

Quantifying the Economic Impact of Ceasefires in the Basque Country. Is There a 'Peace Dividend'?

By Alberto Colino*

Abstract

Economic studies have shown that the existence of terrorism negatively affects economic activity in many different aspects, and some of the direct and indirect economic costs have been estimated. However, not much attention has been devoted to analyse the effects of conflict resolution processes on the economic growth determinants of regions affected by terrorism, and no study has explicitly measured their economic benefits.

In this article, the difference-in-differences methodology is used to assess the impact of ceasefires on productive investment spending. Using as case study the autonomous region of the Basque Country in Spain, we find there is a substantial economic response of this variable when a solution to the conflict was attempted. Accordingly, compared with other subsets of Spanish provinces, the truces declared in 1988 and 1998 propelled the growth rate of investment in this region by 20.1 and 27.3 percentage points respectively. This finding can be exploited as natural experiments to quantify the corresponding 'peace dividend' derived from a complete cessation of violence. (JEL C21, D74, D92, P25)

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Introduction

Nowadays terrorism has become a worldwide occurrence and as a result one of the main sources of concern for world economies in the 21st century. This fact has attracted an increasing interest of economists trying to better understand this phenomenon and its economic consequences.

Although the evidence on this matter is still limited and few quantitative studies have been accomplished until now, the bulk of the literature points towards a negative relationship between political conflict and economic performance. The direct and indirect costs of terrorist activities have been estimated in diverse scenarios giving an idea on the scope of the damage inflicted in the economic activity of the regions involved.¹

Notwithstanding the significance of accounting for the economic costs of conflicts, if we think of terrorism as an occurrence that disrupts and depresses economic activity and that vary in duration, intensity and other characteristics among countries and eventually dies out, a new avenue of research on this topic emerges.

A potential 'peace dividend' could be expected from the cessation or attenuation of violence, and therefore characterising the immediate reaction of economic variables and their posterior behaviour in the event of a ceasefire settlement turns out to be of great interest. In addition, if a relative positive performance of economic growth determinants is found to exist during ceasefires, this result would qualify some of the previous findings regarding the economic costs of conflicts.

Consequently, this article intends to contribute to the scarce literature on this matter by looking into it from the aforementioned perspective. On the one hand, we empirically assess the statistical significance of ceasefires in shaping economic performance at a regional level. More precisely, we will approach it by means of the relative positive impact on the growth rate of productive investment in the Basque Country during peace periods. On the other hand, making use of the significant episodes of ceasefire we will provide a direct estimation on the magnitude of the observed 'peace dividend'.

Due to the scope of terrorism and the subsequent heterogeneity of experiences across countries, the analysis of individual regions is highly valuable. Accordingly, we have chosen the autonomous community of the Basque Country (BC) in Spain as a region with a long history of political conflict and violence. In our analysis, two periods of ceasefire declared by the separatist organisation *Euskadi Ta Askatasuna* (ETA) or "Basque Homeland and Freedom", which is considered by many to be the last mainstream terrorist organisation in Western Europe, turned out to be significant in boosting investment spending in this region.

Thus, a substantial and positive impact of ceasefire events is found to exist on investment spending. For example, the annual growth rate of productive investment during the period 1988-1990, in which the first relevant peace talks occurred, was 20.1

¹ See the works of Alesina and Perotti (1996) and Barro (1991) on the effects of political instability on investment and growth. Frey et al. (2007) offer a complete survey of the literature on this matter to date. See also Enders and Sandler (1991), Ender et al. (1992) and Drakos and Kutun (2003) on the relationship between terrorism and tourism, and empirical evidence for Spain.

percentage points higher in the BC compared with a control group of Spanish provinces. Analogously, if we consider the ceasefire decreed in 1998, which is the longest occurred in the whole history of terrorism in Spain, the BC's growth rate during the truce surpassed in 27.3 percentage points the average growth of comparable regions when balanced with the corresponding figure for the preceding and following years.

The Basque population have suffered largely from political conflict and social unrest, and the disruption inflicted by almost forty years of terrorist activities on many aspects of their economy and society has been noticeable². Therefore, the analysis of the behaviour of economic variables in this region, throughout periods in which peace processes were undertaken, will give us some useful insights about the benefits derived from peace expectations borne in mind by economic agents.

The majority of works on the consequences of terrorism have focused on the economic costs inflicted by terrorism, trying to estimate the extent to which economic outcomes have been harmed using as the main econometric tools the time series methodology or the cross-country analysis. In this paper, we circumvent some of shortcomings of previous studies by relying on the analysis of a particular case and making use of an innovative and simple technique to assess the impact of cease-fires on economic performance; the difference-in-differences estimator.

In order to carry out the intended analysis, the choice of the relevant indicator of real economic activity through which violence affects economic performance is crucial. In this study, we centre our attention on investment for three reasons. First, as suggested by the literature, one of the main channels through which political instability and violence affect economic growth is investment. Secondly, investment spending tends to adjust more negatively to terrorism than do other spending components of GDP (Blomberg et al., 2004)³. Finally, because all kinds of investment are not affected to the same extent by political conflict we would be able to assess how the cessation of violence influences its composition (Collier, 1999).

Thus in the following section, we carry out a brief summary of the main events on ETA's history of ceasefire's declarations. Subsequently, we illustrate the mechanisms through which terrorism affects investment decisions and, hence, embody the potential source of a peace dividend in the event of a cessation of violence. In section 4, we describe the data used and its sources for the regional statistics employed in the analysis. Section 5 presents the estimation methodology used to attain the results exposed in Section 6. Section 7 concludes.

