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Effects of the Colombia Peace negotiation process on gross domestic product per capita

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Abstract

This article attempts to determine whether the peace negotiation process initiated in Colombia that culminated with the Peace Treaty in 2016 had a positive economic effect, using the National Gross Domestic Product per capita as a measure. We apply a synthetic control method that is appropriate for a policy evaluation. Considering the anticipated and realized effects on economic variables, our results suggest that the Peace Treaty has positively influenced gross domestic product per capita. Furthermore, this positive effect has been maintained through 2021, the last available year of data. Data to 2021 show post-pandemic Colombia is better off when compared with a hypothetical Colombia—or synthetic Colombia—that did not begin a peace negotiation process.

KEYWORDS
Colombia Peace Treaty, gross domestic product, synthetic control method

INTRODUCTION

The internal armed conflict in Colombia has been ongoing for 70 years, affecting different social and institutional spheres in the country. According to data from the National Centre for Historical Memory (2023), between 1958 and 2022, there were nearly 270,000 deaths reported and more than eight million people affected by the conflict that involved armed groups, paramilitary forces, and drug trafficking networks.

This situation has meant significant consequences for the country's economy that have been widely documented in specialized literature since the escalation of the violence in the mid-1990s (Álvarez & Rettberg, 2008; Betancur et al., 2020; Rubio, 1995; Villa et al., 2014). Vargas (2003) and Betancur et al. (2020) draw attention to the fact that the conflict has affected both the factors of production (including human and physical capital) and productivity. Murders, massacres, kidnappings, population recruitment, and forced disappearances and displacements

are the main consequences of the conflict as felt by people, whereas physical capital (the labor force) has been negatively affected by the destruction of infrastructure (attacks on pipelines and police stations). The resulting uncertainty has led to a drop in investment, the flight of capital, and an increase in unproductive spending. Additionally, regarding intangible assets, the growth of violence and social insecurity has undermined social cohesion and institutional organization in Colombia, boosting transaction costs (Betancur et al., 2020). All these elements have affected the efficient use of production factors, constraining economic growth.

In November 2012, the government and members of the Revolutionary Armed Forces of Colombia-People's Army (FARC-EP, in Spanish) went to the negotiation table in Havana, Cuba, to build a peace agreement that would end the armed conflict in the country. Although intensification of the armed struggle by the previous government may have placed the new government in a better position to negotiate, the process was neither easy nor fast. After 4 years of dialogue, a preliminary agreement was signed in Cartagena in September 2016. The "final agreement to end the armed conflict and build a stable and lasting peace" was submitted to a process of endorsement and rejected through a public plebiscite in October of the same year. Then, some adjustments to the initial text led the Congress of the Republic to approve the agreement in November 2016.

Although 7 years have passed since the signing of the agreement, the implementation of peace is a work in progress that has not been exempt from violent events. For this reason, its effects on the economy are still not entirely clear. The big question that arises from this process is whether the end of the armed conflict will result in an improvement in economic performance indicators. Some maintain that the termination of violence will generate indisputable economic gains; other sectors believe it will not result in tangible benefits in the short and medium term since the effects of the ceasefire have already been seen over the last 15–20 years without generating concrete positive effects on economic dynamics (Betancur et al., 2020).

Based on the Hobbesian standpoint that considers the construction of peace and security as a condition for economic prosperity, this study aims to determine whether the negotiation process that concluded with the signing of the Peace Treaty had a positive effect on Colombia's gross domestic product (GDP) per capita. To do so, we use a comparative case study approach based on a synthetic control method.

The following section presents a review of the Hobbesian theoretical perspective that relates peace processes to economic prosperity. Section 3 covers some civil war literature to contextualize the work, and Section 4 expands on the history of Colombia's conflict. Section 5 presents some descriptive statistics regarding GDP in Colombia and the regions of South America, and the methodology used. In Section 6, the results of the model applied are analyzed. Finally, Section 7 summarizes the main conclusions.

