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Colombia Peace Treaty effect in GDP per capita and migration

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Abstract

This paper attempts to determine whether the Peace Treaty initiated in Colombia in 2016 had a positive pull effect on two key indicators: the Migration Stock, as a measure of demographic changes and the National Gross Domestic Product (GDP) per capita as a measure of the economic situation. We apply a synthetic control method that is appropriate for a policy evaluation. Our results suggest that the GDP per capita has been positively influenced by the Peace Treaty, since the economic variables are permeable to expectations. However, the Migration Stock has not reacted to the announcement of the beginning of the negotiations, nor to the Peace Treaty being signed. Rather, it corresponds to the path for a counterfactual country with similar socioeconomic characteristics.

Key words: Colombia Peace Treaty/Synthetic Control Method/ migration/GDP

1.Introduction

The contemporary armed conflict in Colombia can be understood as the result of an accumulation of social, cultural and political causes that have been carried over from the early 20th century (De Zubiría, 2015). The use of violence emerged as a social response to land distribution inequalities and to the lack of space for political participation of socially disadvantaged groups (Moreira et al., 2015). The exclusion of rural and indigenous populations from the social scene, together with the influence of intellectuals and leading figures from academia, resulted in the formation of self-defense groups, whose main representatives became the Revolutionary Armed Forces of Colombia (FARC-EP).

According to Duncan (2004) at the end of the 70's the insurgent movements started to change their strategies and patterns of action, moving from a fight for livelihood towards an expansionist war related to drug-trafficking networks. The latter involved an increasing number of fronts and the emergence of conflicts for control over land. Indeed, the production of coca leaf and the manufacture of illicit cocaine have served as means for financing the guerrilla, paramilitary groups and organized crime networks linked to the conflict. The FARC-EP, in particular, concentrated the largest share of coca cultivation, controlling almost 40% of the land from the southeastern Amazonian and Andean region in 2000 (Moreira et al., 2015). The influence of drug-trafficking networks, jointly with the implementation of global security policies by the armed forces of the Colombian State, led to the exacerbation and continuation of the conflict, especially during the 1990's and 2000's (Mantilla Valbuena, 2012).

The latter has negatively impacted society in multiple ways. The most immediate consequences refer to the loss of human life due to massacres and targeted killings,

physical abuse and torture, enforced disappearances, sexual violence and kidnapping Center for Historical Memory (GMH, 2013). According to estimations from the GMH (2013), between 1981 and 2012 the armed conflict in Colombia left 150,000 people dead due to targeted murders and 12,000 due to massacres.

In addition, the Colombian conflict has led to massive internal displacement, which has found a new expression besides the traditional rural displacements to urban areas. In fact, inter-city movements within the main urban centers (Medellín, Bogotá, Barranquilla and Cali) have become increasingly frequent during the last two decades, due to the urbanization of the conflict, as an attempt by the armed groups to intimidate social society and increase their power. The Colombian conflict has also led to external displacements. Colombia has become a migrant-sending country more than a destination for immigrants. Although human mobility is a diverse and multicausal process – not always based on rational decision making – there is a consensus that the contextual features may act as push or pull factors for migration. In this case, the protracted nature of the armed conflict and the increasing heterogeneity of its dynamics and actors involved, threaten the stability and security of living conditions of the population (Gómez Builes et al., 2008), making the country an origin point for emigration instead of attracting a population.

Economic development has also been hit by the conflict. Through a descriptive analysis, Echevery et. al. (2001) calculate the loss in annual growth of GDP at 0.54%. Villa et al. (2014) analyse the effects of this phenomenon on the national economy at the departmental level for a wider period, 1988-2009. Through a panel data and using econometric techniques, they conclude that the elasticity of GDP during the armed

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3 conflict is -0.04, that is, in the context of armed conflict, the GDP takes 18,5 years to
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5 double, while in the context of peace this would be achieved in only 8,5 years.
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10 This literature review shows that the Colombia armed conflict had a harmful influence
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12 on GDP and migration. Therefore, the end of the conflict should have positive
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14 consequences. However, the data do not always confirm the theoretical hypothesis.
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20 In November 2012, the governmental authorities of Colombia and members of the
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22 FARC-EP came to the negotiation table in Havana (Cuba), aimed at building a peace
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24 agreement that would end the armed conflict in the country. Among the topics included
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26 in the discussion agenda were agricultural policies and development, solutions to the
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28 problem of illicit drugs, victims of the armed conflict and the end of the conflict. The
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30 process concluded after four years of dialogue, in 2016, with the "Final agreement to
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32 end the armed conflict and build a stable and lasting peace". How did the Peace Treaty
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34 affect the Migration Stock in Colombia? Did it produce a pull effect? Did it have an
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36 impact on the GDP per capita of the country?
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44 By using a comparative case study approach based on a synthetic control method, this
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46 study aims to determine whether the negotiation process that concluded in the signature
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48 of the Peace Treaty, acted as a pull factor for migration and positively affected GDP per
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50 capita of Colombia.
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54 The following section presents some descriptive statistics regarding migration and
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56 internal displacement in Colombia and the regions of South America, and the
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58 methodology used. In section three the results of the model applied are analyzed and
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finally, section four summarizes the main conclusions.

2.Data, descriptive statistics and methodology.