ETA's ceasefires: Key events

ETA was founded in 1959 as a separatist group whose main purpose was the independence of the Basque region –the autonomous communities of the Basque Country and Navarre in Spain and three provinces in the western Pyrenees under French jurisdiction. Since the first victim was claimed in 1968, ETA has not hesitated to use

² Abadie and Gardeazabal (2003) recount in their study how severely the Basque Country has been affected by terrorism and estimate that as a consequence per capita GDP has declined about 10 percentage points since the outbreak of terrorism.

³ This trait of investment spending is essential to our study since we intend to capture the immediate effects of peace process settlements.

violent methods as extortion, kidnappings for ransom or assassinations to achieve its objectives.

As a result, in almost 40 years of terrorist actions, the number of victims has reached 821 and another 84 people have been kidnapped by March 2008. Likewise, Basque entrepreneurs have been suffering the burden of a continuous campaign of extortion to persuade them to give money to the group; the main mechanism being the collection of the so called *revolutionary tax*.

The Basque Country is the Spanish region that has suffered with highest intensity the cruelty of ETA. Thus, 547 out of the 821 victims of ETA have been killed as a consequence of terrorist actions in the Basque Country.

In Table 1 we report the number of fatalities by terrorist attacks. As can be seen, two thirds of ETA's victims between 1968 and the present were assassinated in the BC, but a significant number of deaths by ETA took place in other regions of Spain, especially in Navarre, Catalonia and, above all, Madrid.

Table 1. - Number of Fatalities, 1968-2008

Autonomous Community	Victims	Percentage
Basque Country	547	66.6
Madrid	123	15.0
Catalonia	55	6.7
Navarre	40	4.9
Other*	56	6.8
TOTAL	821	100.0

Source: Spanish Ministry of Interior (2007) and updated by March 2008.

* Includes seven victims in the French provinces of the western Pyrenees.

In spite of the large number of fatalities occurred outside of the Basque Country, ETA's terrorism has always been related to this region, since it tries to concentrate all its impact there, and therefore every death, even those which occurred in other regions, had a relevant influence inside.

Furthermore, if we accept that the rest of Spanish regions could also be affected to some extent by the presence of terrorism, we would expect they experience a positive economic impact on ceasefire periods too. Thus, our estimations for the BC regarding the impact of truces on investment would correspond to a lower bound.

Under the aforementioned circumstances, it is understandable that the end of the conflict has become a paramount objective for any Spanish government. As a consequence, since the instauration of democracy in 1978, the four successive parties in the government have maintained contacts with the terrorist group, but none of them have achieved the ultimate aspiration of bringing peace to Spain.

Nonetheless, in the whole history of ETA, several partial and total ceasefires have been decreed, which have fostered the hope for a definitive cessation of violence. The last one was announced on the 22 of March 2006 and lasted for nine months.

The truce which commenced on 18 September 1998 and lasted 439 days was the longest. The key events and dates are shown in Table 2.

Table 2. – Partial and Total Ceasefire's Declarations

28.02.1981:	After various contacts and conversations, ETA declared the first truce in its history which extended until August next year.
19.06.1987:	Largest massacre caused by ETA when a bomb exploded on a Barcelona supermarket with the outcome of 21 shoppers killed. This is one of the bloodiest years on ETA's history.
28.01.1988:	ETA offered a two months ceasefire to agree on a non-violent end to the Basque conflict. The contacts did not fructify.
15.02.1988:	New offer of 60-day truce which did not take place.
30.10.1988:	Another offer of 60-day ceasefire which did not materialize.
08.01.1989:	Peace talks started in Algiers and ETA announced a two weeks truce.
28.01.1989:	As the conversations continue, ETA extended the ceasefire for two months.
27.03.1989:	Further extension of the truce for an additional two months.
04.04.1989:	Failure of conversations in Algiers and ETA announces the end of ceasefire.
Spring1990:	The Spanish Secretary of State meets with ETA's representative in Santo Domingo to prolong peace conversations.
10.07.1992:	ETA offered a 60-day truce after its top leaders were arrested in Bidart (France), but it did not fructify.
23.06.1996:	ETA declared a one week ceasefire and offered a negotiated end to the conflict. The conservative party recently elected did not take it into account.
20.11.1997:	Partial truce regarding prison staff in what ETA calls the "Prison's Front".
16.09.1998:	The terrorist group declares a total, unilateral and indefinite truce without conditions which will start two days later. ETA and the government meet in Zurich, Switzerland, but the conversations were not productive.
28.11.1999:	ETA declares the end of the ceasefire which will be effective from the 3rd of December.
08.12.2000:	Two main Spanish political parties sign the "Agreement for Freedom and against ETA's terrorism" which represents a very important milestone in the fight against ETA. During the year ETA maintains conversations with the government.
13.05.2001:	In the autonomic elections, the political wing of ETA, Herri Batasuna (HB), lost 50% of its representation in the Basque Parliament. In June concluded the so called "Batasuna Process", an internal debate in HB taking place since October 2000 in which was discussed the reformulation of the party to pursue exclusively political means of achieving the independence.
18.02.2004:	ETA announced a partial ceasefire limited to Catalonia.
18.06.2005:	After the Spanish Congress approved the beginning of the conversations with ETA, the group announces the cessation of violence against members of the Spanish political parties.
22.03.2006:	Permanent ceasefire declared by ETA to boost a democratic process in the Basque Country.
30.12.2006:	Terrorist attack at Barajas Madrid's airport which killed two people and represented the end of the ceasefire.

Sources of a peace dividend on investment

To pursue the aim of this paper and quantify the 'peace dividend' on productive investment from a cessation of violence it is helpful to start by identifying the sources of this potential increase on investment spending.

