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Abstract

Regions seek more autonomy to reduce transfers to central governments and have more control on regional spending. Yet, decentralization increases regulatory uncertainty on joint responsibilities and quests for independence create political uncertainty. We evaluate costs and benefits from the Catalan-Spanish dispute using an event approach methodology that estimates stock market reactions to new events. We find negative stock market reactions to decentralization and independence. The approval of a Catalan Statute reduces returns for Catalan firms, which later benefitted from the partial reversal imposed by the Spanish Constitutional Court ruling. The strong political uncertainty emerging at the day of a (unconstitutional) referendum on independence strongly reduced returns of Catalan firms and of Spanish firms in the tradable sector. The Spanish Senate rejection of the declaration of Catalan independence reduced short-term political uncertainty and positively affected stock market returns of Catalan, but also Spanish, firms, largely compensating previous losses.

JEL Classification: H77, G14

Keywords: Independence, Decentralization, event approach

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Market Reactions to Quest for Decentralization and Independence: Evidence from Catalonia

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April 2020

Abstract

Regions seeking more autonomy aim at making less (or no) fiscal transfers to central governments and at reaching more (or total) control on regional spending. However, decentralization may lead to joint central-regional responsibility that increases regulatory uncertainty regarding the bureaucratic and fiscal burdens on firms. Moreover, quests for independence create political uncertainty. To evaluate economic costs and benefits for firms from decentralization or independence, we analyze the Catalan-Spanish negotiation leading to the 2006 Catalan Statute and the more recent quest for independence. We use an event approach methodology to estimate the immediate stock market reaction to new events. Our results suggest that the stock market had a conservative reaction both to more decentralization and to independence. The approval of the Catalan Statute was associated with negative returns for Catalan firms, particularly in the tradable sector. These firms later benefitted from the partial reversal imposed by the Spanish Constitutional Court ruling. The large increase in the political uncertainty that emerged at the referendum day had a strong negative effect on all Catalan firms and on Spanish firms in the tradable sector. This uncertainty was partially reduced, when the Spanish Senate rejected the declaration of Catalan independence. Markets reacted positively, with Catalan, but also Spanish, firms in all sectors posting large gains that largely compensated the previous losses.

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In 1945, only 74 nations were internationally recognized. By 2018, they had become 206. While historical political events contributed to this fractionalization – particularly in Eastern Europe, it is undeniable that a quest for independence surfaces also in Western Europe.

This demand of self-determination has many drivers: cultural, linguistic, religious, and of course economic factors. Economic trade-offs determine the incentives for regions with a strong cultural entity to secede. As part of a larger nation, smaller regions enjoy access to a larger domestic market and benefit from cost sharing in the provision of national public goods, but they have to forgive some autonomy in targeting welfare and public programs, such as health and education, to the local needs and culture (Alesina and Spolaore, 1997 and 2003). Furthermore, even in federal states, richer regions tend to transfer part of their tax revenues to poorer regions (Bolton and Roland, 1997).

In the last two decades, globalization and economic crisis have modified these trade-offs by reducing the economic cost of independence. Due to the existence of supranational institutions, such as the WTO and the EU, regions may aim at preserving their cultural homogeneity and at choosing their local policies, while still enjoying access to international markets in a low conflict environment (Alesina et al., 2000, Spolaore, 2009). The recent economic crisis has made fiscal transfers from richer to poorer regions even more salient and the increased dispersion in economic productivity among regions has made the centralization issue more relevant (Lee and Rogers, 2019).

Central governments have reacted to these changing external conditions and to the quest for more independence by conceding more fiscal federalism and decentralization (Le Breton and Weber, 2003, Haimanko et al., 2005, and Desmet et al., 2011).[1]

However, the transition towards more federalism or towards full independence produces uncertainty. Regulatory uncertainty may emerge since federalism typically requires sharing of legal and administrative responsibilities between central and regional authorities. As a result, more bureaucracy may arise (Rodrick, 2000), since double (regional and central) administrative requirements are imposed on the more productive sectors of the economy. At the same time, on the positive side, with more federalism, fewer fiscal revenues are transferred to the central government. Thus, more resources can be kept at the regional level to finance economic and social services or to lower taxes on citizens and firms. A more radical move towards full independence creates political uncertainty. New economic institutions (Central Bank, a new currency, fiscal

[1] Whether this represents a halt to the process of independence or rather a step towards final independence remains an open question (Cederman et al., 2015, Bakke, 2015)

authorities) need to be established. Access to (previously) domestic markets has to be negotiated with the central government, whereas access to foreign markets will depend on international treaties and will require negotiations with international organizations (the EU in the case of European countries or the WTO). Hence, unilateral quests for independence create large uncertainty on the future access to (previously) domestic and foreign markets for companies of the seceding region. Of course, independence implies no more transfers to the (previously) central government and complete autonomy in the targeting of public programs. Assessing the economic costs and benefits of independence is not an easy task (Reynaerts and Vanschoonbeek, 2018).

This paper provides a quantitative assessment of the economic effects of moving towards more federal autonomy and toward full independence in a globalized environment. The crucial trade-off is between increased regulatory and political uncertainty on one hand and more resources retained at regional level on the other hand. We consider the sequel of political and legal events in the Catalan-Spanish relation over the last fifteen years (2003-2017). A new Statute regulating the Catalan-Spanish relation, negotiated between the Catalan and the Spanish (socialist) governments, characterized the 2003-06 events. Proposed by the Catalan parties, later emended and accepted by the Spanish Parliament (with the opposition of the People's Party), the Statute identified areas of joint Catalan-Spanish responsibility. In 2010, a ruling of the Spanish Constitutional Court limited the degree of autonomy provided by the Statute – thereby negatively affecting the process towards more Catalan autonomy. Soon after, the economic benefits from independence became more salient, as fiscal transfers to the central government were more painful during the economic crisis. In 2012, a party coalition supporting independence won the Catalan regional elections. In 2014, a non-binding informal referendum on the political future of Catalonia was held, despite the opposition of the Spanish government, led by the People's Party. The demand for Catalan independence mounted and political tensions with Spain increased. In 2017, the Catalan parties decided to promote a formal referendum on independence. The Spanish government, led by the People's Party, was fiercely hostile. The referendum was declared unconstitutional. On the referendum day, some Catalan voters were forced out of the electoral booths by the national police. Few weeks later, the Catalan Parliament declared independence and the Spanish Senate made use of a Constitutional article to stop it. All powers on Catalonia were transferred to the Spanish Government.