ARGUMENT

In recent years, Thomas Hobbes's theory of war has been reexamined as part of the discussion of the economic effects of war and peace. Hobbes claims that economic prosperity depends on the realization of peace, derived from a broad political agreement through which individuals cede part of their authority to the state (Leviathan), thus allowing collective cooperation. In such a context, security prevails insofar as the level of uncertainty about other people's actions is reduced. On the other hand, in a state of war "there is no place for industry, because the fruit thereof is uncertain (…), no arts, no letters, no society, and which is worst of all, continual fear, and danger of violent death, and the life of man, solitary, poor, nasty, brutish, and short" (Hobbes, [1651], 2008, p. 9).

Three centuries later, neo-institutionalist theorists (Coase, 1937, 1991; North, 1990) argue that the wealth of nations, in other words, the ability of societies to capture profits from

exchange, depends essentially on the containment of transaction costs derived from the uncertainty that characterizes social institutions, norms, and culture. In this vein, Collier et al. (2003) posit that civil wars hamper development, and development holds back internal armed conflicts. Vicious and virtuous circles are produced; where development prospers, "countries become progressively safer from violent conflict, making subsequent development easier. Where development fails, countries are at high risk of becoming caught in a conflict trap in which war wrecks the economy and increases the risk of further war" (Collier et al., 2003, p. 1). This interaction is mainly sustained by the fact that during a civil war, society transfers many of its resources from productive activities to destructive activities. In other words, in a context of internal armed conflict, one part of society is producing while another part is destroying (Collier et al., 2003).

Today, the idea that war represents a threat to countries' economic prosperity is virtually undeniable. Could this point necessarily mean that the construction of peace, in institutional terms, delivers economic prosperity? Faced with this question, it is pertinent to return to Hobbes' reflections—if peace does not broaden *the opportunity for industry*, or conversely, if war did not limit economic growth, then either there was no such war and there is no such peace, or the narrow and complex relationship between peacebuilding, security, and prosperity is illusory (Zuleta, 2019).

The hypothesis tested in this article is, if there are equal conditions, a country with internal conflict will suffer significant economic depression compared to non-conflict countries. The synthetic control method allows us to measure the difference in terms of GDP obtained by Colombia after the beginning of the peace process by comparing Colombia's real GDP with the estimated data of a country similar to Colombia that did not end the conflict.

CIVIL WAR LITERATURE

The relationship between civil wars and economics has been studied from different angles. In a pioneer work regarding the economic determinants of internal armed conflicts, Collier (1998) states that rebel groups will conduct a civil war if the perceived benefits overweigh the costs of rebellion. From this perspective, rebellion is explained in terms of opportunity (greed). According to the authors, the opportunity for civil war is influenced by several factors (Collier, 2004). One of them is the dependence of a country on primary commodities. It is assumed that exports of primary goods provide opportunities for extorsion, thus increasing the risk of conflict. Another factor that determines the outbreak of a civil war is the cost of rebellion. In this regard, the authors identify that countries' performance on educational level, income per capita, and growth rate substantially affect conflict risk (Collier, 2004). Military advantage and the age structure of a population are also factors that catalyze the risk of civil war.

In different works, Collier (1998, 2000, 2004) interprets civil wars as greed-motivated phenomena. Indeed, indicators of grievance, such as social fractionalization, added little explanatory power to their econometric model (Collier & Hoeffler, 2000). Yet, they do not deny that grievance motivation may also lead to rebellion. Collier (2004) recognizes that political factors, including institutional capacity, may also influence the onset of confrontations.

Fearon and Laitin's (2001) work focuses on the *motivation of rebels*, assuming that rebels are "purposive actors seeking some end, such as redressing religious, nationalist, or economic grievances" (p. 2). They propose that many of the civil wars recorded during the second half of the 20th century are anchored on the unceasing accumulation of prolonged conflicts. The authors argue that rather than cultural differences and ethnic grievances, what facilitates the conflict are the conditions that favor insurgency. Countries with financially, organizationally, and politically weak central governments are more prone to civil war.

