

Papal Dividends: Do Popes' Political Communications Move Economic Markets?*

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Abstract

The literature on the effect of political events on economic markets is attentive to the influence of elections and institutional appointments. Less investigated is the economic impact of events related to alternative political leaders, for example religious authorities. This paper builds on new research on the market impact of unconventional leaders and spiritual officials, focusing on the case of the Roman Catholic Pope. We study the material implications of the utmost relevant papal communications – the so-called encyclicals – for stakeholders associated with public issues addressed in these documents. We conjecture that investors are sensitive to Popes' communications that clearly signal a policy approach directed at the scope of their economic activities. However, Popes have ideological leanings that make them more or less sympathetic to the use of markets to solve public policy issues. We thus expect that if a Pope leans towards a market-based approach to a specific issue, the most exposed sectors may be cheerful of a papal communication and materially benefit through stock returns. Vice versa, if a Pope is skeptical of market approaches, investors may see negative returns after the papal announcement. To test our theory, we propose an event study that traces the impact of Pope Francis's 2015 climate encyclical (the *Laudato Si*) on the stocks of the global energy industry. We show that this encyclical by Francis, who is viewed as an opponent of profit-driven solutions to global problems and who distinctly criticized market-based climate policy arrangements, caused renewable energy companies to lose stock value after publication. We also demonstrate that this effect is concentrated among American firms, and is a result of the partisan framing of the encyclical in the US. The findings contribute to the assessment of the material impact of the communications of spiritual authorities, and to the understanding of the causal effects of the political positions of non-elected leaders.

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1 Introduction

Power and authority have long been issues of academic attention. Understanding authority is relevant to political science, for it is believed that through actions and communications powerful leaders - be they democratically elected or publicly appointed - can form political opinions, shape political behavior, and influence policy outputs. A large literature focuses on different traits of leadership and their implications for politics (Fearon, 1994; Bueno De Mesquita and Siverson, 1995; Saunders, 2011; Kertzer, 2016). In parallel to this scholarship, a growing amount of political economy scholars investigate the economic consequences of leaders' foreign policy positions (Clark and Hallerberg, 2000; Arias et al., 2018). In an era of expanding stocks exchange, this research has also focused on how political authorities affect commerce. Along these lines, a number of studies have investigated how leaders' partisan affiliation and credibility move financial markets (Fowler, 2006; Bechtel, 2009; Sattler, 2013; Benton and Philips, 2020).

This research has mainly equated political leaders with elected politicians and institutional representatives. However, it is increasingly clear that this definition of leaders is limited. More nuanced social figures and non-elected institutions have significant political clout, and their influence is a topic of growing public interest. Spiritual leaders, for example, have long been involved in politics. Many studies trace the historical political engagement of religious authorities and their social consequences in early modern states (Gill, 1998; Bueno De Mesquita, 2000; Philpott, 2001; Nexon, 2009; Stark, 2015). Some political scientists have ventured in analyzing the policy consequences of religious leaders and organizations (Minkenberg, 2002; Grzymala-Busse, 2016). However, not a lot of systematic studies exist on the *financial* implications of the political positions of religious authorities today.¹ This research gap is puzzling given the large audiences that spiritual leaders have access to around the world, and that public consideration for them can easily surpass public attention to politicians (Grzymala-Busse, 2012). It is also compelling from a political ideology angle, given that religious institutions have powerful effects on voters' partisanship (Inglehart and Norris, 2004), and presumably on their economic and financial decisions too.

Along these lines, there is a surprising lack of systematic research on the material consequences of perhaps the most prominent spiritual figure in the contemporary political landscape: the Roman Catholic Pope. While a number of studies point to the implications of the Holy See positions on the framing of world issues (Genovese, 2015, 2019; Ziegler, 2020) and the deployment of papal resources to solve them (Warner, 2000; Juergensmeyer, 2008), virtually no study so far has sought to explore the impact of Popes' political positions on the global market economy. In a similar vain, despite common assumptions about the long-fetched implications of papal statements (Hehir, 1990), no political economy study has

¹Some scholars have explored the effects of religious leaders' diplomatic visits and communications on political campaigns and redistributive policies following religious campaigns. 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, this extant scholarship tends to provide more emphasis to the impact of local or national churches (Minkenberg, 2002) rather than the positions of a leader like the Pope, which is the main focus of this paper.

examined if and how the politics of the Vatican can materially affect the stock value of the economic actors invested in the issues tackled by the Pope. This paper confronts precisely this question. We focus on the ways in which a Pope’s political communications can affect stakeholders of the issues raised in the papal message. In so doing, we provide the first theoretical and empirical investigation of why papal politics matter for financial investors and how papal messages may affect stock markets.

Our premise is that, despite his nominal distance from political power, the Pope is consistently incentivized to release political messages that tackle world problems, and frequently provides a political vision of global affairs. The Pope is especially tuned in with issues affecting the poor and vulnerables, given that global crises with few national solutions tend to impact them the most, and motivate the Vatican to step up for these communities (Ferrari, 2006; Chong and Troy, 2011; Genovese, 2019). Popes’ most political messages tend to resonate in the so-called encyclicals, i.e. the most relevant written communications released by the Holy See. Encyclicals are part of a Pope’s repertoire of writings: it is expected that all Popes will write a number of them throughout their tenure. Encyclicals tend to have specific themes, sometimes related to purely spiritual affairs but often targeting public issues directly. These political issues vary, although at their core they usually reflect on economic inequality and the role of the state in global markets (Edelman, 1985; Genovese, 2015). Each encyclical is announced months, if not years, before publication. However, the specific content of an encyclical is not revealed until the official releasing conference. In addition, while the Roman Curia seeks to ensure consistency in the Vatican message across papacies, it is evident that each Pope has his own ‘style,’ i.e. ideology. Importantly, at the outset of publication the ideology embedded in an encyclical may be unknown, especially in the case of the first encyclical of a newly appointed Pope.

In the spirit of the efficient market hypothesis (Fama, 1970), we contend that the message in a new political encyclical – whose general theme may be pre-announced but whose content is de facto unknown until publication – affects markets associated with the policy issue embedded in that papal communication. However, we also contend that the direction of the effect may lie on the ideology of the Pope in question, specifically his position on poverty and economic redistribution. Historians contend that since the beginning of the 20th century Popes have tried to find a fine balance between the rejection of the communist economic model and the endorsement of a socially viable market model (this is the Vatican’s so-called ‘third way’ of thinking about the role of the state in a free market economy, between capitalism and socialism; see Himes, 2006). Accordingly, from an economic policy perspective, Popes may be perceived as more right- or left-leaning.

Building on this observation, we argue that a Pope’s economic orientation should matter for relevant markets. Specifically, we theorize that the perceived ‘ideology’ of the Pope in place in conjunction with the release of an encyclical will create a signal in favor or against markets. Hence, we further conjecture that, if a Pope leans towards a market-based approach to a specific issue, the most exposed sectors may

be cheerful of the papal announcement and materially benefit through stock returns. Vice versa, if a Pope is skeptical of market approaches, investors would interpret the papal message as a sign of restrictive measures to come, and as a consequence stocks may see negative returns. In order to test our theory, we focus on the case study of the *Laudato Si*, i.e. the first encyclical signed off by Pope Francis (2013 –). On the one hand, this encyclical addresses climate change, an issue usually associated with a left-leaning agenda. On the other hand, Francis approached these issues with market skepticism, denouncing the role of profit-oriented incentives to solve the inequalities behind environmental degradation.² This message largely fits the ‘socialist’ depiction of Francis that the global news, and especially American outlets, have offered of him since his installment in Rome.³

In light of these considerations, we expect that the release of Francis’s climate encyclical moved the stocks of companies exposed to climate policies and market incentives, first and foremost the green energy industry. However, in view of the market-skeptic message of the encyclical and the ideological framing of Francis in the media, we hypothesize that the *Laudato Si* may have overall depressed the stocks of green energy companies, especially in a context like the United States where these companies are particularly fragile and where Francis became a polarizing (left) figure (Li et al., 2016).

To test our argument, we present an event study design that draws on daily stock values of a sample of the most traded renewable energy firms in 2015. We focus on renewables companies, because in 2015 these were less locked-in compared to other energy companies and therefore more reliant on political signals and policy support. Additionally, we subset our sample to study US firms more specifically. Our statistical analyses show that Francis’s first encyclical mattered to the relevant financial markets, in line with our first and main hypothesis. The studied companies cumulatively experienced abnormal losses in the range of 3% the month after the publication of the encyclical. However, and in support of our ideological effect hypothesis, we find that the main losses were experienced by American companies. In line with our theory, American green firms are the most exposed to the turbulence of international events but also the ones that have most distinctly experienced Francis’s message as a signal of anti-market socialism.

Our findings contribute to different areas of political science research. We enrich the scholarship on politics and markets by revealing that information from leaders that lack direct policy relevance matter to stock exchanges. We have shown that investors seek out news about likely future policy directions, and that these can come from as unconventional sources as the Pope. More broadly, our analysis indicates the important role that non-elected officials play in forging political discussions that

²In *Laudato Si*, the Pope takes a negative position on carbon credits and allocation of pollution permits, saying that “in no way do [market mechanisms] allow for the radical change which present circumstances require” (171).

³Francis has been consistently called a ‘socialist’ in the mainstream news, and several media outlets made strong associations between his ideological ‘platform’ and the one of leaders like Raul Castro (Cuba) or Bernie Sanders. Similarly, he has also been frequently depicted as the leader of the ‘Global Left’. 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>.

have material consequences. Hence, our paper also refocuses the attention of political communication and political economy research on the understudied effects of religious leaders and transnational non-governmental institutions such as the Holy See.