The Catalan-Spanish relation represents the perfect environment, where to study the economic costs and benefits of moving towards more federalism and towards independence. First, Spain belongs to a highly integrated economic area – the EU and the Eurozone. While seeking independence from Spain, Catalonia expected to keep its access to the EU market and to maintain the common currency – the Euro. Second, this long sequel provides periods associated with different types of regulatory and political uncertainty. We exploit this variation in our estimates. In 2003-06, the new Statute provided more fiscal autonomy to Catalonia and a wider sharing of legal and administrative responsibilities between Catalonia and Spain. Only limited political tension surfaced and no economic uncertainty emerged regarding the access to domestic or foreign markets. At this stage, (Catalan) firms faced regulatory uncertainty raising from more bureaucracy, due to the joint Catalan-Spanish responsibility over ports and airports, and from a perspective double tax collection. Possible gains could arise from additional resources for regional spending that could benefit Catalan firms. The 2010 ruling of the Spanish Constitutional Court emended the Statute. Few articles – mostly related to the judiciary system – were dropped and others were modified. The creation of a Catalan tax authority – and hence the possibility of a double tax collection, was rejected, thereby reducing regulatory uncertainty. The last sequence of events was characterized by strong political tensions reaching the climax at the 2017 referendum day. Economic costs were driven by the political uncertainty, for Catalan firms, regarding their future access to the Spanish and EU market in case of independence.

Not surprisingly, these events raised much concern and generated a heated debate in Catalonia and Spain. Yet, besides the opposite rhetoric by sovereignist and unionist movements and the large use of cultural and political arguments (Martinez-Herrera, 2002, Serrano, 2013, Bourne, 2014), little agreement has been reached on whether the Catalan independence would bring a net economic cost or benefit to Catalonia and to Spain (Castells, 2014, Muñoz and Tormos, 2015).[2]

To evaluate the economic effects of this Catalan-Spanish long dispute, we use an event approach methodology that estimates the immediate stock market reaction to the occurrence of new events. Under the assumption of efficient capital markets, any new information provided by these events on the future economic perspectives of Catalan and Spanish (i.e., non-Catalan) firms should immediately be reflected in their stock market prices. Several important events have occurred

[2] De la Fuente et al. (2014) and Comerford and Rodriguez Mora (2019) point out that the reduction in trade towards Spain and the EU that would follow the Catalan independence would largely reduce GDP both in Catalonia and Spain. Esteller-Moré and Rizzo (2020) find outflow of short-term bank deposits from Catalonia after the referendum.

during these fifteen years. Some of them were largely anticipated and should thus not affect market prices at impact, since expectations should have already been incorporated in stock prices. We identify four events, which were unanticipated (or uncertain) and thus provided new and relevant information on the Catalan-Spanish negotiation process. We measure the stock market reaction for Catalan and Spanish listed companies to these events. This event methodology has initially been used in finance to evaluate the effects of acquisitions (Loughran and Vijh, 1997), strategic alliances (Chan et al., 1997), earning releases (Henry, 2008) or natural disasters (Shelor et al., 1992). But it has gained popularity also in other fields to assess the impact of gender quotas (Ahern and Dittmar, 2012; Ferrari et al., 2016), political connections (Acemoglu et al., 2016) civil wars (Guidolin and La Ferrara, 2007) and terrorist attacks (Abadie and Gardeazabal, 2003). This methodology uses standard single-factor market models (Kothari and Warner, 2007) to estimate the returns that companies would obtain in absence of these events. The abnormal returns – defined as the difference between actual and estimated returns – during an event window measure the market reaction to the news conveyed by the event for a specific firm. To evaluate the effects for Catalan and Spanish listed companies, we thus calculate their cumulated abnormal returns during specific event windows and test whether they are significantly different from zero. Clearly, positive (negative) deviations identify a positive (negative) response to new information for the Catalan and Spanish firms.

