Papal Dividends:
Popes' Political Communications and Financial Markets*

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Abstract

This paper studies the market effects of communications by a non-conventional political leader: the Roman Catholic Pope. We analyze the market implications of Pope's communications, in particular encyclicals, for relevant companies. We claim that investors are sensitive to encyclicals that take a political position on relevant issues, because the Pope's vision can influence debates and decisions in their policy areas. However, the interpretation of the encyclicals also depends on which ideology dominates the discourse around the communication. A papal communication can thus result in a backlash and a material loss for exposed companies. We test this argument with an event study of Francis's 2015 climate encyclical. We show that this communication, viewed as a climate policy manifesto, caused renewable energy companies to lose stock value, but this loss was concentrated among American firms as a result of the conservative recoil at the Pope in the early months of the presidential campaign.

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1 Introduction

Political leadership has long been a relevant issue of investigation. Understanding forms of political authority is important, because actions and communications of leaders and political entrepreneurs influence political opinions, behavior, and policy. Along these lines, a large political science literature studies traits and implications of leadership. In parallel, a growing amount of political economy scholars investigate the economic consequences of leaders' positions, including how the partisanship, platforms, and communications of these individuals move financial markets (Fowler, 2006; Bechtel, 2009; Sattler, 2013; Benton and Philips, 2020).

This research has mainly associated political leadership with elected politicians and institutional representatives. However, it is increasingly clear that this definition is limited: other public figures have significant political clout, and their impact is of growing political interest. Consider for example spiritual leaders. Many studies trace the historical political engagement of religious authorities and their policy impact in early modern states (Gill, 1998; Bueno De Mesquita, 2000; Nexon, 2009; Stark, 2015). However, few systematic assessments exist on the *financial* implications of the political positions of religious entrepreneurs today.[1] This gap is puzzling given that spiritual leaders have access to large audiences and public consideration for them can easily surpass attention to politicians (Grzymala-Busse, 2016; Tuñon, 2019). It is especially compelling from a political economy angle because religious institutions influence voters' partisanship, thus also presumably their economic and financial decisions.

Against this background, we hold that there is a surprising lack of systematic research on the consequences of the most prominent spiritual figure in today's political landscape: *the Roman Catholic Pope*. Studies show that positions of the Vatican affect public framing of world issues (Genovese, 2015, 2019; Ziegler, 2020) and the deployment of papal resources to solve them (Warner, 2000; Juergensmeyer, 2008). Yet, virtually no research explores the impact of Popes' social positions on global financial markets. Despite common assumptions about the implications of papal statements (Hehir, 1990), political economy research has largely ignored if and how the politics of the Vatican materially affect private economic actors. This paper confronts precisely this question. We focus on the ways in which a Pope affects stakeholders linked to the issues raised in his formal communications. We thus provide the first theoretical and empirical investigation of why modern papal politics matters for financial investors, and how papal communications may influence stock markets.

We build on the observation that, despite a nominal distance from politics, the Pope frequently releases messages that tackle global political problems (Ferrari, 2006; Chong and Troy, 2011).[2] We focus

[1] Some scholars explored the effects of religious leaders' diplomatic visits and communications on political campaigns and redistributive policies. However, this research is primarily based on the economic development of specific religious communities (e.g. Gill, 2001) rather than the effects on stock markets. Furthermore, extant scholarship puts more emphasis on the impact of local or national churches (Minkenberg, 2002) rather than the positions of a leader like the Pope, the main focus of this paper.

[2] As others have noted, the Pope is especially tuned in with issues affecting the vulnerables, given that global crises with few national solutions tend to impact them the most. These considerations motivate the Vatican to regularly step up for

specifically on Popes' formal communications represented by *encyclicals*, which are the most authoritative written documents published by the Holy See after apostolic constitutions and decrees. Encyclicals are part of the repertoire of any Pope, and all Popes are expected to write a number of them throughout their tenure. They tend to have specific themes, sometimes related to individual behavior or spiritual affairs but often targeting public issues, e.g. social inequality and economic integration. Each Pope chooses the themes of his encyclicals based on issue priorities and personal preferences. Almost inevitably, through these writings the Pope places himself on either side of a major public debate. In fact, research has shown that encyclicals reveal a Pope's more or less traditional position on various social and economic issues (Genovese, 2015; Li et al., 2016).[3]

We study the effects of a new social encyclical on financial markets. We contend that a clear political message underlying the papal document can affect the value of assets associated with the issue of the encyclical. This is because the Pope's message can affect the policy debate within countries that pay attention – for example, Christian-majority countries, or countries with close linkages to the Vatican (Tuñon, 2019; Ziegler, 2020). We argue that the direction of the effect lies on the left-right ideology of the Pope in question. Additionally, the interpretation of the Pope's text depends on the political context in which his message is discussed. Hence, we further argue that an encyclical has market effects based on how the political leaning of the Pope blends with the political conditions of the country where companies operate and where information related to the Pope is consumed.

More specifically, we claim that a Pope's new encyclical can hurt or reward the most exposed market actors, depending on which public voice dominates the national discourse around the Pope's ideological message. Markets tend to favor right-leaning policies because they provide more predictable returns to investments (Brooks, Cunha and Mosley, 2021).[4] Thus, if a Pope's encyclical embraces a position of the ideological right, right-wing voices would likely back it up. This message would potentially boost investors' confidence in status quo market actors and privilege traditional assets that benefit from conservative policy stands (Sattler, 2013).

By contrast, a left-wing Pope would challenge traditional economic forces. His message could generate price volatility and even hurt some traditional companies in favor of alternative markets. We contend this can happen if the most influential domestic political voices are on the Pope's side. In this case, the Pope's progressive message would gain policy credibility, and would threaten consolidated and traditional market actors. However, a left-wing policy message could also face backlash. The progressive message of a left Pope could generate fierce opposition by those that sustain traditional markets and their stakeholders,

these communities (Chong and Troy, 2011; Genovese, 2019).

[3] Historians argue that, since the beginning of the 20th century, Popes have tried to find a balance between the rejection of the communist economic model and the endorsement of a socially viable market model (the Vatican's so-called 'third way' of thinking about the role of the state in a free market economy, see Himes, 2006). Accordingly, from an economic policy perspective, Popes may be perceived as more right- or left-leaning.

[4] Furthermore, investors regularly follow business outlets, which tend to be more conservative (Patterson and Donsbagh, 1996).

for example right-wing media. If this occurs, backlash would hurt the credibility of the left-wing policy message, and consequently the profitability prospects of companies that would benefit from new policy. Hence, we expect that the release of an encyclical affects companies in a direction consistent with the Pope's left-right position and the reactions of the rallying political forces within relevant countries.

We test our argument with a case study of *Laudato Si*, the first encyclical solely written by Pope Francis and released in 2015. This encyclical is centered around climate change, an issue mostly associated with the political left. Francis approached the case for battling climate change with a strong political voice – emphasizing social justice, blaming materialism, even bordering market skepticism.[5] Importantly, Francis's message was depicted as a socialist agenda in a number of countries. Most notably, the US right-wing outlet Fox News made strong associations between Francis's platform and the 'radicalism' of Bernie Sanders. Similar comparisons were made elsewhere between the Pope and, e.g., Raul Castro of Cuba.[6] Following our argument, one could expect that the encyclical had an effect on the stocks of the biggest energy companies exposed to climate policy, many of which are based in the most industrialized (and Christian) countries around the world. These companies include, on the one hand, fossil fuel firms and, on the other, green energy firms. Following our theory, a negative effect of the *Laudato Si* on fossil fuel stocks and/or a positive effect on green energy stocks would indicate a supportive reception of the Pope's climate message. By contrast, the opposite effects imply the Pope's failure to supply confidence to the green markets and a backlash by right-wing forces.

Our empirical test is an event study that draws on daily stock values of the most traded global fossil fuel and renewable energy firms in the months around the release of the climate encyclical. Statistical analyses show that the publication of Francis's encyclical did not affect fossil fuel returns. Instead, it depressed the stock value of green energy companies: renewable companies cumulatively experienced about 3% abnormal losses on their prices in the month after the publication. In line with our theory, the empirical investigations suggest that American green energy companies experienced the main market losses due to the encyclical, because of the the politicization of the issues in the American domestic debate. We specifically trace this negative effect to the backlash of US right-wing media against Francis.

The findings shed important light on some counterintuitive interactions between international leaders, national politics, and financial speculation. We enrich the scholarship on the political communications of international institutions and their credibility for stock markets by theoretically and empirically documenting that information from non-conventional authorities that lack direct policy relevance transposes to investors (Gray, 2009; Wilf, 2016). Furthermore, we indicate how media discourse can hijack the interpretation of such authoritative messages. Our research ultimately shows that markets seek out in-

[5] In *Laudato Si*, the Pope takes a relatively negative position on carbon markets and pollution permits, saying that "in no way do [market mechanisms] allow for the radical change which present circumstances require" (171).

[6] See BBC. 'Is the Pope a Communist?' June 7, 2015. https://www.bbc.co.uk/news/magazine-33024951, and The Wall Street Journal. 'How Pope Francis Became the Leader of the Global Left'. September 24, 2015. https://www.wsj.com/articles/how-pope-francis-became-the-leader-of-the-global-left-1482431940.

formation about likely future policy directions (Kucik and Pelc, 2016; Benton and Philips, 2020), and that this can come from such distant sources as the Pope. Thus, our study underscores the important role that non-elected officials play in forging political discussions with material consequences, and refocuses the attention of political economy research on the understudied effects of the politicization of and backlash against international actors.

2 Popes and Stocks

2.1 Political Leaders' Communications and Financial Market Behavior

The influence of political leaders over financial markets is an increasingly relevant topic of public and scholarly debate. In political economy research, the main presumption underlining this debate is that asset prices reflect all publicly available information about those leaders, and that new information affects investors' views on the future value of assets (Fama, 1970). New information comes in different forms. It may be a leader's position on an emerging issue that affects assets in the short run; news about the leader herself that impacts markets directly; or a change in policy views that could affect markets in the future. The most influential effects seem to be related to political newcomers, election underdogs, and unexpected appointees (Mosley and Singer, 2008; Bechtel, 2009).

Political economy scholars have investigated if particular nuances about new leadership affect financial stocks. Some works show that turns in the ideological orientation of leaders can trigger volatility. Stronger market reactions occur when new information concerns lesser-known, non-incumbent figures (Bernhard and Leblang, 2006; Jensen and Schmith, 2005), as long as they are credible and unconstrained (Fowler, 2006; Brooks, Cunha and Mosley, 2015). Importantly, a number of studies point to the style and rhetorical positions of leaders, suggesting that not only actions, but also *communications* trigger stock price volatility. Accordingly, high amounts of resolve in newcomers' messages have significant market effects (Benton and Philips, 2020).

The majority of studies on the relation between political communications and financial markets focus on politicians and political representatives. However, political discourse is not only made by politicians, and other personalities are also responsible for salient political events. Along these lines, a new set of studies investigate the effect of other politically salient institutions. Here, too, there is increasing agreement that these actors have important implications for global markets. For example, the appointment of technocrats outside of the realm of policy influences capital movement (Clark and Arel-Bundock, 2013; Alexiadou, 2016; Hallerberg and Wehner, 2020). Similarly, information from meetings at international organizations updates investors' financial risk (Gray, 2009; Wilf, 2016). Importantly, this research has highlighted that it is the content of communications and the public framing around them that cause market reactions (Genovese, 2021).

In this paper we extend the logic about market implications of political communications to actors without any form of political association. Recent studies highlight the political clout of self-authorized representatives and moral entrepreneurs (Ferrari, 2006; Montanaro, 2012). We follow this research and maintain that, as long as an authoritative source expresses an identifiable ideological position, their communications can have a significant impact on financial markets. This is because their communications can stir the direction of public discourse, implant new ideas and inform policy positions across political parties and agenda setters – hence paving a path to policy concerns which, in turn, affect the market value of affected assets.

We believe that a leader whose messages may move financial market is the Pope. The Pope is, of course, a special type of spiritual official: he has access to a jurisdiction and holds formal votes at international organizations, all characteristics that make papal actions particularly important for transnational political agendas (Gill, 2001; Minkenberg, 2002; Pelc, 2019). However, the *material short-term effects* of Popes' positions remain largely understudied. We contend that in most market-oriented countries – many of which have significant Christian populations – Popes' communications are market-relevant. We now outline how reactions to papal communications can reveal information to investors.

2.2 The Market Effects of The Pope's Political Vision

Besides developing spiritual advice and advancing theology, the Pope regularly releases formal communications focused on *social* teaching. Since the 1962 Second Vatican Council and the Roman Catholic reforms, the Vatican has strongly committed to its social doctrine, which is effectively represented by official communications about a range of global social issues. After 1962, the most comprehensive type of communication for these purposes has been the encyclical, "the most characteristic and ultimate purpose of [social] teaching" (Paul VI, 1969).

Social encyclicals concentrate on specific issues, often following crises as they emerge across the world (Genovese, 2015). Nonetheless, virtually all post-1962 encyclicals have reflected on fundamental social dilemmas against the backdrop of globalization, e.g. poverty and war (Stark, 2015).[7] Despite a continuous focus on vulnerability and social tension, the tone and framing of papal issues is far from constant. Several experts have documented that different Popes have taken different positions on global problems (Himes, 2006; Campbell, 2010). So, while social encyclicals may have similar patterns across papacies, the politics reflected in these texts vary substantially across time and Popes.

As an example, consider the issue of economic markets and their role for peace and welfare in the aftermath of World War II. John XXIII (1958-1963) was skeptical of economic liberalism and chose a hard stand on markets. By contrast, John Paul II (1978-2005) favored a liberal view and had vast influence on

[7]Popes also release political communications in other forms. Similar patterns of political messaging are observed, for example, in the Pope's behavior on social media. While we focus on encyclicals given their depth and rarity, we assume the Pope may complement them with other communications (Genovese, 2019).

the market ideology of leaders with conservative orientation (Brown, 2009). These positions spilled onto these Popes' social encyclicals. For example, in John Paul II's 1991 *Centesimus Annus*, which contains a hopeful message for states at the dawn of the post-Cold War era, the Pope defends the efficiency of free markets "for utilizing resources and effectively responding to needs" (34). Similarly, in *Caritas in Veritate* Benedict XVI addresses the market economy in light of the Global Recession, championing the need for stronger banks.

These observations suggest that Popes have an inclination towards political issues that approximates right versus left positions, i.e. what political scientist call the ideological position on the economy. Along these lines, an encyclical on a social issue would reveal *the Pope's economic policy vision*, portraying him as more or less supportive of free market operations for the purposes of solving said public issue (Li et al., 2016). Following this intuition, we assume that a communication from a Pope with a more conservative or liberal position may channel different policy visions that target real-world economic actors.

At the same time, it is unreasonable to expect that papal messages and their policy recommendations would reach investors directly. Rather, we contend that the effect of the Pope's position embedded in an encyclical depends on *the domestic context* where the Pope's message resonates. Evidently, the Pope's message requires a sound board to reach markets. Consider here the role of the media. If the media does not give space to the Pope's message, one may expect that the release of a new encyclical does not reach the salient public discourse and no policy-relevant discussion ignites. In this case, market investors do not feel pressed to react, as the papal message does not provide new information to them.

By contrast, if the encyclical becomes politicized, a policy-relevant debate with market implications emerges. Importantly, we claim that the nature of market reactions depends not only on the underlying ideological position of the Pope, but also *on which public voice dominates the national discourse around a Pope's communication.* Since markets tend to favor right-leaning policy, we expect that a right-leaning Pope's message generates support from right-wing media voices. The Pope's message would then boost market actors that gain from traditional financial investments. This materializes in positive returns for 'locked-in' firms and negative ones for new-coming ones.