2 Popes and Stocks

2.1 Political Leaders' Communications and Financial Market Behavior

The effect of political leaders' positions on financial markets is an old topic of political economy debate. It has recently received more attention in light of the global expansion of commerce and the volatility that recent political turbulences have caused. However, the main presumption remains the same: according to the classical theory of market efficiency (Fama, 1970), asset prices reflect all publicly available information. So, new and unanticipated information about future policy affecting markets affects investors' views about the future value of their assets. Against this background, a wave of new research has shown that the information pertinent to political newcomers - e.g. the time of their election or their appointment - affects stock markets (Bernhard and Leblang, 2006; Mosley and Singer, 2008; Bechtel, 2009; Sattler, 2013). These effects have been found in many countries, and is relevant to both public and private exchanges.

This research has not limited itself to identifying the timing effect of new leadership. Scholars have also explored if particular nuances about new political leaders affect financial stocks. Some works show that news about the likely future political orientation of political officials trigger stronger investor reactions when they concern lesser-known non-incumbent candidates (Bernhard and Leblang, 2006; Jensen and Schmith, 2005), as long as these are credible (Fowler, 2006; Brooks et al., 2015) and unconstrained (Sattler, 2013). Importantly, a number of these studies also point to the style and rhetorical positions of new leaders, suggesting that it is not only their actions but also their communications that trigger market volatility. Accordingly, Benton and Philips (2020) show that a stronger message and high amounts of resolve in newcomers' communications are associated with stock reactions.

The majority of the studies that focus on the relation between political communications and financial markets rely on evidence from elected politicians and representatives. However, it is increasingly clear that political discourse is not only made by people in political institutions, and political events fall also in the realm of other figures. Along these lines, a new set of studies investigate the effect of politically salient organizations and bureaucrats. Here too, there is increasing agreement that these actors, who may indirectly affect policy, have important implications for global markets. Alexiadou (2016) and Hallerberg and Wehner (2020), for example, suggest that the cabinet appointment of professionals outside of the realm of policy (e.g. economists and technocrats) influences capital markets (see also Broz, 2013; Clark and Arel-Bundock, 2013). Similarly, international political economy scholars show that information

stemming from meetings at international organizations make investors update risk and move markets accordingly (Gray, 2009; Wilf, 2016). This body of research has also highlighted that it is not only the diplomatic behavior at these meetings but also the communications themselves that cause market reactions (Baerg, 2020; Genovese, 2021).

In this paper we stretch this logic about market implications of political communications further, extending it to transnational actors with no association to political institutions and policymaking. While traditionally political science has discounted the role of non-appointed political figures, recent studies have painted a new light on self-authorized political representatives (Montanaro, 2012; de Wilde, 2020), including transnational spiritual leaders (Ferrari, 2006; Jones et al., 2015). In concordance with this wave of research, we maintain that, as long as a source of political communication is authoritative and expresses an identifiable ideological position, that communication can have a large impact on the public, and therefore possibly reveal a potential future policy debate. So, communications of moral leaders who operate outside of politics but whose messages are *de facto* political can pave the path to a future policy. In turn, this signal may affect the future value of assets most affected by such policy.

We believe an exemplary case of a spiritual leader whose political messages may move financial market this way is the Pope. The Pope represents a particular type of transnational authority: he is a religious official, although he also has access to a jurisdiction (the Holy See, which operates in the state of the Vatican City), sovereign institutions (e.g. the Roman Curia) and formal votes in international organizations. Importantly, papal directions and actions have given significant credibility to policy agendas, both domestically (Gill, 2001) and internationally (Pelc, 2019). A growing literature studies the actions of the Roman Catholic church and its policy consequences around the world (Minkenberg, 2002; Grzymala-Busse, 2016). However, the material short-term effects of the positions of the Pope himself remain largely understudied. This is puzzling given the common belief that Popes' messages affect public discourse (Brown, 2009; Li et al., 2016) and so, presumably, debates with future policy implications. We contend that, given his salient authority, a Pope's communications should be market-relevant if his opinion on a given issue are unknown *a priori*, for example if a Pope is at the beginning of his tenure, and therefore largely unknown to the world. Under these circumstances, we claim that the papal communication reveals new information. In what follows we describe more precisely how this information, combined with the ideological directionality of the Pope's political recommendations, will affect markets.

2.2 The Market Effects of The Pope's Political Vision

Despite the separation between religion and the state in Europe since the Middle Ages, all Popes have historically engaged in political issues and interacted with political institutions (Bueno De Mesquita, 2000; Nexon, 2009). Since the 1962 Second Vatican Council that reformed the Roman Catholic church,

the Vatican committed to more ‘social teaching’. This effectively translated into regular papal written communications about a range of political issues. The most comprehensive type of communication is the encyclical, which after 1962 became “the most characteristic and ultimate purpose of the teachings” of the reformed church, in the words of Paul VI.⁴ The issues discussed in the encyclicals following the Second Vatican Council have spread over a range of different topics, but essentially reflected two major debates within the Catholic church: economic solutions to vulnerability and poverty, and the role of states in a free market economy (Edelman, 1985; Stark, 2015). In modern history, the Vatican maintained a consistent commitment to give voice to communities plagued by inequality and economic deprivation. As some research has shown, Popes systematically released more politically charged encyclicals when secular authorities failed to address global crises (Genovese, 2015).⁵

At the same time, historians suggest that different Popes took different ideological positions on market solutions (Himes, 2006). For example, commentators note that Popes like John Paul II (1978-2005), while critical of unlimited capitalism, favored a liberal view of markets. Accordingly, John Paul II had vast influence on the market ideology of people with conservative orientation (Brown, 2009). By contrast, other Popes such as Pius XI (1922-1939) and John XXIII (1958-1963) took a softer tone with respect to progressive socialism, and chose a harder stand on liberal markets. Seemingly, these ideological positions transcended in the Popes’ encyclicals, and a number of anecdotes support this assumption. For example, John Paul II’s *Centesimus Annus* contains a message for states at the dawn of the post-Cold War era (1991). In this encyclical the Polish Pope offers a message about the efficiency of free markets “for utilizing resources and effectively responding to needs” (34). Similarly, in his 2009 *Caritas in Veritate*, Benedict XVI addresses the market economy in light of the Global Recession. However, Benedict’s position was more critical of markets, and the German Pope indicated the need for more global regulations.

In light of this observation, we assume that all Popes – just like other transnational leaders in global politics and international institutions (Voeten, 2021) – have an inclination towards economic policy that approximates ‘right versus left’ ideological positions. Accordingly, a Pope’s economic policy inclination should make him more or less supportive of free market operations for the purposes of solving the church’s dearest public issues. Importantly, this ideological take should permeate the framing of the political message embedded in a Pope’s encyclical (Li et al., 2016). We then expect that the effect of a communication from a Pope leaning towards a more conservative or liberal approach to market-oriented solutions should have similar repercussions on relevant financial markets as the communications of partisan leaders would (Fowler, 2006; Broz, 2013; Sattler, 2013).

Specifically, we expect that if a Pope leans towards a market-based approach to a specific issue, the investors of more exposed firms may be cheerful of papal communications that embrace this approach,

⁴ *Sanctities Clarior* Motu Proprio. 19 March, 1969.

⁵ Evidently, Popes also release political communications in other forms, but 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 be complement these with other political communications (Campbell, 2010; Genovese, 2019).

and this may cause a positive abnormal return for these firms. In other words, an issue-specific encyclical published by a market-supportive Pope may make companies directly involved in the relevant issue areas more profitable. Vice versa, if a Pope is skeptical of market approaches, investors may lower expectations about the profitability of traded firms. Hence, a market-skeptic Pope may cause negative reactions in the stocks of more exposed traded companies. To illustrate the validity of our argument, we concentrate on one specific case and narrow our focus to the first encyclical released by Pope Francis. In the next section we provide the background to the case study and provide hypotheses that we later empirically test with an event study design.

3 Pope Francis and the Impact of the Climate Encyclical on Energy Markets

We study the material economic implications of Papal messages focusing on the case of Pope Francis (2013 –) and his first social encyclical letter, called the *Laudato Si*. The *Laudato Si* is a 184-page document dedicated to environmental degradation and global warming. Dated May 24, 2015, it was first unofficially leaked by the Italian newspaper *L'Espresso* on June 15, 2015, and then officially published (though virtually unchanged) at noon on June 18, 2015, accompanied by a 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 for the planet. It unambiguously reflects on the economic rules that influence environmental exploitation and degradation, and puts forward a political position on these mechanisms. As Francis himself clarified 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” (June 18, 2015).

The encyclical was interpreted around the world in consistent ways. Environmentalists and progressive activists welcomed the hard tones and full punches directed to liberal markets. Experts and media pundits largely read the document as an attack to capitalism broadly intended. Overall, many relevant voices decoded the *Laudato Si* as a collection of anti-market, pro-government centralization ideas. Some even registered it as a new political manifesto.⁶ Along these lines, in an email to the International New York Times on June 20, 2015, environmental economist and Harvard professor Robert 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 – carbon taxes and/or cap-and-trade systems”.

⁶Damian Carrington. *Will Pope Francis's encyclical become his 'miracle' that saved the planet?* The Guardian, June 18, 2015. <http://www.theguardian.com/environment/damiancarrington-blog/2015/jun/18/will-pope-franciss-encyclicalbecome-his-miracle-that-saved-the-planet>.