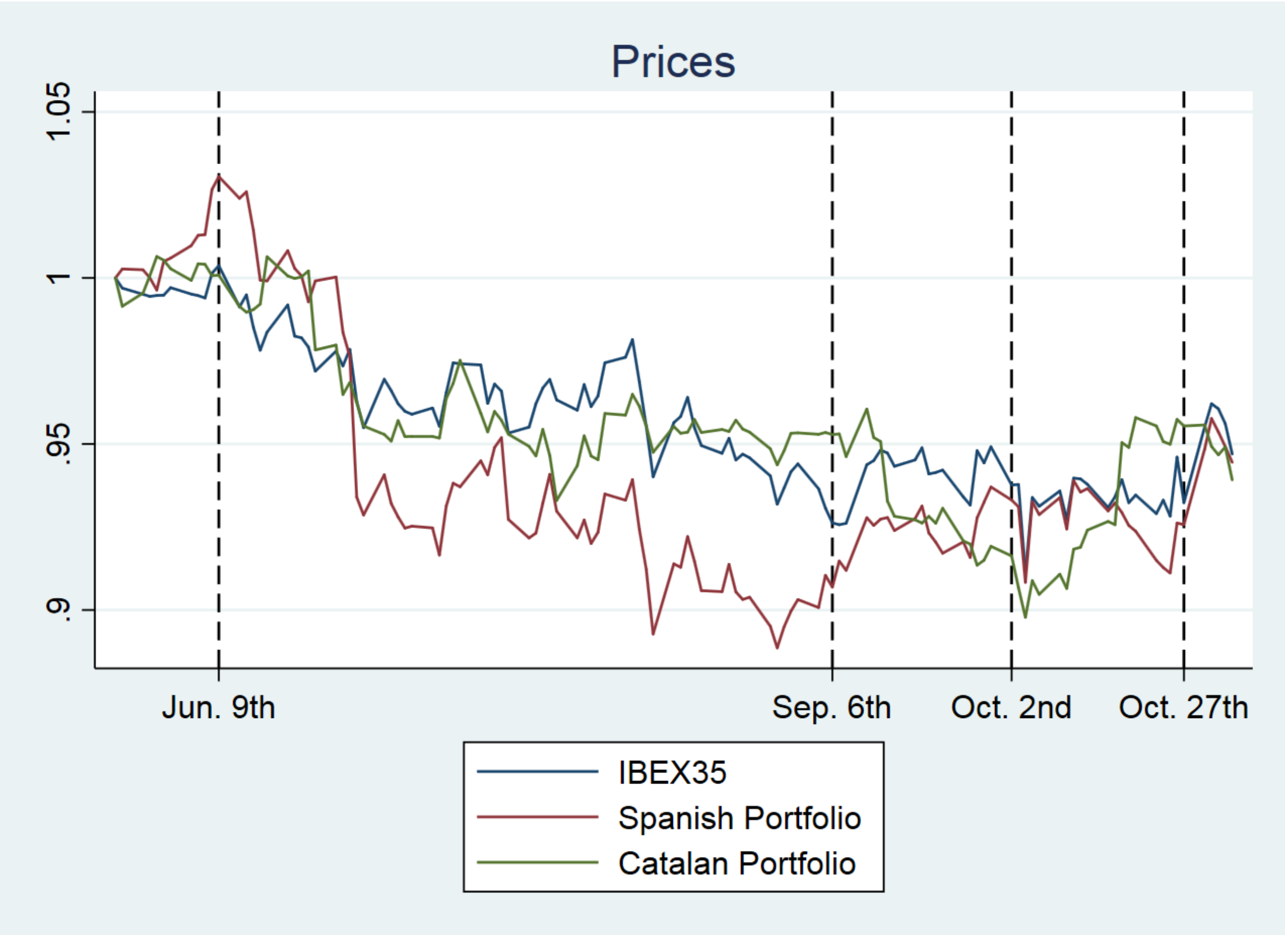
We select four milestone events over these fifteen years, which represented crucial steps on the path towards Catalan autonomy or independence. The first event is the approval of the new Statute by the Spanish Parliament on May 2006. Despite the long negotiation process, the result of the ballot in the Spanish Senate was very close: 128 votes in favor, 125 votes against (from the People' Party) and 6 abstentions (mostly from members of the radical Catalan party, ERC). Catalan autonomy increased, joint Catalan-Spanish responsibilities were identified in some important areas, potentially producing regulatory uncertainty, but no major political tension emerged. The second event is the 2010 ruling of the Constitutional Court, which emended the Statute and reduced Catalan autonomy. The third event is the Catalan referendum of independence held on October 1st 2017. The Catalan authorities announced the referendum in June, but the Constitutional Court ruled it unconstitutional and the Spanish government urged the Catalan government not to hold it. Uncertainty lingered on the intentions of the Catalan authorities. The final decision to held the referendum was therefore crucial, since it provided additional information on the intention to move forward with a claim of independence. The fourth crucial moment occurred on October 27th, when two events took place. Based on the results of the referendum, the Catalan Parliament declared independence. Immediately after, the Spanish Senate enforced Article 155 of the Spanish Constitution, which transferred powers on Catalonia to the Spanish government – thereby putting a halt to the independence process. Again, uncertainty had been lingering for three weeks over the intentions of the Catalan Parliament. Hence, these two events were crucial, as they certified the strong will of the Catalan government to push forward with independence and of the Spanish government to stop the process.

Our empirical evidence suggests that the stock market had a conservative reaction both to more decentralization and to independence. A negative effect emerged after the initial approval of the Catalan Statute by the Spanish Parliament – particularly for Catalan and Spanish firms in the tradable sectors, which were more affected by the regulatory uncertainty. The ruling of the Constitutional Court, which emended the previous Statute eliminating the possibility of double tax collection, was instead associated with positive abnormal returns among Catalan – but not Spanish – firms, again in the tradable sectors. The two most political tense events occur in October 2017 and prompted strong market reactions, as shown in Figure 1. The events of the referendum day led to strong negative abnormal returns for Catalan firms, in both tradable and non-tradable sectors, and for Spanish firms in tradable sector. The increased political uncertainty took a toll on all firms. The contemporaneous declaration of Catalan independence and the use of article 155 by the Spanish Senate induced large positive abnormal returns for Catalan firms, and still positive, but smaller returns for Spanish firms.

Taken together, these empirical results suggest that, even in absence of strong political tensions, markets judged negatively the approval of the Catalan Statute, particularly for firms in the tradable sectors. This may be due to the regulatory uncertainty related to the likely increase in the bureaucratic burden for firms using Catalan ports or airports and with the possibility – introduced by the Statute, of double tax collection in Catalonia. The Constitutional Court ruling that voided a Catalan tax authority, and thus reduced the possibility of double taxation, led instead to a positive market reaction for Catalan firms. As expected, the political tensions that exploded at the referendum day and the resulting political and economic uncertainty induced by these events caused a large drop in market returns for all firms. The subsequent halt to the independence process led to stock market gains of similar magnitude as the previous losses.

The paper proceeds as follows: section 2 provides a brief presentation of the recent Spanish-Catalan relation. Section 3 introduces the theoretical arguments used to identify the possible economic effects of further decentralization and of a quest for independence. Our methodological framework is presented in section 4. Section 5 discusses the results and section 6 concludes.

Figure 1



Recent History of the Catalan-Spanish Relation

After Franco's dictatorial regime, the relation between Catalonia and Spain was regulated by the Statute of Autonomy – approved on October 1979, with a referendum held in Catalonia. The Catalan population was identified as a "nationality" and Catalan became an official language in the region along with Spanish. In the next twenty years, Catalonia and the Spanish central government continued to negotiate. Due to its increased political and economic power and to the pivotal role occasionally played in the formation of the Spanish government by the Catalan (moderate) political coalition "Convergència i Unió," (CiU) Catalonia obtained more fiscal autonomy and gained exclusive competence on issues such as culture, local administration, environment and transport.