What if a Pope's communication is not aligned with the traditional right, but rather leans towards the left? We argue that a left-leaning papal message could give credibility to alternative policy, which could then create an opportunity for economic newcomers to gain market share. That is, unless traditional public forces react. The Pope's message may be seen with hostility by right-wing media, which may mobilize against the Pope's stand and policy vision implications. The more powerful the backlash by conservative media, the less certainty there is around the assets that would win from a left-wing policy. Hence, in this case investors would lower expectations about the profitability of the firms that gain from this policy, and disinvest on the premise of backlash.

Below we explore the implications of this argument with a case in point: the market effects of the

climate encyclical by Pope Francis. We first describe the context of the encyclical and the potential mechanisms driving its market support or backlash. We then identify the companies we expect to be more vulnerable to any market volatility generated by this event, and evaluate our argument with a statistical analysis of stock market data. We conclude by discussing how our argument is generalizable beyond the case study of Francis's 2015 encyclical.

3 Francis, the Climate Encyclical, and Energy Markets

We analyze the financial implications of the publication of Francis's first social encyclical, called *Laudato Si*. Written in May 2015, the 184-page letter focuses on environmental degradation and climate change. It was first leaked by the Italian newspaper *L'Espresso* on June 15, 2015, and then officially released (unchanged) at noon on June 18, 2015 at a Vatican news conference. The Pope reportedly thought of this encyclical not only as an environmental statement but a meditation on the greater problems captured by environmental degradation, namely inequality and poverty. At the same time, the letter tackles the science and implications of climate change directly. It explicitly laments sources of pollution as well as the implications of lack of clean water and loss of biodiversity. It unambiguously reflects on the economic rules that influence environmental exploitation, and puts forward a political position on these mechanisms. As Francis himself noted on Twitter on the day of the encyclical release, his message was that "there is a need to seek other ways of understanding the economy and progress #LaudatoSi" (June 18, 2015).

The encyclical was received by the public in various ways. Environmentalists and climate activists registered it as a political manifesto and welcomed the punches directed to liberal economic forces.[8] Economists read it as an attack to capitalism broadly intended, a collection of ideas in support of progressive social policy, some even in tension with markets themselves.[9] Importantly, the media played a major role in the projection of the Pope's message. According to our theory, the public discussion and politicization of the Pope determine how investors react to an encyclical. Since public debates are built first and foremost around the news, exploring media coverage is useful to start inferring investors' mood at the time of the encyclical.

For exploratory purposes, we first traced the media reporting of this event in English-language print sources. Figure 1 reports the percentage of newspaper articles featuring the word '*Pope*' out of all the news published in the four weeks before and after the publication of the *Laudato Si* (i.e. about 54,443 articles). Given our interest in left-right positions, and consequently the ideology of newspapers broadly consumed in (English-speaking) Christian majority countries, we sampled four sources: *The Guardian*,

[8] Carrington. *Will Pope Francis's encyclical become his 'miracle' that saved the planet?* The Guardian, June 18, 2015.

[9] In an email to the NYT on June 20, 2015, Harvard economist Professor Stavins said "I respect what the pope says about the need for action, but this is out of step with the thinking and the work of informed policy analysts around the world, who recognize that we can do more, faster, and better with the use of market-based policy instruments".

the *Financial Times*, *The New York Times*, and *Wall Street Journal*. Two of them (*The Guardian* and *The New York Times*) represent more general audiences with more social-liberal views. The other two (*Financial Times* and *Wall Street Journal*) are consumed in particular by businessmen and investors.

Figure 1 shows that newspapers raised the attention on the Pope around the encyclical. The *New York Times* dedicated more than 4% of its articles to the Pope in the days around the publication (91 articles in the whole June – 1% of their full coverage –, compared to 40 articles in the second half of May). Interestingly, business-focused news also gave significant volume to the Pope at the time of the release. Perhaps surprisingly, the *Wall Street Journal* – i.e. the most conservative of the selected outlets – spent about 6% of their coverage (6 articles) on the Pope the day of and after the release of the *Laudato Si*. This suggests that the central event concerning the Pope at this point in time was not only made relevant by the general-audience media, but especially so among conservative, business-savvy news sources.

The content of the news articles is also noteworthy. Figure 2 describes the word frequencies of 104 most relevant encyclical-related articles we qualitatively identified in the news sources.[10] As indicated by the size of word frequencies, the news articles mainly focused on the central topic of the encyclical – i.e. climate change. At the same time, a significant number of articles also refers to issues related to the economy and markets, as shown by the recurrence of words such as '*compani*', '*invest-*' and '*capit*[al]' (in red). This pattern suggests that influential media emphasized the economic policy dimension of the Pope's message, and this was equally underscored in conservative outlets. Presumably, in some outlets this message was conveyed with enthusiasm, while in others – e.g., the conservative ones – with concerns.

The political divisiveness of Francis's message seems to emerge in the articles. On the day of the release (June 18, 2015), a Guardian reporter states: "*One recurring motif throughout the encyclical is a general scepticism [...] to the role that big business should play in tackling climate change.*" Similarly, the Pope's hostility to traditional business in face of climate change resonates in the Financial Times articles of June 18. One article notes that the Pope made the case for "*a new global economic structure that would make it more difficult for large oil companies, agricultural producers and industrial groups to harm the environment in their quest for profit.*" In short, the news conveyed that Francis sought to take a strong position on a predominantly left-wing issue space.

Against this background, which financial sectors should be receptive of this political message? Given the topic of the encyclical, we focus on the effects of Francis's message on energy companies. Energy markets are globally dominated by fossil fuel enterprises, especially oil and gas. These firms account for more than 50% of energy production in industrialized countries (more than 70% in some countries such as the United States). At the same time, renewable energy has steadily burgeoned, and electricity from cleaner natural sources has been increasingly included in the make-up of international energy portfolios.

[10] This search was based on the keyword 'encyclical' between spring 2014 (when it became known that the Pope was going to write a social encyclical) and summer 2016 (a year after the release of the *Laudato Si*) on *The Guardian*, *The Financial Times*, and *The New York Times*, including the international edition (we could only access abstracts for the *Wall Street Journal*, so we did not use those).

Figure 1: *Newspaper coverage of the query "Pope" by representative sources.* This figure shows the coverage of articles that include the key-term 'Pope' for (left) The New York Times and The Guardian, and (right) Financial Times and Wall Street Journal. Data from the Lexis Nexis database (May 31, 2015 – July 2, 2015). Percentage over the daily total number of articles published by the outlets.

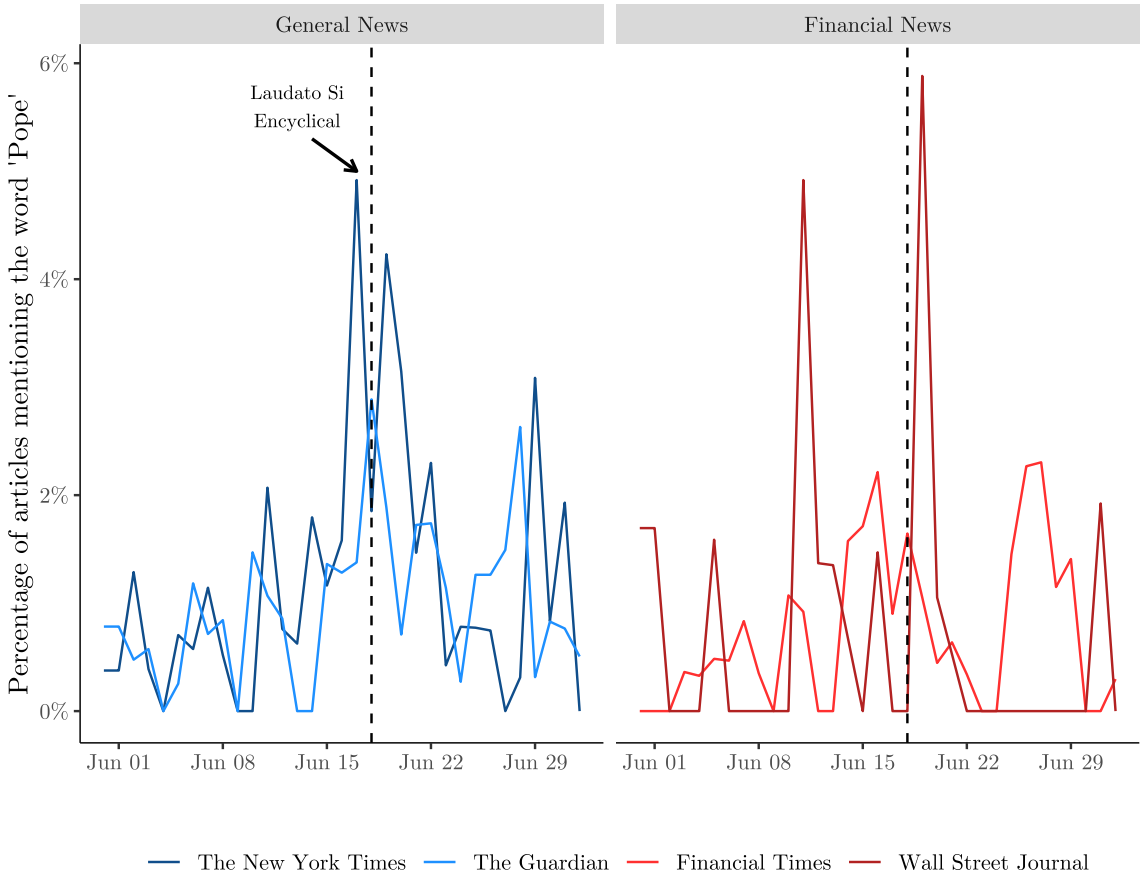
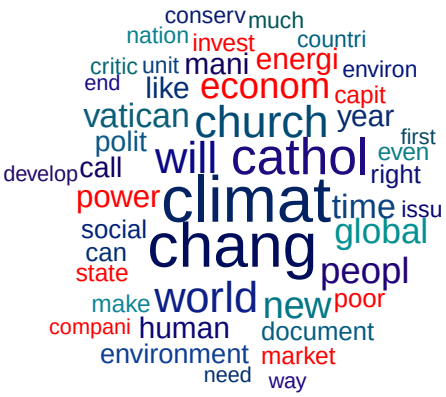


Figure 2: *Word cloud of most frequent words in relevant newspaper articles.* This figure reports the 50 most frequent words (frequency $>$ 150) related to the *Laudato Si* as per the sampled 104 news articles. Higher word font size corresponds to higher word frequency. Words in red correspond to an economic/market policy theme and were highlighted by the authors.



The profit trends of these two categories of energy firms have varied as a function of industrial and economic policy. Fossil fuel companies became dominant in the second half of the 20th century and still constitute the most 'locked-in' energy firms (Bayer and Urpelainen, 2016). Fossil fuels have also profited from climate policy adverse leadership (Aklin, 2018; Ramelli et al., 2018). At the same time geopolitical risks, in combination with technological innovation and experimental policies, have helped renewables increase their market share. As of 2015 (the year of the encyclical), renewables had become more successful, although not equally everywhere. Backlash against renewable energy installation existed partly because of fossil fuel lobbying, partly because of the bottom-up public objection to energy developments (Meckling, 2011; Aklin and Urpelainen, 2018; Kennard, 2020).

We investigate the impact of the 2015 climate encyclical on these two energy markets. We contend that this left-wing encyclical introduced information that moved investments as a function of the public discourse in support of or opposition against the Pope. Following out theoretical argument, Francis's message could have induced negative returns for fossil fuel companies and a boost in profitability of renewable energy companies if progressive media had battled traditional right-wing views and rallied in favor of the Pope's policy vision. Vice-versa, had the media mobilized *against* the Pope's message (as some patterns in Figure 1 suggest), the opposite effect can be expected. As per our previous discussion, a right-wing media recoil would reduce confidence in the more vulnerable renewable energy sector. This reaction, we argued, would result in negative returns for green firms.

There is reason to believe that the market effects envisioned in this theory can emerge across countries. At the same time, media coverage is specific to national contexts and responds to domestic audiences, and political media landscapes vary from country to country. Therefore, market effects of the encyclical may also be specific to countries where the Pope is more salient and where the public engages with his messages in a political way.

In the case of *Laudato Si*, we believe the United States presents a context where to expect strong effects for a number of reasons. First, the historical structural characteristics of the energy markets in this country suggest that some firms may be particularly vulnerable to external information. Fossil fuel investments in the US are larger than in Europe, where gas and oil are less predominant and largely imported. Furthermore, and differently from European counterparts, renewable firms in the US receive fewer economic incentives and less government protection (Bayer and Urpelainen, 2016). Liberal policy choices have left the renewable industry in the US vulnerable to information cycles and investors' power (Smith and Urpelainen, 2014; Aklin, 2018).

Figure 3: *TV coverage of the query "Pope" by representative US broadcasting sources.* The figure shows the percentage of relevant TV clips over total airtime by major US broadcasts. Data units correspond to GDELT 15-seconds clips mentioning the word "Pope" in the four selected networks (May 31 - July 2).

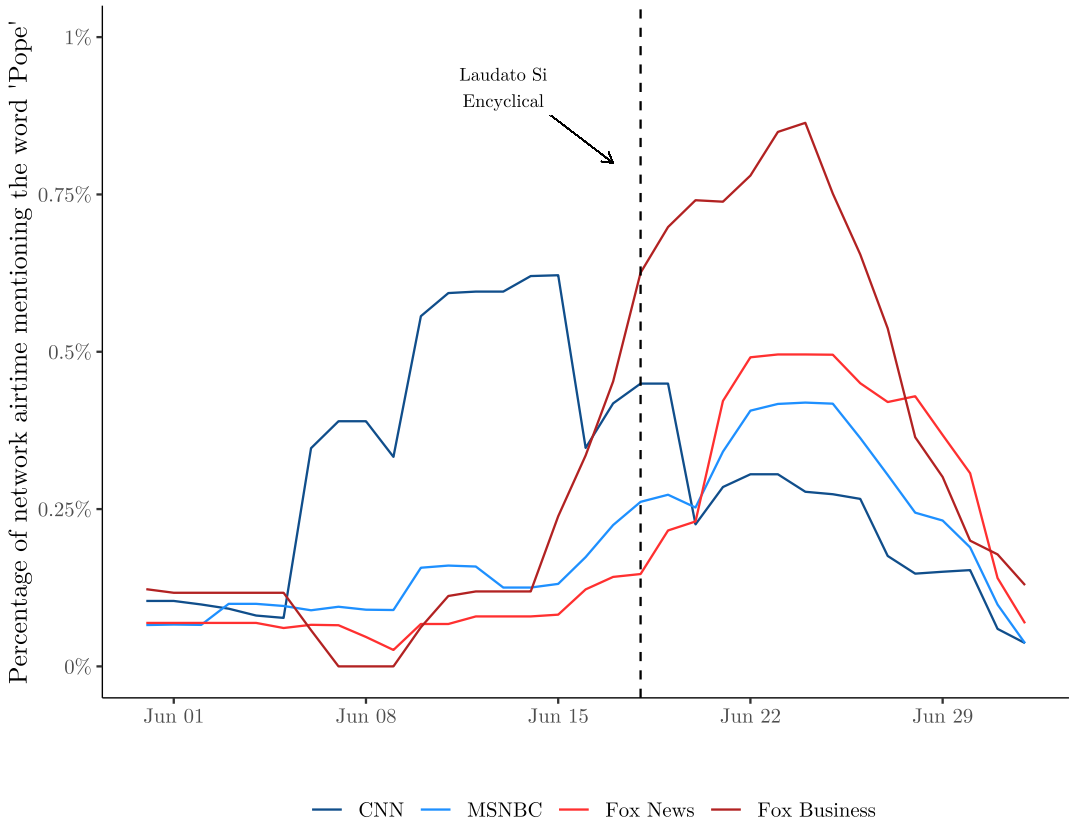
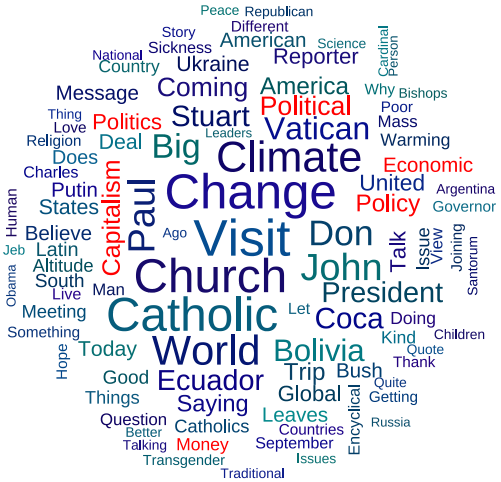


Figure 4: *Word cloud of most frequent words in relevant TV clips.* This plot shows the 100 most frequent words in TV coverage of the query "Pope" by CNN, Fox News, Fox Business, and MSNBC. Higher word font size corresponds to higher word frequency. Words in red correspond to an economic policy theme and were highlighted by the authors.