Evidently, observers viewed the Pope’s position as considerably left. In the United States, some compared it to the economic visions of Senator Bernie Sanders. The analogy should not come as surprise: in 2016, during his Democratic primary candidacy, Sanders made several remarks in awe of Pope Francis. In April 2016 the Senator went to meet Francis in Rome, and their discussion involved a conversation on climate change, which reportedly saw them in full agreement of the perils of modern economies. In the following months, several media channels framed both leaders as believers of centralized federal action (i.e. nationalization of industries) and skeptics of private markets, including green technology companies and private renewable firms. In the view allegedly shared by Francis and Senator Sanders, whilst going in the right direction, the private market ‘will not deliver the needed reforms quickly enough to combat climate change’.⁷

We argue that the ideological message underlying the Pope’s encyclical and the partisan context in which it was received are critical to understand what its effects on financial markets might have been. Clearly the Pope’s position on the climate crisis and its economic roots became polarizing. Along these lines, Li et al. (2016) show that conservative Catholics in the US devalued the Pope’s credibility on climate change, while left Catholics found consistency between pontiff’s views and those of their political allies. Building on this intuition, we argue that investors may have reacted to Francis’s message assuming that the Pope was taking a “partisan” stance – in this case, tilting towards the political left. But which stocks would have been exposed to this interpretation of Francis’s message, and which markets would have reacted the most? For our purposes, it is important to specify which actors should have experienced these effects. Given the environmental focus of the encyclical, we focus on its effects on energy markets.

Energy markets are deeply embedded in infrastructural investments and economic constructions, and constitute a fundamental element throughout which to judge the state of the economy. Historically, the development of modern society capitalized on fossil fuels. However, lately renewable energy has burgeoned, and electricity from cleaner natural sources has been increasingly included in the energy make-up of several countries. These developments have been the result of intense political struggles over the domestic production of electricity (Bayer and Urpelainen, 2016). Declining prices due to technological innovation and supportive policies have helped renewables increase their market supply. However, renewables have not been equally successful everywhere. Backlash against renewable energy installation is still existent, partly due to fossil fuel lobbying (Meckling, 2011), partly because of the bottom-up public objection to energy developments in local areas (Stokes, 2016). Also, the renewable energy industry is still vulnerable to policy fluctuations, and to date there is not yet a renewable energy lock-in (Aklin and Urpelainen, 2018).

A question in environmental politics research is whether the energy industry, and especially the renewable energy sector, is particularly sensitive to authorities involved in environmental and climate

⁷Bade, 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>.

discussions. Focusing on the case of Trump’s election in 2016, some investigations show that the announcement of a climate policy adverse leader boosted the price of fossil fuels and depressed the stock performance of renewable energy companies (Aklin, 2018; Ramelli et al., 2019). This outcome was driven by Trump’s ideological, far-right position on environmental issues and, more generally, his stand on the economy. During the 2016 campaign the Republican candidate remained skeptical of ‘green transition’ and became a proponent of coal. Furthermore, the negative effect of Trump’s election on green energy stocks is connected to his general position on trade and economic relations, which implied little emphasis on regulations but also little help for vulnerable market actors, such as green energy firms.

We argue for a similar mechanism switching the focus on the Pope, in order to inquire what the material effects of this alternative authoritative political message may be for such industry. We claim that the energy industry, and especially the renewable energy sector, was particularly exposed to the Papal climate encyclical, and investors updated their belief on the profitability of energy firms in the aftermath of its release. Importantly, we focus on the stock reactions in the renewables sector, which in 2015 were far from competitive in many countries, and were therefore potentially more exposed to subtle policy signals. Following our discussion, if Francis is considered a policy agenda-setter, the anti-market message in Francis’s climate encyclical may have dropped confidence in the fact that future political leaders would have supported the renewable energy sector. Our first hypothesis therefore is:

Hypothesis 1: *Pope Francis’ 2015 encyclical affected the stock performance of renewable energy companies negatively.*

However, we suspect these effects to be distinctly relevant for renewable companies in specific locations where the Pope message may be considered more ‘policy credible’. In the case of the *Laudato Si* encyclical, we believe this may be the United States for reasons that have to do both the structural market characteristics of the clean energy sector in this country and the national politicization of Francis. Firstly, and differently from several counterparts in Europe, renewable firms in the United States have not received economic incentives nor trade protection in recent decades (Smith and Urpelainen, 2014; Bayer and Urpelainen, 2016). Liberal policy choices have left this American industry particularly vulnerable to economic cycles and the power of investors. Additionally and complementarily, the framing of Francis as an opposer of market approaches and its conflation with Sanders’ positions seems particularly relevant to the US markets at a time in which the country was in electoral campaign mode and the Vermont senator was leading the polls.⁸ If the Pope’s message was seen as a preview of policies to come under a possible Sanders-led presidency, we expect markets to have reacted similarly to the encyclical as they would to the announcement of a high chance of left leadership in political institutions (Clark and Arel-Bundock, 2013; Sattler, 2013). In light of these two observations, we expect investors of US green energy markets to receive these as especially bad news, and we therefore expect a particularly negative

⁸The Guardian. July 2015. Bernie Sanders sees poll surge after series of record-breaking appearances. <https://www.theguardian.com/us-news/2015/jul/02/bernie-sanders-poll-surge-hillary-clinton>.

effect on US renewable energy stocks. This yields our second testable hypothesis:

Hypothesis 2: *The effect of Pope Francis' 2015 encyclical on energy stock markets is stronger for U.S. firms.*

4 Event Study Design

In order to empirically validate our theoretical argument, we study the stock trends of a global sample of firms in the energy sector. We specifically focus on renewable energy firms, for our theory suggests that these should be most reactive to the message of voices like the Pope. Below we describe how we use the firms' stocks data to capture investors' perceptions of Francis's 2015 encyclical. We then describe the event study methods employed to estimate the market reactions to the *Laudato Si*.

4.1 Data

Our main quantity of interest are stock returns. In order to construct a measure of returns, we collected information on stock prices of firms in the renewable energy sector. Following other event studies of energy markets (Aklin, 2018; Ramelli et al., 2019), we focused on a sample of 48 major (*i.e.* large) firms included in the Bloomberg Industry Classification Standards list of Renewable Energy companies. This sample draws on the Bloomberg list but we follow common practice and discard shell companies and penny stock firms, in other words we ignore companies traded at less than \$1. 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.⁹

After identifying the relevant sample, we retrieved daily data on stock prices to these 48 firms. We obtained this information from Thomson Reuters' Eikon financial database. A few of these firms had been delisted before or within the time window of interest in our study. This further narrowed down our initial sample to 42 firms for which available financial data exist. A list of firms included in the sample, their headquarter country, and their sector of activity is reported in the appendix (Table A.1). Our sample consists of a majority of US firms (25 firms, 60%). Among the 17 non-US firms, 6 are European and other 6 are Chinese. China is currently the major global producer of renewable energy; however, its investments mainly involve its central government, hence Chinese firms are scarce in our

⁹Our 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. The results, which are shown in the Appendix, show that adding these firms to the sample does not change our substantive results.

sample.¹⁰ By contrast, the representation of United States companies in the sample is in line with global figures of private renewable energy investment, especially in terms of solar photovoltaic capacity and biodiesel/ethanol production.¹¹ In terms of sectoral heterogeneity, the majority of our companies are focused on solar energy (17 firms), followed by biofuels (13 firms) and other (6).

We employ stock prices information for each firm in our dataset to compute daily percentage changes with respect to 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. All financial data span from November 1, 2014 until the July 23, 2015, to include the *Laudato Si* publication event (June 18, 2015) and, alternatively, its leakage (June 15, 2015). This time selection ensures we have enough information for the relevant time windows in the estimation strategy.

4.2 Event analysis

Two events are of potential interest in our study: the publication of the *Laudato Si* encyclical on June 18, 2015 and its leakage by the Italian newspaper *L'Espresso* a few days before (June 15). In order to study the effect of these events on financial returns to firms in the renewable energy sectors, we adopt an event analysis strategy. This methodology allows to estimate firms' returns under the synthetic counterfactual that the encyclical was not published. We can thus compare counterfactual and factual returns and attribute a causal effect to the document's publication (or, possibly, its leakage), 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 one is an "estimation window", which corresponds to the pre-event timespan used to estimate synthetic counterfactuals; the second is an "event window", when 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.

Our event analysis strategy proceeds in two steps. First, we focus on observations in the estimation window solely. The goal of the first step is to estimate models that best predict daily percentage changes in returns to each individual firm as a function of a vector of covariates $\mathbf{X}_{i,t}$. Once these models are estimated, we use them to predict daily percentage changes in returns to each firm in the event window: $E[Returns_{i,t}|\mathbf{X}_{i,t}]$. Next, we estimate two main outcomes of interest for our theoretical purposes. We compute *Abnormal Returns* $_{i,t}$ for each observation in the event window, defined as the difference between

¹⁰See Chiu, D. 2017. 'The East Is Green: China's Global Leadership in Renewable Energy', in *New Perspectives in Foreign Policy*, 13, 3-12.

¹¹According to 2018-2019 capacity and generation figures, the United States is the top investor in solar and biofuels, and the second with respect to wind power. See REN21. 2019. *Renewables Global Status Report*. https://www.ren21.net/wp-content/uploads/2019/05/gsr_2019_full_report_en.pdf.

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).

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

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

The second step of the analysis represents the proper causal estimation. If the publication provided no additional information to firms in our sample, on 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 (leakage). Having defined these variables as the difference between observed returns (factual) and predicted returns (synthetic counterfactual) in the event window, we are able to 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 a few critical assumptions. First, that models obtained in the estimation window do not systematically under- or over-predict daily percentage changes in returns in the event window. Second, that no shock simultaneous to the event of interest in the second window affects firms in the population we intend to represent (as opposed to market-wide shocks).