On *October 2003*, several Catalan parties proposed to draft a new Statute to redefine the political status of Catalonia. A month later, regional election were held in Catalonia: CiU obtained a majority of seats, but was unable to remain in power and had to step down agter twenty-three years. A coalition of left parties, including those proposing the new Statute, formed a government. Meanwhile, in the 2014 national election, the Socialist party defeated the People's Party, which had always been opposed to the new Statute. On *September 30th 2005*, the Catalan Parliament approved (with a 120 to 15 majority) a proposal of the new Statute, which included the official recognition of Catalonia as a nation, an improved division of competence between the regional and the central government and greater control over fiscal matters. A year later, on *May 10th 2006,* the Spanish Parliament approved an amended version of the new Statute. A long negotiation between the Spanish (socialist) government and the Catalan parties had taken place. Changes to the original version of the proposal provoked a street protest in Barcelona on February 18th 2006 and the opposition of the Catalan party ERC. The final ballot in the Spanish Senate was in fact close: 128 votes in favor, 125 against (mostly from the People's Party) and 6 abstentions (mostly from the Catalan separatist Esquerra Republicana de Catalunya, ERC). On *June 18th 2006*, the emended version of the statute obtained the popular approval (with a 78.1% majority) in a referendum in Catalonia.

Demand for more fiscal autonomy came with the 2008 Great Recession that required a harsh fiscal restructuring in Catalonia (and in all other Spanish regions) and made the fiscal transfer from Catalonia to the central government more salient. The independent movements gained momentum and symbolic votes of independence took place in the small municipality of Arenys de Munt on September 2009, immediately followed by other 167 municipalities. This demand was largely frustrated. In fact, on *June 28th 2010*, the Spanish Constitutional Court ruled on an appeal made by the People's Party and restrictively emended the Catalan Statute approved in 2006. The articles on the definition of a Catalan judiciary system were rewritten or reinterpreted. The reference to a Catalan authority for fiscal collection was also cancelled. The verdict created resentment and many people took the streets in Barcelona.

In the following years, the political tension between the Catalan independence movements and the Spanish central government increased, particularly after 2011, when the People's Party gained the absolute majority in the Spanish elections and set an agenda to re-centralize powers. On November 25th 2012, early regional elections were called in Catalonia in an attempt to obtain a popular mandate to seek independence. Parties supporting Catalan self-determination obtained a majority of seats in the Catalan parliament, albeit not a majority of the votes.[3] The newly elected Catalan Parliament issued a declaration of sovereignty and a statement on the right to decide by the Catalan people. On May 8th 2013, this declaration was suspended (and then ruled unconstitutional) by the Spanish Constitutional Court. The Catalan Parliament sent a formal petition to Spanish government asking to hold a referendum on independence, but it was rejected. On *November 9th 2014*, a non-binding informal consultation took place in Catalonia. The pro-independence side won, but the results were largely disregarded at the national level.

Early regional elections were called again in Catalonia, in a new attempt to obtain a stronger popular mandate to seek independence. On September 27th 2015, pro-independence parties won a majority of seats in the Catalan Parliament (72 out of 135), albeit not a majority of votes (47.8%). The new head of the Catalan government, the separatist Carles Puigdemont, promised to prioritize Catalonia's path towards independence. Meanwhile, the Spanish (conservative) central government kept its hard line against Catalan independence. Between November 2016 and March 2017, more than 400 legal proceedings were initiated against pro-independence officials and the former president of Catalonia, Artur Mas, was banned from public office for two years for allowing the 2014 consultation.

Political hostilities reached a new level on *June 9th 2017*, when the Catalan Prime Minister, Carles Puigdemont, called for a referendum on the self-determination of Catalonia to be held on October 1st. A law allowing referendum to take place was passed by the Catalan Parliament on *September 6th 2017*, but it was immediately suspended by the Spanish Constitutional Court, which also prohibited public officials from taking part in the organization of the referendum. In the following weeks, a criminal probe of more than 700 mayors was ordered and a dozen of high-ranking officials were arrested.

Despite the referendum on Catalan independence being ruled unconstitutional, on *October 1st 2017*, Catalan voters massively tried to cast a ballot. In several occasions, the national police closed voting centers, seized ballots boxes and repressed manifestations. At the end of one of the most conflictive day in the history of the Catalan-Spanish relation, the registered turnout at the referendum was 43%, with 90.2% of the voters in favor of independence. The results had no legal bearing, but a strong political valence. In the following days, demonstrations took place in Catalonia and in the rest

[3] This voting result is in line with the discussion of the ethnic vote in Huber (2012), who makes a specific reference to the Catalan case.

of Spain. Many supported the result of the referendum and denounced violence by the national police. Others defended the national unity or asked for a dialogue and for a rapid resolution of the controversy. Political uncertainty on the future of Catalonia reached unseen levels. Pro-independence parties signed a declaration of independence, but refrained from bringing it to the Catalan Parliament. The Spanish Prime Minister, Mariano Rajoy, imposed a deadline for the Catalan government to clarify its official position on independence. Meanwhile, some Catalan companies started to relocate their headquarters outside of Catalonia.

On *October 27th 2017*, in a plenary session of the Catalan Parliament, with a majority of 70 votes to 10, the declaration of independence was ratified and unilaterally announced. Few hours later, the Spanish Senate approved, with a majority of 214 votes to 47, the enforcement of Article 155 of the Spanish Constitution, which empowered the Spanish central government to dismiss the Catalan Parliament and to appoint a Spanish representative to restore the rule of law in Catalonia. Snap local elections were called for December 22nd. Few days later, the Spanish Constitutional Court suspended the declaration of independence and the Spanish attorney general charged several Catalan politicians, including the Catalan Prime Minister, Carles Puigdemont, with alleged sedition and rebellion.