Perhaps more importantly, the national political discourse over Francis and the climate encyclical was particularly politicized in the US. In 2015, several American commentators compared the message of Francis's letter to the economic visions of Senator Bernie Sanders.[11] Relatedly, the Pope became a highly controversial figure at the backdrop of the presidential primary campaign.[12] So, if the Pope's message was seen as a preview of policies to could come under a strong Democrats' presidency, we expect that markets would have reacted similarly to the encyclical as they would to the announcement of a high chance of a radical left-wing president (Clark and Arel-Bundock, 2013; Sattler, 2013).

At the same time, a strong media apparatus in the US supports right-wing policy views. A large body of research shows that Fox News channels have been influential at rallying Americans against left-leaning policies (DellaVigna and Kaplan, 2007; Clinton and Enamorado, 2014), including climate change (Feldman et al., 2012), at important times such as the onset of crises or during electoral campaigns. If the Fox News media slant can affect political views among public opinion and elites, then it may as well influence investors' concerns and investment behavior. Hence, depending on the coverage of the Pope by outlets like Fox News, US renewables firms may have been particularly exposed to any public backlash inducing concerns among investors.

For this part of our argument to hold, we then ask if sources such as Fox News mobilized around the time of the encyclical. To engage with this question, we looked at data about broadcast events on US television channels, specifically the airtime of CNN and MSNBC (two general audience channels), Fox News and Fox Business (both part of Fox Corporation). This data is available online at the Global Database of Events, Language and Tone (GDELT). For this initial evaluation, we concentrate on all televised clips including the word '*Pope*' between May and July 2015. As Figure 3 suggests, in the US a significant amount of TV time was unsurprisingly focused on the Pope after the release of the encyclical. However, not all channels proposed the same amount of Pope content. Fox News and Fox Business proposed most of the programmes covering the Pope and the encyclical. Importantly, this coverage referred consistently to the economic policy implications of the Pope's message, as highlighted in red in Figure 4. These descriptive patterns suggest that the ideological framing around the encyclical, and the media context in which it was received, are critical to understand effects on investors' perceptions. Given the significant coverage of the Pope by Fox Corporation channels, we may expect that the content generated sizeable uncertainty for climate policy investments in the US, and that this may have resulted in negative returns in green stock markets. We explore more systematically whether this is the case with an event study design.

[11] In 2016, during his Democratic primary candidacy, Sanders made several remarks in awe of Francis. In April 2016 the Senator went to meet Francis in Rome. Bade, Gavin. 2020. 'Power to the people: Bernie calls for federal takeover of electricity production'. *Politico*. https://www.politico.com/news/2020/02/02/bernie-sanders-climate-federal-electricity-production-110117.

[12] Li et al. (2016) show that conservative Catholics in the US devalued the Pope's credibility on climate change in 2015, while left-wing Catholics found consistency between the Pontiff's views and those of their political allies.

4 Event Study

We empirically test our argument by studying stock prices of global energy firms. We first start with a sample representing the most sizeable firms in industrialized countries; we later focus on differences across countries. We consider two sets of firms: companies in the non-renewable (fossil fuel) energy sector and renewable energy companies. We perform separate analyses for these two sets of companies and compare results. We now describe the sample selection and the firms' stocks data that capture investors' perceptions of Francis's encyclical. We then describe the event-study methodology employed to estimate market reactions to the *Laudato Si*.

4.1 Data

Stock returns are our main quantity of interest. In order to construct a measure of returns, we collected information on stock prices of firms in the fossil fuel and renewable energy sector. The sample of non-renewable energy companies is made of 46 firms whose primary energy production activity is fossil fuel-based. We started from a sample of the most traded polluting companies identified in other market event studies (Genovese, 2021). For our purposes, we concentrate on the listed companies in the 2010 Forbes Global 2000 dataset that belong to the energy-production business. Stock price data availability narrowed the sample down to 46 companies involved in traditional energy production, e.g. in coal and oil business.[13] The vast majority of these companies has headquarters in North America and European countries (more than 70%). This is in line with what other studies on influential companies involved in climate policy lobbying suggest (Green et al., 2021). It is also convenient for our purposes, as these countries have important Christian constituencies, hence reasons to care about the words and deeds of Popes. The list of polluting firms and their headquarter countries are reported in the appendix (Table A.4). 24 of them are US-based (52% of the sample).

Our sample of renewable energy companies is also built following previous studies of clean energy markets (Aklin, 2018; Ramelli et al., 2018). We started from a sample of 48 major firms included in the Bloomberg Industry Classification Standards list of Renewable Energy companies. This sample draws on the Bloomberg list but we follow common practices and discard shell companies and penny stock firms. Additionally, we concentrate on firms whose primary activity is in wind, solar, hydro, biofuel, and other explicit clean energy operations, thus staying consistent to studies that stick to identifiable renewables firms and remove companies with ambiguous ties to the energy industry (Aklin, 2018). The final sample is representative of a cross-national population of traded companies whose main activities are in the green energy sector, and whose value on stock markets is not trivial.[14] Stock price data availability further

[13] From the original list of most traded fossil fuel companies, we exclude two due to extremely volatile stock prices in the time frame of interest, however our substantive results do not hinge upon their exclusion.

[14] Our final sample is almost identical to the one in Aklin (2018), although in additional explorations we tried to extend the sample by adding 11 more clean energy firms that are not in Aklin (2018) but are referenced in IG UK as top renewable energy companies. Adding these firms to the sample does not change our substantive results (Table B.7).

reduced our sample of renewable energy companies to 42 firms in this sector. The list of firms included in this sample and their headquarter country is reported in the appendix (Table A.5). Just like for the polluting firms sample, among the renewable energy firms the US is significantly represented, with 25 companies headquartered there (60% of the total).

We retrieved daily data on stock prices from Thomson Reuters' Eikon financial database. We employ this information to compute percentage changes in price of each company's stocks at the end of a trading day, with respect to the closing price at the end of the previous day. We call this measure $Returns_{i,t}$ for each firm i on day t. From the Thomson Reuters database we also obtained daily information on three market-wide indexes necessary to benchmark our analysis. These indexes are the New York Stock Exchange (NYSE), the Frankfurt Stock Exchange (DAX) and the Financial Times Stock Exchange (FTSE) indexes. We choose these indicators since the majority of energy firms in our sample are headquartered in either the US or Europe and those indexes measure performances of the most important financial hubs in these areas. All financial data span from November 1, 2014 until the July 23, 2015, to include the *Laudato Si* publication event (June 18, 2015). This time selection ensures we have enough information for the relevant time windows in the estimation strategy.

4.2 Event analysis

Our event of interest is the publication of the *Laudato Si* encyclical (June 18, 2015). We adopt an event-analysis design to study the effect of this publication on financial returns to energy-producing firms. This methodology estimates firms' returns under the synthetic counterfactual that the encyclical was not published. We can thus compare counterfactual and factual returns and identify the effect of the document's publication, controlling for the confounding effect of any pre-existing market-wide information, time trends, and shocks. We begin by defining two time-windows of analysis. The first is an "estimation window", which corresponds to the pre-event timespan used to estimate synthetic counterfactuals. The second is an "event window", where the effect of the event under consideration is estimated. The first window spans over 190 days: from November 1, 2014 (t_0) to May 10, 2015 (t_1). The second time window spans from May 18, 2015 (t_2) until July 18, 2015 (t_3): it is 61 days long and is centered around the publication of the encyclical.[15]

Our empirical strategy proceeds in two steps. First, we focus on observations in the estimation window solely ($t_0 < t < t_1$). The goal is to estimate, for each individual company, a linear market model – using ordinary least squares (OLS) – that predicts daily $Returns_{i,t}$ to that firm as a function of a vector of covariates $\mathbf{X}_{i,t}$ made of our three market-wide indicators (NYSE, DAX, and FTSE). An analysis of measures of fit confirms this procedure yielded satisfactorily predictive models. The average market model in the estimation window has an R^2 of 0.25. We do not observe significant differences in

[15] In a series of robustness tests we shrink and extend the arbitrary length of our event window and verify that results hold (Figures B.1 and B.2)

explanatory performance of our market models when distinguishing between clean energy and fossil fuel companies or US and non-US firms.[16] This gives us confidence that the models perform similarly across firms.

Once market models are estimated, we use them to predict daily percentage changes in prices for each firm's stocks in the event window ($t_2 < t < t_3$). Predicted $Returns_{i,t}$ represent our daily synthetic counterfactual observations around the publication of the encyclical. Next, we estimate two main outcomes of interest. We compute *Abnormal Returns*$_{i,t}$ for each observation in the event window, defined as the difference between the daily *observed* returns to a firm and those that are *expected* by our models (equation 1). We also compute *Cumulative Abnormal Returns*$_{i,t}$ as the sum of all *Abnormal Returns*$_{i,t}$ to a firm i from the beginning of the event window (t_2) until that moment t (equation 2). Table A.1 reports descriptive statistics of these outcome variables.

$$Abnormal\ Returns_{i,t} = Returns_{i,t} - E[Returns_{i,t}|\mathbf{X}_{i,t}] \mid t_2 < t < t_3 \tag{1}$$

$$Cumulative\ Abnormal\ Returns_{i,t} = \sum_{\tau=t_2}^{t} Abnormal\ Returns_{i\tau} \mid t_2 < t < t_3 \tag{2}$$

The second step of our set-up is the proper causal estimation. If the publication provided no additional information to firms in our sample, average *Abnormal Returns* before and after the event should not differ. We therefore use *Abnormal Returns*$_{i,t}$ and *Cumulative Abnormal Returns*$_{i,t}$ as dependent variables in a before-after design to assess the effect of the publication. Having defined these variables as the difference between observed returns (factual) and predicted returns (synthetic counterfactual) in the event window, we control for all time-trends, financial market-wide shocks, and previous information available to firms.

Our strategy attributes variations in the dependent variables to the effect of the publication under two critical assumptions. First, that the predictive performance of market models from the estimation window does not systematically change in conjunction with the publication of the encyclical. In other words, estimated market models should not systematically over-predict or under-predict counterfactual returns after the event. Second, that no shock simultaneous to the event of interest in the second window affects solely firms in the population we intend to represent (market-wide shocks are already accounted for in the counterfactual estimation).

The first assumption claims that market models estimated in the first window are fit to predict returns to companies across the entire second window. This assumption is untestable, but we minimize the distance in days between the two windows so as to make it plausible. Our preferred event window begins only eight days after the end of the estimation window, although shorter and longer event windows reported in appendix provide broad support to our results.[17] Regarding the second assumption, we reviewed all public events that occurred around the days the encyclical was released. At an international

[16] The average R^2 value for US companies is 0.29 and that for non-US companies is 0.20. The average R^2 value for fossil fuel companies is 0.31 and that for renewable energy companies is 0.19

[17] See Figures B.1 and B.2.

level, we find no major transnational event occurred in the weeks under analysis. In our results section we focus on one potential threat to this assumption that pertains the US political domain, specifically the beginning of the presidential primaries. This concern can be empirically evaluated. As we illustrate below, it does not threaten the internal validity of our analysis nor the logic of our argument.[18]

We estimate the effect of the encyclical by means of linear models of *Abnormal* and *Cumulative Abnormal Returns* that include a binary indicator called *June 18 onward*, taking value 1 after the publication of the encyclical, 0 before. We also include *June 18*, a dummy taking the value 1 exclusively for the date of the publication. On the right-hand side of our *Abnormal Returns* model, a lagged dependent variable further accounts for unobserved time dependence. We do not include lags in our *Cumulative Abnormal Returns* models because this variable at time $t-1$ is automatically correlated with its value at t. Finally, we include firm-level fixed effects. We introduce them because we intend to study within-firm variation before and after the event of interest, and fixed-effects allow us to control for firm-level unobserved heterogeneity.[19]

The coefficients of our binary treatment variables quantify the effect of the encyclical on firms' returns, reporting the average amount by which firms' observed returns depart from expectation following the event. We estimate models distinctively for the sample of fossil fuel and renewable energy firms to study sector-specific effects. Estimated effects should be negative for fossil fuel companies and positive for renewable energy companies in case Francis's message resonated in the markets by virtue of its progressive vision, *without* conservative media backlash. Vice-versa, coefficients should be of opposite sign in case the message resonated as a preview of policy opposition, e.g. in the case of backlash.

A descriptive analysis of *Abnormal Returns* provides some insights in this direction. Figure 5 shows estimated *Abnormal Returns* to fossil fuel and renewable energy companies in our sample and their averages in the event window.[20] The renewable energy sample shows more volatility in the entire event window than the fossil fuel sample, consistently with studies that point out clean energy firms are more vulnerable to political shocks than their fossil fuel counterparts (Aklin, 2018). Before the event, average *Abnormal Returns* are close to zero for both samples.[21] This indicates that, on average, there is no diversion from expected returns before the publication of the encyclical. After the event, instead, average *Abnormal Returns* are below the zero line, but *only* for the renewable energy sample. Fossil fuel companies have post-event abnormal returns that do not differ from zero.[22] Thus, clean energy firms'

[18] Other events that could have affected financial markets in June 2015 were the EU bank reform talks, which were however not officially announced, and the Greek IMF bailout expired on June 30. We believe that the likely effect of these specific events on (European) firms' returns should be captured by the market-wide indexes we use to compute $E[Returns_{i,t}|\mathbf{X}_{i,t}]$, and should therefore not be a reason of concern for our identification strategy.