To this end, in this section we highlight some of the channels through which investment performance can be affected by terrorist activities. Under these circumstances, the establishment of a peace process which suppresses or attenuates violence and removes some uncertainty in the region would entail a direct improvement on investment performance.⁴

As shown by the existing literature, apart from the instantaneous destruction of the capital stock caused by terrorist attacks, terrorism cause an increase in the level of uncertainty which distorts the allocation of resources within the economy and disrupts household, business and government spending plans, therefore depressing economic activity.

Households' savings

If we take foreign investment as given, investment spending is mainly constrained by the domestic savings rate. Therefore, households' choice between consumption and savings is crucial to determine the amount of resources in the economy which are available for investment and, hence, economic growth.

Accordingly, in the presence of violence, households must decide how to allocate their disposable income between consumption and saving, which in turn is seen as forego consumption. Two major factors are affecting this choice. On the one hand, since terrorism affects the perception of security in the region exposed to conflict, diminishing the probability of survival, it will increase the discount factor for the future. Thus, the value of the future is lowered relative to the present altering consumer's decisions.⁵

Consequently, consumers substitute future expenditure for present consumption, and as a result of the decline in savings within the economy, investment spending possibilities are reduced.

On the other hand, the increasing uncertainty about the future due to the existence of terrorism can reduce current consumption and increase savings. This type of saving is known as precautionary saving (Leland, 1968).

These two forces operate in opposite directions and therefore the level of household's savings depends on the relative importance of each factor. As regards of this, Carroll (1992) argues that the precautionary effect is very important and households always save to be protected in the event of a fall in income.

An additional issue concerning household's consumption plans is raised in Abadie and Gardeazabal (2008) where these authors point out that the relationship between consumption and savings could be modified because terrorism induces a negative

⁴ See Fielding (2003) on the case of Israeli investment.

⁵ Eckstein and Tsiddon (2004).

income effect and a positive substitution effect on consumption, where the latter dominates for individuals with risk aversion smaller than the given by logarithmic utility.

Firms' investment

The existence of social unrest and violence in a region disturbs firms' investment decisions predominantly through increasing uncertainty and the subsequent change in the perceived return to investment. Given that investors are concerned with the expected returns and risk associated to an investment plan compared with alternative investments, the presence of terrorism which distorts production will repress investment spending.

Due to the reduction in the expected return to investment, domestic firms will skew the distribution of profits between dividends and reinvestment towards the former. This redirection of economic resources from more productive activities will directly limit growth.

In addition, increased uncertainty and the irreversible nature of investment may also induce hysteresis in an individual firm's investment decisions (Dixit and Pindyck, 1994), with asymmetries in the response of investment to positive and negative shocks.

Therefore, in the face of increasing uncertainty, the existence of asymmetries on the adjustment costs towards the desired level of capital (i.e. it is less costly to increase the capital stock rather than to reduce it) raises the value of the "option" to delay investment and keep a low level of capital when this decision is irreversible. Besides, under increasing uncertainty some firms could decide to shut down and relocate in a different region with the consequent reduction of investment spending in the area subject to conflict.

Foreign resources could also be diverted to other regions as a consequence of the persistence in violence. For example, Enders and Sandler (1996) noted that the imposition of an extortionist revolutionary tax can reduce expected returns and dissuade NFDI, and estimated an annual negative 13.5 percent effect of terrorism on foreign direct investment for the whole Spanish territory in the period 1976-91.⁶

Additionally, terrorist risks could raise the cost of doing business as expensive security measures must be deployed and personnel must be duly compensated, both of which reduce the returns to NFDI (Sandler and Enders, 2005).

Government's investment

Blomberg et al. (2004) state that a decline in the investment rate and a rise in the government spending rate would be consistent with conflict and terrorism leading to a reallocation of resources away from the accumulation of productive inputs, through reduced investment spending, towards increased spending on security (and presumably less productive government activities).

⁶ See also Abadie and Gardeazabal (2008) on the effects of terrorism on FDI in an open economy framework.

This phenomenon has been called ‘diversion effect’ as public expenditure is deflected from output-enhancing activities.⁷

Other authors as Eckstein and Tsiddon (2004) argue in the same sense that to deal with the perceived change in the probability of survival in the country the government responds by increasing defence expenditures.

Additional support for this idea is found in a paper by Knight et al. (1996) where the authors empirically estimate the effect of a reduction in military expenditure on growth for a sample of 79 countries.

Notwithstanding the general validity of the aforementioned effects of political conflicts on economic activity, a qualification is noteworthy. The motivation, intensity, and length of conflicts vary substantially from one case to another, and this depicts very different scenarios and economic sequels for the regions affected. Moreover, the ways through which economic agents react to terrorism and try to mitigate its impact are diverse and subsequently imply different responses to non violent scenarios too.

Accordingly, other factors have also to be taken into account when analysing the effects of peace processes on investment spending. For example, the intensity and length of the conflict are very important as it is expected that the size of the peace dividend increases when the economy has been depressed to a large extent and when the duration of the conflict was larger.

Finally, all types of investment are not affected by terrorism to the same extent. Thus, some components of investment are more mobile as machinery and transport equipment and therefore less affected by periods of violence. Likewise, the impact on investment in different sectors is not symmetric and it seems that manufacturing investment is one of the most affected.⁸

Data sources and Stylised facts

Regional data for the autonomous communities (17) or provinces (50) and the two autonomous cities of Ceuta and Melilla, in which the Spanish territory is divided, has mainly been obtained from Fundación BBVA (1999, 2007).

Thus, data on real gross domestic product, population, gross value added and employment by sectors is published by Fundación BBVA (1999) in its regular issue entitled “Renta nacional de España y su distribución provincial”, which reports regional data since the decades of the 1950s and 1960s.