Most of the research work produced on this matter studies the determinants of a conflict and its short-term consequences, but there is not much literature that analyzes its effect in the long term. This article sheds light on this aspect and seeks to draw attention to how peace-building processes interact with economic performance (in this case, by considering GDP per capita). Following Fearon and Laitin (2001), we suggest that the Colombian Peace Treaty may function as an institutional mechanism that tackles the conditions of insurgency.

COLOMBIA CONFLICT AND PEACE TREATY

Modern Colombian history presents a constant tension between war and peace (Gutiérrez Sanín, 2014). Díaz Pavón (2018) considers two periods in the process of consolidation of statehood in Colombia since 1948—from 1948 to 1991, and from 1991 to 2010. The initial period is the emergence of the modern form of violence in Colombia, which began with violent initiatives throughout the country following the assassination of Jorge Eliécer Gaitán and ended with the new political covenant in the 1991 Constitution. 1991 to 2010 was a period of transformation, between the enactment of the new constitution and the 2012–2016 peace process. The 1991–2010 period had multiple peace processes and, at the same time, counterresponses by armed actors and local elites. The Álvaro Uribe presidency (2002–2006 and 2006–2010) brought mandates to tackle the guerrilla groups with Security Forces. Uribe's successor, President Juan Manuel Santos (2010–2014 and 2014–2018) marked a turning point in the relationship between the government and FARC-EP as he began negotiations with a view to achieve peace. In 2011 and 2012, there was rise in the number of war-like actions taken by FARC-EP[1] in response to the implementation of the Victims and Land Restitution Law in 2011, which includes measures of attention, assistance, and comprehensive reparation (including land restitution) to victims of the armed conflict (Nuevo Arco Iris, 2012). In October 2012, the negotiation process in Oslo between the Colombian government and FARC-EP began. One month later, the dialog round table was installed in Havana. The peace agreement is more than the Peace Treaty. It is a long series of agreements toward peace that started with treating FARC as an issue requiring military intervention. The achievement of peace combined periods of conflict and tension. In May 2014, the FARC group called off the ceasefire, committing over 60 attacks against civilians and affecting the energy infrastructure of the country. The energy crisis, along with the kidnapping of military officers, led President Santos to interrupt the dialog between the Colombian government and the guerrilla group in November 2014. The chain of events described is in accordance with the rising trend in new displacements throughout 2014.

In December 2014, after the kidnapped persons were released, the dialog in Havana resumed, and FARC announced a unilateral and indefinite ceasefire. From 2015 onward, the peace process began to move toward the progressive demobilization of the armed conflict. The dialog process concluded in August 2016, with the signing of the Final Agreement to End the Armed Conflict and Build a Stable and Lasting Peace.

DATA, DESCRIPTIVE STATISTICS, AND METHODOLOGY

Data

The variables used in the paper are from the GDP, defined as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. It is

converted to international dollars using purchasing power parity (PPP) rates. An international dollar has the same purchasing power over GDP that the US dollar has in the United States. GDP Data are in 2017 international dollars. Other data are from gross capital formation over the GDP, used as investment ratio; population density averaged for the period (people per square kilometer); sectoral shares (percentage of agriculture, forestry, and fishing over GDP and percentage of industry including construction over GDP, averaged for the available 1991–2014 period); and human capital measured by the unemployment rate and the unique variable available for all the countries, which is compulsory education (years children are legally obligated to attend school).

All the variables used in the model come from the World Bank Database (World Bank, 2023).

In principle, the potential controls are South American countries, excluding Peru and Venezuela. The emergence of a conflict in Peru in the studied period could bias the result. The internal conflict in Peru has lasted for almost 40 years, starting in 1980, as an armed conflict. Even though the number of deaths has significantly dropped since 2000, there were some resurgences of violence in 2002 and 2014. Venezuela has been removed from the donor pool because there is no available data for the endogenous variables from 2014.