We discuss the plausibility of the first assumption in the next section. Regarding the second assumption, we conducted a search on financial newspapers about simultaneous events during the days the encyclical was released. No event that could affect firms specifically in the energy sector emerged.¹² To reduce concerns that the state of the world had changed between the two windows, we minimize the distance in days between them. Our preferred event window begins only eight days after the end of the estimation window, although larger event windows reported in Appendix provide broad support to our main results.¹³

4.3 Model specification

We estimate models in the first window employing three market-wide indexes of financial performances: the NYSE, DAX and FTSE indicators. We employ these variables to construct the vector of covariates $\mathbf{X}_{i,t}$ since the majority of renewable energy firms in our sample (31) are headquartered in either the US

¹²An event that could have potentially affected financial markets in June 2015 was the EU bank reform talks, which were alleged but not officially announced <https://www.telegraph.co.uk/finance/economics/11672728/Bank-reform-must-reflect-changes-since-crisis-says-Liikanen.html>. Moreover, the Greek IMF bailout expired on June 30 and a referendum was proposed on the repayment of the debt <https://www.theguardian.com/business/2015/jun/28/greek-crisis-ecb-decide-emergency-funding>. The likely effect of these events on 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. It seems unlikely that these events affected specifically firms in the renewable energy sector and not the financial market as a whole.

¹³See Figures A.2 and A.3.

or the EU and those indexes measure performances of the most important financial hubs in these areas. For each firm i in our dataset we estimate the following model in the estimation window using ordinary least squares (OLS):

$$Returns_{i,t} = \alpha_i + \beta_i NYSE_t + \gamma_i DAX_t + \theta_i FTSE_t + \epsilon_{i,t} \mid t_0 < t < t_1 \quad (3)$$

Since we employ performance indicators mainly for US and EU markets, our models may underperform when predicting returns to the eleven firms headquartered outside these markets. This could threaten the plausibility of our first assumption that our models do not systematically under- or overpredict changes in returns in the event window. To assess the validity of this assumption, we analyze measures of fit to firms in our sample based on their financial market. Figure 1 reports the distribution of the R^2 values for the estimated models, and distinguishes the distributions by the nationality of the firm. Overall, the estimation window does not seem to significantly explain less variation for non-US firms. This gives us confidence that models perform similarly across firms' nationalities. Put differently, the indexes for the performance of US and EU financial markets seem capable of explaining variation in returns to basically all our sampled firms.

We use the estimated models to predict values of $Returns_{i,t}$ in the event window:

$$E[Returns_{i,t} | \mathbf{X}_{i,t}] = \hat{\alpha}_i + \hat{\beta}_i NYSE_t + \hat{\gamma}_i DAX_t + \hat{\theta}_i FTSE_t \mid t_2 < t < t_3 \quad (4)$$

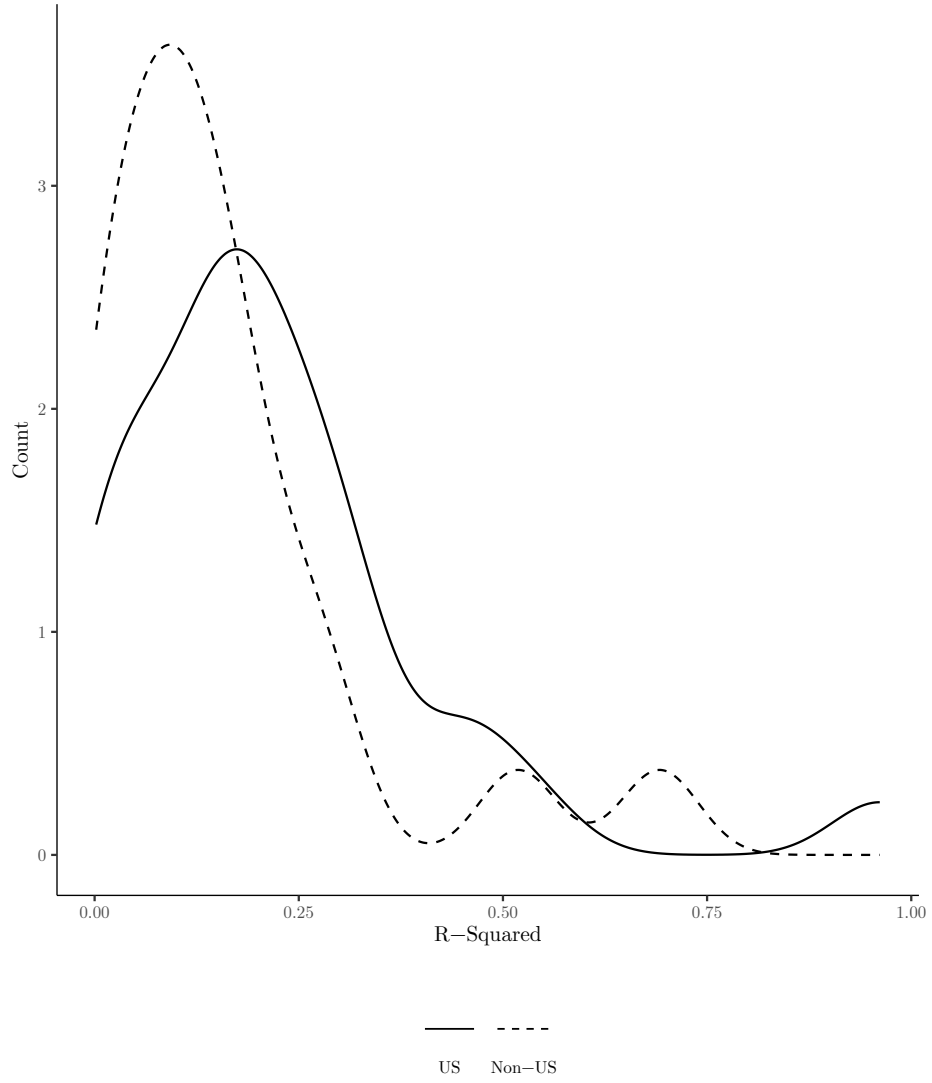
We then compute our measures of *Abnormal Returns* $_{i,t}$ and *Cumulative Abnormal Returns* $_{i,t}$ for each firm, at each point in time of the event window, as described by equations 1 and 2 (see Table A.2 in appendix for the descriptive statistics of these two outcome variables). Our hypotheses are tested with econometric models of *Abnormal* and *Cumulative Abnormal Returns* that take the following specification:

$$Abnormal\ Returns_{i,t} = \delta D_t + \lambda Abnormal\ Returns_{i,t-1} + \zeta_i + \mu_{i,t} \mid t_2 < t < t_3 \quad (5)$$

$$Cumulative\ Abnormal\ Returns_{i,t} = \eta D_t + \zeta_i + \phi_{i,t} \mid t_2 < t < t_3 \quad (6)$$

In equations 5 and 6, D_t is our central variable. This is a binary indicator that takes value 1 after the event of interest (be it publication or leakage of the encyclical), 0 before. Our empirical model of equation 5 also includes a dummy that takes the value 1 exclusively for the date of the publication (or leaked release) and 0 otherwise. Equation 5 also includes a lagged dependent variable to account for unobserved time dependence. Equation 6 does not include lags because *Cumulative Abnormal Returns* at time $t - 1$ are mechanically correlated with their value at t . The term ζ_i represents firm-level fixed effects. We introduce these fixed effects because we intend to study within-firm variation in our dependent

Figure 1: Fitness of estimation models by nationality of the firm



This figure reports the distribution of the R^2 values for each model fitted in the estimation window. We estimated one model for each firm in the dataset (42) using ordinary least squares and daily observations in the estimation window (November 1, 2014 – May 10, 2015). We report the distribution of this measure of fit for each model as the goal of the estimation window is to predict returns to individual firms.

variables, before and after the event of interest, and these allow us to control for all firm-level unobserved heterogeneity. In alternative specifications we substitute this term with country (headquarter) and sector-level fixed effect. Terms $\mu_{i,t}$ and $\phi_{i,t}$ represent the idiosyncratic error terms of the two models.

In equation 5, parameter δ represents the average treatment effect of the encyclical on the treated (ATT) firms' returns, and quantifies the average amount by which firms' observed returns depart from expected returns following the event. By contrast, η in equation 6 quantifies the cumulative average effect of the publication over the entire period that follows the event. Our argument suggests that Francis's political vision in the *Laudato Si* was interpreted by investors as a message of unsupportive (i.e. anti-market) future policy (Hypothesis 1). We also suggested that this effect may have been largely concentrated among American companies, due to the vulnerability of clean energy firms and the polarizing partisan framing of Francis in the US (Hypothesis 2). Our argument hence implies that, following our theory, these parameters would be negative and statistically significant, especially with respect to the US subsample.

A simple descriptive analysis of the *Abnormal Returns* variable we compute is suggestive of the negative effect we expect. Figure A.1 shows the estimated *Abnormal Returns* to clean energy companies in our sample and their averages in the event window. Before the event, average *Abnormal Returns* are close to zero¹⁴. This indicates that, on average, no shock makes observed *Returns* diverge from expected ones. After the event, instead, average *Abnormal Returns* tend to be *below* the zero horizontal line¹⁵. Panel (c) exemplifies this effect highlighting *Abnormal Returns* to three selected companies. As the figure shows, before the event their observed *Returns* tend to be similar to what is expected by our predictive models (*Abnormal Returns* lines fluctuate around the horizontal zero-line). After the event, instead, *Abnormal Returns* tend to be below the zero-line, indicating that observed stock prices to these companies are systematically smaller than what is expected by predictive market models. Evidently, clean energy firms' returns were on average worse off in the period that followed publication of the encyclical. In the next section we attribute a causal interpretation to these descriptive patterns.

5 Results

5.1 The Francis Effect: Abnormal and Cumulative Abnormal Returns

In our main econometric models, we estimate the effect of the publication of the encyclical (June 18, 2015) on *Abnormal Returns* and *Cumulative Abnormal Returns* to firms in the renewable energy sector. We first report the test on the whole sample, to address our first hypothesis. We then subsample the firms by national headquarters and separate the US companies from non-US companies, to follow up on our second hypothesis.