Likewise, data on the stock of capital and on real gross total investment, the key indicator of real economic activity analysed in our study, for the period 1964 to 2004, comes from a joint project developed by the Fundación BBVA and IVIE (Fundación BBVA, 2007). The information is parsed in four categories; *housing*, *other*

⁷ Collier (1999).

⁸ Fielding (2003) uses Israeli quarterly data from 1988–1999 to find that zero fatalities to both sides of the conflict would raise steady-state investment in nontraded capital goods by 27.9% and in traded capital goods by 14.6%.

construction, transport equipment and machinery, equipment material and other products.

To analyse the impact of ceasefires on investment spending we will focus on non-residential private investment, which includes *transport equipment and machinery, equipment material and other products* plus the part of *other construction* that excludes investment on *infrastructures*. Since this type of investment comprises all private sources of investment devoted to productive uses, we will refer to it as private productive investment (ppi).

In addition, the average years of total schooling have been calculated using data on the different educational levels of employed population compiled by Mas et al. (2004). Thus, we have integrated the different levels of education completed by the workforce into a single measure of years of schooling, assigning a specific duration in years to each level, following the criterion applied by De La Fuente and Doménech (2006).

In Table 3 we present some basic indicators for the period before the outbreak of terrorism. We use this information to show the similarities between the Basque Country and two other groups of Spanish regions before the outburst of terrorist violence. Later on, we will make use of this resemblance to compare the relative performance of the BC with respect to these composite regions during ceasefires.

Table 3. - Economic Indicators, 1960-1969

	Basque Country (BC)	Catalonia and Madrid (CM)	Cantabria and Navarre (CN)
Real per capita GDP ¹	7,309	7,759	5,459
Labour Productivity ²	16,905	18,195	12,753
Employment rate ³	43.4	42.7	42.9
Capital Stock per worker ⁴	49,799	49,039	38,945
Capital-Output ratio	2.7	2.5	2.8
Investment Rate ⁵	25.7	28.6	23.4
Manufacturing Share ⁶	36.5	25.2	26.4
Average Years of Schooling ⁷	5.5	5.5	5.4
Industrial Specialisation Differences ⁸	-	45	40

Sources: Author's calculations from Fundación BBVA (1999, 2007) and Mas et al. (2004).

¹ 1995 Euros per inhabitant.

² 1995 Euros per worker.

³ Percentage over total population.

⁴ 1995 Euros, average for 1964-1969.

⁵ Percentage of Real Gross Total Investment over GDP, average for 1964-1969.

⁶ Percentage over total GVA.

⁷ Employed population, average for 1964-1969.

⁸ Data refers to 1978 from Encuesta Industrial (Instituto Nacional de Estadística, INE), first available.

We have chosen two regional Spanish subsets as comparison groups. On the one hand, our preferred group consist of Catalonia and Madrid (CM), though their join economies are larger than that of the BC. Thus, the Basque Country had the highest per capita income and one of the highest population densities, only surpassed by Madrid among the Spanish regions during the mid 1960s. Moreover, the BC also shares with Catalonia an important resemblance; they were two of the main industrial areas (although their

specialisations are slightly different), with a considerable presence of metal manufacturing activities.⁹

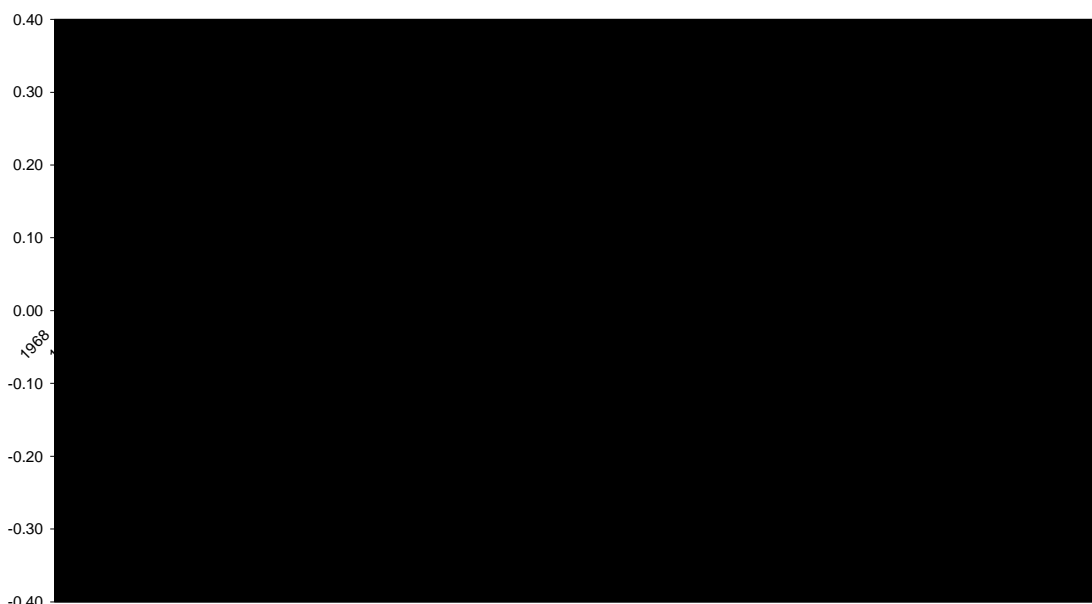
On the other hand, we have looked for another subset of regions, which industrialised early and are geographically bordering with the BC, to account in the analysis for industrial restructuring and idiosyncratic spatial effects in northern Spain. We have formed this last group by minimising the bilateral differences in an index of manufacturing industry specialisation (MIS) between different subsets of industrialised and northern regions in Spain, and the BC.¹⁰

Using this procedure, which also places the subset formed by CM in a very favourable position, we have chosen a group of two regions that have a joint economic dimension smaller than the BC, and which we will refer to as CN. It is a mixture of a dynamic and less industrially specialised region (Navarre) and a former industrialised region (Cantabria) that is now in decline.