2.1.Data

We have used several variables in the paper, but the main could be summarized as: Migration, Internal Displacements and Gross Domestic Product. All these three concepts can include different ideas, therefore, our first step will be to present the definition of the variables used. We study the Migration Stock, defined as: *the number of people born in a country other than that in which they live. It also includes refugees. When data on the foreign-born population is not available, data on foreign populations – that is, people who are citizens of a country other than the country in which they reside – are used as estimates*". These data are provided by the United Nations Statistics Division (UNSD) and are available every five years, except for 2017. An interpolation using the mean growth for the years between the available intervals is made.

Internally Displaced People Stock by conflict and violence and New Displacement associated with conflict and violence data comes from the Internal Displacement Monitoring Centre (IDMC) and are defined as: *people or groups of people who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of armed conflict, or to avoid the effects of armed conflict, situations of generalized violence, violations of human rights who have not crossed an international border. "Internally displaced people" refers to the number of people living in displacement as of the end of each year, and reflects the stock of people*

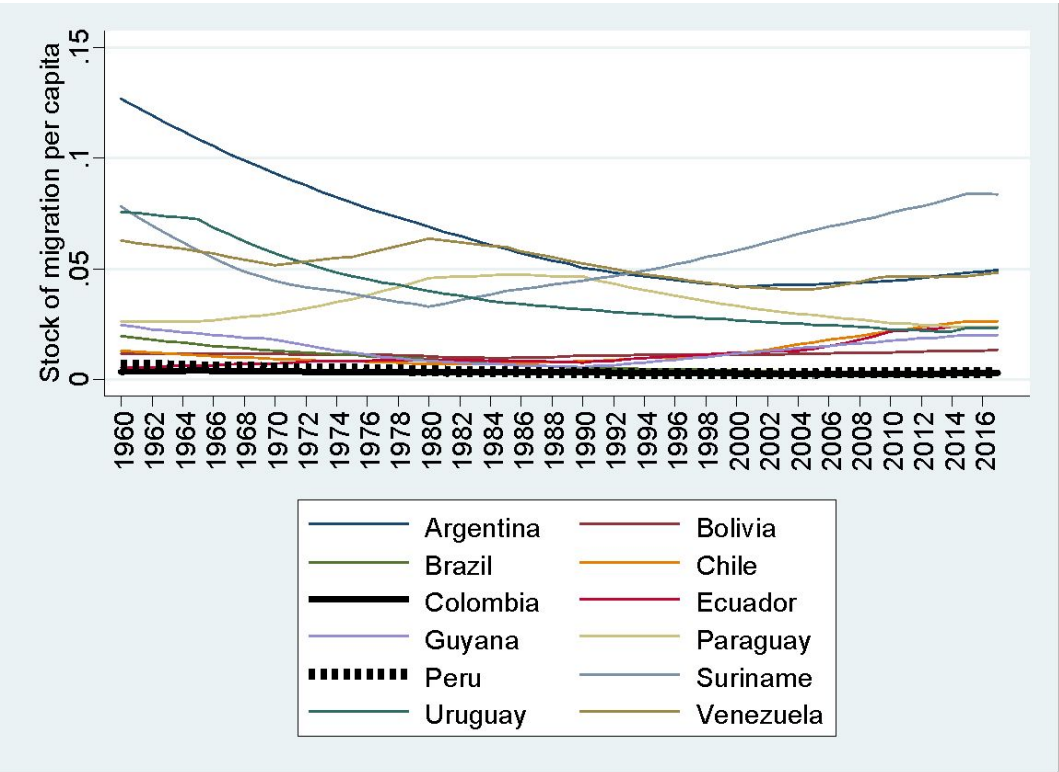
displaced at the end of the previous year, plus inflows of new cases arriving over the year as well as births over the year to those displaced, minus outflows which may include returnees, those who settled elsewhere, those who integrated locally, those who travelled over borders, and deaths. "New Displacement" refers to the number of new cases or incidents of displacement recorded over the specified year, rather than the number of people displaced. This is done because people may have been displaced more than once.

Gross Domestic Product is 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 rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP Data are in constant 2011 international dollars. And, as the rest of variables used in the model, it comes from the World Bank Database (WBD).

2.2.Descriptive Statistics

Colombia shows one of the lowest migration stocks per capita in the South American region. One plausible reason for this fact is the armed conflict experienced by the country during the last five to six decades. Given the continuity, diversification and internationalization of the conflict, Colombia has more push than pull factors associated with human migration. Thus, instead of being a migrant-receiving country (see Figure 1), Colombia has been a sending country, mostly of extra-continental migrants (Wabgou & Vargas, 2012).