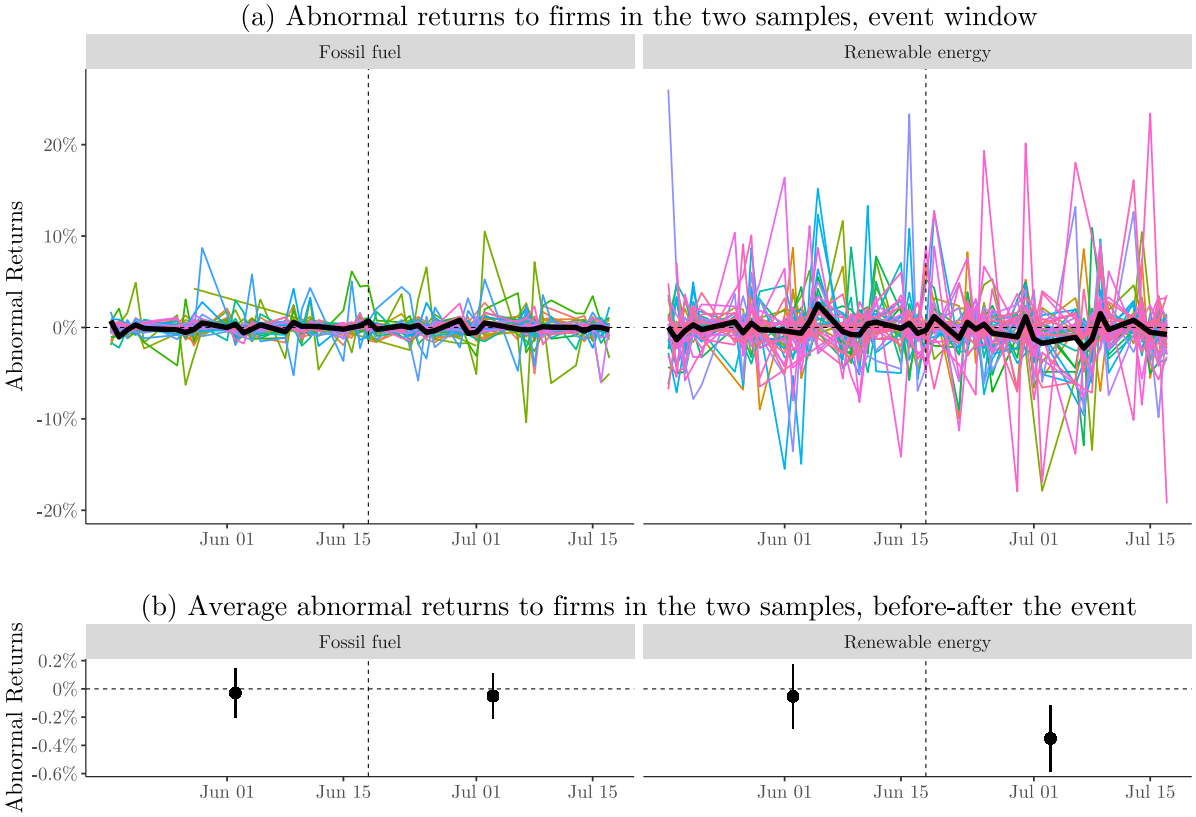
[19] In alternative specifications we substitute this with country-level fixed effect and consider the firm's headquarter country, however the results remain consistent.

[20] The plots exclude the companies Yingli Green Energy Holding Co Ltd (renewable energy sample) and BHP Group PLC (fossil fuel sample) due to high bound variation.

[21] Mean value is -0.03 in the fossil fuel sample, indistinguishable from 0 at p-value = 0.74. Mean is -0.05 in the renewable energy sample, indistinguishable from 0 at p-value = 0.65.

[22] Mean value for the renewable energy companies is -0.35 after the event, distinguishable from zero at p-value = 0.003. For fossil fuel companies the value is -0.05, with p-value = 0.54.

Figure 5: *Abnormal returns before and after publication of the Laudato Si.* This figure shows the abnormal returns for all companies for the entire period of analysis (a) and the averages before-after the encyclical (b). The dashed vertical line represents the publication of the *Laudato Si* encyclical (June 18, 2015). The thick black line in panel (a) reports daily average *Abnormal Returns*.



The analysis for the estimates in panel (b) is reported in the appendix (Table A.2).

returns were on average *worse* following the publication of the encyclical, both compared to fossil fuel returns and against their pre-encyclical values.[23] In the next section we delve deeper into these patterns.

5 Empirical Results

Table 1 presents the first set of results. Models 1–4 focus on fossil fuel companies, while models 5–8 consider renewable energy companies. First, we study within-firm variation in *Abnormal Returns* (AR) for the two industries, respectively. These are models 1 and 5. The main variable of interest is *June 18 onward*, which captures the effect of the encyclical on the entire period in the event window following publication. Consistently with our descriptive evidence, we find that the returns of fossil fuel companies were not abnormal following the release of the encyclical, neither immediately after nor in the entire period of the event window. On the other hand, the publication of the encyclical had a significant negative effect on *Abnormal Returns* to firms in the renewable energy sector. On average, renewable energy firms had daily observed returns after the *Laudato Si* publication that were smaller than expected returns by around 0.35%. Immediate effects of the publication (*June 18*), instead, are not distinguishable from zero, suggesting a marked prolonged negative effect. This negative effect – which holds also in Models 2 and 6 that substitute firm-fixed effect with headquarter-fixed effect[24] – is counter-intuitive if one assumes that some policy forces would be receptive of the climate message of Francis, and a boost of climate policy visions should incentivize green energy investments. At the same time, following our argument, it is explainable in a context of negative politicization of the Pope.

How large is this daily average effect when cumulated over the entire event window? Models 3 – 4 and 7 – 8 study the effect of the encyclical on *Cumulative Abnormal Returns* in the entire period after its publication. We find that firms in the fossil fuel sector did not experience *Cumulative Abnormal Returns* that differ from those before the event. This is consistent with the lack of an effect found when looking at *Abnormal Returns*. Instead, renewable energy companies lost on average 3% in value of their stocks following the publication of the encyclical. The effect is distinguishable from zero at conventional (0.05) significance levels.

Our results suggest that the fossil fuel companies that would hurt most due to an authoritative and unambiguous call for climate action did not in fact experience any significant market concern. Rather, new-coming companies, i.e. renewable energy firms expected to gain from a climate policy agenda, suffered from a lack of market confidence. This outcome may be the result of investors believing these firms to be less profitable, or responding to public signals that make these firms more vulnerable. As noted, we believe this can be explained by a media backlash against a considerably left-wing Pope. We

[23] Additionally, differences in mean of *Abnormal* and *Cumulative Abnormal Returns* in the renewable energy sector across different countries suggest that most action occurs in the US companies subsample (Table A.3) – something we come back to later in the empirics.

[24] We cannot include this fixed effect simultaneously to firm fixed effect due to perfect multicollinearity (each firm i is incorporated in exactly one country).

Table 1: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* of fossil fuel and renewable energy firms

	Fossil fuel				Renewable energy			
	AR		CAR		AR		CAR	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 18 onward	−0.03	−0.04	0.11	0.06	−0.35**	−0.34**	−3.12**	−3.00**
	(0.04)	(0.04)	(0.59)	(0.59)	(0.14)	(0.13)	(1.47)	(1.45)
June 18	0.85	0.85			−0.03	−0.01		
	(0.64)	(0.64)			(0.47)	(0.46)		
Abnormal Returns (t-1)	−0.34***	−0.34***			−0.18**	−0.16**		
	(0.04)	(0.04)			(0.07)	(0.07)		
Constant	−0.10***	−0.01	−3.36***	−0.20	−0.12	−0.12	−4.20***	−4.27***
	(0.03)	(0.03)	(0.29)	(0.29)	(0.08)	(0.07)	(0.81)	(0.81)
Firm FE	Yes		Yes		Yes		Yes	
Headquarter FE		Yes		Yes		Yes		Yes
Number of firms	46	46	46	46	42	42	42	42
Observations	1,864	1,864	1,937	1,937	1,767	1,767	1,783	1,783
Note:								*p<0.1; **p<0.05; ***p<0.01

All models in the table are linear estimations of returns using observations in the event window (May 18, 2015 - July 18, 2015). Standard errors clustered at the firm-level.

delve into this explanation by further exploring firms on a case-to-case basis. Given the US debate around Francis in combination with the American politicization of the climate issue in right-wing media, we split our samples between US and non-US firms. US renewable energy firms should have been disproportionately exposed to the media backlash that emerged in 2015 in the US, led by the Fox News Corporation and resulting in more extreme Republican views (Li et al., 2016). The effect of the encyclical should then be especially negative in the US sub-sample.

Table 2: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns*: Comparison of US and non-US firms.

	Fossil fuel				Renewable energy			
	US		Non-US		US		Non-US	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 18 onward	−0.08**	−0.10	0.04	0.34	−0.43***	−4.21**	−0.15	−1.46
	(0.04)	(0.51)	(0.07)	(1.12)	(0.14)	(1.96)	(0.26)	(2.19)
June 18	0.24**		1.44		−0.66*		0.94	
	(0.11)		(1.33)		(0.34)		(1.00)	
Abnormal Returns (t-1)	0.02		−0.36***		−0.06**		−0.24**	
	(0.04)		(0.03)		(0.03)		(0.10)	
Constant	0.06***	1.75***	−0.15**	−3.47***	0.003	−0.15	−0.26*	−5.12***
	(0.02)	(0.25)	(0.06)	(0.55)	(0.07)	(0.96)	(0.15)	(1.22)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	24	24	22	22	25	25	17	17
Observations	992	993	872	944	1,071	1,075	696	708
Note:								*p<0.1; **p<0.05; ***p<0.01

All models in the table are linear estimations of returns using observations in the event window (May 18, 2015 - July 18, 2015). Standard errors clustered at the firm-level.

Table 2 explores this hypothesis. The specifications follow the previous analysis, for we again study *Abnormal Returns* and *Cumulative Abnormal Returns*.[25] The results show interesting country-specific heterogeneity. Overall, we find significant effects for US-based companies, whereas results are not significant for non-US companies. Models 1 and 2 concentrate on US fossil fuel firms. These companies had slightly lower returns than expected by around -0.08% in the entire period following the publication of the encyclical. The same firms also experienced a boost by about 0.24% on the day of the encyclical. Both coefficients are statistically significant; however, they are very small in magnitude and do not amount to any significant *Cumulative Abnormal Returns* effect. Estimates are also not robust to alternative event window lengths (see Figure B.2). We observe no significant effect in the non-US sample of fossil fuel companies (Models 3 and 4).

We then turn to models focused on renewable energy companies. Here, US companies had lower returns than expected by around 0.43% in the period following the publication of the encyclical (Model 5). The effect is significantly different from zero at conventional levels. Importantly, the US subsample experienced a negative immediate shock: a reduction in stock value by around 0.66% on the very day the encyclical was published. The short-term effect on this subsample is associated with a p-value of 0.05 and is more precisely estimated in robustness tests (see Table B.6). Consistent with these findings, Model 6 shows that, over the entire event window, US companies in the clean energy sector lost an average 4.21% value in their *Cumulative Abnormal Returns* following the publication of Francis's encyclical. The non-US group of renewable energy companies, instead, reports no significant effect (Models 7 and 8).

Overall, these additional results suggest that the political stand of Francis, resonating in a clear left message through his climate encyclical, did not generate confidence in the markets, specifically not in the US stocks of renewable companies. On the one hand, these companies would be most cheerful of strong climate policy. On the other hand, they were most exposed to policy debates and conservative backlash. As we argued, this effect is best understood in the context of a politicized debate like the one around the Pope in the US in 2015. At that time, American politics started grappling with the beginning of the presidential primaries, in view of the 2016 elections. American political events may have influenced the views of the Pope and therefore the effects identified in our empirical analysis.

Along these lines, a potentially relevant threat to identification and a source of concern about the effect found among US-based renewable energy companies comes precisely from the primary campaign. June 2015 was the month of Republican primaries candidatures, and Donald Trump made his own announcement of running in the afternoon of Tuesday, June 16,[26] Our design removes the effect of this shock, to the extent that it affected the entire stock market. However, previous studies have shown the negative effect Trump's 2016 election had specifically on stocks of renewable energy companies, who

[25] The exception is the exclusion of headquarter country-fixed effect, which we cannot include here since we are conditioning the effect of the encyclical on this attribute.

[26] See: https://time.com/3923128/donald-trump-announcement-speech/.

stood to suffer from his vocal climate skepticism. For example, Aklin (2018) estimates clean energy companies lost about 3% of their value following Trump's victory in 2016. Although climate skepticism was not a defining feature of the speech Trump gave on June 16, it is possible that our estimation picks up earlier concerns specific to renewable energy market actors about the policy prospects in case of a Trump presidency.

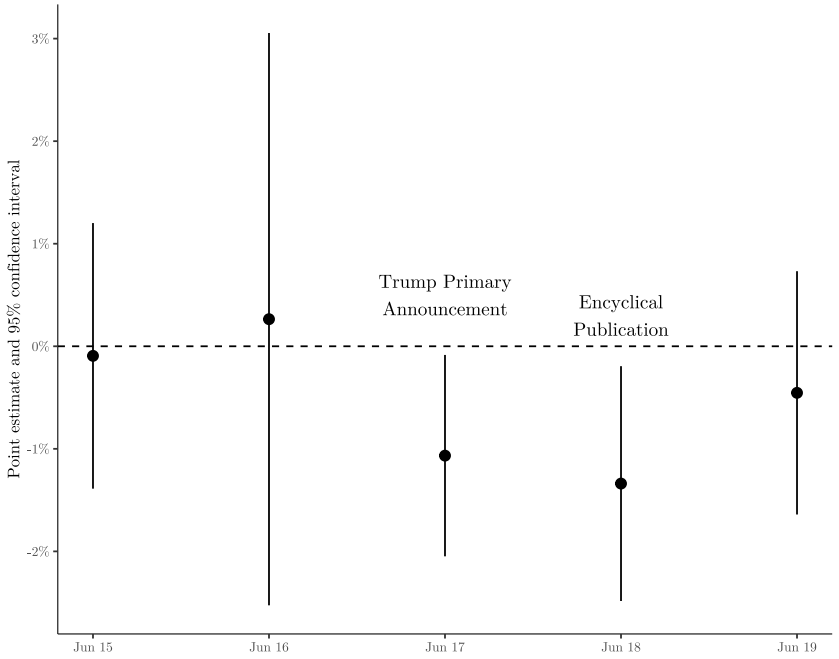
To tackle this concern, we narrow down our event-study analysis of *Abnormal Returns* to US-based clean energy companies, by studying in details the trading week that includes both Trump's primary announcement and the publication of the *Laudato Si* encyclical. Stock exchanges are usually closed for business on weekends, therefore we focus on days going from Monday, June 15 until Friday, June 19. We re-estimated a linear model of *Abnormal Returns* which includes firm-fixed effects to study within-firm variation. We substitute our binary treatment variable with a categorical variable specific to each trading day. The reference point of this variable is Friday, June 12 (the end of the trading week before the one we study). Our goal is to calculate day-by-day effects for this group of US-based companies in this narrow time window.

Point estimates and 95% confidence intervals for the categorical variable of interest are reported in Figure 6. *Abnormal Returns* at the end of trading day Wednesday, June 17 were about 1% lower on average for US-based renewable energy companies than what these companies experienced on June 12. Trump made his primary announcement in the afternoon of June 16. Although we do not observe any significant effect on that very day, it is possible that renewable energy investors took a full day to respond to the information. On the other hand, and even controlling for this effect, we still observe an idiosyncratic shock on the day of June 18, when the encyclical was released. At the end of this trading day, US-based clean energy companies recorded negative *Abnormal Returns* that were about 1.34% lower than what they had experienced on the trading day of Friday, June 12. This negative effect could still be partly compounded by Trump's announcement. However, *Abnormal Returns* measure by how much stock prices differed at the end of a trading day with respect to the end of the previous day (discounting the effect of market-wide trends or shocks). We therefore take the consistent negative effect in *Abnormal Returns* on June 18 as evidence that on this very day new information was released that lead renewable energy investors to update their portfolios. We attribute this new information to the publication of Francis's climate encyclical.[27] Moreover, the effect on June 17 becomes insignificant when we include a one-day lag of our dependent variable to control for *Abnormal Returns* to each firm in the previous day, whereas the June 18 effect is still detectable and statistically significant (Table B.1).

We further test the robustness of our results in a number of ways presented in the appendix. We show our results do not hinge on the arbitrary length of the event window we choose by replicating our models in shorter and longer windows. We unpack whether the leakage of the encyclical on June 15 had a similar

[27] This interpretation seems reasonable also in light of the fact that Trump had not yet formed any clear plan or manifesto that regarded energy at this point, so the effects of that were possibly relevant to all stocks.