The notable similarity between the BC and the CM group can be observed, making of this the best comparative reference. The CN group becomes a worse reference as its per capita income and labour productivity theoretically situated it in a better position for fostering growth. Nevertheless, as aforementioned, the latter group will be particularly useful when analysing the effects of the 1988 truce at the height of industrial restructuring in northern Spain.

At this stage, we can proceed to the comparison of the evolution of private productive investment for the two control regions to identify any possible systematic deviation with respect to the BC. Thus, in Figure 1 we represent the difference in the growth rates of productive investment in the BC compared to CM and CN for the period 1968-2004.

Figure 1. - Private Productive Investment growth rate differences



Source: Author's calculations from Fundación BBVA (2007).

⁹ This group of regions was identified by Abadie and Gardeazabal (2003) as the best comparison group to the BC using synthetic control methods.

¹⁰ $MIS = \sum_i |S_{ij} - S_{ik}|$, where S_{ij} represent the share of sector i in the gross added value of region j and S_{ik} the same ratio for region k .

As can be seen, productive investment in the BC has generally progress at a lower pace than in any of the comparison groups, particularly during the industrial crisis stretching from 1975 to the first half of the 1980s, which coincided with an intensification of ETA's terrorist activities. Moreover, as we will argue later, it seems that in the period after the crisis terrorist activities impeded the BC to attain a more rapid recovery.

Nevertheless, there are no recurrent differences in the growth rates of the BC and the two control groups. This evidence validates our choice of control regions and enables us to compare them with the performance of the BC's investment during ceasefires.

Although the rates of growth of productive investment do not differ systematically in the period after the outbreak of terrorism, substantial differences between the regions are evident. Consequently, in Table 4 we can see that, on average, productive investment in the BC have been growing at a lower rate for almost 40 years when weighted against any of the two comparison groups.

Table 4. - Productive Investment Growth Rates, 1968-2004

Regions	Obs.	Mean	Std. Dev.	Min	Max
Basque Country (BC)	37	.0330567	.1149499	-.1730763	.2362373
Catalonia & Madrid (CM)	37	.0579763	.1001402	-.1555317	.2946162
Cantabria & Navarre (CN)	37	.0405784	.1146845	-.1772773	.2184656

Source: Author's calculations from Fundación BBVA (2007).

As a result, the average annual growth rate of investment in the BC has been substantially lower than the corresponding figure either for the CM region or for the Cantabria and Navarre region.¹¹

On average, Basque's investment growth was approximately 2.5 percentage points lower than the CM in the period stretching from 1968 to 2004. Analogously, the difference with CN was less striking, but also the lag was considerable at 0.8 percentage points accumulated during 37 years of terrorist activities.

Additionally, if we look at the standard deviation of the series, the evolution of investment in the BC seems to be more erratic than in any of the two composite groups of regions. Nevertheless, the volatility appears to be more similar to that of the bordering provinces, which could be indicative of a higher level of uncertainty in the northern regions close to the BC.

Therefore, the observation of the data presented above suggests the BC has been a slow growing region with higher instability in terms of productive investment when compared either with Catalonia and Madrid or Cantabria and Navarre. In the subsequent econometric estimation we will try to test whether this behaviour was consistent during ceasefires or overturned by the expectations of peace.

¹¹ See Myro et al. (2004) on the relationship between terrorism, investment spending and economic growth in the Basque Country. These authors found that the decline in economic growth occurred in the BC after the outbreak of terrorism can be almost entirely reproduced by looking exclusively at the evolution of its productive investment.

Statistical methodology

One of the main concerns we faced when undertaking this project regards the fact that in economics we mainly deal with observational data, and we rarely have the opportunity to replicate the conditions under which an event took place.

In the case of regions experiencing political conflicts this is also true, and therefore there is no way we could possibly know how these economies had evolve if they had not suffered from terrorism. Hence, the choice of an appropriate counterfactual scenario is very important for the validity of the conclusions drawn.

Likewise, when intending to evaluate the economic effects of attempts to bring peace to a region, the specific context in which they happened make the analysis of individual cases the only way to know unambiguously to what extent economies react on the event of a peace process settlement.¹²

Among the different techniques available to approach this question, in this article we consider an innovative methodology never used before to analyse this issue. Thus, since the matter at hand can be evaluated within the framework of the so called “treatment effects” models, we make use of one of the simplest and more powerful techniques for estimating treatment effects with observational data: the Difference-in-Differences estimator (DiD).

This statistical technique is based on the comparison of a treatment group, in our case the autonomous region of the BC, and a control group (i.e. CM and CN) not exposed to treatment¹³. For that reason, to identify the treatment effect, the key assumption of this model is that the average change in the outcome is presumed to be the same for both the non-participants and, counterfactually, for participants if they had not participated.

Consequently, to estimate the treatment effect, the standard version of the model calculate the within group differences before and after the event and then compare the differences between these differences. Due to the particular nature of our investigation, we slightly modify this setup and compare the differences between the average of the join period “before and after” the event and the period during the event.

For example, if we consider the truce period stretching from 1988 to 1990, first we calculate the difference between the annual growth rate of productive investment during the ceasefire (i.e. 1988-1990) and the average of the previous and subsequent periods (i.e. 1986-87 and 1991-92) for the BC and the control regions, and then the difference between groups.

Implicitly, we are assuming the performance of productive investment was affected by the truce neither in the preceding period nor in the period following the ceasefire. Had this been the case our estimation of the treatment effect would represent a minimum.

