	0	SLB	0	GDPpc(1982)	1026.616	1014.609
BEL	0	STP	0	GDPpc(1983)	1005.363	998.0401
BEN	0	SUR	0	GDPpc(1984)	1061.031	1040.055
BGR	0	SWE	0	GDPpc(1985)	1010.86	1001.371
BHR	.005	SWZ	0	GDPpc(1986)	1039.716	1027.717
BHS	0	SYC	0	GDPpc(1987)	1046.538	1033.943
BLZ	0	SYR	0	GDPpc(1988)	1051.22	1035.399
BRA	0	TGO	0	GDPpc(1989)	1065.846	1050.942
BRB	0	TON	0	GDPpc(1990)	1046.205	1036.855
BRN	0	TTO	0	Investment share	10.07301	28.99038
BTN	.119	TUN	0	Trade openess	28.09322	95.13173
BWA	0	TZA	0	Population growth	.0239912	.0254302
CAN	0	URY	0	Sec. education	17.49352	17.06225
CHE	0	USA	0			
CHL	0	VCT	0			
CIV	0	VEN	0			
COM	.114	VUT	0			
CPV	0	WSM	0			
CRI	0	ZAF	0			
CUB	0	ZMB	0			
CYP	0					
DMA	0					
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	.527					
GNQ	0					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ISR	0					
ITA	0					
JAM	0					
JOR	.003					
JPN	0					
KIR	.098					
KNA	0					
KOR	0					
LCA	0					
LSO	0					
LUX	0					
MAC	0					
MDG	.107					
MDV	.001					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	.011					
MYS	0					
NER	0					
NLD	0					
NOR	0					
NZL	0					
OMN	0					
POL	.013					
PRT	0					
PRY	0					

El Salvador

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
AUS	0			GDPpc(1965)	3931.989	3946.458
AUT	0			GDPpc(1966)	4102.176	4065.167
BEL	0			GDPpc(1967)	4146.359	4136.504
BEN	0			GDPpc(1968)	4091.936	4035.433
BOL	.306			GDPpc(1969)	4121.297	4112.308
BRA	0			GDPpc(1970)	4149.477	4119.879
BRB	0			GDPpc(1971)	4199.043	4202.308
BWA	0			GDPpc(1972)	4290.495	4317.862
CAF	0			GDPpc(1973)	4463.89	4474.456
CAN	0			GDPpc(1974)	4608.914	4586.882
CHE	0			GDPpc(1975)	4707.229	4700.231
CHL	.027			GDPpc(1976)	4880.36	4897.367
CIV	0			GDPpc(1977)	5158.448	5098.016
CMR	.199			GDPpc(1978)	5274.422	5254.174
COG	0			Investment share	14.02393	18.80145
COM	0			Trade openess	37.00112	42.07761
CPV	0			Population growth	.0295756	.0183921
CRI	0			Sec. education	26.95957	35.96593
DNK	0					
ECU	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	0					
GNQ	.047					
GRC	0					
HKG	0					
IRL	0					
ISL	0					
ITA	0					
JAM	0					
JPN	0					
KOR	0					
LSO	0					
LUX	0					
MDG	0					
MEX	0					
MRT	0					
MUS	.101					
MWI	0					
NER	0					
NLD	0					
NOR	0					
NPL	0					
NZL	0					
PRT	0					
PRY	0					
ROM	.032					
SWE	0					
SYC	0					
TGO	0					
TTO	.004					
TUN	0					
URY	.099					
USA	.068					
VEN	.057					
ZMB	.058					