As Figure 1 shows, Guyana also must be excluded from the donor pool because the discovery of significant amounts of offshore oil has increased the country's development prospects. Having begun in December 2019, this oil production has enabled the country to withstand much of the economic fallout from the pandemic. In 2020, despite a global recession,
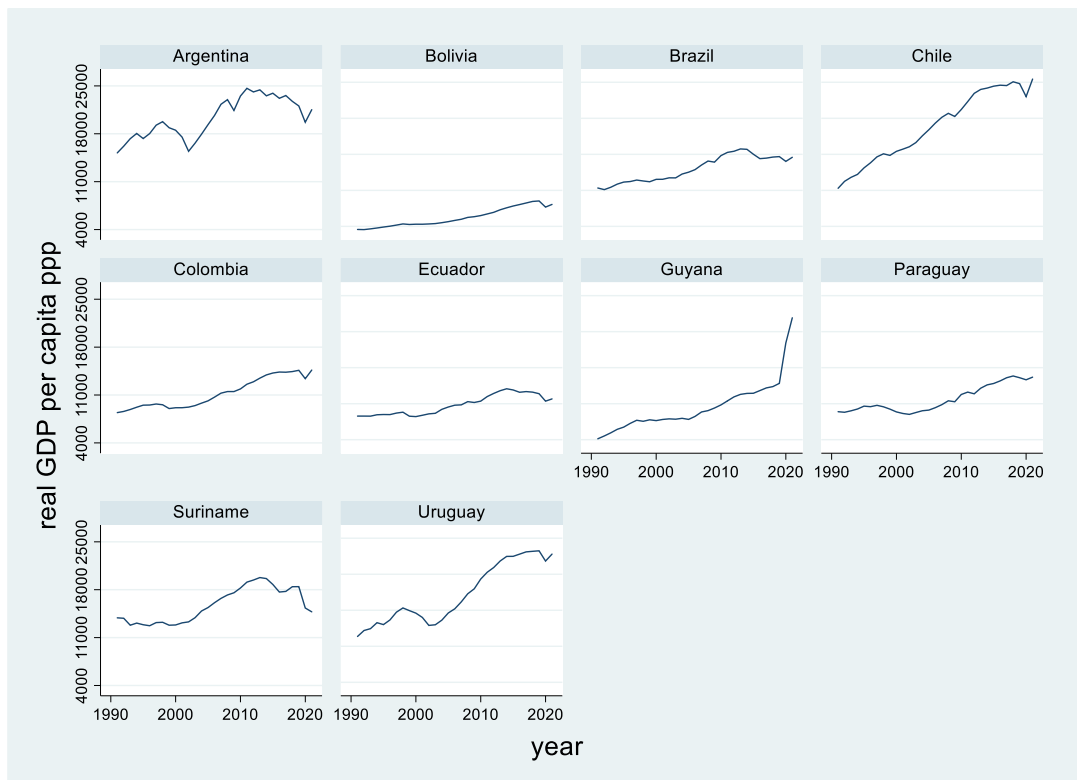

FIGURE 1 Evolution of real GDP per capita in PPP by country. GDP, gross domestic product; PPP, purchasing power parity. *Source*: World Bank (2023).

Guyana's economy grew almost 44%, and in 2021, almost 20%, which makes the country ineligible for comparing events in the post-treaty period.

We are left with eight potential control countries to build the synthetic counterfactual Colombia. Although there are several variables with values from 1960, we will only consider the period from 1991 to 2021, because it is the interval with the least empty cells.

Descriptive statistics

Table 1 summarizes the descriptive statistics of the variables for the 1991–2021 period for Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Suriname, and Uruguay.