¹⁴Panel (b): mean value is -0.05, indistinguishable from 0 at p-value = 0.65

¹⁵Panel (b): mean value is -0.35, distinguishable from zero at p-value = 0.003

Table 1 presents the first set of results. Model 1 introduces firm-level fixed effect and studies within-firm variation. 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 its publication. This model also includes the binary variable *June 18* to control for any immediate effect of the encyclical on firms' returns, and a first lag of the dependent variable, *Abnormal Returns* ($t - 1$). Model 1 provides support for our first hypothesis. We find a negative effect of the publication of the encyclical on *Abnormal Returns* to firms in the renewable energy sector, significant at a 0.05 conventional level. On average, renewable energy firms around the world had daily observed returns, after the *Laudato Si* publication, which were smaller than expected returns by around 0.35%. Immediate effects of the publication, instead, are not distinguishable from zero due to a rather large standard error. This suggests that the encyclical on average had a marked prolonged negative effect, possibly as a function of the political discussion it caused in the following weeks.

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

	<i>Dependent variable:</i>					
	Abnormal Returns			Cumulative Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
June 18 onward	-0.35** (0.14)	-0.34** (0.13)	-0.34** (0.13)	-3.12** (1.47)	-3.00** (1.45)	-3.00** (1.45)
June 18	-0.03 (0.47)	-0.01 (0.46)	-0.01 (0.46)			
Abnormal Returns ($t - 1$)	-0.18** (0.07)	-0.16** (0.07)	-0.17** (0.07)			
Constant	-0.12 (0.08)	-0.12 (0.07)	0.38** (0.18)	-4.20*** (0.81)	-4.27*** (0.81)	4.35 (7.45)
Firm FE	Yes			Yes		
Headquarter FE		Yes	Yes		Yes	Yes
Sector FE			Yes			Yes
Number of firms	42	42	42	42	42	42
Observations	1,767	1,767	1,767	1,783	1,783	1,783
Adjusted R ²	0.02	0.02	0.02	0.71	0.11	0.18
F Statistic	1.90***	4.21***	3.47***	103.36***	20.56***	27.21***

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.

Models 2 and 3 investigate whether this result is sensitive to the inclusion of headquarter and sector-fixed effects, which control for heterogeneity at these levels. We cannot include these fixed effects simultaneously to firm fixed effect due to perfect multicollinearity (each firm i has exactly one headquarter country and has its main activities in exactly one sector). Therefore, we introduce only headquarter-fixed effect in Model 2, and add sector-fixed effect in Model 3. Results in these models are robust to those

presented in Model 1: the publication of the *Laudato Si* encyclical reduced daily returns to firms in the renewable energy sector by 0.34%.

How large is this daily average effect when cumulated over the entire event window? Models 4–6 study the effect of the entire period after the publication of the encyclical on *Cumulative Abnormal Returns*. They introduce fixed effects with the same logic as in Models 1–3. When considering the entire time-period following the publication of the encyclical, firms in the renewable energy sector lost on average between 3.00% and 3.12% in value of their stocks. The effect is distinguishable from zero at a 0.05 significance level.

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

	<i>Dependent variable:</i>							
	US				Non-US			
	Abnormal Returns (1)	Cumulative Abnormal Returns (2)	Abnormal Returns (3)	Cumulative Abnormal Returns (4)	Abnormal Returns (5)	Cumulative Abnormal Returns (6)	Abnormal Returns (7)	Cumulative Abnormal Returns (8)
June 18 onward	−0.43*** (0.14)	−0.42*** (0.13)	−4.21** (1.96)	−4.21** (1.94)	−0.15 (0.26)	−0.13 (0.25)	−1.46 (2.19)	−1.29 (2.16)
June 18	−0.66* (0.34)	−0.65** (0.33)			0.94 (1.00)	0.97 (0.97)		
Abnormal Returns ($t - 1$)	−0.06** (0.03)	−0.04 (0.03)			−0.24** (0.10)	−0.23** (0.10)		
Constant	0.003 (0.07)	0.55*** (0.09)	−0.15 (0.96)	12.63** (5.06)	−0.26* (0.15)	0.07 (0.14)	−5.12*** (1.22)	−2.19** (1.10)
Firm FE	Yes		Yes		Yes		Yes	
Sector FE		Yes		Yes		Yes		Yes
Number of firms	25	25	25	25	17	17	17	17
Observations	1,071	1,071	1,075	1,075	696	696	708	708
Adjusted R ²	0.01	0.01	0.75	0.12	0.04	0.05	0.58	0.05
F Statistic	1.38*	2.11**	129.06***	31.45***	2.53***	6.58***	58.34***	10.52***

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.

Are these results homogenous across our sample or are they driven by specific companies? Our theory suggests that American firms may have been disproportionately exposed to the political vision in the climate encyclical. We suspect this is partly because of the relative vulnerability of US renewable firms and their particular exposure to global events, partly because of the pronounced ‘anti-market’ depiction of the Pope in the media and the specific association between Francis and market-skeptic leaders such as Senator Sanders. In light of this discussion, we proceed to test our second hypothesis. In Table 2 we explore the heterogeneous effects of the publication of the encyclical on two subsets of our sample which include only US and non-US companies respectively. The specifications follow the logic of the previous analysis, for we again study *Abnormal Returns* and *Cumulative Abnormal Returns* for both subsamples.¹⁶

¹⁶The 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.

Models 1 and 2 in Table 2 show that US firms had lower returns than expected by around 0.43% in the period following the publication of the encyclical. The effect is significantly different from zero at a 0.01 conventional level. Interestingly, the US subsample also experienced a negative immediate shock: a reduction in stock value by around 0.65% on the very day the encyclical was published. The short-term effect on this subsample is statistically significant at a 0.05 conventional level, is robust to further specifications and becomes more significant with alternative lag choices (see Table A.6). Consistent with these findings, Models 3 and 4 show 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 the encyclical.

The coefficients for the publication of the encyclical relative to the subsample of non-US companies, instead, are never statistically distinguishable from zero. Point estimates relative to the effect of the *Laudato Si* on their *Abnormal Returns* are negative, but fail to meet statistical significance in Models 5 and 6. The effect on *Cumulative Abnormal Returns* too is negative but undistinguishable from zero. Overall, we have evidence that US companies were disproportionately negatively affected by the encyclical than non-US firms, in line with our second hypothesis.

5.2 Robustness Tests

We subject our results to a series of robustness tests, all of which are reported in the appendix. First, we tested whether our findings depend on the arbitrary length of the event window we chose. We re-estimated models 1 and 4 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). Figure A.2 reports point estimates and 95% confidence intervals for the variable *June 18 onward* for each of these models. Results from models 1 and 4 of Table 1 are highlighted in red for comparison.

Panel (a) shows that we observe a consistently negative and statistically significant effect of the publication on *Abnormal Returns* for event windows of at least 38 days and until 66 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. Longer event windows, instead, effectively compare the pre-treatment group with days in the after-treatment group in which the effect had become weaker. Panel (b) shows that a negative and statistically significant effect on *Cumulative Abnormal Results* is detected for time windows that include at least 54 days around the event, and remains consistently negative after that. Figure A.3 replicates the same test on the subsamples of US and non-US firms (adopting specifications of models 1, 3, 5, and 7 of Table 2). Overall, it confirms our findings on heterogeneous

effects when changing the length of the event window.

Next, we unpacked whether the leakage of the encyclical on June 15 had an effect on firms' returns. Table A.3 replicates the exercise proposed in Table 1, but studies the leakage. Overall, we still observe a negative and statistically significant effect of the leakage on *Abnormal Returns* and *Cumulative Abnormal Returns*, although the effect becomes smaller in size and noisier. We speculate that 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. Some received this treatment later on in the event window, depending on the readiness of newspaper and information sources to engage in a conversation around the themes of the Papal document. The same considerations hold when we unpack the effect of the leakage on US and non-US firms (Table A.4).

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 A.5, A.6, and A.7 report the results. They apply alternative lag choices to models relative to the publication and leakage 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 $t - 4$. Our results are robust to all those alternative specifications.

A competing alternative explanation for our results is that the *June 18 onward* dummy variable is in fact capturing broader trends or shocks to firms in the energy industry in 2015, unrelated to the Papal document but not captured by the market indexes that we use to compute $E[Returns|\mathbf{X}_{i,t}]$. We then selected a new sample of 47 firms in non-renewable energy markets that are as similar as possible to those in our sample. We started from the sample of 38 EU and 70 non-EU polluting companies selected by Genovese (2021) from the 2010 Forbes Global 2000 dataset. These firms include polluting firms that are not in the energy industry. We then discarded companies that did not fit this requirement, in order to obtain a sample of non-renewable energy firms as similar as possible to ours. Further data availability on Thomson Reuters' Eikon dataset narrowed the sample down to 47 polluting companies in the non-renewable energy industry. The resulting sample includes polluting firms from energy sectors as diverse as those related to coal, oil, and chemicals. The list of firms in the sample and their headquarter countries are reported in appendix (Table A.10).

We then replicated the entire event analysis and studied the effect of the publication of the encyclical on *Abnormal Returns* to this new sample of firms. Results are reported in Table A.11. We do not find any statistically significant effect of the publication of the encyclical on returns to firms in this sample. We interpret the null effect from this exercise as a placebo test on the results we presented above. This is evidence that the publication of the *Laudato Si* encyclical had an effect which was specific to more 'vulnerable' firms in the renewable energy industry.