Somalia

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	ROM	0	GDPpc(1970)	914.2837	931.0108
ATG	0	SLB	0	GDPpc(1971)	929.8576	986.3704
AUS	0	STP	0	GDPpc(1972)	1078.784	972.2028
AUT	0	SUR	0	GDPpc(1973)	933.1995	907.3767
BEL	0	SWE	0	GDPpc(1974)	1003.68	1022.397
BEN	0	SWZ	0	GDPpc(1975)	993.1599	996.2376
BGR	0	SYC	0	GDPpc(1976)	880.7025	899.6494
BHR	0	TGO	0	GDPpc(1977)	944.1864	924.1382
BHS	0	TON	0	GDPpc(1978)	1018.684	946.6926
BLZ	0	TTO	0	GDPpc(1979)	850.9204	927.2013
BMU	0	TUN	0	GDPpc(1980)	755.8995	793.3781
BOL	0	URY	0	GDPpc(1981)	752.4422	782.1512
BRA	0	USA	0	GDPpc(1982)	821.9892	792.6498
BRB	0	VCT	0	GDPpc(1983)	759.5155	724.9748
BRN	0	VEN	0	GDPpc(1984)	685.3557	673.7995
BTN	0	VUT	0	GDPpc(1985)	637.6561	696.7871
BWA	0	WSM	0	GDPpc(1986)	668.1816	697.3492
CAN	0	ZMB	0	GDPpc(1987)	680.3332	682.5084
CHE	0			Investment share	15.63023	22.25247
CHL	0			Trade openess	6.326407	70.90237
COM	0			Population growth	.0378221	.0236696
CPV	0			Sec. education	7.252489	15.06768
CRI	0					
CUB	0					
DMA	0					
DNK	0					
DOM	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
FSM	0					
GAB	0					
GHA	.277					
GIN	0					
GMB	0					
GNQ	.061					
GRC	0					
GUY	0					
HKG	0					
HND	0					
HUN	0					
IRL	0					
ISL	0					
ITA	0					
JAM	0					
JPN	0					
KIR	.06					
KNA	0					
KOR	0					
LCA	0					
LSO	.044					
LUX	0					
MAC	0					
MDG	0					
MDV	0					
MEX	0					
MLT	0					
MNG	0					
MRT	0					
MUS	0					
MWI	.02					
MYS	0					
NER	.539					
NLD	0					
NOR	0					
NZL	0					
POL	0					
PRT	0					
PRY	0					

Thailand

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
ALB	0	LVA	0	GDPpc(1994)	5832.412	5848.999
ARE	0	MAC	.061	GDPpc(1995)	6160.535	6117.649
ARG	0	MAR	0	GDPpc(1996)	6373.621	6278.595
ARM	0	MDA	0	GDPpc(1997)	6175.957	6083.971
ATG	0	MDV	0	GDPpc(1998)	5470.729	5687.777
AUS	0	MEX	0	GDPpc(1999)	5682.335	5632.169
AUT	0	MHL	.024	GDPpc(2000)	5761.755	5799.081
BEL	0	MKD	0	GDPpc(2001)	5945.024	5941.343
BEN	0	MLT	0	GDPpc(2002)	6156.79	6169.84
BFA	0	MNE	0	GDPpc(2003)	6540.388	6513.574
BGR	0	MNG	0	Investment share	34.45689	22.52789
BHR	0	MOZ	0	Trade openess	121.4885	69.97648
BHS	0	MRT	0	Population growth	.0098712	.0209541
BLR	0	MUS	0	Sec. education	55.85307	37.92384
BLZ	0	MWI	0			
BMU	0	MYS	0			
BOL	0	NAM	0			
BRB	0	NER	0			
BRN	.009	NIC	0			
BTN	0	NLD	0			
BWA	0	NOR	0			
CAN	0	NZL	0			
CHE	0	OMN	0			
CHL	0	PAN	0			
CHN	0	PLW	.092			
COM	0	POL	0			
CPV	0	PRT	0			
CRI	0	PRY	0			
CUB	0	QAT	0			
CYP	0	ROM	0			
CZE	0	SLB	0			
DMA	0	SLV	0			
DNK	0	STP	0			
DOM	0	SUR	0			
ESP	0	SVK	0			
EST	0	SVN	0			
FIN	0	SWE	0			
FJI	0	SWZ	0			
FRA	0	SYC	0			
GAB	0	SYR	0			
GBR	0	TGO	0			
GER	0	TON	0			
GHA	0	TUN	0			
GIN	.722	TZA	0			
GMB	0	UKR	0			
GNQ	0	URY	0			
GRC	0	USA	0			
GRD	0	UZB	0			
GUY	0	VCT	0			
HKG	0	VEN	0			
HUN	0	VNM	0			
IRL	0	VUT	0			
IRN	0	WSM	0			
ISL	0	ZAF	0			
ISR	0	ZMB	0			
ITA	0	ZWE	0			
JAM	0					
JOR	0					
JPN	0					
KAZ	0					
KEN	0					
KGZ	0					
KHM	0					
KIR	0					
KNA	0					
KOR	.074					
KWT	.017					
LAO	0					
LBN	0					
LBY	0					
LCA	0					
LSO	0					
LTU	0					
LUX	0					