Figure 2 presents the evolution of GDP per capita in Colombia from 1991 to 2021. In 1999, Colombia suffered the second main economic crisis in the analyzed period, with a negative growth of 5.7%. Also shown are the effects of the 2008 financial crisis and the 2020 pandemic crisis, when the drop in GDP per capita reached almost −9%. Furthermore, the figure shows a change in the trend in 2010, with the second-highest GDP per capita growth rate in 2011, and a trend toward growth from 2012 to 2014. Between 2012 and 2014, there were two pre-agreements between the parties concerned.[2] Still, although we consider the hypothesis that the peace negotiations affected Colombia's economic situation, not all variations in GDP per capita besides the mentioned crises can be attributed to the conflict. There was a parallel evolution of socioeconomic characteristics that also determined the trend in GDP; otherwise, Colombia could have felt an economic bump after the peace agreement.

We will use a policy measure to isolate the socioeconomic effect, a technique we explain in the following section.

Methodology

The technique used in this paper consists of the construction of a synthetic control as developed by Abadie and Gardeazabal (2003) and Abadie et al. (2010). This method allows us to determine whether the increase in real GDP per capita is due to the Peace Treaty or to socioeconomic factors. The model consists of comparing the evolution of the variables in one agent affected by the policy ("real Colombia") with the evolution of the same variables in one

TABLE 1 Descriptive statistics for the potential control countries, 1991–2021.

	Observations	Mean	SD	Minimum value	Maximum value
GDP per capita	279	13675.04	5191.91	4556.994	25449.13
Investment rate	249	0.1067784	0.0310487	0.0442186	0.2122596
Population density	270	21.82623	15.47922	2.666545	70.81895
Sectoral shares					
Agriculture/GDP	279	9.00675	4.11039	3.274934	23.40316
Industry/GDP	279	28.63389	5.301925	16.14076	42.17103
Human capital					
Unemployment rate	279	8.059276	3.794827	2.02	20.52
Compulsory education	216	10.75463	2.795341	6	15

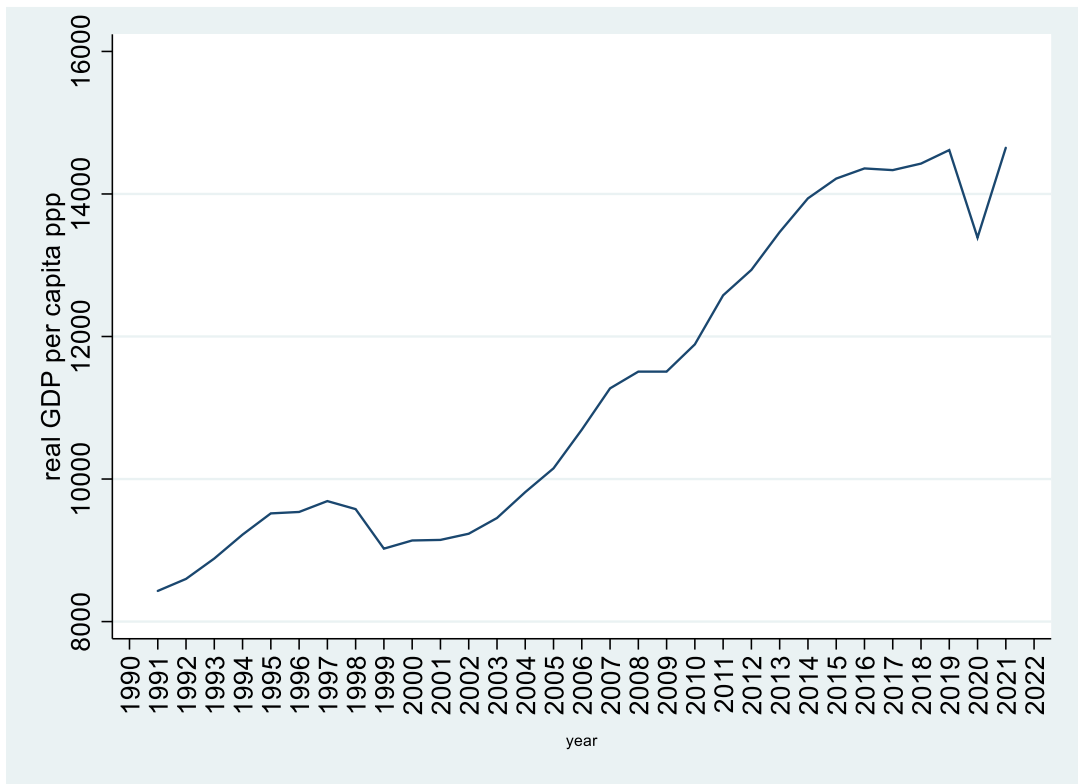Abbreviation: GDP: gross domestic product. *Source*: World Bank (2023).