We also investigate other heterogeneous effects in our sample. For example, we explore heterogeneity

by ‘sectors’ of clean energy firms. We classified companies according to their main activity – either of solar, wind, hydro, biofuel, or other. We then subset our sample in these five groups and estimate our firm-FE and headquarter country-FE models of *Abnormal Returns* and *Cumulative Abnormal Returns* within each of these samples (Table A.12). Subsetting by those categories leaves us with few firms in each subsample, which drastically compromises the power of our analysis. Nevertheless, we detect a significant effect for the largest group: the solar industry. Firms in this sample lost on average 0.46% of their returns after the encyclical was published (firms in the ‘other’ sector too show a similar negative effect). This evidence buttresses the intuition that the effect mattered most for the US companies, which dominate the solar sector in our sample. Additionally, for the US subsample, we also investigate whether heterogeneity exists across firms whose assets are concentrated in Democratic-led or Republic-led states (as measured by the party of the governor in place in summer 2015). We find that in both types of states the average abnormal return post-Laudato Si is lower than before its publication; however, the difference is statistically distinguishable from zero only for the Democratic states. While this may be in part due to selection mechanisms, i.e. the fact that Democratic states (for historical and geographical reasons) tend to attract more investments in clean energy, it also suggests that the decrease in prices is indeed associated with firms in states where the political imagery would take more seriously the policy implications of Francis’s message.

Finally, we investigate the effect of yet another event related to the *Laudato Si* encyclical on firms’ returns. On January 24, 2014, the Holy See Press Office announced that the Pope was working on an encyclical about the ecology of man. It is possible that firms were exposed to this early information about the document and its likely ideological take. We therefore replicate the entire event analysis procedure for firms in our clean energy sample, selecting two early time windows. The new estimation window starts on June 1, 2013 and ends on December 1, 2013 (183 days long). The new event window starts on December 24, 2013 and ends on February 24, 2014 (62 days long). Tables A.13 and A.14 replicate our analysis to study the effect of this announcement. We find that, on average, renewable energy firms were immediately negatively affected by the announcement on January 24, 2014, although these results are more opaque – note for example that the *Cumulative Abnormal Returns* did not suffer from the event. We take this as further evidence that the detailed message exposed in the encyclical - and not just its general theme announced in 2014 – caused a reaction in the market.

6 Mechanism: Media Framing of Francis and the Climate Encyclical

Our research design allows a causal estimation of the economic effect of Pope Francis’s 2015 encyclical on the climate. We found that this effect was negative and prominent among renewable energy stocks,

especially in the US. This is in line with our interpretation of the Pope’s skeptical view of high-risk renewable energy industry and, more generally, the use of markets for public good provision.

To further verify whether this interpretation is valid, we directly explored how the media reporting about the *Laudato Si* revealed the Pope position on the climate and, more generally, how this encyclical was framed in relation to the Pope’s general ideology. Evidently, the encyclical was reviewed by commentators and observers once published; however, it is still useful to explore the tone and message of the media around the published encyclical due to the privilege access the media that forms ideas about sensitive religious documents (Campbell, 2010), and for the importance that media framing has on event evaluation in markets (Benton and Philips, 2020; Genovese, 2021). Our quantitative findings would be buttressed if we find that, at the time of the publication of the encyclical, the media emphasized the economic policy dimension of the Pope’s message, and in particular his market-skeptic positions.

In order to gather a representative sample of news articles reporting on the Pope’s encyclicals, we performed a systematic search of English-speaking newspapers entries on Lexis Nexis. Time-wise, we constrained our search between January 1, 2014 (a time when it became known that the Pope was going to focus on writing an encyclical on the environment) and December 31, 2016 (counting a few months after the released of the *Laudato Si*). We preferred this to more narrowly focus on the dates around the release date of June 18, given that several pieces came out earlier (due to the leak) and much later, as opinion pieces. We focused on English-speaking news sources because they have the most outreach and possibly are the most influential for international market investors. The news search was based on the keyword ‘encyclical’, although in a separate search we also included the word ‘market’ to narrow down the results. The final compilation includes 104 relevant articles from 5 main sources: *The Guardian*, the *Financial Times*, *The New York Times*; *The International New York Times* (previously *International Herald Tribune*), and *The Washington Post*.¹⁷ These sources represent a global Anglophone readership, and provide a window to the news consumed in the United States and countries closely tied to the US.

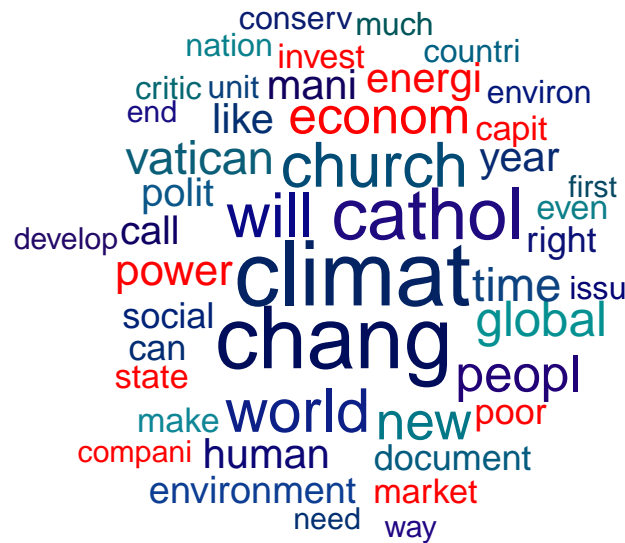
We conducted both quantitative and qualitative content analyses of these 104 articles. We pre-processed the documents so to drop all unnecessary formal details and ignore a standard set of English stop words (including ‘Pope’ and ‘encyclical’). We then moved to calculate the most frequent words and identify if any of those referred to the economy and markets. Figure 2 shows that a relevant theme clearly emerges in the selected news. In particular, a focus on the market economy is prominent as signified by words like ‘market’, ‘company’, ‘invest-’ and ‘capital’.

This theme seems robust and cohesive. To show that, we ran a simple unsupervised topic model following the Latent Dirichlet Allocation (LDA) method (Blei et al., 2003). This approach allows us to find sets of words that characterize the news’ latent dimension. The results from a three-topic model are reported in Table 3. We find a strong economy-related topic (topic 2), which encompasses the same terms

¹⁷In numbers of articles, we collected 29 articles from *The Guardian*, 16 from *The Financial Times*, 25 from *The New York Times*, 17 from *The International New York Times*, and 17 from *The Washington Post*.

identified in the descriptive word cloud. This cluster also appears in the output of other topic models that include more topics. Interestingly, words like ‘coal’ and ‘solar’ are connected in this dimension. This indicates that, as we argued, the public discourse may have interpreted Francis’s words as an outcry for general reforms of all economic rules, and that investors may have interpreted the document as a market-skeptic message.¹⁸

Figure 2: Word cloud of 50 most frequent words related to the Laudato Si as per the sampled news articles (2014-16). Higher word font size corresponds to higher word frequency. Words in red intuitively correspond to an ‘economic policy’ theme and were highlighted by the authors.



Top 50 words (>150 frequency) in sampled news articles (N=104).

Table 3: Topic model: This table illustrates the top 12 words identified for each cluster of a three-topic LDA estimation with 50 random initialization values. The terms highlighted for Topic 2 refer to the expected economic dimension.

<i>Topic 1</i>	<i>Topic 2</i>	<i>Topic 3</i>
cathol	invest	sept
church	energi	western
climat	power	west
vatican	nrg	street
peopl	compani	nationst
human	solar	bst
mani	electr	galleri
global	plant	theater
chang	emiss	noon
will	gas	centuri
poor	renew	intelectu
capit	coal	democraci

¹⁸We also checked whether both left and right news sources (e.g. Guardian [more left orientation] v. Financial Times [more right orientation]) picked up on these themes. We find that they do, hence suggesting that the identified framing is mainly an artifact of the ideological position of some of the news outlets. See word clouds in the Appendix.

To clarify our results from a qualitative stand point, we read the news articles and identified passages that validate our intuition and corroborate the quantitative findings. In the months before the release of the encyclical, the Associated Press Online (October 28, 2014) clearly highlighted how the Pope's care for social and environmental issues does not encompass a trust in markets:

Francis [...] said he knew well that 'If I talk about this, some will think that the pope is communist.' [...] His speech Tuesday broadened his concerns to include the environment, the rights for farmers to have land, and for young people to have work. He promised that the concerns of the poor would be highlighted in his upcoming encyclical on ecology and the environment.

A similar way of framing the message of Pope Francis appeared when the encyclical was out. A piece published in the Guardian on the day of the release (June 18, 2015) stated:

One recurring motif throughout the encyclical is a general scepticism or outright hostility to technological solutions to environmental challenges, and to the role that big business should play in tackling climate change. For example: "Technology, which, linked to business interests, is presented as the only way of solving these problems, in fact proves incapable of seeing the mysterious network of relations between things and so sometimes solves one problem only to create other."

Importantly, the same article indicates the skepticism of Pope Francis towards carbon trading, a policy mechanism dear to cleaner energy companies. The author continues:

[Francis] doesn't like carbon trading either. In this passage he seems to be referring to the only current global carbon trading scheme, the CDM: "The strategy of buying and selling 'carbon credits' can lead to a new form of speculation which would not help reduce the emission of polluting gases worldwide. This system seems to provide a quick and easy solution under the guise of a certain commitment to the environment, but in no way does it allow for the radical change which present circumstances require. Rather, it may simply become a ploy which permits maintaining the excessive consumption of some countries and sectors."

This commentary is not unique to the Guardian. In the United States, several news outlets took a similar perspective. Already in the early 2015 the New York Times had mentioned some similarities between the Pope's environmental and economic views and the position of the progressive wings of the US Democratic party.¹⁹ In an article from June 20, 2015, a NYT correspondent wrote:

[T]he encyclical's criticism of market forces, and its references to sacrificing economic growth to protect the environment, could have the unintended consequence of strengthening the arguments of opponents of climate change policy. For years, opponents of climate change policy have argued that a global push to cut fossil fuel pollution will impede economic growth, particularly in poor countries that are heavily dependent on cheap fossil fuels. Francis' encyclical could give ammunition to that argument, which is being pressed by Republicans in Congress and on the presidential campaign trail. But some liberal policy experts say the document aims to weaken that case.