Figure 6: *Day-by-day estimates of Abnormal Returns to US-based renewable energy companies in the trading week starting on Monday, June 15 2015.*



Point estimates and 95% confidence intervals are obtained from a linear model of *Abnormal Returns*. Reported coefficients refer to a variable for each individual trading day in the week including the *Laudato Si* publication and Trump's primary announcement. The reference level is Friday, June 12 (excluded from the plot). The model includes firm-fixed effect. Standard errors are clustered at the firm-level. Full results are reported in column 1 of Table B.1 in the appendix.

effect on returns. This event allows a further test against the potential threat to identification coming from the Trump primary candidacy, given that the leakage predated the candidate's announcement by a full day. We also propose alternative lag specifications for our models of *Abnormal Returns*, to tackle potential issues relative to the inclusion of lags and unit fixed effects. Finally, we extend our sample of renewable energy companies to include other minor firms. Our main findings hold across these alternative models.

5.1 Mechanism and additional US evidence

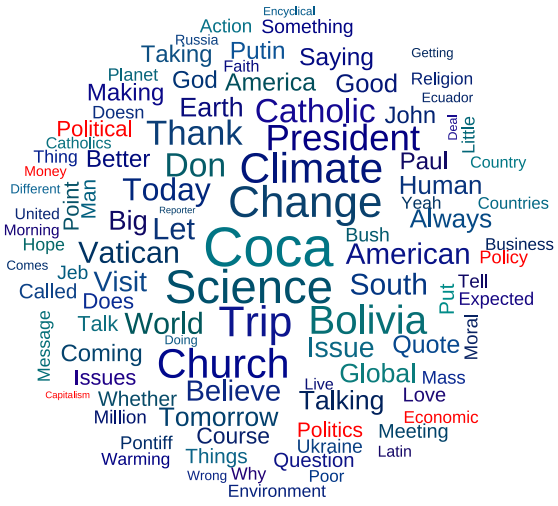
Our event study results show that the climate encyclical generated negative returns among renewable energy stocks and that this effect was especially significant in the US. Our argument suggests this can be traced to the high politicization of the Pope fueled by the opposition of strong public forces, especially the media. Here we explore the plausibility of the driving mechanisms of this polarizing environment in the US by discussing some complementary evidence to our event study. We focus on the Pope's polarized framing on the media, which we believe to be the central driver of backlash against the renewable energy sector. In Appendix C we also discuss related trends in public opinion polls and Congress debates.

Because investors rely heavily on the media to understand global affairs (Patterson and Donsbagh, 1996), it is safe to assume that they should have relied on the news to understand the climate encyclical

Figure 7: *Word cloud of 100 most frequent words from TV clips mentioning the word "Pope" on CNN, Fox News, Fox Business, and MSNBC.* This figure shows the TF-IDF scores of the most frequent words identified in the US broadcasting video clips between June 18, 2015 and July 18, 2015. Higher word font size corresponds to higher word frequency. Words in red correspond to an economic policy theme (see text).

(a) CNN

(b) MSNBC



(c) Fox Business

(d) Fox News

Data exported from the GDELT Television Comparer API. The query draws on GDELT's Television News Archive and compared 15-seconds clips mentioning the word "Pope" in the broadcasts of the four selected US networks.

and assess its impact. As we have already argued at the beginning of the paper, trends in coverage of the Pope in major news outlets should also be indicative of the confidence investors form around traditional and riskier investments related to the encyclical. Media backlash against the Pope could have undermined investors' confidence in the feasibility of Francis's preferred policies (e.g. ambitious green transition). This should be identifiable in the break-down of the content of the media sources covering the Pope at the time of the encyclical.

As we have shown earlier, the most influential printed and broadcasting news sources followed the encyclical and provided significant coverage around the week of the release. Importantly for the US, the message of the Pope was covered at length in Fox News and Fox Business, the two main extreme right-wing voices. Now we ask, what did the Fox Corporation convey in this coverage? Did Fox lash against the Pope, generating anxiety around his message as we suggested?

To explore this, we elaborated the frequencies of the most recurrent words in the four broadcasting channels in the US for the period between June 18 and July 18, 2015. Figure 7 reports these words weighted by their term frequency-inverse document frequency (TF-IDF) scores, which standardize each word's importance in each document (or, in this case, each channel) relative to the full text corpus. The top wordclouds in this figure refer to the more generalist CNN and MSNBC, and show that in these channels the topic of the Pope was associated with climate change generically as well as some geopolitical discussions (e.g. South American visits, diplomatic missions in Ukraine). However, little content in the CNN and MSNBC channels seems to be centered on terms related to economic policy themes (highlighted in red). Arguably, CNN and MSNBC did not use the encyclical as an opportunity to discuss climate politics directions within the country.[28]

The word frequencies of Fox News and Fox Business provide a substantively different picture. Words related to economic policy broadly defined (in red) are much more frequent here. '*Politics*' is much repeated; '*capitalism*' is one of the top five words associated with the Fox Business clips. To be clear, we checked if this language was systematically used to challenge the Pope and his left-wing agenda and indeed we find that it was often used to critize him. In *Making Money with Charles Payne* (Fox Business) on July 11, Charles Payne notes that '*the Pope is socking it to capitalism.*' Similarly, on *Varney Company* (Fox News) on July 1, Stuart Vaney said: '*I don't think the Pope is socialist or communist, but it is very easy to jump to that conclusion.*'

We draw two considerations from these findings. First, that Fox News Corporation took a different, more political, and to some extent more aggressive take on the Pope at the time of the encyclical, making explicit connections between capitalism, markets, and Francis's message for climate action. This in itself was information that could influence business-savvy consumers of TV news. Second, the stark difference between the skeptical, domestically oriented voice of Fox News and the other channels indicates that

[28] A similar limited salience of economic topics is observed in the printed news. As wordclouds in appendix C show, the articles in The Guardian put less emphasis on these words than the Financial Times.

at minimum the encyclical contributed to a divided stream of news coverage, which could also push investors to doubt riskier investments (e.g. renewable energy portfolios).

In the appendix, we provide additional evidence of the framing of *Laudato Si* and the impact of US polarization. Studying the debates in Congress around the Pope and the encyclical, we confirm similar forms of polarization in the highest US legislative body: only Democrats engaged with Francis's text, while Republican representatives and senators remained silent on the matter (Table C.1). Additionally, we show that the timing of the encyclical corresponded to a sharpening of the polarization in public polling for primaries' candidates at the beginning of the US presidential campaign (Figure C.1). In light of the politicization of Francis fueled by Fox News, elicited in Congress and measured in public polls, it is well possible to conclude that the papal communication hit a US context that was building up for a right-wing populist shift at the expense of left policy and their winners, e.g. the renewable energy sector. Consequently, the encyclical ignited volatility in the clean energy markets.

5.2 Beyond Francis: Stock effects of other encyclicals

Our results show a significant degree of internal validity and traceable mechanisms of politicization around the Pope. But are our findings specific to this Pope and his reception among the (US) public or does our argument travel beyond Francis? Here, we address the potential generalizability of our theory that Popes who release communications with clear ideological stands can spark political reactions that affect other markets. We do so by engaging with an additional investigation focused on the previous Pope: Benedict XVI.

As we have already indicated, the social teachings embedded in encyclicals have let most Popes take explicit positions on a number of topics and issues. The key question here is whether, at the moment of an encyclical, other Popes may have been as politicized as Francis and if this transposed to relevant markets related to the topic of the encyclical. The reception of Popes' ideological positions should generate market signals that affect exposed actors differently, depending on whether the Pope leans towards the left or the right.

To explore this conjecture empirically, we propose an additional study leveraging the publication of another papal text that, we believe, had potential for market policy implications. We study Pope Benedict XVI's *Caritas in Veritate*, his first social encyclical released in the summer of 2009. The figure of Benedict XVI in itself is important: Cardinal Joseph Ratzinger is considered a conservative voice of European theology and has often been associated with images of an elitist Vatican. As for his encyclical, this was born by the reference to the financial crisis of 2008-2009 and is centered on the problems of global development, with specific passages dedicated to business leaders, financiers, and aid agencies (Genovese, 2015). While the Pope's letter aggressively proposed help for the poor, it also lent a hand for banks' global self-regulation in the wake of a major financial crisis. That Benedict XVI avoided taking

strong critical stands on banking is also evidenced by the fact that the encyclical was released in the eve of the 2009 G8 Summit in Italy, and purposefully planned to be discussed among senior business leaders and bankers in London the same week.[29] Against this background, we expect the banking sector to be most exposed to the release of the encyclical. However, in the case of *Caritas in Veritate*, given the warming reception of Benedict XVI by conservative media and the rapprochement with financial leaders, our argument suggests that larger banks may have benefited from the message of this publication.

We test this empirically. First, we selected a sample of financial companies exposed by Benedict XVI's text. We drew on the 45 US investment banks selected by Wilf (2016). We study 43 of these companies due to data availability in our period of interest. We complemented this list by selecting 25 publicly traded non-US incorporated banks. We drew from the top commercial banks by total assets as reported on Bureau van Dijk's Orbis corporate ownership database.[30] The list of companies in this analysis, and their headquarter country, is in Table D.1.

Next, we replicated the same procedure followed for the *Laudato Si* analysis. Our estimation window starts on November 23, 2008 and ends on June 1, 2009. It is 190 days long as for the *Laudato Si* study. We adopted the same market-wide indexes to explain returns to companies. The event window for this analysis is 61 days long, as for the previous study. It starts on June 7, 2009 and ends on August 7, 2009. It is therefore centered around the event of interest (July 7, 2009).

Table 3 reports results obtained by estimating the models of *Abnormal* and *Cumulative Abnormal Returns*. We find that financial institutions experienced on average about 0.65% higher *Abnormal Returns* on the day *Caritas in Veritate* was published. When considering the entire time period following the publication, in the event window, these firms experienced average higher abnormal gains by about 0.25%. Both estimates are statistically significant at the conventional 0.05 level. This means that, according to our data, investors were cheerful of Benedict XVI's message, possibly because it did not renegate commercial banks. Note that this boost in returns did not result into any significant effect in terms of *Cumulative Abnormal Returns*.[31] This result requires a more in-depth investigation to tease out the mechanisms underlying the estimated effects. Nonetheless, we believe this evidence further underscores the material relevance of authoritative, politically oriented communications by the Pope.

6 Conclusion

Studies on the impact of politics over markets have extensively concentrated on the effect of actions and communications of appointed political leaders (e.g. elected politicians or political institutions) on the

[29] Mychasuk, Emiliya. 24 October 2009. "Money and Morals". Financial Times. London. Retrieved 15 November 2009.

[30] We considered only companies under the North American Industry Classification System with code 522110: Commercial Banking.

[31] In the appendix we also investigate differences between US and non-US based companies. Although the effect appears stronger for US-based banks in this case too, there is evidence that non-US institutions were also rewarded by investors at the onset of Benedict XVI's encyclical.

Table 3: Effect of the publication of Benedict XVI's *Caritas in Veritate* encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* of the sampled commercial banks.

	AR		CAR	
	(1)	(2)	(3)	(4)
July 7 onward	0.26***	0.25***	0.84	0.83
	(0.10)	(0.09)	(1.37)	(1.36)
July 7	0.66**	0.65**		
	(0.30)	(0.30)		
Abnormal Returns (t-1)	0.10***	0.12***		
	(0.02)	(0.02)		
Constant	0.02	0.04	−1.14	0.83
	(0.06)	(0.06)	(0.75)	(1.58)
Firm FE	Yes		Yes	
Headquarter FE		Yes		Yes
Number of firms	68	68	68	68
Observations	2,784	2,784	2,967	2,967
Note:		*p<0.1; **p<0.05; ***p<0.01		

All models are linear estimations of returns using observations in the event window (June 07, 2009 - August 07, 2009). Standard errors clustered at the firm-level.

returns to sensitive market actors. In this paper we note that this scholarship has surprisingly overlooked the impact of other authorities. Spiritual leaders, for example, have wide audiences, frequently address social issues, and often question specific economic actors. Presumably, their political visions can have material consequences. However, little research has so far investigated theirs influence on the economy, and specifically on financial markets. We fill this gap focusing on the case of a most understudied international leader: the Roman Catholic Pope.

Our paper seeks to explore the financial implications of the most relevant papal writings – the encyclicals – for stakeholders invested in the political issues addressed by these forms of communications. Our argument draws from theories of political communication and political economy to explain why papal messages could alter normal financial outcomes. We conjecture that investors of particularly exposed economic activities are sensitive to Popes' communications that signal a policy approach directed at them. Additionally, we argue that investors react to a papal communication if the Pope is particularly politicized. In a context of low salience and little politicization, we expect that the message of a Pope may have small effects. However, in a context of more politicization and salience, papal communications divide the public and become more market-relevant. We contend that, in this case, a Pope's message with conservative views may be received as good news by markets. Vice versa, the encyclical of a left-wing Pope may generate more tension, especially if right-wing forces, e.g. the media, antagonize his message. Along these lines, a left-wing message can cause backlash against market actors that would gain from

the Pope's policy vision if the conservative media rallies against it.

We test our argument studying the market effects of Pope Francis's 2015 *Laudato Si* climate encyclical. An event study analysis shows that this document, which in theoretical circumstances should have been received with cheer by green energy investors and concern by fossil fuel competitors, had the opposite effect. In particular, it resonated negatively in the clean energy industry. Our findings show that international firms in the renewable energy sector lost on average 0.35% in their stock value each day for 30 days after the encyclical was published, a loss equivalent to a 3% reduction in share aggregate value. Fossil fuel competitors saw no significant loss, instead. We also find that US companies are driving this effect, while non-US counterparts do not appear to have equally suffered the consequences of the encyclical, or at least not as consistently. The US-specific effects are insightful, because they suggest that a polarizing, authoritative left-wing figure like Pope Francis in combination with a polarized, populist-driven political environment can materially affect vulnerable companies. The interpretation of these results is buttressed by a range of additional analyses of media framing and multiple robustness checks.

Our study sheds new light on the material effects of the political communications of unconventional leaders, and suggests new lines of research. Whilst our results indicate the crucial and necessary role that the domestic political context plays in absorbing the Pope's message, the findings also elevate the direct role of international actors that comparative politics tend to discount, and gives new angles to the study of the rise of anti-establishment politics, which clearly also extend to reactions to the Pope. Furthermore, our research gives credit to the political economy scholarship that believes in the power of words in international politics. Official communications, even if by political outsiders, seem to influence financial markets. Our research therefore encourages further studies on the effect of the timing and content of the message of political 'influencers.'

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Appendix

Papal Dividends:
Popes' Political Communications and Financial Markets

A Description of the sample for *Laudato Si* analysis

Table A.1: Descriptive statistics of fossil fuel and renewable energy firms in our sample. Event window (May 18, 2015 - July 18, 2015)

	Mean	Median	Std. Dev.	Min	Max	N
Fossil fuel						
Abnormal Returns	−0.04	−0.001	2.68	−48.15	40.06	1,901
Cumulative Abnormal Returns	−1.39	−0.12	11.52	−96.78	31.33	1,937
Abnormal Returns (US)	−0.02	0.001	0.70	−6.02	4.26	993
Cumulative Abnormal Returns (US)	0.31	0.33	3.34	−12.85	15.60	993
Abnormal Returns (Non-US)	−0.07	−0.002	3.81	−48.15	40.06	908
Cumulative Abnormal Returns (Non-US)	−3.18	−0.57	15.95	−96.78	31.33	944
Renewable energy						
Abnormal Returns	−0.20	−0.20	3.51	−35.46	26.01	1,775
Cumulative Abnormal Returns	−2.06	−0.87	14.06	−62.02	39.60	1,783
Abnormal Returns (US)	−0.14	−0.14	2.70	−17.86	26.01	1,073
Cumulative Abnormal Returns (US)	0.41	0.23	14.61	−62.02	39.60	1,075
Abnormal Returns (Non-US)	−0.28	−0.26	4.48	−35.46	24.82	702
Cumulative Abnormal Returns (Non-US)	−5.80	−2.69	12.29	−48.03	29.18	708

Table A.2: Average *Abnormal Returns* to firms in the Fossil fuel and Renewable energy samples during the 30 days before and after publication of the *Laudato Si* encyclical with 95% confidence intervals

	Before publication		After publication	
	Mean	95% Conf. Int.	Mean	95% Conf. Int.
Fossil fuel: Abnormal Returns	-0.03	[-0.21, 0.15]	-0.05	[-0.21, 0.11]
Renewable energy: Abnormal Returns	-0.05	[-0.28, 0.17]	-0.35	[-0.59, -0.12]

Table A.3: Difference-in-mean *Abnormal Returns* and *Cumulative Abnormal Returns* before-after publication of the encyclical (June 18, 2015). Fossil fuel and renewable energy firms, event window data.