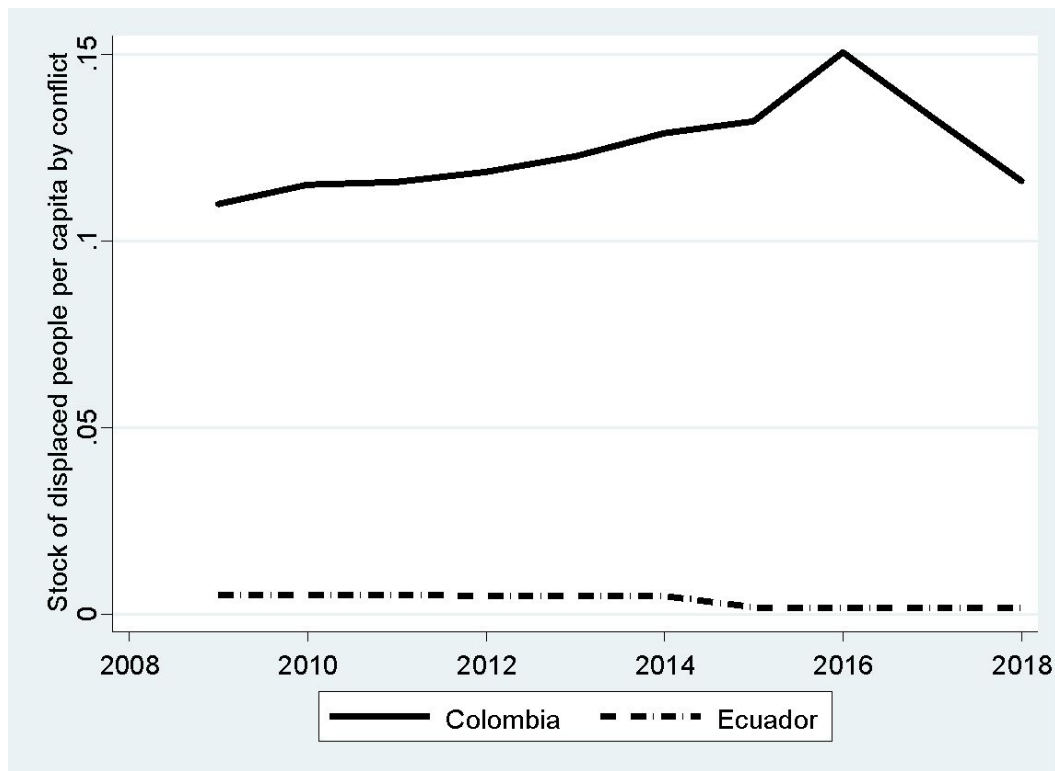
Figure 1: Migration Stock per capita, 1960-2017.



Source: UNSD and WBD.

In fact, the only two countries in South America that have suffered internal displacements due to conflict or violence, Colombia and Peru, are the countries with the lowest Migration Stocks per capita. Figure 2 shows the evolution of total displaced people per capita by conflict and violence over the period in which data is available. It can be noted that only Colombia and Peru have positive values, and the percentage of displaced people in relative terms is much more relevant in Colombia.

Figure 2: Stock of internal displaced people per capita, 2009-2018.



Source: IDMC and WBD.

This preliminary analysis leads us to consider the hypothesis that armed conflict discourages immigration to a country, and makes it relevant to measure the effect of the end of the conflict in the Migration Stock. Figure 2 shows a change in the trend of internal displacement stock in 2016 in Colombia, the same year in which the Peace Treaty was signed.

Figure 3 presents new displacements by conflict or violence in Colombia. The non-monotonic trend can be interpreted as the result of the different steps followed by the Peace process developing in Colombia during recent years. The abrupt decrease observed in the number of displaced people between 2010 and 2011 can be explained by the end of Álvaro Uribe presidency, under whose mandates (2002-2006 and 2006-2010) the country experienced the greatest confrontation between the Security Forces and the guerrilla groups. Although his successor, President Juan Manuel Santos (2010-2014 and

2014-2018) marked a turning point in the relationship between the government and the FARC-EP, as he was open to begin negotiations with a view to achieving peace, during his mandate new displacements occurred. In particular, the increase in new displaced population recorded from 2011 to 2012 can be attributed to a rise in the number of war-like actions taken by the FARC-EP¹, in response to the implementation of the Victims and Land Restitution Law (2011), which includes measures of attention, assistance and comprehensive reparation (including land restitution) to victims of the armed conflict (Nuevo Arcoiris, 2011). In October 2012, the negotiation process in Oslo between the Colombian government and the FARC-EP began. One month later, the dialogue table was installed in Havana. This new political context explains the decreasing trend in the number of new displacements that occurred between 2012 and 2014, a period in which two pre-agreements between the parties concerned were accomplished². The achievement of peace, however, was not a linear process and periods of conflict and tension were experienced while it was taking place. In fact, 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 latter, along with the kidnapping of military officers, led President Santos to interrupt the dialogue 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.

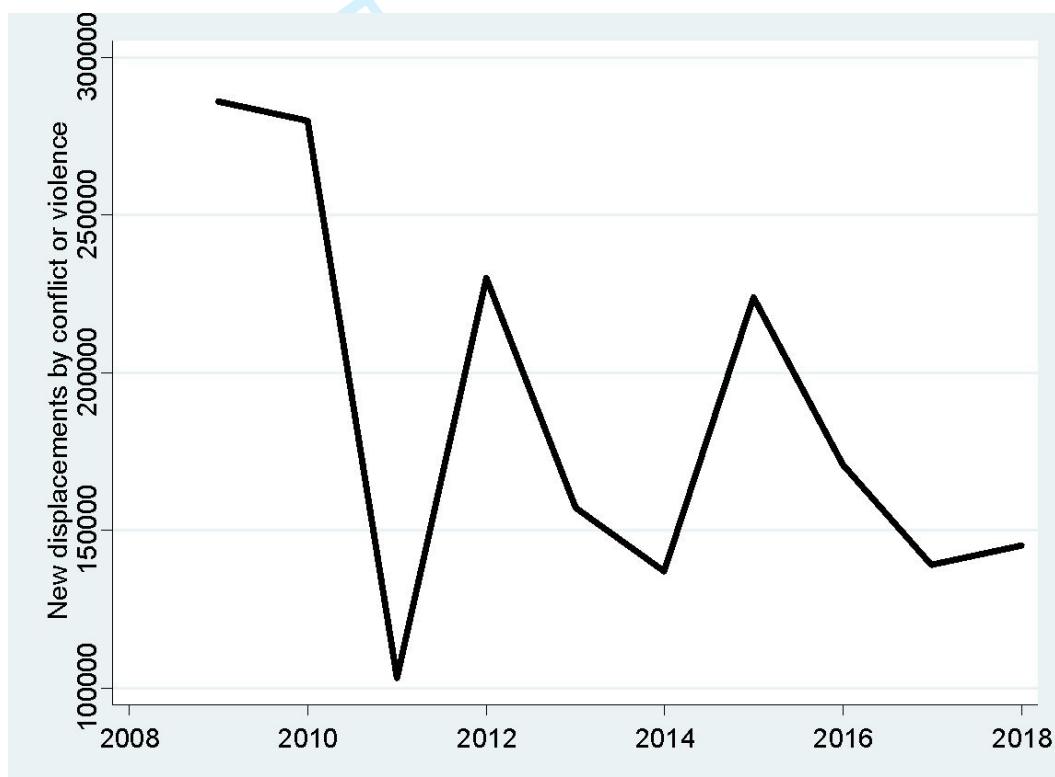
In December 2014, after releasing the kidnapped persons, the dialogue in Havana was resumed and FARC announced a unilateral and indefinite ceasefire. From 2015