Table 1

Event	Date	Description
I	*October 31st 2003*	Catalan parties propose to draft a new Statute to redefine the political status of Catalonia
II	*September 30th 2005*	Catalan Parliament approves a proposal of the new Statute
III	***May 10th 2006***	**Spanish Parliament approves an emended version of the new Statute**
IV	*June 18th 2006*	emended version of the Statute approved in a referendum in Catalonia
V	***June 28th 2010***	**Spanish Constitutional Court emends the new Statute**
VI	*November 9th 2014*	informal consultation on the political future of Catalonia takes place. Results are largely disregarded at the national level
VII	*June 9th 2017*	Catalan government Prime Minister announces a formal referendum on the self-determination of Catalonia to be held on October 1st
VIII	*September 6th 2017*	Catalan parliament approves a law allowing the referendum to take place
IX	***October 1st 2017***	**Unconstitutional referendum on independence held in Catalonia. National police forcefully tries to stop the vote**
X	***October 27th 2017***	**Catalan Parliament declares independence based on the referendum results. Spanish Senate enforces Article 155 of the Spanish Constitution and dismisses the Catalan government**

To carry out our event studies, we select events that were directly related to the Catalan Statute or to the quest for independence, as summarized in Table 1. The former five events refer to the drafting and the approval of the Catalan Statute between 2003 and 2006 and to the ruling of the Spanish Constitutional Court in June 2010. The latter five episodes belong to the quest for independence: from the 2014 informal referendum in Catalonia to the October 27th 2017 events that stopped (at least temporarily) the process of Catalan independence. The former five events feature the release of information on the likely approval and implementation of the Catalan Statute. The new statute had important economic consequences due to the introduction of joint fiscal and bureaucratic responsibilities. Hence, these episodes may create regulatory uncertainty, but little political tensions. The latter five events, instead, relate to the process of Catalan independence and are characterized by strong political uncertainty.

However, not all these events provided new information. In some cases, information could easily be anticipated and thus no stock market reaction should be expected, since the news had already been incorporated in the stock market prices. We thus concentrate on four events, which can be argued to be ex-ante unanticipated or uncertain. The first one is the approval of the Catalan Statute by the Spanish Senate (event III in Table 1). Despite the long negotiation, in fact, some uncertainty remained, as the Statute was approved by a narrow margin. The second event (event V in Table 1) is the Constitutional Court ruling, which came long after the appeal by the People's Party. The third crucial event is the referendum on October 1st 2017 (event IX in Table 1). In this case, the magnitude of the popular turnout for a (unconstitutional) referendum and the violent reaction by the national police were largely unexpected. The final event(s) took place on October 27th 2017 (event X in Table 1), when the Catalan Parliament made its declaration of independence and the Spanish Senate reacted with the use of Article 155. Also in this case, there were many doubts on the final decision by the Catalan Parliament – albeit perhaps less so on the Spanish reaction.

Theoretical Background

The demand of self-determination by (small or large) regions of national countries may be driven by several factors: cultural, linguistic, religious and economic. Being part of a larger nation has clear economic benefits. It provides insurance against idiosyncratic local economic shocks, it allows to share the financial burden of providing national public goods and it gives access to larger markets. In international negotiations, large countries have more bargaining power (Abbott, 1975, Schneider, 2011). However, belonging to a nation entails also important costs. Regions have less autonomy to target welfare and public programs, such as health and education, to local needs, customs and culture. Furthermore, richer regions tend to transfer part of their tax revenues to poorer regions.[4]

In this paper, we examine the short run effects of a path towards more autonomy within a federal state and of a bolder quest for independence.

A negotiated pattern towards more autonomy helps to reduce political tension between the region seeking autonomy and the central government, thereby minimizing uncertainty for firms located in autonomous regions. Moreover, to the extent that more fiscal autonomy leads to lower business taxes, these firms may benefit from the process. The main risk of a negotiated decentralization process rests in the definition of joint responsibility – at regional and central level – over bureaucratic procedures and fiscal revenue collection. This may create regulatory uncertainty, since any increase in bureaucracy or taxation would be detrimental to firms that are fiscally located or operate in the autonomous region.

On the contrary, a harsh political negotiation for independence has economic consequences due to the political tensions it creates between the region seeking autonomy and the national state. According to a realist perspective, this political hostility may have negative economic consequences, particularly on trade flows, as regions may decide to boycott each other products (Pollins, 1989) or may choose not to strengthen the enemy by continuing valuable trade exchanges (Gowa and Mansfield, 1993).[5] This political tension is thus detrimental for firms, particularly for those in the tradable sector. Independence may harm the economy of the region seeking autonomy and potentially of the national state, even in absence of political tension, depending on the magnitude of the different effects. In fact, firms will have access to smaller markets and tax payers will have to

[4] An economic literature (Alesina and Wacziarg, 1998, Alesina and Spolaore, 2003) has focused on the pros and cons for a region with a strong cultural identity of being part of a larger nation. However, besides the economic factors, cultural aspects also matter. Nationalist and sovereignist movements sometimes criticize the attention given to the economic consequences of their political actions, particularly when they involve the reactions from the financial markets that are often portrayed as being under the control of the international elites.

[5] Liberal theories suggest instead that economic interdependence reduces the risk of political conflicts across countries (Maoz, 2009). Parties would thus employ soft bargaining strategies to avoid clashes that may lead to inefficient economic consequences.

face the full cost of the public good provision. Yet, no monetary transfer to the central government will be due.

The latest political events in Catalonia represent an excellent testing ground to examine these two different processes. The 2003-06 events took place within the context of a negotiation for more autonomy between the Catalan and the Spanish (socialist) government. Among these events, the most significant was the approval of the Catalan Statute by the Spanish Senate in May 2006. Since political tension was limited,[6] the stock market reaction for Catalan and Spanish firms to this step towards more autonomy identifies mostly the economic effect of the provisions established by the Catalan Statute. Particularly relevant is thus the introduction of a joint responsibility over Catalan infrastructures, such as ports and airports, and the reference to a Catalan fiscal authority for tax collection. Both provisions created regulatory uncertainty about additional costs emerging for firms operating or paying taxes in Catalonia. The Spanish Constitutional Court ruling in June 2010 partially reverted this process. Besides emending the judiciary system, the Constitutional Court removed the reference to a Catalan fiscal authority.