Turkey

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
AUS	0			GDPpc(1968)	4210.197	4196.89
AUT	0			GDPpc(1969)	4316.556	4372.92
BEL	0			GDPpc(1970)	4417.469	4424.832
BEN	0			GDPpc(1971)	4604.601	4529.802
BOL	0			GDPpc(1972)	4817.911	4682.369
BRA	0			GDPpc(1973)	4836.477	4937.768
BRB	0			GDPpc(1974)	4806.94	4930.797
BWA	0			GDPpc(1975)	5067.409	5112.304
CAN	0			GDPpc(1976)	5470.709	5481.98
CHE	0			GDPpc(1977)	5753.53	5653.408
CHL	0			GDPpc(1978)	5686.152	5568.433
CIV	.003			GDPpc(1979)	5520.438	5594.355
COM	0			GDPpc(1980)	5413.279	5431.023
CPV	.201			GDPpc(1981)	5410.354	5470.131
CRI	0			GDPpc(1982)	5468.346	5502.4
DNK	.09			GDPpc(1983)	5661.571	5607.329
DOM	0			Investment share	13.92202	17.73225
ESP	0			Trade openess	11.36782	49.38251
FIN	0			Population growth	.0237791	.0116697
FJI	0			Sec. education	33.73925	29.74894
FRA	0					
GAB	.004					
GHA	0					
GIN	0					
GMB	0					
GNQ	.494					
GRC	.021					
HKG	0					
IRL	0					
ISL	0					
ITA	0					
JAM	0					
JPN	0					
KOR	0					
LSO	0					
LUX	0					
MDG	0					
MEX	0					
MRT	0					
MUS	.081					
MWI	0					
MYS	0					
NER	0					
NLD	0					
NOR	0					
NZL	0					
PRT	0					
PRY	0					
ROM	.023					
SWE	0					
SYC	0					
TGO	0					
TTO	0					
TUN	0					
URY	0					
USA	.083					
VEN	0					
ZMB	0					

Uganda

Units weights				Predictor Balance:		
Co_No	Unit weight	Co_No	Unit weight		Treated	Synthetic
AUS	0			GDPpc(1968)	787.8007	802.5776
AUT	0			GDPpc(1969)	829.9768	800.4683
BEL	0			GDPpc(1970)	817.0081	804.0583
BEN	.368			GDPpc(1971)	805.7487	811.4929
BOL	0			GDPpc(1972)	800.6339	815.1933
BRA	0			GDPpc(1973)	792.2103	768.7889
BRB	0			GDPpc(1974)	777.2396	787.5147
BWA	0			GDPpc(1975)	752.6695	747.8287
CAF	0			GDPpc(1976)	731.0294	735.0278
CAN	0			GDPpc(1977)	726.8201	756.4114
CHL	0			Investment share	9.157436	18.23037
CIV	0			Trade openess	30.90925	56.14205
CMR	0			Population growth	.0263294	.0258375
COG	0			Sec. education	4.130173	3.979736
COM	0					
CPV	0					
CRI	0					
DNK	0					
DOM	0					
DZA	0					
ECU	0					
ESP	0					
FIN	0					
FJI	0					
FRA	0					
GAB	0					
GHA	0					
GIN	0					
GMB	0					
GNB	.043					
GNQ	0					
GRC	0					
HKG	0					
IRL	0					
ISL	0					
ITA	0					
JAM	0					
JPN	0					
KEN	0					
KOR	0					
LSO	0					
LUX	0					
MDG	0					
MEX	0					
MRT	0					
MUS	0					
MWI	0					
MYS	0					
NER	.39					
NLD	0					
NOR	0					
NPL	0					
NZL	0					
PAN	0					
PNG	0					
PRT	0					
PRY	0					
ROM	0					
RWA	.199					
SEN	0					
SLE	0					
SWE	0					
SYC	0					
TGO	0					
TTO	0					
TUN	0					
URY	0					
USA	0					
VEN	0					
ZMB	0					