1 According to the annual report made by the Corporation "Nuevo Arcoiris" (2011), during the first semester of 2011 the conflicts caused by the guerrilla grew 10% at the national level, in relation to the same period in 2010.

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

onwards, the peace process began to move towards the progressive demobilization of the armed conflict. The whole dialogue process concluded in August 2016 with the signature of the Final Agreement for the Conflict Ending and the Construction of a Stable and Lasting Peace. This is consistent with the reduction (2015-2017) and further stability (2017-2018) in the number of newly displaced populations (Figure 3).

Figure 3: New displacements in Colombia, 2009-2018.

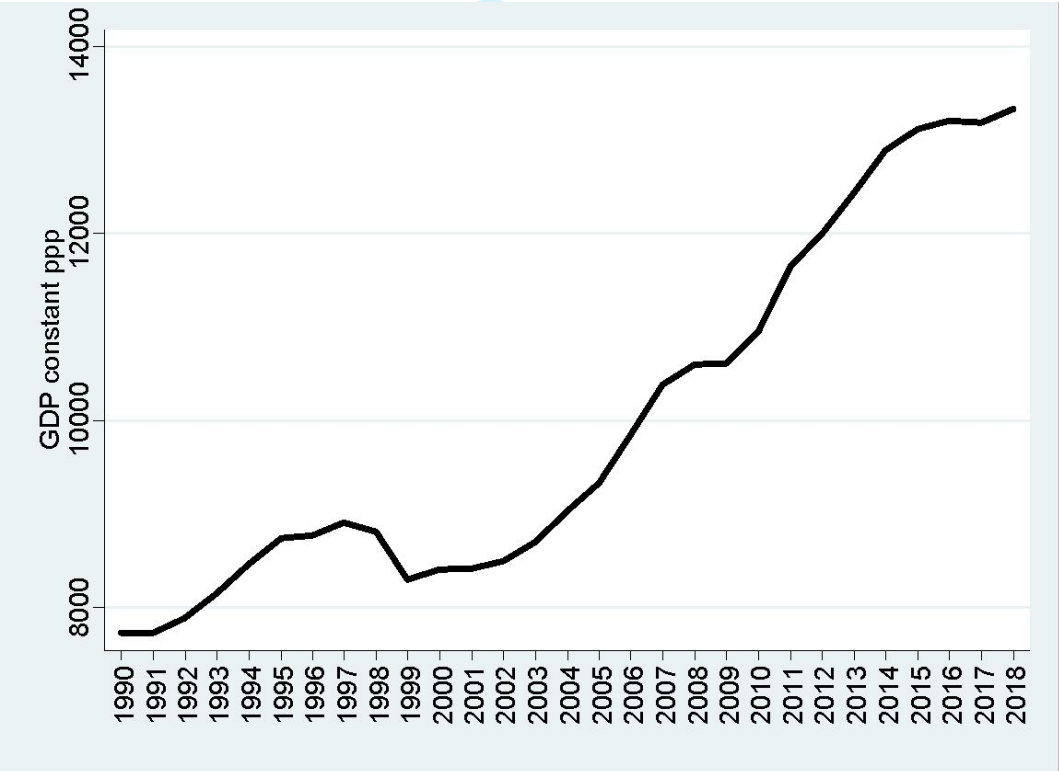


Source: IDMC and WBD.

Furthermore, not only people are suspicious of a future with internal conflict, the economy also reacts negatively, see (Miguel, et. al., 2004).

Figure 4 presents the evolution of GDP per capita in Colombia for the period 1990-2018. In 1999 Colombia suffered the main economic crisis registered in the analyzed period, with a negative growth of 4.2%. This economy also displays the effects of the financial crisis in 2008 and in 2015 with the oil price drop. This drop made the GDP per capita go down, and it seems as though the Peace Treaty ought to make the GDP per capita go up. In order to isolate the latter effect, a policy measure should be used. This technique will be explained in the following section.

Figure 4: Gross Domestic Product constant 2011 ppp, 1990-2018.



Source: WBD.

2.3 Methodology

The technique used in this paper consists of the construction of a synthetic control developed by (Abadie & Gardeazabal, 2003) (Abadie, et. al, 2010). This method will allow us to determine whether the increase in the Migration Stock or real gross national product per capita is due to the Peace Treaty or to socioeconomic factors. The model consists of comparing the evolution of the variables under scrutiny in the case of one agent affected by the policy ('treated') with the evolution of the same variables in one or more unaffected agents ('synthetic control'). The main difficulties when applying this approach are how to choose the units of comparison and the uncertainty about 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 country than a single one. Details of the technique are provided in the referenced articles.