These extracts, together with other qualitative excerpts listed in the Appendix, confirm the portrayal of Francis as a market-pessimist and a skeptic of financial tools to deal with environmental degradation.

¹⁹On April 15, 2016, the International New York Times covered Sanders's visit to Rome during his Democratic convention campaign, and suggested that "Mr Sanders is hoping to cement that common bond on economic issues with an embrace [...] from [the] pope.

Together with our econometric findings, these patterns indicate that the *Laudato Si* was interpreted in disfavor of market policies, and this hinged heavily on the most high-risk market actors of the energy sector, namely renewable energy. This negative effect might be driven by the nature of renewable energy systems, their dependence on small voluntary markets and set-asides, which make them particularly vulnerable to any signal going against the liberalization of the market. Still, identifying such effect denotes the relevant impacts that authorities outside of the realm of policy can make among attentive investors.

In sum, our data suggest that the Pope’s messages have not only political implications but also material consequences, and can in fact move financial markets. Notably, the direction of financial gains and losses seems contingent on the perceived ideology of the Pope. In the case of the 2015 climate communication, the political framing around Francis seems to have contributed to a prediction of anti-market policies following the encyclical.

7 Conclusion

Studies on the impact of politics over markets have concentrated extensively on the effect of the actions and communications of appointed political authorities (e.g. elected politicians or formal institutions) on the returns to market actors that are sensible to this information. In this paper we note that this scholarship has surprisingly overlooked the impact of moral or religious authorities. Spiritual leaders, for example, have wide audiences, frequently address social issues, and often question specific economic actors. Presumably, their political vision can even have material consequences. However, little research has so far investigated the causal effects that these authorities have on financial markets. We fill this gap focusing on the case of a most relevant, yet largely understudied, international leader: the Roman Catholic Pope.

Our paper seeks to explore the financial implications of the most relevant papal writings – the so-called encyclicals – for stakeholders invested in the political issues addressed by these forms of communications. Our argument draws from theories about the role of authorities’ communication and ideological framing on economic outcomes. We conjecture that investors with particularly vulnerable economic activities are sensitive to Popes’ communication when it signals a policy approach directed at them. A Pope’s ideological positions make him more or less sympathetic to market-based solutions to policy issues addressed in

the encyclical. Exposed and vulnerable market actors will be sensible to the policy implications of this piece of information. As a result, we expect that investors in sectors exposed by a Pope in an encyclical will be cheerful when he leans towards market-based solutions, and their stock returns will benefit. On the other hand, private stakeholders invested in the topic will see negative returns if the Pope is openly critical of market approaches to the issues addressed.

Empirically, we test our argument with the case of Pope Francis' 2015 *Laudato Si* encyclical. This encyclical addressed the problem of environmental degradation, although touching more broadly on issues of economic injustice and poverty. In this document, the Pope was openly skeptical of several market-based policies for emission abatement, and profit-driven solutions to the problems of industrialization. We claim that this message should have resonated particularly with the global clean energy industry, which – at least at the time of the *Laudato Si* release – was a sector not yet in economic 'lock-in', hence particularly vulnerable to political and economic shocks. We apply an event analysis methodology to study the effect of this encyclical on the returns to 42 firms in this industry. Our findings show that 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. When cumulated, this loss amounts to a 3% reduction in share value. However, when looking at the heterogeneity of this effect, we also showed that US companies are driving the loss, while non-US counterparts do not appear to have equally suffered the consequences of the publication of the 2015 encyclical. The US-specific effects of the encyclical are insightful, because they suggest that a polarizing, authoritative figure like Pope Francis in combination with an explicitly political message can materially affect new, internationally vulnerable companies. The interpretation of these results is buttressed by a text analysis of relevant news articles from English-speaking newspapers.

Our findings shed new light on the material effects of the political positions of unconventional leaders, and suggest new lines of research for political science. We expand the scholarship on the effects of spiritual authorities on markets, by showing that information generated by religious officials with no direct policy relevance can directly affect the returns of specific traded firms. We also give support to studies that focus on communications, and not only actions, of leading figures in international politics. Finally, our study exhorts political economy research to consider more thoroughly the understudied effects that spiritual leaders and transnational non-governmental institutions – like the Holy See – have on domestic and global markets.

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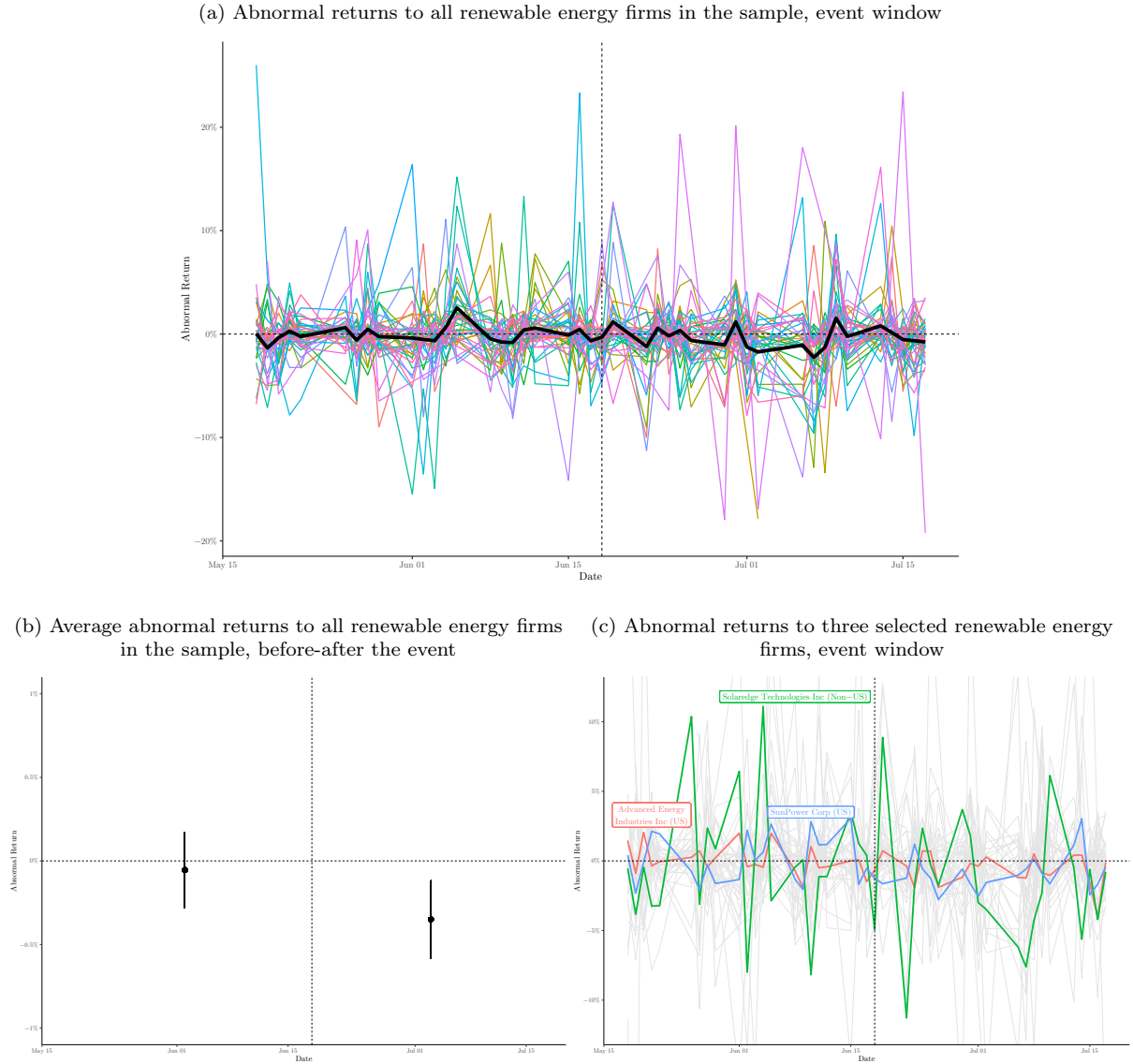
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Appendix

Papal Dividends: Do Popes' Political Communications Move Economic Markets?

A Event Analysis

Figure A.1: Abnormal returns before and after publication of the *Laudato Si* for all renewable energy companies (a), three selected firms (c), and averages before-after the event (b)



In all panels, dashed vertical lines represent the main event under analysis, *i.e.* the publication of the *Laudato Si* encyclical on June 18, 2015. The thick black line in panel (a) reports daily average *Abnormal Returns* to firms in this sample. This plot excludes the Chinese company Yingli Green Energy Holding Co Ltd due to high bound variation. Panel (b) reports average abnormal returns to all companies before and after the event (95% confidence intervals are reported). Panel (c) plots abnormal returns to three selected companies in the sample, before and after the event.