Table A.3: Country's name and code

Country	*Co_No*	*Country*	*Co_No*	*Country*	*Co_No*	*Country*	*Co_No*	*Country*	*Co_No*
Afghanistan	AFG	Comoros	COM	Iceland	ISL	Moldova	MDA	Solomon Islands	SLB
Albania	ALB	Congo, Dem. Rep.	ZAR	India	IND	Mongolia	MNG	Somalia	SOM
Algeria	DZA	Congo, Republic of	COG	Indonesia	IDN	Montenegro	MNE	South Africa	ZAF
Angola	AGO	Costa Rica	CRI	Iran	IRN	Morocco	MAR	Spain	ESP
Antigua and Barbuda	ATG	Cote d`Ivoire	CIV	Iraq	IRQ	Mozambique	MOZ	Sri Lanka	LKA
Argentina	ARG	Croatia	HRV	Ireland	IRL	Namibia	NAM	St. Kitts & Nevis	KNA
Armenia	ARM	Cuba	CUB	Israel	ISR	Nepal	NPL	St. Lucia	LCA
Australia	AUS	Cyprus	CYP	Italy	ITA	Netherlands	NLD	St.Vincent & Grenadines	VCT
Austria	AUT	Czech Republic	CZE	Jamaica	JAM	New Zealand	NZL	Sudan	SDN
Azerbaijan	AZE	Denmark	DNK	Japan	JPN	Nicaragua	NIC	Suriname	SUR
Bahamas	BHS	Djibouti	DJI	Jordan	JOR	Niger	NER	Swaziland	SWZ
Bahrain	BHR	Dominica	DMA	Kazakhstan	KAZ	Nigeria	NGA	Sweden	SWE
Bangladesh	BGD	Dominican Republic	DOM	Kenya	KEN	Norway	NOR	Switzerland	CHE
Barbados	BRB	Ecuador	ECU	Kiribati	KIR	Oman	OMN	Syria	SYR
Belarus	BLR	Egypt	EGY	Korea, Republic of	KOR	Pakistan	PAK	Taiwan	TWN
Belgium	BEL	El Salvador	SLV	Kuwait	KWT	Palau	PLW	Tajikistan	TJK
Belize	BLZ	Equatorial Guinea	GNQ	Kyrgyzstan	KGZ	Panama	PAN	Tanzania	TZA
Benin	BEN	Eritrea	ERI	Laos	LAO	Papua New Guinea	PNG	Thailand	THA
Bermuda	BMU	Estonia	EST	Latvia	LVA	Paraguay	PRY	Timor-Leste	TLS
Bhutan	BTN	Ethiopia	ETH	Lebanon	LBN	Peru	PER	Togo	TGO
Bolivia	BOL	Fiji	FJI	Lesotho	LSO	Philippines	PHL	Tonga	TON
Bosnia and Herzegovina	BIH	Finland	FIN	Liberia	LBR	Poland	POL	Trinidad &Tobago	TTO
Botswana	BWA	France	FRA	Libya	LBY	Portugal	PRT	Tunisia	TUN
Brazil	BRA	Gabon	GAB	Lithuania	LTU	Puerto Rico	PRI	Turkey	TUR
Brunei	BRN	Gambia, The	GMB	Luxembourg	LUX	Qatar	QAT	Turkmenistan	TKM
Bulgaria	BGR	Georgia	GEO	Macao	MAC	Romania	ROM	Uganda	UGA
Burkina Faso	BFA	Germany	GER	Macedonia	MKD	Russia	RUS	Ukraine	UKR
Burundi	BDI	Ghana	GHA	Madagascar	MDG	Rwanda	RWA	United Arab Emirates	ARE
Cambodia	KHM	Greece	GRC	Malawi	MWI	Samoa	WSM	United Kingdom	GBR
Cameroon	CMR	Grenada	GRD	Malaysia	MYS	Sao Tome and Principe	STP	United States	USA
Canada	CAN	Guatemala	GTM	Maldives	MDV	Saudi Arabia	SAU	Uruguay	URY
Cape Verde	CPV	Guinea	GIN	Mali	MLI	Senegal	SEN	Uzbekistan	UZB
Central African Republic	CAF	Guinea-Bissau	GNB	Malta	MLT	Serbia	SRB	Vanuatu	VUT
Chad	TCD	Guyana	GUY	Marshall Islands	MHL	Seychelles	SYC	Venezuela	VEN
Chile	CHL	Haiti	HTI	Mauritania	MRT	Sierra Leone	SLE	Vietnam	VNM
China Version 1	CHN	Honduras	HND	Mauritius	MUS	Singapore	SGP	Yemen	YEM
China Version 2	CH2	Hong Kong	HKG	Mexico	MEX	Slovak Republic	SVK	Zambia	ZMB
Colombia	COL	Hungary	HUN	Micronesia, Fed. Sts.	FSM	Slovenia	SVN	Zimbabwe	ZWE