3.Results

3.1 The determinants of Gross Domestic Product per capita

The first variable to be studied in our empirical analysis is the real Gross Domestic Product (GDP) per capita in purchasing power parity of Colombia during the available period 1990–2018 using 2011 as a base. In principle, the potential controls are those South America countries except Peru and Venezuela. Peru does not enter into the donor pool because it suffers its own conflict and the emergence of the conflict in the studied period can bias the result. The internal conflict in Peru has lasted for almost 40 years. It

started in 1980 as an armed conflict and, despite the fact that since 2000 the number of deaths has dropped significantly, there were some resurgences of violence in 2002 and 2014.

Venezuela has also been removed from the donor pool because there is no available data of the endogenous variable from 2014. As a result, there are nine potential control countries that could build the synthetic counterfactual.

For estimating GDP per capita we have used similar variables to Abadie & Gardeazabal, 2003. The Gross Capital formation over the GDP is used as Investment Ratio, Population density average for all the period (people per square kilometer), Sectoral Shares (Percentage of Agriculture, Forestry and Fishing over GDP and percentage of Industry including construction also over GDP averaged for the available period 1991-2014) and Human Capital measured as Unemployment Rate and the unique variable available for all the countries that is Compulsory Education (years that children are legally obligated to attend school).

Weights assigned by the technique to each country in the donor pool when constructing the synthetic stock of GDP per capita in are shown in Table 1

Table 1. Weights assigned to South America Countries for GDP per capita.

Weights	
Argentina	0
Bolivia	0

Brazil	0.063
Chile	0
Ecuador	0.593
Guyana	0.106
Paraguay	0
Suriname	0.014
Uruguay	0.225

Table 2 presents the average characteristics of the GDP per capita and its determinants in the period previous to the Peace Treaty, that is, previous to 2016. It can be checked that characteristics of the Synthetic Control constructed are quite similar. In fact, by using the Wilconox matched-pair signed-rank test (Wilcoxon, 1945), we cannot reject the null hypothesis, the median of the differences in GDP per capita is expected to be zero prior to 2016. 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.

Table 2. Pre-Peace Treaty characteristics, Colombia and Synthetic Control, 1990-2018.

	Colombia	Synthetic Control
GDP per capita	9631.562	9647.054
Investment Rate	0.1219045	0.1408081
Population Density	36.8004	36.80106

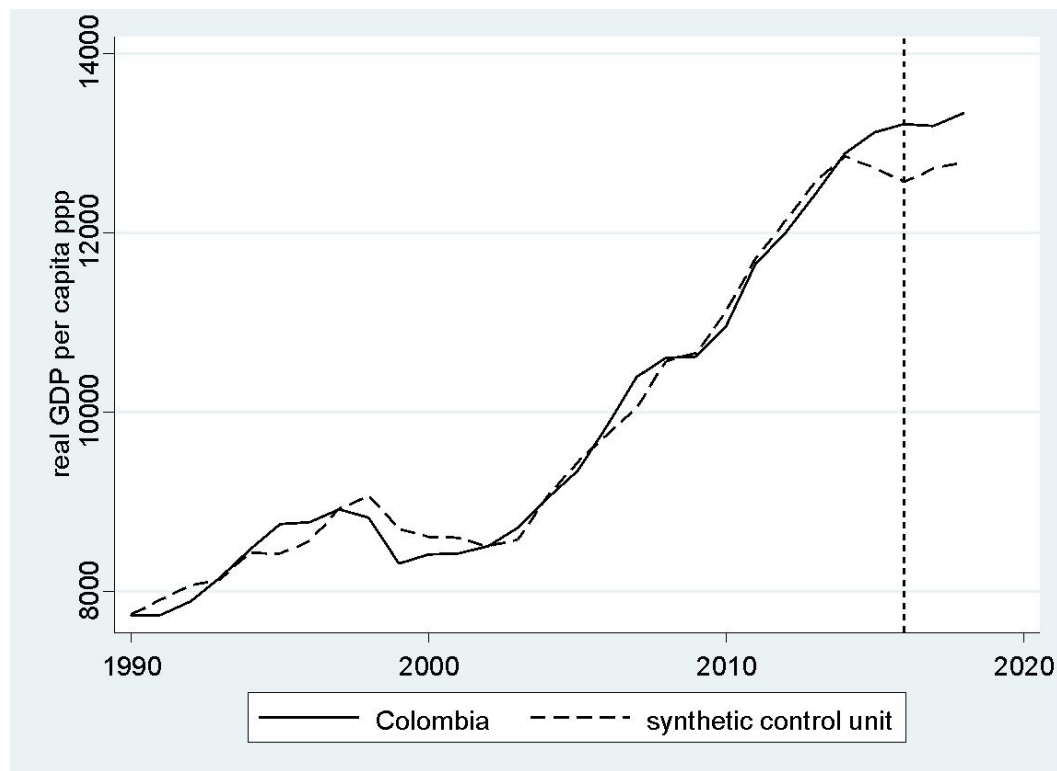
Sectoral Shares

Agriculture/GDP	9.792311	13.6814
Industry/GDP	29.8158	28.72654

Human Capital		
Unemployment rate	11.88468	6.903172
Compulsory education	10	10.75483

Figure 5 plots the evolution of GDP per capita in Colombia and for the Synthetic Control created and both behave similarly until 2013, after this year the evolution of the GDP per capita in Colombia is over the synthetic control and statistically significant using Wilcoxon test. This difference is around 4% over the value of the synthetic control for the post-Peace Treaty period. It seems that economy reacts not only to the Peace Treaty signature, but also to the announcement, which is consistent with the rational expectations theory that establishes that decisions in an economy are taken based on rationality, information available (present and future) and past experiences (Muth, 1961). In fact, the dialogue in Havana resumed and FARC announced a unilateral and indefinite ceasefire in 2014.