	Before publication		After publication			
	Mean	Std. Dev.	Mean	Std. Dev.	Diff. in Means	Std. Error
Fossil fuel						
Abnormal Returns	-0.03	2.82	-0.05	2.53	-0.02	0.12
Cumulative Abnormal Returns	-1.40	10.84	-1.38	12.21	0.01	0.53
Abnormal Returns (US)	0.02	0.59	-0.06	0.80	-0.09	0.04
Cumulative Abnormal Returns (US)	0.36	2.43	0.27	4.08	-0.09	0.21
Abnormal Returns (Non-US)	-0.09	4.00	-0.04	3.59	0.05	0.25
Cumulative Abnormal Returns (Non-US)	-3.20	15.04	-3.16	16.91	0.03	1.05
Renewable energy						
Abnormal Returns	-0.05	3.49	-0.35	3.53	-0.30	0.17
Cumulative Abnormal Returns	-0.54	11.02	-3.63	16.49	-3.09	0.67
Abnormal Returns (US)	0.07	2.68	-0.37	2.71	-0.44	0.16
Cumulative Abnormal Returns (US)	2.46	10.50	-1.75	17.68	-4.21	0.89
Abnormal Returns (Non-US)	-0.25	4.47	-0.32	4.50	-0.07	0.34
Cumulative Abnormal Returns (Non-US)	-5.18	10.17	-6.42	14.09	-1.24	0.92

Table A.4: Sample of fossil fuel firms and their headquarter country

Name	Nationality
Abb Ltd	Sweden
Abbott Laboratories	United States
Akzo Nobel NV	Netherlands
American Electric Power Company Inc	United States
Atco Ltd	Canada
Baltimore Gas and Electric Company	United States
Baxter International Inc	United States
BHP Group PLC	United Kingdom
Boeing Co	United States
BP PLC	United Kingdom
Celanese Corp	United States
Centrica PLC	United Kingdom
Chevron Corp	United States
China Shenhua Energy Co Ltd	China
China Yangtze Power Co Ltd	China
Clariant AG	Switzerland
Dow Chemical	United States
Duke Energy Corp	United States
Eli Lilly and Co	United States
Enel SpA	Italy
Eni SpA	Italy
Eramet SA	France
Exelon Corp	United States
Exxon Mobil Corp	United States
Fluor Corp	United States
Fortis Inc	Canada
Fortum Oyj	Finland
Freeport-McMoRan Inc	United States
General Motors Co	United States
Honeywell International Inc	United States
Huaneng Power International Inc	China
L'Air Liquide	France
Manila Electric Co	Philippines
Medtronic PLC	United States
Merck and Co Inc	United States
Monsanto	United States
PetroChina Co Ltd	China
Petroleo Brasileiro SA Petrobras	Brazil
Pfizer Inc	United States
Power Construction Corporation of China Ltd	China
PPG Industries Inc	United States
Praxair	United States
Public Service Enterprise Group Inc	United States
Royal Dutch Shell PLC	Netherlands
Sempra Energy	United States
Swire Pacific Ltd	China

Table A.5: Sample of renewable energy firms and their headquarter country

Name	Nationality
ABO Group Environment SA	Belgium
Adecoagro SA	Luxembourg
Advanced Energy Industries Inc	United States
American Superconductor Corp	United States
Andersons Inc	United States
Archer-Daniels-Midland Co	United States
Ballard Power Systems Inc	United States
Broadwind Inc	United States
Canadian Solar Inc	Canada
Cosan Ltd	Brazil
Daqo New Energy Corp	China
EnerSys	United States
Enertronica SpA	Italy
Enviva Partners LP	United States
First Solar Inc	United States
FutureFuel Corp	United States
General Electric Co	United States
Gladstone Land Corp	United States
Green Plains Inc	United States
Hanwha Q Cells	South Korea
JA Solar Holdings	China
JinkoSolar Holding Co Ltd	China
Ocean Power Technologies Inc	United States
ON Semiconductor Corp	United States
Ormat Technologies Inc	United States
Pacific Ethanol Inc	United States
ReneSola Ltd	China
Renewable Energy Group Inc	United States
REX American Resources Corp	United States
Siemens AG	Germany
Sky Solar Holdings Ltd	China
Solar Alliance Energy Inc	Canada
Solaredge Technologies Inc	Israel
SunPower Corp	United States
Sunworks Inc	United States
Teledyne Technologies Inc	United States
Tesla Inc	United States
Valero Energy Corp	United States
Vestas Wind Systems A/S	Denmark
Vivint Solar Inc	United States
Wacker Chemie AG	Germany
Yingli Green Energy Holding Co Ltd	China

B Event Analysis: Robustness Tests

Table B.1: Event-analysis of *Abnormal Returns* to US-based renewable energy firms in the trading week beginning Monday, June 15 and ending Friday, June 19.

	Dependent variable:	
	AR	
	(1)	(2)
June 15	−0.09	0.11
	(0.65)	(0.54)
June 16	0.26	0.44
	(1.41)	(1.39)
June 17	−1.07**	−0.79
	(0.50)	(0.59)
June 18	−1.34**	−1.46**
	(0.58)	(0.58)
June 19	−0.45	−0.65
	(0.60)	(0.63)
Abnormal Returns (t-1)		−0.30***
		(0.03)
Constant	0.23	0.04
	(0.47)	(0.49)
Firm FE	Yes	Yes
Number of firms	25	25
Observations	150	150
Adjusted R^2	−0.11	−0.02
F Statistic	0.48	0.90
Note:	*p<0.1; **p<0.05; ***p<0.01	

All models in the table are estimated using observations spanning from Friday, June 12 and ending Friday, June 19. They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level. Estimated daily coefficients refer to a categorical variable with baseline level defined relative to *Abnormal Returns* on Friday, June 12.

We subject our results to an extensive series of robustness tests. First, we tested whether our findings depend on the arbitrary length of the event window we chose. We re-estimated models 1 and 5 from Table 1 on event windows of alternative lengths. We selected event windows of all possible durations, with an even number of days before and after the publication of the encyclical (June 18). The narrowest event window we considered included only 30 days around the event (15 before, 15 after). The longest event window considered included 70 days around the event (35 days before, 35 after). Panel (a) of Figure B.1 reports point estimates and 95% confidence intervals for the variable *June 18 onward* for each of these models. Results from models 1 and 5 of Table 1 are highlighted in red for comparison. We observe no significant effect for any time window length in the fossil fuel sample. Instead, we find a consistently negative and statistically significant effect of the publication on *Abnormal Returns* for event windows of at least 38 days around the event. Shorter event windows find no significant coefficient, confirming our interpretation that the negative effect of the encyclical took some time to kick in.

Next, we replicate the same procedure but modelling *Cumulative Abnormal Returns* (*i.e.* we study models 3 and 7). Panel (b) confirms the lack of a significant cumulative effect for fossil fuel companies is not dependent on the arbitrary lenght of the time window. We also find that a negative and statistically significant effect on *Cumulative Abnormal Results* is detected for event windows that include at least 54 days around the event, and remains consistently negative after that.

Figure B.2 replicates the same test by splitting the samples among US and non-US firms (presented in Table 2). Overall, it confirms our findings on heterogeneous effects when changing the length of the event window: American fossil fuel companies experienced a tiny negative effect on their *Abnormal Returns* following the publication of the encyclical, although the effect did not cumulate to any relevant loss. On the other hand, US renewable energy companies experienced larger and statistically significant losses on their *Abnormal Returns*, which amount to a significant cumulative negative effect. No effect is detected among non-US companies in either sample.

Next, we unpacked whether the leakage of the encyclical on June 15 had an effect on firms' returns. Table B.2 replicates the exercise proposed in Table 1, but studies the leakage instead of the publication. Overall, results are consistent with what we observe in Table 1. We find no significant effect for fossil fuel companies. Instead, we observe a negative and statistically significant effect of the leakage on *Abnormal Returns* and *Cumulative Abnormal Returns* of renewable energy companies, although the effect becomes smaller in size and noisier – but this loss of precision might be due to the fact that not all firms in our sample were equally exposed to the information leaked on June 15, hence warranting our choice of focusing on June 18.

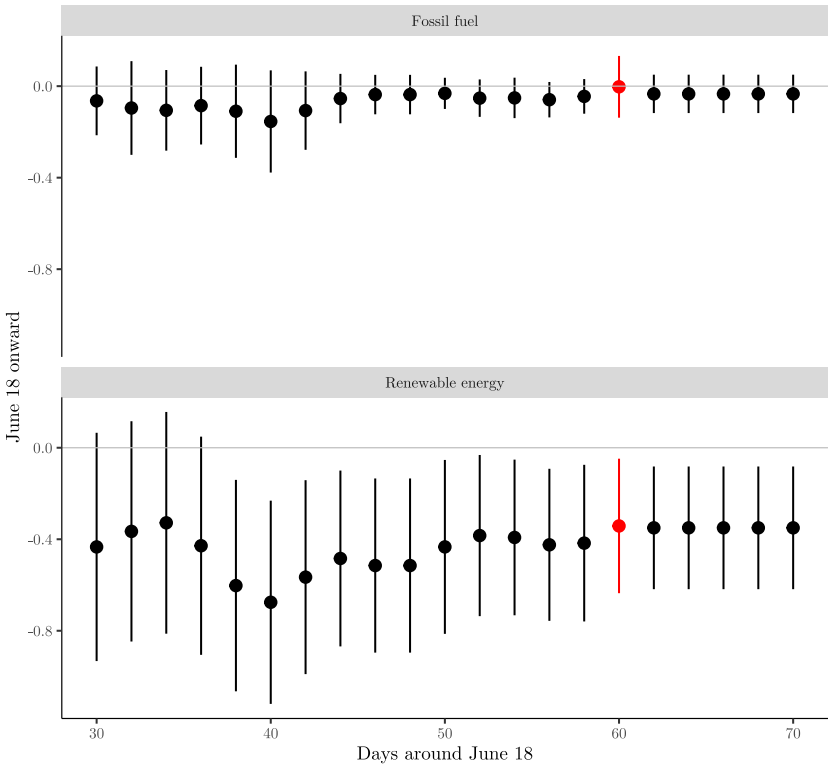
We also substitute the publication of the encyclical with its leakage for the sub-sample analyses (Table B.3). In this case, the small significant effects for US fossil fuel companies disappear completely. We still observe no effect for non-US fossil fuel companies. Instead, the significant effect for US renewable energy firms holds and is comparable in size to what we documented in Table 2 (we still observe no significance for non-US renewable energy companies).

Introducing lags of the dependent variable with unit fixed effects can create problems for the estimation. We thus propose alternative lag specifications of models reported in Tables 1 and 2. Tables B.4, B.5, and B.6 report the results. They apply alternative lag choices to models relative to the publication of the encyclical on *Abnormal Returns*. They also unpack the effect on US and non-US firms. Specifications start from a firm-FE model with no lag and introduce all lags one-by-one until lag $t-4$. Results discussed in the main text are robust to all those alternative specifications.

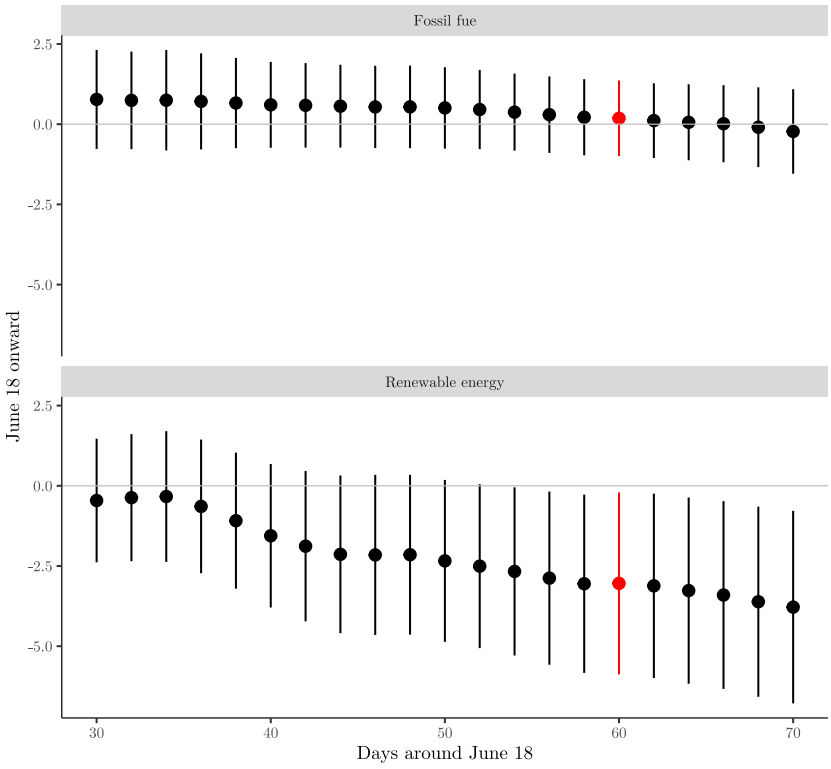
Finally, we test whether our significant results among renewable energy companies hold in a larger sample of clean energy-producing companies. We enlarge our sample of 42 companies by adding 11 more renewable energy firms that are reference din IG UK as top renewable energy companies. We then replicate the main analysis of *Abnormal* and *Cumulative Abnormal Returns* and subsample by headquarter (US vs non-US). Results are generally in line with our previous findings: we observe clean energy companies experiencing systematically lower average *Abnormal Returns* after the encyclical was published, by about 0.26%. This estimate is significant at the .05 conventional level. However, the effect on *Cumulative Abnormal Returns* is not distinguishable from zero. When we split our extended sample among American and non-American firms, we still find that US companies are driving the effect, with *Abnormal Returns* that are on average about 0.41% lower after the publication of the encyclical than before it. This effect is statistically significant at conventional levels and results in a significant reduction of *Cumulative Abnormal Returns* by about 4.33% when looking at the entire post-event period in the event window. No significant effect is detected for non-US companies.