FIGURE 2 Gross domestic product constant 2017 purchasing power parity, 1991–2018. GDP, gross domestic product; PPP, purchasing power parity. *Source*: World Bank (2023).

or more unaffected agents ("synthetic Colombia"). The main difficulties when applying this approach are how to choose the units of comparison and how to deal with uncertainty in the ability of the synthetic control to reproduce the counterfactual situation of interest. The main idea of the referenced authors is that a combination of countries is expected to provide a better counterfactual for the treated case than just one country.

In the rest of this section, we briefly describe the application of the model used by Abadie et al. (2010) to explain the applicability of synthetic controls in comparative case studies.

This synthetic Colombia is constructed as the weighted average of the available control units (Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, Suriname, and Uruguay) that best approximate the relevant characteristics of the real Colombia before the intervention. All these countries are the control group, and they will help us predict what would have occurred in Colombian GDP per capita if the negotiation process had not taken place. The technique selects the weights and the countries that best adjust Colombian GDP per capita before the peace negotiation process. The post-intervention outcomes are then used to estimate the counterfactual situation, which refers to whether real Colombia GDP per capita is equal to, greater than, or less than synthetic Colombia GDP per capita.

We have information about nine countries during 31 periods. The intervention analyzed is applied to Colombia at a certain date, and we have chosen 2012,[3] which forms part of the available data period, 1991–2021. We have eight countries that can be labeled as potential controls and that comprise the donor pool. Let synthetic Colombia GDP per capita be the variable of interest in the absence of the policy intervention for Colombia during the 1991–2021

period. If the intervention had no effect before its implementation, the difference between real Colombia GDP and synthetic Colombia GDP is the effect of the policy.

Details of the technique are provided in the referenced articles.

RESULTS

The variable to be studied in our empirical analysis is the GDP per capita in Colombia's PPP during the available period, 1991–2021.

To estimate GDP per capita, we have used variables similar to those used by Abadie and Gardeazabal (2003).

Table 2 shows weights assigned to each country in the donor pool when constructing the synthetic GDP per capita.

Table 3 presents the average characteristics of GDP per capita and its determinants in the period before the Peace Treaty, that is, before 2012. The characteristics of the synthetic control constructed are quite similar. In fact, using the Wilcoxon matched-pair signed-rank test (Wilcoxon, 1945), we cannot reject the null hypothesis that the median of the differences in GDP per capita is expected to be zero before 2012. This non-parametric test is often used to compare the data collected before and after an experimental manipulation when the data cannot be assumed to be normally distributed.

Figure 3 plots the evolution of real GDP per capita in Colombia and for synthetic Colombia, and both behave similarly until 2012. After this year, the evolution of GDP per capita in Colombia is higher than for synthetic Colombia, and this result is statistically significant using Wilcoxon's test. It would seem that the economy reacted not only to the signing of the Peace Treaty but also to the announcement of a peace negotiation process in the country, which is consistent with the rational expectations theory, which establishes that decisions in an economy are taken based on rationality, information available (present and future), and past experiences (Muth, 1961).

This difference is approximately 12% in terms of mean over the value of synthetic Colombia for the post-peace negotiation process (2013–2021).

Table 4 shows the real values of GDP per capita PPP in Colombia, and the values that would have occurred without the peace negotiation process (GDP synthetic Colombia) and the difference as a percentage. There is a high increase in GDP, and GDP is higher closer to the signing of the Peace Treaty in 2016, due to the peace negotiation process.