Figure 5. GDP per capita ppp (constant 2011) in Colombia, 1990-2018.



3.2. The determinants of the Migration Stock

We cannot analyze directly the Migration Stock per capita in Colombia because they are so small magnitude that it is not possible to construct an appropriate counterfactual. As our concern is mainly the trend of stock migration we consider the ratio over the base year (base year being 2011), the same used in the determinants, during the period 1980 to 2017. This is an attempt to also solve the limitation of data mentioned in section 2.1 that is, that in some countries the definition of ‘migrant’ could vary.

The potential controls are those South American countries, except Peru for the explained motive. As a result, there are 10 potential control countries that could build the synthetic counterfactual.

Similar variables to (Author own, 2016) have been used as determinants of the Migration Stock for the available period: population density, sectoral shares, standard of living and expected wages. Population density is averaged for all the period, sectoral shares from 1983 to 2014. Standard of living is measured differently because same variable is not available for the sample considered. We use life expectancy at birth using the whole period and government consumption in expenditures as a percentage of the GDP for 2006 to 2010, the years available for all the donor pool countries. Expected wages was already mentioned in the pioneering model for the economic analysis of migration proposed by (Harris & Todaro, 1970). In this model, expected wage is defined as wage multiplied by unemployment rate, this rate incorporates expectations. As there is no data on wages for the countries of our donor pool, we use as a proxy the GDP per worker in purchasing power parity base year 2011 and unemployment rate, both for the available period, that is 1991 to 2017.

Weights assigned by the technique to each country when constructing the synthetic Migration Stock per capital in are shown in Table 3.

Table 3. Weights assigned to South America Countries for Migration Stock

Weights	
Argentina	0
Bolivia	0
Brazil	0
Chile	0

Ecuador	0.392
Guyana	0
Paraguay	0.315
Suriname	0
Uruguay	0.294
Venezuela	0

Table 4 presents the average characteristics of the Migration Stock per capita, base year 2011 and its determinants in the period prior to the Peace Treaty, that is, prior to 2016 but for a longer period, 1980-2017. There is no data available for 2018. It can be noted again that characteristics of the Synthetic Control constructed are similar. Wilcoxon matched-pair signed-rank test (Wilcoxon, 1945) do not allow us to reject the null hypothesis that the median of the differences in stock of migrants per capita is expected to be zero previous to 2016.

Table 4. Pre-Peace Treaty characteristics, Colombia and Synthetic Control, 1980-2017.

	Colombia	Synthetic Control
Migration Stock per capita	1.061531	1.058815
Expected wages		
GDP per worker	22542.7	22572.69
Unemployment rate	11.88468	7.109225

Standard of living

Government consumption	13.68597	10.86231
Life expectancy	70.26875	71.62052

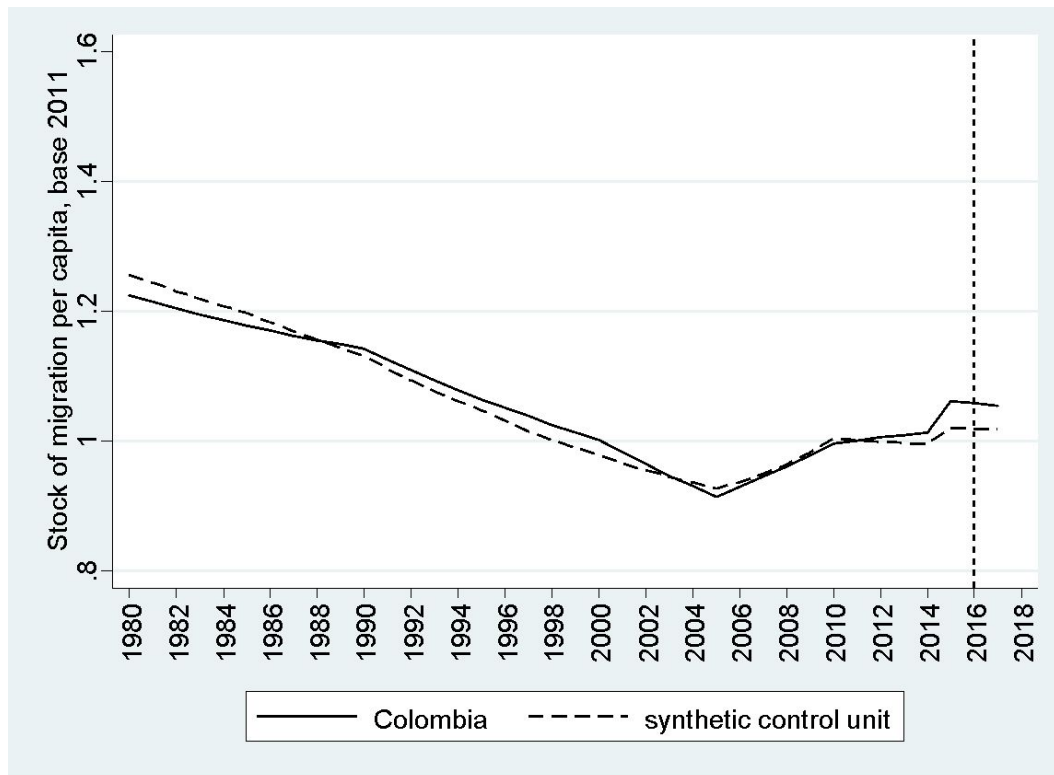
Population density	34.00242	27.57947
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Sectoral shares