¹² This shortcoming is circumvent in the literature by assuming as a counterfactual a reduction of the number of violent deaths to zero, and deducing from the estimated coefficients the potential ‘peace dividend’ of such an event.

¹³ As mentioned above, even though ETA’s actions take place also in other Spanish regions, all of them are intended to cause an impact on the Basque Country. Therefore, we expect ceasefires to mainly have an effect on this region.

Since panel data is available, we use the following specification for the econometric model:

$$\Delta ppi_{it} = \alpha_0 + \alpha_1 bc_{it} + \alpha_2 truce_t + \alpha_3 bc_{it} * truce_t + \varepsilon_{it}$$

where Δppi_{it} denotes the annual growth rate of private productive investment for every province i over time t , bc is a “dummy” variable which takes value 1 for the Basque Country and 0 otherwise, $truce$ is coded 1 if the observation is in the period during the ceasefire and 0 if it is either in the previous or subsequent period, and $bc*truce$ is an interaction term which takes value 1 for the Basque Country during the truce. The final term ε_{it} is the error term for each unit at each time period.

Therefore, the interpretation of the coefficients is as follows:

- α_0 : average growth rate of ppi in the periods before and after the truce for the control regions.
- α_1 : difference between the average growth rate of the BC’s ppi and the control regions in the periods before and after the truce.
- α_2 : difference in the growth rate of ppi between the average of the periods before and after and the truce episode for the control regions.
- α_3 : difference in the differences between the BC and the control regions (treatment effect).

Therefore, the coefficient of interest is α_3 which denotes the relative differential impact of ceasefires on Basque’s investment.

It is worth noticing that we do not anticipate a permanent effect of a ceasefire on investment spending, but a temporary one. This is because we are considering the main channel through which a truce affects investment decisions is the expectations about higher future returns, and as it is known, they change very rapidly with economic conditions.

Accordingly, by the end of a ceasefire, expectations will change to the new situation, and even though we suspect they do not go back to the same level of the pre-truce period, they definitely will adjust to a relative lower level. Thus, as mentioned above, we have considered the impact of truce episodes compared to the average of the “before and after” period. Additionally, to account for the effect of anticipated expectations, we have also tested with the inclusion of the preceding year in the ceasefire period.

As aforementioned, the DiD estimation has many advantages over other techniques, but it is not exempt of possible problems too. Thus, several issues could undermine the validity of our results¹⁴. On the one hand, we have to be sure that the interventions are not endogenous of. In other words, ceasefires were not caused by economic conditions. On the other hand, we must estimate standard errors which account for the possibility of serial correlation. Otherwise, any inference made about the significance of the coefficients would not be valid.

¹⁴ Bertrand et al. (2004).

Regarding the endogeneity issue, the conflict under analysis was motivated by political reasons and, even though this does not rule out completely any causality between the economic conditions and the interventions, attenuates the problem to a large extent. Additionally, we have plotted some graphs to observe the evolution of the endogenous variable, analyse the possible existence of an anticipated effect of the truce and test for the persistence of its impact.

With respect to the latter concern, we address the possible serial correlation by performing two different types of estimation. Firstly, we collapse the time series information in three period's averages. Thus, we calculate the average annual growth rate of productive investment for the ceasefire and for the periods before and after the truce (i.e. a "during", "pre" and "post" truce periods) and estimate with robust standard errors. Secondly, we also estimate the regression equation using all the time series information, but clustering the observations by region and controlling for unobserved heteroskedasticity. Thus, we allow for the observations within the same region to have a maximal degree of association among them.

Following Meyer (1995) we have also addressed some of the threats posed to the causal interpretation of DiD estimates. Thus, our dependent variable is expressed in annual growth rates taking into account the existence of unit roots on the original series in levels. Moreover, to strengthen our analysis we have used two different comparison groups to deal with the potential existence of dissimilar biases and be able to test for the equality of the estimate of the treatment effect. In addition, we have carried out the estimation considering various time windows to test for the permanence of the results.

Other robustness tests performed include the estimation at two different levels of aggregation -Autonomous Communities and Provinces- to deal with a potential problem of grouped error terms, and the estimation for two ceasefire episodes (1988 and 1998) to account for the differential impact on investment spending¹⁵.

Estimation results

This section assesses the impact of the ceasefires declared by the separatist group ETA on the growth rate of private productive investment in the BC. We compare the performance of this variable in the region subject to conflict with respect to other two composite groups of Spanish regions; Catalonia & Madrid (CM) and Cantabria & Navarre (CN).

The DiD estimates for the effect on the period that stretched between the first relevant ceasefire declared by ETA in 1988 and the end of the contacts between the separatist group and the Spanish government in 1990 are reported in Table 5.

As stated in Table 2, peace talks between ETA and the Spanish Socialist Workers' Party (PSOE in its Spanish initials) took place since January 1988 until 1990, and no other attempt of contact is reported until the summer of 1992. Consequently, we estimate the impact of the ceasefire on private productive investment during the period 1988-1990 with respect to the preceding and following periods.

¹⁵ The other two ceasefires declared by ETA in 1992 and 1996 did not appear to be significant in fostering investment spending in the Basque economy.

As regards of the time window used, in columns (1) and (2) we report the estimates when considering the period between the Spanish integration in the European Union in 1986 and the year of the following offer of ceasefire in 1992. Therefore, we are estimating the differential performance of the growth rate of ppi during the ceasefire (1988-1990) compared with the average of the previous (1986-1987) and posterior (1991-1992) periods.

Column (1) reports the relative performance of BC's investment compared with the CM group at a province level¹⁶. The coefficient on the treatment effect is positive and statistically different from zero indicating that the effect of the ceasefire was a relative positive performance in the BC's investment growth rate.