The new events occurred when the political tension between Catalonia and the Spanish central government – led by the People's Party – had reached unprecedented levels. The two most crucial episodes occurred in October 2017. On October 1st, a referendum on Catalan independence was held in Catalonia, despite being ruled unconstitutional by the Spanish Constitutional Court. The Spanish central government sent the national police to (unsuccessfully) prevent consultations from taking place. Political uncertainty reached its climax. Was Catalonia about to declare independence? How was Spain reacting to it – politically, judiciary and militarily? After more than three weeks, on October 27th, part of this uncertainty was solved. Based on the results of the referendum, the Catalan government declared independence and the Spanish Senate immediately reacted by activating Article 155 of the Spanish Constitution, which allowed the central government to take control over the governing of Catalonia. Although further political uncertainty remained on the future of the Catalan-Spanish relation, the process of Catalan independence had come a clear (albeit perhaps only temporary) stop.

[6] An intent to boycott some Catalan products took place in Spain at the end of 2005. However, according to Cuadras-Morató and Raya (2016), the overall effect of the boycott was null, since in some regions Catalan products were indeed boycotted whereas in others their demand increased.

Methodology and Data

To evaluate the market reactions to these crucial episodes in the recent path towards more autonomy or towards independence in Catalonia, we use an event study approach. In the previous section, we identified four events in the last fifteen years that revealed crucial information on the future of the Catalan-Spanish relation (see events III, V, IX and X in Table 1). The objective of this event study approach is to examine the market reactions to these events – separately for Catalan and Spanish listed companies. This methodology relies on calculating the abnormal returns of securities of Catalan and Spanish companies in the financial market. They are measured as the deviations of the actual returns from the normal (i.e., estimated) returns. Positive (negative) abnormal returns identify favorable (unfavorable) news – for instance on firms' future market prospects deriving from regulatory and political uncertainty – that lead to positive (negative) market reactions.

Our main data consists of daily market closing prices for all Catalan and Spanish companies listed in the Madrid Stock Exchange, as well as of the IBEX35 index closing price, from 2003 to 2017. Data are available on Datastream. Companies are categorized as Catalan, if their headquarter is in Catalonia and/or they have a considerable portion of their economic activity in Catalonia. Over our period of analysis, new companies were listed, while some old ones abandoned the Madrid Stock Exchange. The final number of listed companies used in the analysis ranges from 90 to 101. A complete list of the companies is in the appendix[7].

In order to estimate the abnormal returns during the different event periods, we first need to calculate the normal returns. We follow a standard approach in this literature (Kothari and Warner, 2007) and use a single-factor market model, in which the daily returns of each stock are assumed to be linearly related to the market return. For each company *i*, we thus estimate the following equation:

$$R_{i,t} = \alpha_i + \beta_i R_{M,t} + \varepsilon_{i,t} \tag{1}$$

[7] The daily price of some of these companies' stocks did not change, perhaps because only few market transactions were made. We decided to drop those companies, whose stocks experienced no price change during more than one third of our period of interest.

where $R_{i,t}$ and $R_{M,t}$ represent respectively the daily stock return of company *i* and the market return at time *t*. The market index is represented by the IBEX-35. These daily returns are calculated from the daily closing prices of the stocks as follows:

$$R_{i,t} = \log(P_{i,t}) - \log(P_{i,t-1}) \qquad (2)$$

where $P_{i,t}$ represents the daily closing price at time *t* for the stock of company *i* and analogously for the IBEX-35.

The estimated parameters $\widehat{\alpha_\iota}$ and $\widehat{\beta_\iota}$ at equation (1) for each company *i* are then used to calculate the abnormal returns according to the following equation:

$$AR_{i,t} = R_{i,t} - \widehat{\alpha_\iota} - \widehat{\beta_\iota} R_{M,t} \qquad (3)$$

where $AR_{i,t}$ represents the abnormal return at time *t* for the stock of company *i*.

Finally, for each firm, we obtain the cumulated abnormal returns by summing the corresponding abnormal return over the relevant event window:

$$CAR_{i,S,F} = \sum_{t=S}^{F} AR_{i,t} \qquad (4)$$

where $CAR_{i,S,F}$ represents the cumulative abnormal return for the stocks of company *i* over an event window that begins at day *S* and finishes at day *F*.

An important decision in these event studies is to establish the time period, which precedes the time of the event, over which to estimate the parameters $\widehat{\alpha_\iota}$ and $\widehat{\beta_\iota}$ at equation (1) for each firm *i.* We use a period of 200 days prior to the event for the estimation of the relevant parameters in order to reduce the overlapping between the estimation period for an event and the event window of previous events. Another crucial choice is about the event window [S,F] over which to calculate the abnormal returns and the cumulative abnormal returns. This is the timespan believed to be relevant for the market reaction, over which the prices of securities are expected to adjust. This window contains the event date, but includes also periods before and after the event. We use three different event windows: a symmetric three-day period [-1,+1] around the date of the event, meant to capture the effect of the event on impact, an asymmetric seven-day period [-1,+5] that puts more emphasis on the post-event period and a symmetric eleven-day period [-5,+5]. A clear trade-off emerges in selecting these windows. Large periods allow our estimates to capture more news, which may spread immediately before and after the occurrence of the event. Smaller – and asymmetric – periods, on the other hand, are more precise in identifying the actual effect of the event. In session 4, we show our empirical results for all three event windows.