Figure B.1: Point estimates and 95% confidence intervals for the effect of *June 18 onward* on *Abnormal Returns* (a) and *Cumulative Abnormal Returns* (b)

(a) Effect of *June 18 onward* on *Abnormal Returns*



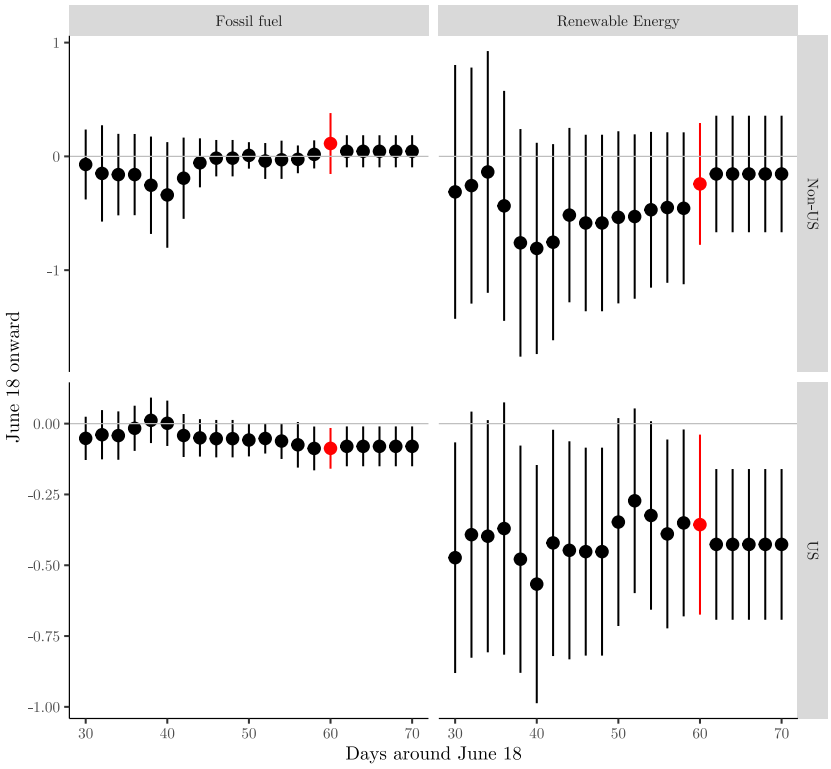
(b) Effect of *June 18 onward* on *Cumulative Abnormal Returns*



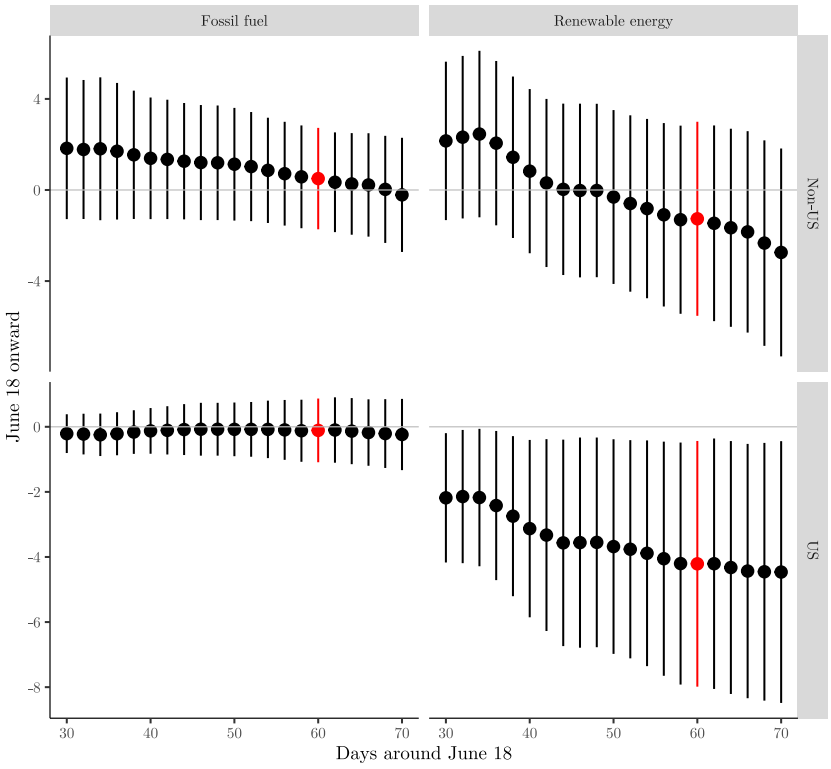
Horizontal axes report alternative choices for the length of the event window (expressed in days around the event). Red dots indicate estimates reported in the tables included in the main text. All estimated models include firm-fixed effect, a one-day lag of the dependent variable and the *June 18* binary variable. Standard errors are clustered at a firm level.

Figure B.2: Point estimates and 95% confidence intervals for the effect of *June 18 onward* on *Abnormal Returns* (a) and *Cumulative Abnormal Returns* (b) for US and non-US firms

(a) Effect of *June 18 onward* on *Abnormal Returns*. US and non-US firms



(b) Effect of *June 18 onward* on *Cumulative Abnormal Returns*. US and non-US firms



Horizontal axes report alternative choices for the length of the event window (expressed in days around the event). Red dots indicate estimates reported in the tables included in the main text. All estimated models include firm-fixed effect, a one-day lag of the dependent variable and the *June 18* binary variable. Standard errors are clustered at a firm level.

Table B.2: Effect of the leakage of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* for fossil fuel and renewable energy firms

	Fossil fuel				Renewable energy			
	AR		CAR		AR		CAR	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 15 onward	0.03	0.02	0.09	0.03	-0.32^{**}	-0.31^{**}	-2.63^{*}	-2.53^{*}
	(0.07)	(0.07)	(0.58)	(0.58)	(0.15)	(0.15)	(1.48)	(1.47)
June 15	-0.08	-0.08			0.36	0.35		
	(0.12)	(0.12)			(0.55)	(0.55)		
Abnormal Returns (t-1)	-0.34^{***}	-0.34^{***}			-0.18^{**}	-0.16^{**}		
	(0.04)	(0.04)			(0.07)	(0.07)		
Constant	-0.11^{***}	-0.02	-3.35^{***}	-0.19	-0.12	-0.12	-4.25^{***}	-4.31^{***}
	(0.04)	(0.04)	(0.33)	(0.32)	(0.08)	(0.08)	(0.95)	(0.94)
Firm FE	Yes		Yes		Yes		Yes	
Headquarter FE		Yes		Yes		Yes		Yes
Number of firms	46	46	46	46	42	42	42	42
Observations	1,864	1,864	1,937	1,937	1,767	1,767	1,783	1,783
Adjusted R^2	0.10	0.11	0.87	0.32	0.02	0.02	0.70	0.10
F Statistic	5.52^{***}	17.64^{***}	284.60^{***}	76.74^{***}	1.88^{***}	4.16^{***}	101.52^{***}	19.88^{***}
Note:								*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table B.3: Effect of the leakage of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* for fossil fuel and renewable energy firms. Comparison of US and non-US firms

	Fossil fuel				Renewable energy			
	US		Non-US		US		Non-US	
	AR	CAR	AR	CAR	AR	CAR	AR	CAR
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 15 onward	−0.05	−0.05	0.14	0.25	−0.42**	−3.63*	−0.10	−1.10
	(0.04)	(0.53)	(0.13)	(1.08)	(0.18)	(1.93)	(0.24)	(2.32)
June 15	−0.02		−0.12		0.65		−0.13	
	(0.09)		(0.25)		(0.50)		(1.15)	
Abnormal Returns (t-1)	0.02		−0.36***		−0.06**		−0.24**	
	(0.04)		(0.03)		(0.02)		(0.10)	
Constant	0.05**	1.73***	−0.17**	−3.44***	−0.001	−0.18	−0.25**	−5.23***
	(0.02)	(0.29)	(0.07)	(0.60)	(0.10)	(1.08)	(0.13)	(1.48)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	24	24	22	22	25	25	17	17
Observations	992	993	872	944	1,071	1,075	696	708
Adjusted R^2	0.01	0.70	0.11	0.88	0.01	0.74	0.04	0.58
F Statistic	1.46*	99.54***	5.55***	302.02***	1.30	125.31***	2.49***	57.96***

Note: *p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table B.4: Effect of publication of the encyclical on *Abnormal Returns* to firms in the fossil fuel and clean energy industries. Alternative lag specifications

	Abnormal Returns									
	Fossil fuel					Renewable energy				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 18 onward	−0.06*	−0.03	0.03	−0.01	−0.03	−0.30***	−0.35**	−0.35**	−0.45**	−0.47**
	(0.03)	(0.04)	(0.09)	(0.06)	(0.05)	(0.12)	(0.14)	(0.16)	(0.19)	(0.19)
June 18	0.79	0.85	0.84	0.81	0.82	0.04	−0.03	0.01	−0.002	0.05
	(0.67)	(0.64)	(0.61)	(0.62)	(0.60)	(0.45)	(0.47)	(0.46)	(0.46)	(0.44)
June 15 onward		−0.34***	−0.39***	−0.24***	−0.31***		−0.18**	−0.19**	−0.23***	−0.21**
		(0.04)	(0.05)	(0.04)	(0.06)		(0.07)	(0.07)	(0.08)	(0.08)
June 15			−0.23***	−0.20***	−0.16***			−0.06**	−0.08***	−0.06**
			(0.04)	(0.03)	(0.02)			(0.03)	(0.03)	(0.03)
Abnormal Returns (t-1)				0.11***	0.11***				−0.04	−0.05*
				(0.02)	(0.02)				(0.03)	(0.03)
Abnormal Returns (t-2)					0.06**					−0.07**
					(0.03)					(0.03)
Abnormal Returns (t-3)	−0.07***	−0.10***	−0.17**	−0.002	0.01	−0.11	−0.12	−0.41***	−0.48***	−0.06
	(0.02)	(0.03)	(0.07)	(0.05)	(0.04)	(0.07)	(0.08)	(0.08)	(0.10)	(0.11)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	46	46	46	46	45	42	42	42	42	42
Observations	1,901	1,864	1,782	1,700	1,618	1,775	1,767	1,717	1,667	1,617
Adjusted R^2	−0.02	0.11	0.15	0.11	0.12	−0.01	0.02	0.03	0.05	0.03
F Statistic	0.40	5.63***	7.45***	5.32***	5.58***	0.66	1.90***	2.00***	2.91***	2.16***
Note:										*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table B.5: Effect of the publication of the encyclical on *Abnormal Returns* to firms in the fossil fuel industry. Alternative lag specifications, comparison of US and non-US firms

	Abnormal Returns									
	US					Non-US				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 18 onward	−0.10**	−0.08**	−0.09**	−0.09**	−0.09**	−0.01	0.04	0.21	0.13	0.08
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.07)	(0.20)	(0.12)	(0.11)
June 18	0.25**	0.24**	0.24**	0.24**	0.22*	1.38	1.44	1.39	1.34	1.34
	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)	(1.41)	(1.33)	(1.25)	(1.27)	(1.22)
Abnormal Returns (t-1)		0.02	0.03	0.04	0.04		−0.36***	−0.41***	−0.26***	−0.33***
		(0.04)	(0.03)	(0.03)	(0.03)		(0.03)	(0.04)	(0.03)	(0.05)
Abnormal Returns (t-2)			−0.02	−0.04	−0.05			−0.24***	−0.21***	−0.17***
			(0.04)	(0.04)	(0.04)			(0.03)	(0.02)	(0.02)
Abnormal Returns (t-3)				0.002	0.01				0.10***	0.11***
				(0.06)	(0.06)				(0.02)	(0.02)
Abnormal Returns (t-4)					−0.15**					0.07***
					(0.06)					(0.02)
Constant	0.07***	0.06***	0.06***	0.06**	0.06**	−0.11***	−0.15**	−0.27**	−0.08	−0.06
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.06)	(0.13)	(0.09)	(0.07)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	24	24	24	24	23	22	22	22	22	22
Observations	993	992	968	944	920	908	872	814	756	698
Adjusted R^2	0.01	0.02	0.01	0.01	0.02	−0.02	0.11	0.17	0.12	0.13
F Statistic	1.28	1.62**	1.25	1.42*	1.74**	0.40	5.69***	7.46***	5.03***	5.02***
Note:										*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table B.6: Effect of the publication of the encyclical on *Abnormal Returns* to firms in the renewable energy industry. Alternative lag specifications, comparison of US and non-US firms

	Abnormal Returns									
	US					Non-US				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 18 onward	−0.41***	−0.43***	−0.35**	−0.36**	−0.42**	−0.14	−0.15	−0.25	−0.51	−0.53
	(0.14)	(0.14)	(0.16)	(0.17)	(0.18)	(0.20)	(0.26)	(0.30)	(0.38)	(0.38)
June 18	−0.63*	−0.66*	−0.66**	−0.63*	−0.58*	1.02	0.94	0.99	0.97	1.00
	(0.33)	(0.34)	(0.32)	(0.33)	(0.35)	(0.97)	(1.00)	(0.99)	(0.99)	(0.96)
Abnormal Returns (t-1)		−0.06**	−0.07**	−0.10*	−0.11*		−0.24**	−0.26**	−0.31***	−0.27**
		(0.03)	(0.03)	(0.05)	(0.06)		(0.10)	(0.11)	(0.11)	(0.12)
Abnormal Returns (t-2)			−0.01	−0.03	−0.02			−0.10***	−0.11***	−0.09**
			(0.03)	(0.03)	(0.04)			(0.03)	(0.04)	(0.05)
Abnormal Returns (t-3)				−0.10***	−0.11***				−0.01	−0.01
				(0.03)	(0.03)				(0.04)	(0.03)
Abnormal Returns (t-4)					−0.10***					−0.04
					(0.03)					(0.04)
Constant	0.01	0.003	−0.04	−0.06	−0.05	−0.23*	−0.26*	−0.52***	−0.51***	−0.09
	(0.07)	(0.07)	(0.08)	(0.10)	(0.11)	(0.13)	(0.15)	(0.17)	(0.20)	(0.20)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	25	25	25	25	25	17	17	17	17	17
Observations	1,073	1,071	1,044	1,017	990	702	696	673	650	627
Adjusted R^2	0.01	0.01	0.01	0.02	0.03	−0.02	0.04	0.05	0.08	0.05
F Statistic	1.32	1.38*	1.43*	1.86***	1.99***	0.38	2.53***	2.62***	3.75***	2.36***
Note:										*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table B.7: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* of renewable energy firms, extended sample

	AR		CAR		US		Non-US	
					AR	CAR	AR	CAR
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 18 onward	−0.26**	−0.25**	−2.18	−2.09	−0.41***	−4.33**	−0.003	0.50
	(0.13)	(0.12)	(1.41)	(1.40)	(0.13)	(1.83)	(0.22)	(2.11)
June 18	0.19	0.19			−0.49		1.05	
	(0.39)	(0.38)			(0.31)		(0.73)	
Abnormal Returns (t-1)	−0.16**	−0.14**			−0.05*		−0.22**	
	(0.07)	(0.07)			(0.03)		(0.09)	
Constant	1.03***	−0.01	−0.85	−5.78***	−0.01	−0.09	0.92***	−2.10**
	(0.08)	(0.06)	(0.66)	(0.72)	(0.06)	(0.89)	(0.13)	(0.98)
Firm FE	Yes		Yes		Yes	Yes	Yes	Yes
Headquarter FE		Yes		Yes				
Number of firms	51	51	51	51	28	28	23	23
Observations	2,139	2,139	2,175	2,175	1,200	1,204	939	971
Adjusted R^2	0.02	0.02	0.69	0.11	0.01	0.74	0.04	0.63
F Statistic	1.77***	3.27***	97.82***	19.03***	1.39*	123.59***	2.37***	73.76***
Note:								*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

C Mechanisms

Congress debates In addition to the media discourse and the backlash from far-right news channels, we also explore whether the debates within the main American deliberative institution - the Congress - covered the Pope's encyclical and if this generated further partisan division that could preoccupy investors. For this purposes, we retrieved the relevant congressional speeches based on key word searches on the Congressional Record Database between June and September 2015.[32] We find 17 relevant speeches, of which all are led by Democrats (and one Independent, Senator Sanders) in support of the Pope's views. Of these 17 speeches directly address the Pope's views in this time frame, 12 were made by unique speakers; 9 of them are senators, 2 are representatives, and one governor (Jared Polis, Colorado) gave a speech at the Congress on September 17. See Table C.1 for details.

The content of these speeches suggests a clear tendency by Democrats to use the Pope's encyclical in order to push for an ambitious climate agenda. On June 23 Paul Tonko said '*I thank Pope Francis, and I hope the words he shared last week will ring true with all of us, including those who continue to deny climate change, both in this body and around the world*'. Additionally, the Democratic speakers seemed particularly interested in leveraging the Pope's message to confront the Republican candidates for presidency, and especially the leading one at that point – Jeb Bush. For instance, on July 21 Senator Sheldon Whitehouse said: '*The question is why Republican Presidential candidates refuse to engage on climate change. [...] The Republican candidates from Florida are running against the facts and they are running against the opinions of experts and leaders [...].*' Evidently, the Democrats in Congress associated their policy vision to the message of the Pope. This net division between supportive Democrats and silent Republicans further indicates that the vision of Francis had policy credibility among the left, and was generally polarizing. With left elites in support but the right (e.g. Fox News) against the climate policies implied by the encyclical, it is reasonable to expect stockholders to worry about the returns on the more fragile climate investments. As we know ex-post, the right political apparatus eventually prevailed in 2016 with the presidential victory of Donald Trump. But what about about the voting attitudes of public opinion at the time of the encyclical?