To be precise, the BC's growth differential between the period 1988-1990 and the "before and after" period surpassed the CM's differential by 20.1 percentage points. Accordingly, during the truce the CM group was growing at a rate 9.9 pp lower than in the "non ceasefire" period, while the BC's ppi grew at a faster rate, 10.2 pp higher than the average of the "before and after" period.

Table 5. - Difference-in-Differences Estimates, 1988 cease-fire

Dependent variable Rate of Variation of PPI				
	(1)	(2)	(3)	(4)
Constant	0.1318*** (0.0092)	0.0849*** (0.0097)	0.0898*** (0.0060)	0.0483** (0.0161)
bc	-0.1183*** (0.0151)	-0.0714*** (0.0160)	-0.0654*** (0.0187)	-0.0239 (0.0249)
truce	-0.0987 (0.0577)	-0.0091 (0.0181)	-0.0566 (0.0560)	0.0275* (0.0119)
bc*truce	0.2007*** (0.0587)	0.1111*** (0.0213)	0.1477** (0.0603)	0.0636* (0.0266)
Observations	56	35	48	30
R- squared	0.16	0.13	0.08	0.11

Clustered standard errors in parentheses.

*** Indicates statistical significance at the 1% level.

** Indicates statistical significance at the 5% level.

* Indicates statistical significance at the 10% level.

An idea of the importance of this result is given by the fact that the BC's productive investment grew, on average, at a remarkable rate of 11.6% during the three years considered. As a remainder to the reader we would like to highlight that, in the BC, the average ppi's growth for the whole period of terrorist violence was merely 3.3% per year (see Table 4).

In column (2) we display the results obtained for the same estimation, but using as a control group the regions limiting to the BC and with very similar industrial specialisation. The relative impact of the ceasefire in the BC appears to be positive and significant again, but of a smaller magnitude.

¹⁶ All the estimations presented in Table 5 and Table 6 refers to the maximum level of disaggregation available in the data (i.e. province level) and for the clustered standard errors estimation. The results at the autonomous community's level and the collapsing observations estimations are consistent with them, and available upon request.

Thus, when compared to the CN group, the differential in the BC is still 11.1 percentage points higher. If we split this difference in the within group differences between periods, we will be able to analyse in more details its determinants.

On the one hand, during the “before and after” period, whereas the investment in the CN group was growing at a much faster pace than its average for the 1968-2004 period (8.5% per year), in the BC’s provinces was growing well below (1.4% per year). On the other hand, throughout the three years of intermittent truces, the growth rate in CN was still above its 1968-2004 average, though lower than in the “before and after” period (7.6% per year), whilst in the BC was considerably larger (11.6% per year). In other words, as a consequence of the ceasefire the BC’s productive investment was growing at an astonishing annual rate eight times larger than the average of the immediate and posterior years.

To contextualize these results we should point out that the period considered coincide with a phase of industrial restructuring in the north of Spain, in which the septemtrional economies of the peninsula were recovering from the crisis suffered in the previous decade.

Therefore, it is not surprising that during this interlude the CN investment was growing well above its average for the whole period. Nevertheless, the slower pace during the truce, when the BC was increasing its investment substantially, could be indicative of a substitution effect on investment spending, in such a way that a proportion of investment diverted previously to these regions changed direction towards the BC as the expectations of an end of violence became credible.¹⁷

In the case of the BC, the low growth of productive investment during the periods before and after the truce is a sign of the extent to which terrorism depressed economic activity in the region, which hampered its recovery from the crisis and not allowing it to follow the pace of other northern regions.

Because the estimated treatment effect could be largely driven by the differences generated between the BC and the comparison regions in 1987 (See Figure 1 and Table 2), in columns (3) and (4) we replicate the analysis eliminating the effect of this year.

As expected, the differences with CM and CN appear to be lower than before (14.8 pp and 6.4 pp respectively), but they are still positive and significant at conventional test levels.

Since the only difference with respect to the previous exercise regards the average growth rate for the “before and after” period, we can to some extent identify the impact of 1987 on the growth rate of productive investment in the regions involved.

Thus, when we suppress 1987 from the estimation, we observe that the growth rates of the two comparison regions fall quite importantly (4.2 pp for CM and 3.7 pp for CN) whereas the BC’s rises by 1.1 percentage points. In other words, the intensification of

¹⁷ Even though the difference between periods in the case of the CM group could be affected by the higher investment occurred in Catalonia, which hosted the Olympic Games in 1992, it is also true that during the truce this region grew at a rate 2.5 percentage points below its average for the 1968-2004 period.

terror occurred during the year 1987 reduced the average growth rate of investment in the BC by 78.5% in the period before and after the truce.

In Table 6, we now analyse the effect of the ceasefire declared in 1998. Since this truce has been the longest lasting in the whole history of terrorism in Spain until date, and we consider the duration of the non-violent period as one of the main characteristics of peace processes affecting the perception of security of economic agents, *a priori* we expect this ceasefire to have a greater impact on investment spending.

We consider the response of BC's ppi during the fourteen months of the truce and the immediate posterior years in which the Spanish and French police carried out an important amount of arrests that hit ETA very hardily.

The results of the estimation shown in columns (1) and (2) correspond to the period 1996-2004, and refer to CM and CN respectively. In consequence, we can observe a positive and significant treatment effect in the BC when compared with any of the control regions (21.4 pp and 23.4 pp). Moreover, we also detect an important relative positive performance of productive investment during the ceasefire when compared with the average growth rate of the previous and posterior periods.¹⁸

In column (1) we can see that whilst on average the BC was growing at a rate of minus 3% in the period "before and after" the ceasefire, during the truce and the subsequent years the growth rate increased sharply to 17.2 % per year.