To evaluate the economic impact of our crucial events, we run the following OLS regression:

$$CAR_{i,S,F} = \gamma CAT_i + \delta SP_i + \rho_j \sum\nolimits_j I_{j,i} + \varepsilon_{i,t} \tag{5}$$

where $CAR_{i,S,F}$ represents the cumulative abnormal return for the stocks of firm *i* for an event period that begins at day *S* and finishes at day *F*, CAT_i and SP_i are dummies respectively for Catalan and Spanish companies and $I_{j,i}$ are industry fixed effects, according to the Industry Classification Benchmark (ICB). Firms may belong to one of ten industries: basic material, consumers' good, industrials, oil and gas, technology, consumers' services, financial, health care, telecoms and utilities. The former five industries constitute the tradable sector, the latter five the non-tradable. Hence, positive (negative) values of $\gamma$and δ indicate positive (negative) cumulative abnormal returns following an event respectively for Catalan and Spanish firms, after controlling for industry specific characteristics.

As discussed in the previous section, the economic effects of these events may differ across sectors. Large difference may emerge between tradable and non-tradable sectors, particularly if the events provide new information on access to foreign markets or on increased bureaucracy in the use of transportation infrastructures. To account for these possible differences, we run also the following OLS specification, separately for tradable and non-tradable:

$$CAR_{i,S,F} = \gamma CAT_i + \delta SP_i + \varepsilon_{i,t} \tag{6}$$

Results

The empirical results on the economic impact of the four main events in the Catalan-Spanish relation, estimated according to eq. (5), are shown in Table 2. For each of the four episodes, we report the average cumulative abnormal returns (CARs) for Spanish and Catalan companies for the three event windows, which measure the effect on impact [-1,+1], the evolution in the post-event period [-1,+5] and the average pre and post-event effect [-5,+5].[7]

Table 2

			[-1,1]	**[-1,5]**	**[-5,5]**
Event III	Spanish Parliament	**CAT**	-2.6%**	-5.4%***	-0.5%
	Approval	**No-CAT**	-2%**	-4.5%***	-1%
		# obs			
Event V	Constitutional	**CAT**	2.7%***	3.7%**	5.5%**
	Court Ruling	**No-CAT**	1.2%	1.2%	2.3%
		# obs			
Event IX	Referendum	**CAT**	-3.3%**	-5.1%***	-6.1%**
		No-CAT	-1.3%	-2.8%*	-3.6%*
		# obs			
Event X	Declaration of	**CAT**	2.7%**	4.8%***	5.6%***
	Independence & art 155	**No-CAT**	1.0%	3.7%**	5%***
		# obs			

The approval of the Catalan Statute by the Spanish Senate on *May 10th 2006* (event III) is associated with a reduction in the CAR of both Catalan and Spanish firms on impact and in the post-event period. The average effect on the larger event window is instead not statistically significant, suggesting possible positive excessive returns in the pre-event period.[8] According to the theoretical arguments provided in section 3, this negative effect may be due to the increase in regulatory uncertainty associated with the additional bureaucracy or to the possible double fiscal collection induced by the Statute. In particular, joint Catalan-Spanish responsibility on Catalan ports and airports should increase the bureaucratic burden for Catalan firms in the tradable sector and for

[7] Table A.1 in the appendix presents the estimates of eq (5) for all ten events described in Table 1 using the [-1,5] event window.

[8] Estimates on the [-5,1] window, available upon request, are positive (albeit not statistically significant) for both Catalan (+2.4%) and Spanish (+1.6%) firms, thereby confirming this interpretation.

Spanish (tradable) firms using Catalan infrastructures. Table 3 reports the estimates according to eq. (6) separately for Catalan and Spanish firms in tradable and non-tradable sectors for our three event windows. As expected, the negative effect is driven by firms in the tradable sector and emerges mainly in the post-event period [-1,+5].

Table 3 (Event III)

		[-1,1]	[-1,5]	[-5,5]
Catalan Firms	Tradable	-0.015	-0.056***	-0.024
		(0.014)	(0.020)	(0.016)
	Non Tradable	0.004	-0.003	0.042*
		(0.011)	(0.018)	(0.023)
Non Catalan Firms	Tradable	-0.003	-0.034***	-0.007
		(0.006)	(0.008)	(0.006)
	Non Tradable	-0.002	-0.009	-0.001
		(0.004)	(0.007)	(0.009)

The ruling of the Spanish Constitutional Court (event V) on *June 28th 2010* modified the course of action in the Catalan-Spanish negotiation. More specifically, it eliminated the possibility of creating a Catalan authority for fiscal collection and thus reduced regulatory uncertainty. Table 2 (event V) shows that the CAR of Catalan firms increased on impact (+2.7%), in the post-event period (+3.7%) and also in the longer window (+5.5%); whereas the no statistically significant effect emerged for Spanish firms. Table 4 provides a closer look at this event and suggests that, also in this case, the (positive) effect on Catalan firms was entirely due to firms in the tradable sector.

Table 4 (Event V)

		[-1,1]	[-1,5]	[-5,5]
Catalan Firms	Tradable	0.019**	0.041***	0.062***
		(0.009)	(0.013)	(0.018)
	Non Tradable	0.001	0.000	0.013
		(0.010)	(0.012)	(0.019)
Non Catalan Firms	Tradable	-0.000	0.001	0.017**
		(0.004)	(0.006)	(0.009)
	Non Tradable	-0.006	-0.009	-0.009
		(0.005)	(0.006)	(0.009)

Unlike the episodes associated with the Catalan Statute, the October 2017 events, which related to the Catalan independence, increased political uncertainty and sent ripples through the Spanish financial market (see Figure 1). As suggested by the results in Table 2 (event IX), the episodes of the *October 1st 2017* referendum largely reduced the CAR of Catalan firms on impact (-3.3%), in the post-event period (-5.1%) and in the longer window (-6.1%). Spanish firms were also affected, but the impact was of a lower magnitude: -1.3%, -2.8% and -3.6%, depending on the event window. Unlike in the previous episodes, the results in Table 5 show that a negative impact of similar magnitude occurred for Catalan firms in both tradable and non-tradable sectors. Among Spanish firms, instead, the negative effect emerged mostly in the tradable sector.