Agriculture/GDP	11.67322	13.82772
Industry/GDP	30.95445	30.78759

Figure 6 plots the evolution of the Migration Stock per capita in Colombia and for the Synthetic Control and both behave similarly for all the period. Using the Wilcoxon test we can conclude that there is not a significant indicative break in 2016 as occurs with GDP per capita. This result shows that although the economy reacts to announcements of peace due to expectations, people need to be assured of peace to incorporate the change in their decision to migrate.

Figure 6. Migration Stock per capita (base 2011) in Colombia, 1980-2017.



4. Conclusion

This study attempted to determine whether the Peace process that started in 2012 in Colombia affected the Migration Stock and the GDP per capita of the country. Based on the review of specialized literature, it is assumed that, nowadays, the decision to migrate to another country depends mainly on economic factors. Thus, human migration tends to flow from countries with less economic development, to countries with greater relative development in this area. In line with this, another underlying assumption is that armed conflicts have an adverse impact on the national economy, which is reflected in macroeconomic indicators, as the GDP per capita. If armed conflicts negatively affect

the economic variables and inhibit the decision to migrate to the country experiencing conflict, the end of the conflict should show positive results in the economy, thus increasing the Migration Stock.

However, the GDP per capita and the Migration Stock, by themselves, are variables influenced by other factors besides internal conflict, including: investment, population density, sectoral shares, human capital, standard of living and expected wages. This makes it necessary to use a synthetic control method capable of isolating the effect of a policy, such as the Peace Treaty, in the evolution of the GDP per capita and Migration Stock in Colombia, and to compare it with the evolution of the same variables in several unaffected countries that form the synthetic control. The application of this method allowed us to determine whether the increase in the GDP per capita or Migration Stock is due to the Peace Treaty or to the factors considered.

Results show that the increase of GDP per capita after the Peace Treaty in Colombia is around 4% over the value Colombia would have had without the Treaty, and a difference can be also checked in the previous years, that is, the economy reacts not only to the Peace Treaty signature, but also to the announcement. This result is consistent with the rational expectations theory, and with the findings made by Villa et al. (2014) but uses a more precise technique to evaluate the effect of a policy. However, the Migration Stock does not present differences with the hypothetical situation of a continuity of the conflict. This result shows that although the economy reacts to the announcements of peace, possibly due to expectations, the decision to migrate is not affected by these expectations, nor to the official Peace Treaty, over the short term. Two main reasons, complementary to each other, can explain this. On one hand, there is the fact that nowadays the migration process is mainly based on the construction of

migratory networks, especially in Latin American countries, where intra-regional patterns of immigration prevail. Secondly, it is well known that public policies, by themselves, do not change people's behavior immediately, nor their decision-making process at the individual and domestic scale. In fact, in 2019 a splinter group of the FARC, which after the Treaty signature became a legal political party, announced a return to arms, arguing that the national government was not respecting the Peace Treaty. Longer periods of time will have to provide data for conclusions in the long run.

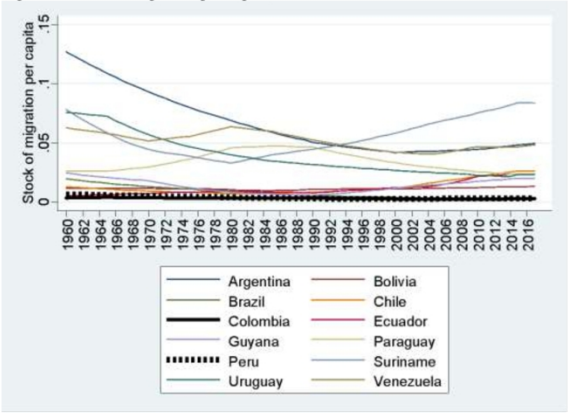
Or Peer Review

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Figure 1: Stock of migration per capita, 1960-2017.

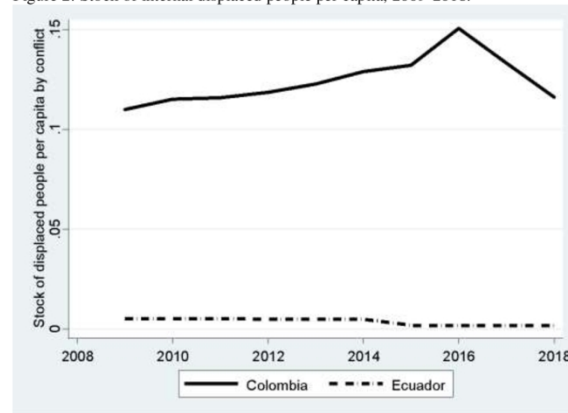


Source: UNSD and WBD.

Figure 1: Stock of migration per capita, 1960-2017.

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Figure 2: Stock of internal displaced people per capita, 2009-2018.