TABLE 2 Weights assigned to South American countries for gross domestic product per capita.

	Weights
Argentina	0.089
Bolivia	0.235
Brazil	0.27
Chile	0
Ecuador	0.321
Paraguay	0.085
Suriname	0
Uruguay	0

Source: Authors' elaboration.

TABLE 3 Pre-Peace Treaty characteristics, real Colombia, and Synthetic Colombia, 1991–2011.

	Colombia	Synthetic Control
GDP per capita	9631.562	9647.054
Investment rate	0.0900044	0.115038
Population density	35.72238	26.10726
Sectoral shares		
Agriculture/GDP	9.788296	10.57765
Industry/GDP	29.84468	28.78581
Human capital		
Unemployment rate	11.46452	5.770294
Compulsory education	10.11111	10.50606

Abbreviation: GDP, gross domestic product. *Source*: Authors' elaboration, with data from World Bank (2023).
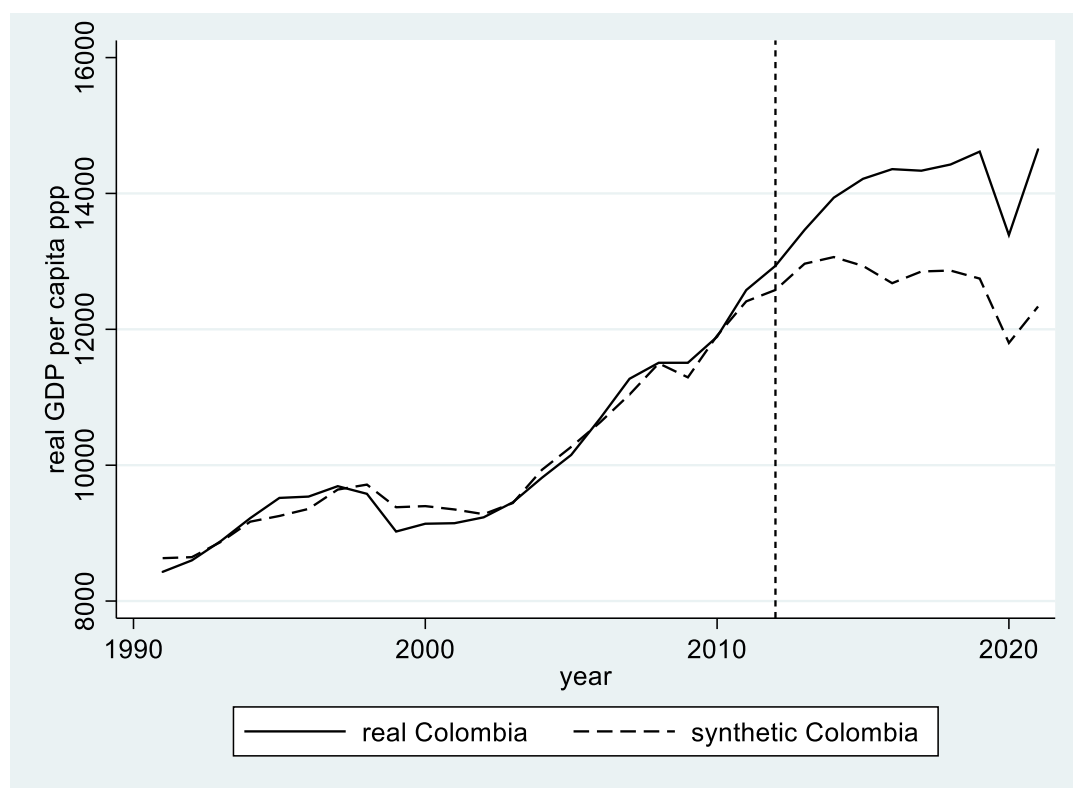

FIGURE 3 GDP per capita purchasing power parity (constant 2017) in Colombia, 1991–2021. GDP, gross domestic product; PPP, purchasing power parity. *Source*: Authors' elaboration.