Table 6. - Difference-in-Differences Estimates, 1998 cease-fire

Dependent variable Rate of Variation of PPI				
	(1)	(2)	(3)	(4)
Constant	0.0646*** (0.0107)	0.0298 (0.0188)	0.0724*** (0.0129)	0.0647 (0.0371)
bc	-0.0952** (0.0381)	-0.0604 (0.0433)	-0.1063** (0.0444)	-0.0987 (0.0585)
truce	-0.0126 (0.0304)	-0.0330 (0.0233)	-0.0204 (0.0312)	-0.0679 (0.0395)
bc*truce	0.2141** (0.0998)	0.2345** (0.1040)	0.2253** (0.1024)	0.2728** (0.1112)
Observations	72	45	64	40
R- squared	0.12	0.17	0.14	0.19

Clustered standard errors in parentheses.

*** Indicates statistical significance at the 1% level.

** Indicates statistical significance at the 5% level.

* Indicates statistical significance at the 10% level.

Additionally, the CM group reduced its rate of growth during the truce compared with the "non-truce" period. To be precise, the growth rate in CM decreased from 6.5% to 5.2%, rate that was below its average for the entire period 1968-2004.

The same features emerge when we compare to the CN group in column (2). Thus, this group of regions were outperforming the BC's growth rate by 6 percentage points in the

¹⁸ Abadie and Gardeazabal (2003) use as a natural experiment the truce of 1998-1999 to show how a portfolio of basque stocks outperforms a non-basque portfolio when the ceasefire was credible.

“before and after” period, but during the truce the situation reversed and productive investment grew at an average rate 17.5 pp higher in the BC.

Consequently, as in the case of the previous truce considered, the above results could be indicative of a substitution effect on productive investment among Spanish regions during ceasefires.

It is worth noticing that the period considered was a low growing period in the northern regions since both groups were growing below their 1968-2004 averages. Nevertheless, the BC economy was able to increase its productive investment by 17.2% per year during this period, which makes the achievement even more remarkable.

To qualify the results above and as a robustness test, we have estimated in columns (3) and (4) a narrower time window, stretching from 1997 to 2004. In this way we drop from the analysis the effect of considering the year 1996, in which the terrorist group declared a ceasefire with the intention to look for a non-violent solution to the conflict with the conservative party recently elected.¹⁹

The result of this exercise is that the treatment effect remains positive and significant, and appears to be even larger, with a greater increase in the case of CN.

Summary and Conclusion

Terrorism has been thrashing the Spanish society, and with singular intensity the population of the Basque Country, for the last forty years. The most important of the damages inflicted been reflected in the number of human lives lost during the conflict.

Furthermore, terrorist actions have distorted and depressed economic activity hampering the growth of this region and, hence, reducing the standards of living of its inhabitants.

Empirical studies have quantified some of the economic costs of terrorism and the evidence suggests the impact has been noticeable. Nevertheless, a complementary approach to the issue is valuable in order to qualify some of the previous results and offer a different and more positive perspective to the Basque conflict.

Throughout ETA’s history of assassinations and extortion, the intensity of terrorist actions has changed considerably over time and so has their impact on economic activity in the Basque Country. Thus, several partial and total ceasefires have been declared and peace talks, even though fruitless, aimed to a non-violent end to the conflict maintained.

We expect that even though these ceasefires failed, leading to further violence, they could be indicative of a close end to political violence and have paved the way for a final ceasefire.

Therefore, in this article we contribute to the scarce literature on the relationship between conflicts and economic outcomes. We exploit different ceasefire episodes as natural experiments to compare the relative performance of the Basque Country with

¹⁹ Even though we have not found any significant treatment effect on this year, its inclusion in the analysis could distort to some extent the results.

other Spanish regions and give an insight on the magnitude of the potential peace dividend derived from a complete cessation of violence in the region.

In this respect, we make use of the variable identified as the most sensitive to terrorism and the main channel through which political instability and violence affect economic growth.

We found evidence to support the idea that investment plans in the Basque Country are significantly distorted by terrorism. Thus, in our analysis, periods of ceasefire appear to be of great importance in enhancing productive investment undertaken in this region. Economic agents seem to respond to changes in the environment by intensifying or lessening the amount of resources devoted to productive uses and, hence, the growth rate of productive investment reacts substantially to more favourable economic perspectives during ceasefires.

At the same time, other Spanish regions experience a reduction in their rates of growth which could suggest the presence of potential substitution effects on productive investment across regions. Thus, the relative positive performance of the Basque Country during ceasefires would be indicative of the response of economic agents to a new environment with reduced levels of uncertainty and the prospect of a definitive end of the conflict.

These results are very important on its own as allow us to quantify the relevance of peace expectations in determining investment spending in a region largely affected by terrorism. Additionally, our findings qualify previous results on the economic costs of conflict, since these studies did not take into account the relative positive performance of economic variables during ceasefires which would be indicative of an even higher cost of violence.

Moreover, as a product of our analysis we can identify some of the features which make a ceasefire process to be successful in fostering growth. Thus, the duration of the ceasefire, directly related to its reliability, seems to be an important feature in shaping the expectations of economic agents about peace.

Accordingly, it would be very valuable to investigate in depth the context in which successful ceasefires took place. For example, the intermediation of a third country during peace talks emerge as a common characteristic in the two truces which turned out to have an important impact in the Basque economy.

Finally, it would be an interesting exercise to extent the study to use firm level data on companies operating in the Basque Country. In this way, we could describe at a micro level the response of economic agents to reductions in uncertainty. Moreover, we could observe in more detail whether the positive performance during the truces was due to a change in the behaviour of the existing entrepreneurs facing a higher expected return to investment or to an increase in the number of firms created during that period.

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