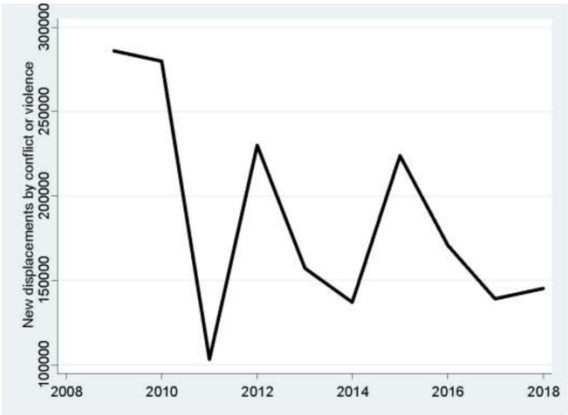


Source: IDMC and WBD.

Figure 2: Stock of internal displaced people per capita, 2009-2018.

209x297mm (200 x 200 DPI)

Figure 3: New displacements in Colombia, 2009-2018.

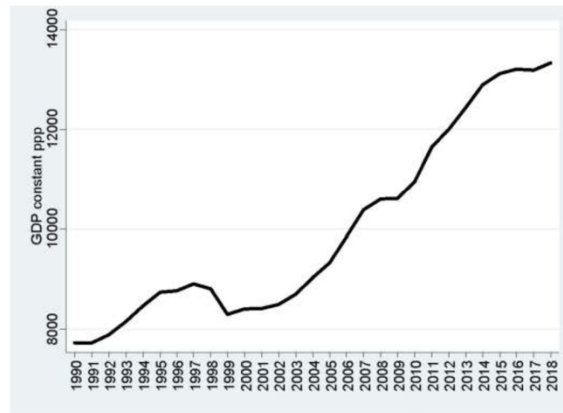


Source: IDMC and WBD.

Figure 3: New displacements in Colombia, 2009-2018.

209x297mm (200 x 200 DPI)

Figure 4: Gross Domestic Product constant 2011 ppp, 1990-2018.



Source: WBD.

Figure 4: Gross Domestic Product constant 2011 ppp, 1990-2018.

209x297mm (200 x 200 DPI)

Figure 5. GDP per capita ppp (constant 2011) in Colombia, 1990-2018.

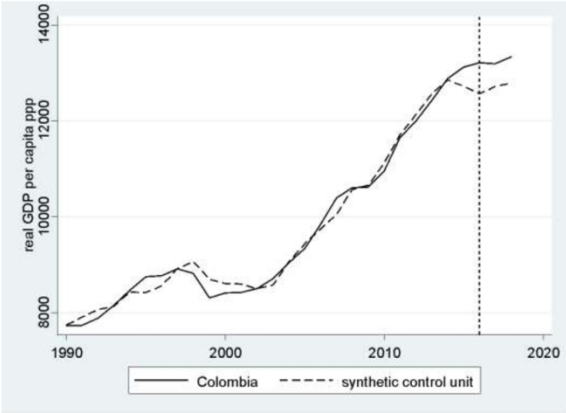


Figure 5. GDP per capita ppp (constant 2011) in Colombia, 1990-2018.

209x297mm (200 x 200 DPI)

Figure 6. Stock of migration per capita (base 2011) in Colombia, 1980-2017.

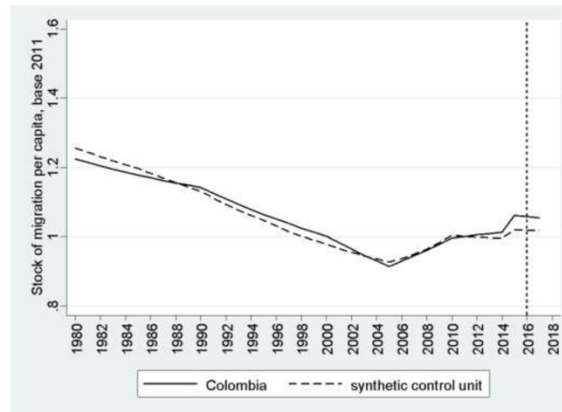


Figure 6. Stock of migration per capita (base 2011) in Colombia, 1980-2017.

209x297mm (200 x 200 DPI)

Table 1. Weights assigned to South America Countries for GDP per capita.

	Weights
Argentina	0
Bolivia	0
Brazil	0.063
Chile	0
Ecuador	0.593
Guyana	0.106
Paraguay	0
Suriname	0.014
Uruguay	0.225

Table 2. Pre-Peace Treaty characteristics, Colombia and Synthetic Control, 1990-2018.

	Colombia	Synthetic Control
GDP per capita	9631.562	9647.054
Investment Rate	0.1219045	0.1408081
Population Density	36.8004	36.80106
Sectoral Shares		
Agriculture/GDP	9.792311	13.6814
Industry/GDP	29.8158	28.72654
Human Capital		
Unemployment rate	11.88468	6.903172
Compulsory education	10	10.75483

Table 3. Weights assigned to South America Countries for stock of migration

Weights	
Argentina	0
Bolivia	0
Brazil	0
Chile	0
Ecuador	0.392
Guyana	0
Paraguay	0.315
Suriname	0
Uruguay	0.294
Venezuela	0

Table 4. Pre-Peace Treaty characteristics, Colombia and Synthetic Control, 1980-2017.

	Colombia	Synthetic Control
Stock of migration per capita	1.061531	1.058815
Expected wages		
GDP per worker	22542.7	22572.69
Unemployment rate	11.88468	7.109225
Standard of living		
Government consumption	13.68597	10.86231
Life expectancy	70.26875	71.62052
Population density	34.00242	27.57947
Sectoral shares		
Agriculture/GDP	11.67322	13.82772
Industry/GDP	30.95445	30.78759