Furthermore, we can observe that the effect of the 2020 pandemic crisis affected each Colombia differently. In 2021, instead of maintaining a difference of a 13%–14% increase in GDP (difference in 2016), Colombia increased its difference with the non-peace synthetic Colombia to 18%, five points higher.

TABLE 4 Gross domestic product per capital real and synthetic and variations, 2013–2021.

	GDP real Colombia	**GDP synthetic Colombia**	**% of variation by negotiations start**
2013	13465.075	12966.233	3.85
2014	13938.231	13063.547	6.70
2015	14215.688	12933.352	9.91
2016	14358.168	12679.182	13.24
2017	14334.915	12852.177	11.54
2018	14426.435	12864.798	12.14
2019	14616.135	12746.712	14.67
2020	13387.701	11799.258	13.46
2021	14648.592	12336.239	18.74

Abbreviation: GDP, gross domestic product. *Source*: Authors' elaboration, with data from World Bank (2023).

CONCLUSION

This study attempts to determine whether the peace process that started in Colombia in 2012 affected the country's GDP per capita. Based on the review of specialized literature, it is assumed that armed conflicts have an adverse effect on a national economy, which is reflected in macroeconomic indicators, such as GDP per capita. If armed conflicts affect the economic variables negatively, the end of the conflict should show positive results in the economy.

Meanwhile, GDP per capita is influenced by other factors besides internal conflict, including investment, population density, sectoral shares, and human capital. In our case, we must therefore use a synthetic control method capable of isolating the effect of a policy, such as the peace-negotiation process, in the evolution of GDP per capita in Colombia, and compare this effect with the evolution of the same variables in several unaffected countries that make up synthetic Colombia—Argentina, Bolivia, Brazil, Ecuador, and Paraguay. The application of this method allowed us to determine whether the increase in GDP per capita was due to the development of the peace process or to the factors considered.

Results show that the increase in GDP per capita after the Peace Treaty in Colombia was a mean of approximately 12% over the value Colombia would have had without the treaty negotiation process, and the difference was maintained in the following years. The economy reacted to the announcement of the starting of the process that culminated with the Peace Treaty signature. This result is consistent with rational expectations theory and with findings by Villa et al. (2014) but uses a more precise technique to evaluate the effect of a policy. Furthermore, the latest available data allow us to conclude that Colombia's reaction to the 2020 pandemic crisis showed a higher result in GDP per capita when compared with the predicted result in synthetic Colombia. Economies with a lower GDP because of a conflict can experiment a drastic increase when this conflict ends. The higher GDP could decrease unemployment and increase the workers' bargaining power and salaries or could increase the market power of entrepreneurs. Both effects would contribute to inflation, but it does not seem that this phenomenon has affected Colombia. Although the data show an increase in inflation by 2016, it falls in successive years. The effect of the pandemic crisis in Colombia on other economic variables offers a new line of research, but it is beyond the scope of this article.

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ENDNOTES

[1] According to the annual report by the "Nuevo Arco Iris" (2012) Corporation, in the first semester of 2011, conflicts caused by the guerrillas grew 10% over the same period in 2010, at the national level.

[2] The first pre-agreement dealt with agrarian reform, while the second (achieved in November 2013) had to do with the political participation of the guerrillas who demobilized once the process had concluded.

[3] This year was chosen because, although the Peace Treaty was signed in 2016, in October 2012, the negotiation process between the Colombian government and FARC-EP began in Oslo. Appendix A includes the analysis using 2016 as the intervention period, and the results are very similar.

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APPENDIX A: Weights assigned to South American countries with 2016 as the breakpoint

	Weights
Argentina	00.81
Bolivia	0.198
Brazil	0.291
Chile	0
Ecuador	0.3
Paraguay	0.13
Suriname	0
Uruguay	0

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