Table 5 (Event IX)

		[-1,1]	[-1,5]	[-5,5]
Catalan Firms	Tradable	-0.026**	-0.032	-0.066**
		(0.012)	(0.020)	(0.025)
	Non Tradable	-0.031***	-0.042***	-0.045***
		(0.009)	(0.011)	(0.016)
Non Catalan Firms	Tradable	-0.010*	-0.020**	-0.036***
		(0.005)	(0.009)	(0.012)
	Non Tradable	-0.007	-0.010	-0.023**
		(0.005)	(0.006)	(0.009)

Also the last episode analyzed in the Catalan-Spanish relation, the declaration of independence by the Catalan Parliament on *October 27th 2017* and the immediate enforcement of Article 155 by the Spanish Senate, affected the average cumulative abnormal returns of Spanish and Catalan companies. As shown in Table 2 (event X), the CAR of Catalan firms increased on impact (+2.7%), in the post-event period (+4.8%) and in the longer window (+5.6%) – thereby compensating almost exactly the losses suffered with the referendum (event IX). Spanish firms also enjoyed positive CARs: +1%, +3.7% and +5% depending on the event window. As in the previous episode related to the Catalan independence (i.e., event IX), for the Catalan firms the (positive) effect was present in both tradable and non-tradable sector (see Table 6), whereas it emerged mostly in the tradable sector for Spanish firms.

Table 6 (Event X)

		[-1,1]	[-1,5]	[-5,5]
Catalan Firms	Tradable	0.017	0.032*	0.034*
		(0.012)	(0.016)	(0.020)
	Non Tradable	0.016**	0.029**	0.024
		(0.008)	(0.013)	(0.016)
Non Catalan Firms	Tradable	0.004	0.025***	0.028***
		(0.006)	(0.007)	(0.009)
	Non Tradable	0.001	0.012*	0.024
		(0.004)	(0.007)	(0.016)

Conclusions

Even in Western Europe, a heated debate is taking place on the economic costs of peaceful, non-violent quest for independence. Scotland, Catalonia, South Tirol are few examples of regions that have tried to become autonomous countries. This quest for independence may seem anachronistic in an ever more integrated world, in which supranational institutions, such as the EU, provide access to larger markets and contribute to equalize legislations. Quite on the contrary, the existence of institutions that provide some of the economic benefits previously associated with being part of a nation, such as the access to large markets, may create more demand of independence. Faced with this quest, central governments respond by conceding more fiscal federalism and decentralization. The transition towards more decentralization or outright independence creates cost, benefits and uncertainty. Decentralization may increase the amount of resources available to a region, if fiscal transfers to the central government are reduced. Yet, the establishment of joint responsibility over bureaucratic and fiscal procedures raises regulatory uncertainty regarding the fact that the costs to firms fiscally located or operating in the autonomous region may indeed increase. A quest for full independence poses additional political problems, since tensions will mount between the region seeking independence and the national state. This political uncertainty creates economic costs.

To evaluate these channels, we studied the two stages of the recent Catalan-Spanish relation: the negotiation for more autonomy that led to the Catalan Statute and the more recent request of independence. Using an event study methodology, we show that economic costs emerged – particularly for firms in the tradable sector – from the approval of the Catalan Statute, which increased the bureaucratic procedures for firms using Catalan infrastructures and created regulatory uncertainty. Instead, the ruling of the Constitutional Court that eliminated some features introduced by the Stature – such as a possible Catalan authority for fiscal collection – was associated with a positive stock market reaction for Catalan firms – again in the tradable sector. The same effects, but of a lower magnitude, emerged from these two episodes also for Spanish firms in the tradable sector.

The events related to the Catalan independence were largely surrounded by political tensions. With the October 1st referendum, the political confrontation between Catalonia and Spain reached unprecedented levels. Political uncertainty grew huge, as it become increasingly more difficult to predict whether the Catalan government was about to declare independence and, in this case, how Spain would react politically and even militarily. Our empirical results show that this episode imposed large economic costs on all firms. The negative stock market reaction was particularly strong for Catalan firms but – unlike in the previous episodes – no difference emerged between firms in tradable and non-tradable sectors. On October 27th, part of this political uncertainty was – at least temporarily, solved: the Catalan government declared independence and the Spanish Senate reacted by blocking the independence process. These joint events were met with a positive stock market reaction, particularly for Catalan firms.

Taken together, our results suggest that the stock market had a conservative reaction both to more decentralization and to the quest for independence. In the former case, the negative market evaluation of the approval of the Catalan Statute is likely to emerge in response to more regulatory uncertainty regarding a possible increase in the number of bureaucratic and fiscal procedures associated with the newly drafted joint Catalan-Spanish responsibilities. In fact, the negative impact affected mostly Catalan firms and firms in the tradable sector. The partial reversal imposed by the Spanish Constitutional Court ruling – particularly on the joint fiscal collection – was associated with a positive effect again for Catalan firms in the tradable sector. In the latter case, markets reacted negatively to the large increase in the political uncertainty on the Catalan-Spanish controversy that occurred at the referendum day. Catalan firms were hit strongly– regardless of their sector. Among Spanish firms, the effect was more concentrated in the tradable sector. The unravel of the event on October 27th certainly did not stop the political tension between Catalonia and Spain, but it did reduce the uncertainty on the future evolution of the events. Markets reacted positively to this new information, with Catalan firms in all sectors posting large gains.

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Table A.1

Event	Catalan Firms	Non Catalan Firms	# Obs
I	0.00713	0.0165**	101
	(0.00965)	(0.00720)	
II	-0.00363	-0.00679	93
	(0.0178)	(0.0139)	
III	**-0.0540*** **	**-0.0449*** **	**90**
	(0.0197)	**(0.0155)**	
IV	0.0142	0.00549	93
	(0.0128)	(0.0102)	
V	**0.0374** **	**0.0121**	**93**
	(0.0143)	**(0.0119)**	
VI	0.0102	0.00602	94
	(0.0257)	(0.0214)	
VII	0.0265	0.00834	99
	(0.0195)	(0.0165)	
VIII	0.00921	0.00103	99
	(0.0203)	(0.0171)	
IX	**-0.0514*** **	**-0.0279* **	**99**
	(0.0175)	**(0.0148)**	
X	**0.0477*** **	**0.0371** **	**99**
	(0.0172)	**(0.0145)**	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1