Public Polls It it also possible that US investors in June 2015 bet on the backlash against the Pope and his climate policy vision given the success of the right in public polls. To illustrate the trends of public polling at the time of the encyclical, we retrieved the polling percentages by individual primary candidates computed by independent pollsters and then gathered by FiveThirtyEight.[33] Figure C.1 shows these data and the two-week moving averages for four candidates: Bush and Trump (on the top panel) and Clinton and Sanders (in the bottom panel). The grey bar indicates the two-month window centered around the encyclical of June 18.

The figure suggests some observations. First, it is evident that in the time window under consideration the new comers of the primary races, i.e. Trump and Sanders, increased their respective polling compared to their previous levels and also compared to Bush and Clinton, respectively. After June 18, Trump and Sanders were about 15 and 10 percentage points above their May 18 polling, respectively. Whether this increase is at least partly attributable to the Pope is hard to gauge (other events were occurring at that time, for example - as we already mentioned- Trump officially announced his candidacy to the primaries in June 2015, although he paid little attention to Francis at that point). However, it is noteworthy that the Pope contributed to some political action and manoevering. For example, Senator Sanders repeatedly expressed support to the Pope's encyclical, and even met him in Rome that summer. Clearly, these trends indicate that at the time of the encyclical US politics was receptive to a message that could have shed voters towards the extremes, like the one of the *Laudato Si*.

So, in light of the polling data in addition to the politicization of Francis fueled by Fox News and elicited in Congress, it is well possible that the encyclical ignited volatility in the markets. Evidently, the papal communication hit a US context that was building up for a right-wing populist shift at the expense of left policy and their winners, e.g. the renewable energy sector.

[32] Extending the search to later in the year does not change the inference.

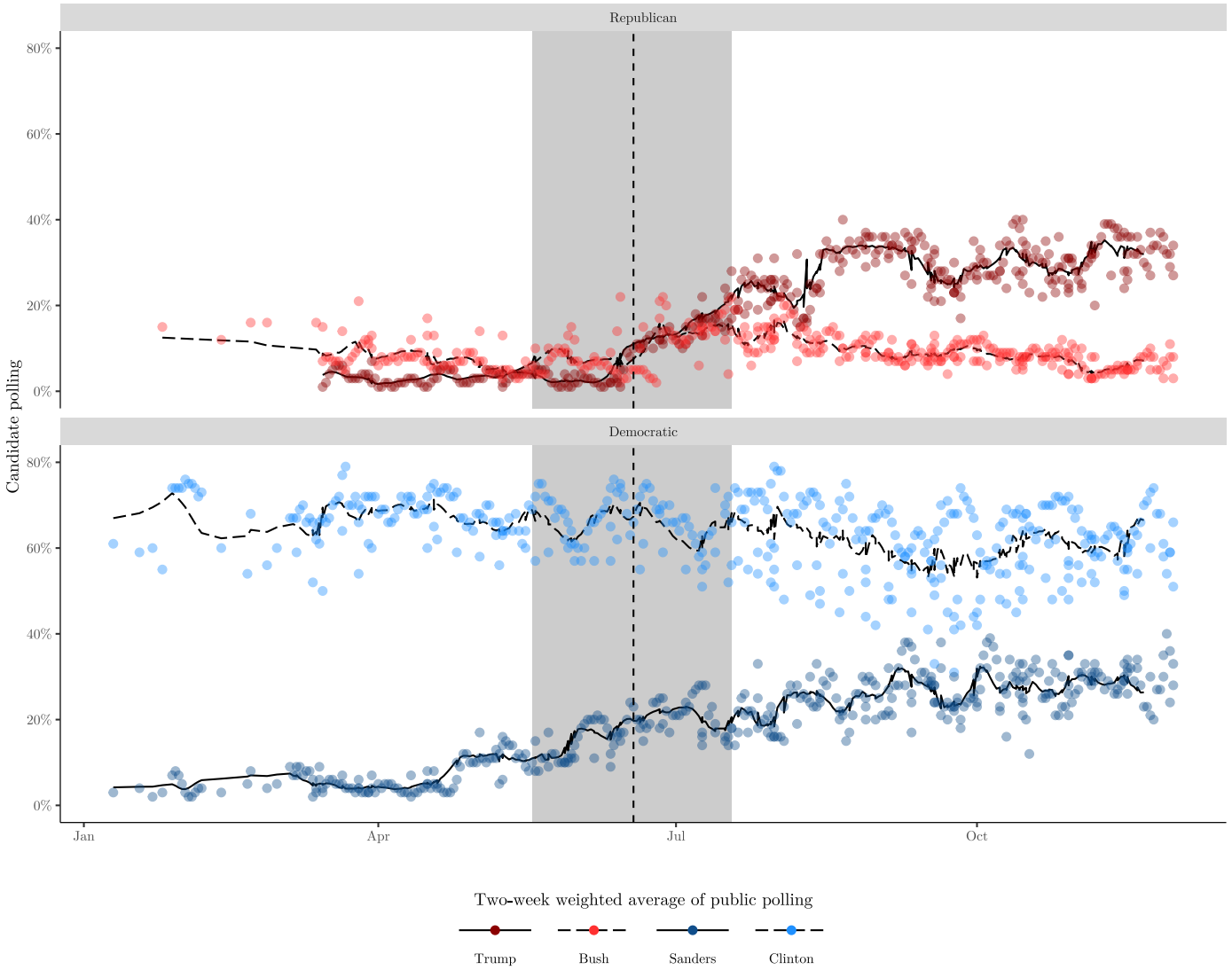
[33] Data retrieved from https://projects.fivethirtyeight.com/election-2016/national-primary-polls/republican/.

Table C.1: US congressional speeches mentioning either 'Pope', ' Francis's, 'climate change', and 'environment' between June 2015 and September 2015.

Date	Speaker	Body	State	Party	Position on Pope
June 16, 2015	Edward Markey	Senate	Massachussets	Democrat	Support
June 18, 2015	Edward Markey	Senate	Massachussets	Democrat	Support
June 23, 2015	Paul Tonko	House	New York	Democrat	Support
July 21, 2015	Sheldon Whitehouse	Senate	Rhode Island	Democrat	Support
August 08, 2015	Al Franken	Senate	Minnesota	Democrat	Support
August 08, 2015	Tom Udall	Senate	New Mexico	Democrat	Support
August 08, 2015	Patrick Leahy	Senate	Vermont	Democrat	Support
August 08, 2015	Tammy Baldwin	Senate	Wisconsin	Democrat	Support
August 08, 2015	Jeffrey Merkley	Senate	Oregon	Democrat	Support
August 08, 2015	Bernie Sanders	Senate	Vermont	Independent	Support
September 09, 2015	Paul Tonko	House	New York	Democrat	Support
September 17, 2015	Jared Polis	Governor	Colorado	Democrat	Support
September 17, 2015	Edward Markey	Senate	Massachussets	Democrat	Support
September 18, 2015	Bill Francis	House	Illinois	Democrat	Support
September 22, 2015	Amy Klobuchar	Senate	Minnesota	Democrat	Support
September 22, 2015	Jeffrey Merkley	Senate	Oregon	Democrat	Support
September 29, 2015	Sheldon Whitehouse	Senate	Rhode Island	Democrat	Support

The table reports the number of US Congressional speeches identified based on the key word searches on the US Congress' Congressional Record database: https://www.congress.gov/congressional-record. A research assistant manually coded the party membership of the speaker and whether the speech was in support of the Pope's view or opposing it.

Figure C.1: *Support for Republican and Democratic primary candidates around the time of the 2015 encyclical*



Data points report raw polling percentages by individual primary candidates computed by independent pollsters and gathered by FiveThirtyEight. Two-week moving average (weighted according to original scoring) is overlayed to adjust for pollster quality and sample size.

Figure C.2: Word cloud of most frequent words related to the Laudato Si in *The Guardian* (top) and *The Financial Times* (bottom). Higher word font size corresponds to higher word frequency. Words in red intuitively correspond to an 'economic' theme and were highlighted by the authors.

Top words (>50 frequency) in The Guardian articles (N=29), 2014−2016.

Top words (>25 frequency) in Financial Times articles (N=16), 2014−2016.

D *Caritas in Veritate* analysis

Table D.1: Sample of commercial banks and their headquarter country

Name	Nationality
Associated Banc-Corp	United States
Australia and New Zealand Banking Group Ltd	Australia
Banco Bilbao Vizcaya Argentaria SA	Spain
Banco do Brasil SA	Brasil
Banco Santander SA	Spain
BancorpSouth Bank	United States
Bank of America Corp	United States
Bank of Hawaii Corp	United States
Bank of Montreal	Canada
Bank of New York Mellon Corp	United States
Bank of Nova Scotia	Canada
Barclays PLC	United Kingdom
BNP Paribas SA	France
BOK Financial Corp	United States
Canadian Imperial Bank of Commerce	Canada
Cathay General Bancorp	United States
Citigroup Inc	United States
Citizens Republic Bancorp Ord Shs	United States
Comerica Inc	United States
Commerce Bancshares Inc	United States
Commonwealth Bank of Australia	Australia
Credit Suisse Group AG	Switzerland
Cullen/Frost Bankers Inc	United States
Deutsche Bank AG	Germany
East West Bancorp Inc	United States
Fifth Third Bancorp	United States
First Citizens BancShares Inc (Delaware)	United States
First Horizon Corp (Tennessee)	United States
FirstMerit Ord Shs	United States
Fulton Financial Corp	United States
HSBC Holdings PLC	United Kingdom
Huntington Bancshares Inc	United States
ING Groep NV	Netherlands
International Bancshares Corp	United States
Intesa Sanpaolo SpA	Italy
JPMorgan Chase and Co	United States
KeyCorp	United States
Lloyds Banking Group PLC	United Kingdom
M and T Bank Corp	United States
Natwest Group PLC	United Kingdom
New York Community Bancorp Inc	United States
Northern Trust Corp	United States
PNC Financial Services Group Inc	United States
Popular Inc	United States
PrivateBancorp Ord Shs	United States
Regions Financial Corp	United States
Royal Bank of Canada	Canada
Sberbank Rossii PAO	Russian Federation
Societe Generale SA	France
Standard Chartered PLC	United Kingdom
State Bank of India	India
State Street Corp	United States
Sterling Financial Ord Shs	United States
Susquehanna Community Financial Inc	United States
SVB Financial Group	United States
Synovus Financial Corp	United States
TCF Financial Corp	United States
Toronto-Dominion Bank	Canada
Truist Financial Corp	United States
U.S. Bancorp	United States
UBS Group AG	Switzerland
UMB Financial Corp	United States
UniCredit SpA	Italy
Valley National Bancorp	United States
Webster Financial Corp	United States
Wells Fargo and Co	United States
Wintrust Financial Corp	United States
Zions Bancorporation NA	United States

Table D.2: Effect of the publication of the *Caritas in Veritate* encyclical on *Abnormal Returns* to commercial banks. Comparison of US and non-US firms

	US		Non-US	
	AR	CAR	AR	CAR
	(1)	(2)	(3)	(4)
July 07 onward	0.30**	2.37	0.21*	−1.71
	(0.13)	(1.93)	(0.13)	(1.65)
July 07	0.96**		0.20	
	(0.40)		(0.45)	
Abnormal Returns (t-1)	0.13***		−0.01	
	(0.03)		(0.03)	
Constant	−0.24***	−9.55***	0.08	0.25
	(0.07)	(1.05)	(0.07)	(0.90)
Firm FE	Yes	Yes	Yes	Yes
Number of firms	43	43	25	25
Observations	1,771	1,856	1,013	1,111
Adjusted R^2	0.01	0.55	0.01	0.73
F Statistic	1.40**	53.52***	1.42*	123.23***
Note:				*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (June 07, 2009 - August 07, 2009). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table D.3: Effect of the publication of the *Caritas in Veritate* encyclical on *Abnormal Returns* to commercial banks. Alternative lag specifications

	AR				
	(1)	(2)	(3)	(4)	(5)
July 07 onward	0.34***	0.26***	0.28***	0.32***	0.37***
	(0.11)	(0.10)	(0.10)	(0.11)	(0.12)
July 07	0.60*	0.66**	1.00**	0.79**	0.85**
	(0.31)	(0.30)	(0.40)	(0.38)	(0.38)
Abnormal Returns (t-1)		0.10***	0.11***	0.11***	0.12***
		(0.02)	(0.03)	(0.03)	(0.03)
Abnormal Returns (t-2)			−0.03	−0.03	−0.04
			(0.03)	(0.03)	(0.03)
Abnormal Returns (t-3)				−0.08***	−0.07***
				(0.02)	(0.02)
Abnormal Returns (t-4)					−0.01
					(0.03)
Constant	0.01	0.02	0.05	−0.01	−0.06
	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)
Firm FE	Yes	Yes	Yes	Yes	Yes
Number of firms	68	68	68	68	68
Observations	2,876	2,784	2,692	2,600	2,508
Adjusted R^2	0.002	0.01	0.01	0.02	0.02
F Statistic	1.10	1.42**	1.41**	1.65***	1.54***
Note:					*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (June 07, 2009 - August 07, 2009). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

Table D.4: Effect of the publication of the *Caritas in Veritate* encyclical on *Abnormal Returns* to commercial banks. Comparison of US and non-US firms. Alternative lag specifications

	AR									
	US					Non-US				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
July 07 onward	0.40***	0.30**	0.30**	0.31**	0.37**	0.24*	0.21*	0.27**	0.40**	0.45***
	(0.16)	(0.13)	(0.14)	(0.15)	(0.16)	(0.13)	(0.13)	(0.13)	(0.17)	(0.17)
July 07	0.82**	0.96**	1.01**	0.85**	0.95**	0.21	0.20	1.23***	0.57***	0.51***
	(0.41)	(0.40)	(0.42)	(0.41)	(0.40)	(0.45)	(0.45)	(0.09)	(0.15)	(0.18)
Abnormal Returns (t-1)		0.13***	0.13***	0.14***	0.15***		−0.01	−0.02	−0.03	−0.04
		(0.03)	(0.03)	(0.03)	(0.03)		(0.03)	(0.03)	(0.03)	(0.03)
Abnormal Returns (t-2)			−0.03	−0.03	−0.03			−0.06**	−0.05*	−0.06*
			(0.03)	(0.03)	(0.03)			(0.03)	(0.03)	(0.03)
Abnormal Returns (t-3)				−0.06**	−0.05**				−0.13***	−0.14***
				(0.03)	(0.02)				(0.03)	(0.03)
Abnormal Returns (t-4)					−0.02					0.02
					(0.04)					(0.04)
Constant	−0.40***	−0.24***	−0.28***	−0.32***	−0.38***	0.07	0.08	0.10	0.01	−0.05
	(0.08)	(0.07)	(0.08)	(0.09)	(0.11)	(0.07)	(0.07)	(0.08)	(0.10)	(0.10)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	43	43	43	43	43	25	25	25	25	25
Observations	1,814	1,771	1,728	1,685	1,642	1,062	1,013	964	915	866
Adjusted R^2	−0.004	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.03	0.04
F Statistic	0.84	1.40**	1.32*	1.57***	1.53**	1.60**	1.42*	1.53**	2.00***	2.07***
Note:										*p<0.1; **p<0.05; ***p<0.01

All models in the table are estimated using observations in the event window (June 07, 2009 - August 07, 2009). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.