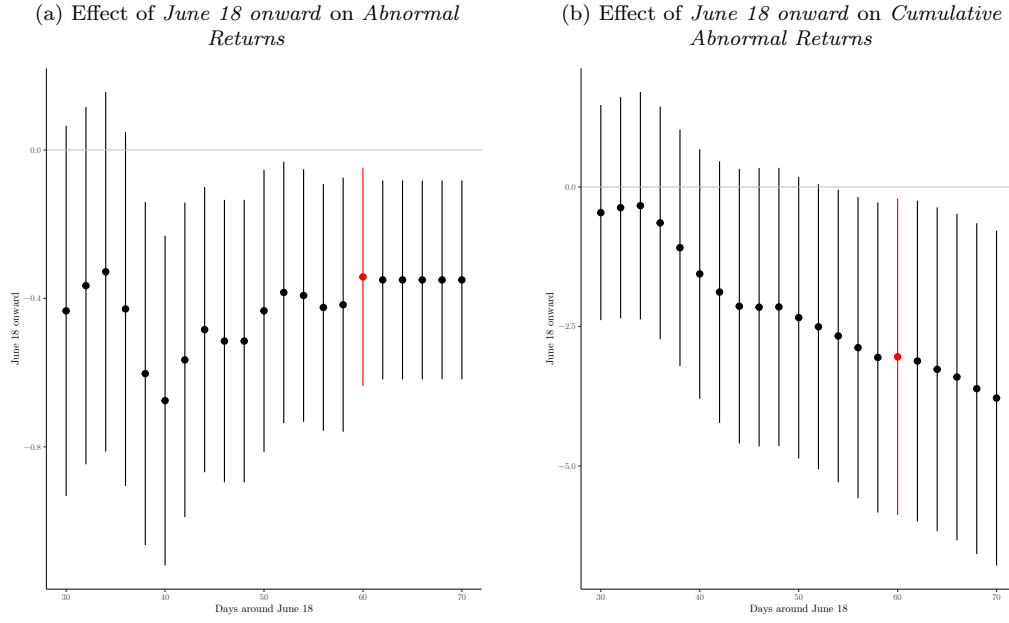
Table A.1: Sample of firms considered in the clean energy industry

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

Table A.2: Descriptive statistics of clean energy firms. Event window (May 18, 2015 - July 18, 2015)

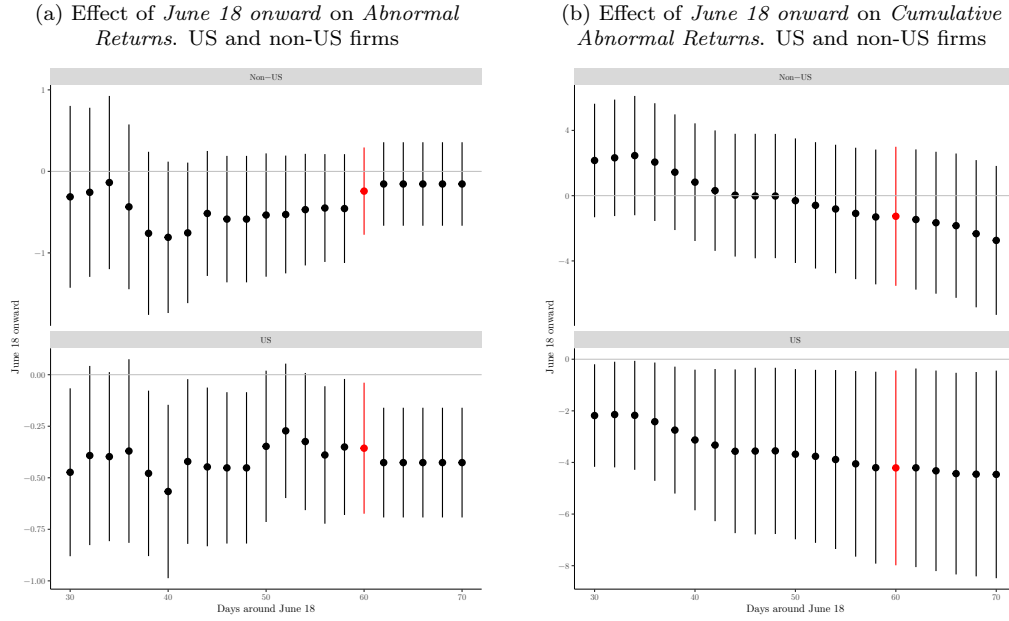
Statistic	Mean	Median	St. Dev.	Min	Max	N
Returns	-0.27	-0.18	3.59	-36.91	24.47	1,790
Abnormal Returns	-0.20	-0.20	3.51	-35.46	26.01	1,775
Cumulative Abnormal Returns	-2.06	-0.87	14.06	-62.02	39.60	1,783
Returns (US)	-0.21	-0.15	2.77	-17.83	24.12	1,075
Abnormal Returns (US)	-0.14	-0.14	2.70	-17.86	26.01	1,073
Cumulative Abnormal Returns (US)	0.41	0.23	14.61	-62.02	39.60	1,075
Returns (Non-US)	-0.35	-0.24	4.56	-36.91	24.47	715
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

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



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. 95% critical values are drawn from t-student distributions with degrees of freedom equal the number of observations in each model minus one.

Figure A.3: 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



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. 95% critical values are drawn from t-student distributions with degrees of freedom equal the number of observations in each model minus one.

Table A.3: Effect of the leakage of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* for firms in the clean energy industry.

	<i>Dependent variable:</i>					
	Abnormal Returns			Cumulative Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
June 15 onward	−0.32** (0.15)	−0.31** (0.15)	−0.31** (0.15)	−2.63* (1.48)	−2.53* (1.47)	−2.53* (1.47)
June 15	0.36 (0.55)	0.35 (0.55)	0.36 (0.55)			
Abnormal Returns ($t - 1$)	−0.18** (0.07)	−0.16** (0.07)	−0.17** (0.07)			
Constant	−0.12 (0.08)	−0.12 (0.08)	0.38** (0.18)	−4.25*** (0.95)	−4.31*** (0.94)	4.31 (7.51)
Firm FE	Yes			Yes		
Headquarter FE		Yes	Yes		Yes	Yes
Sector FE			Yes			Yes
Number of firms	42	42	42	42	42	42
Observations	1,767	1,767	1,767	1,783	1,783	1,783
Adjusted R ²	0.02	0.02	0.02	0.70	0.10	0.18
F Statistic	1.88***	4.16***	3.43***	101.52***	19.88***	26.61***

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 A.4: Effect of the leakage of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* for firms in the clean energy industry. Comparison of US and non-US firms

	<i>Dependent variable:</i>							
	US				Non-US			
	Abnormal Returns		Cumulative Abnormal Returns		Abnormal Returns		Cumulative Abnormal Returns	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 15 onward	-0.42** (0.18)	-0.41** (0.17)	-3.63* (1.93)	-3.63* (1.91)	-0.10 (0.24)	-0.08 (0.23)	-1.10 (2.32)	-0.98 (2.28)
June 15	0.65 (0.50)	0.64 (0.49)			-0.13 (1.15)	-0.11 (1.13)		
Abnormal Returns ($t - 1$)	-0.06** (0.02)	-0.04 (0.03)			-0.24** (0.10)	-0.23** (0.10)		
Constant	-0.001 (0.10)	0.54*** (0.11)	-0.18 (1.08)	12.61** (5.06)	-0.25** (0.13)	0.08 (0.11)	-5.23*** (1.48)	-2.28* (1.33)
Firm FE	Yes		Yes		Yes		Yes	
Sector FE		Yes		Yes		Yes		Yes
Number of firms	25	25	25	25	17	17	17	17
Observations	1,071	1,071	1,075	1,075	696	696	708	708
Adjusted R ²	0.01	0.01	0.74	0.12	0.04	0.04	0.58	0.05
F Statistic	1.30	1.82*	125.31***	29.91***	2.49***	6.44***	57.96***	10.29***

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 A.5: Effect of publication and leakage of the encyclical on *Abnormal Returns* to firms in the clean energy industry. Alternative lag specifications

	<i>Dependent variable:</i>									
	Abnormal Returns									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 18 onward	−0.30*** (0.12)	−0.35** (0.14)	−0.35** (0.16)	−0.45** (0.19)	−0.47** (0.19)					
June 18	0.04 (0.45)	−0.03 (0.47)	0.01 (0.46)	−0.002 (0.46)	0.05 (0.44)					
June 15 onward						−0.29** (0.13)	−0.32** (0.15)	−0.31* (0.18)	−0.41** (0.21)	−0.44** (0.21)
June 15						0.22 (0.54)	0.36 (0.55)	0.41 (0.56)	0.41 (0.57)	0.32 (0.57)
Abnormal Returns ($t - 1$)		−0.18** (0.07)	−0.19** (0.07)	−0.23*** (0.08)	−0.21** (0.08)		−0.18** (0.07)	−0.19** (0.07)	−0.23*** (0.08)	−0.21** (0.08)
Abnormal Returns ($t - 2$)			−0.06** (0.03)	−0.08*** (0.03)	−0.06** (0.03)			−0.06** (0.03)	−0.08** (0.03)	−0.06* (0.03)
Abnormal Returns ($t - 3$)				−0.04 (0.03)	−0.05* (0.03)				−0.04 (0.03)	−0.05 (0.03)
Abnormal Returns ($t - 4$)					−0.07** (0.03)					−0.07** (0.03)
Constant	−0.11 (0.07)	−0.12 (0.08)	−0.41*** (0.08)	−0.48*** (0.10)	−0.06 (0.11)	−0.10 (0.08)	−0.12 (0.08)	−0.42*** (0.10)	−0.47*** (0.12)	−0.03 (0.14)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	42	42	42	42	42	42	42	42	42	42
Observations	1,775	1,767	1,717	1,667	1,617	1,775	1,767	1,717	1,667	1,617
Adjusted R ²	−0.01	0.02	0.03	0.05	0.03	−0.01	0.02	0.03	0.05	0.03
F Statistic	0.66	1.90***	2.00***	2.91***	2.16***	0.65	1.88***	1.98***	2.88***	2.14***

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

	<i>Dependent variable:</i>									
	Abnormal Returns									
	US					Non-US				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 18 onward	-0.41*** (0.14)	-0.43*** (0.14)	-0.35** (0.16)	-0.36** (0.17)	-0.42** (0.18)	-0.14 (0.20)	-0.15 (0.26)	-0.25 (0.30)	-0.51 (0.38)	-0.53 (0.38)
June 18	-0.63* (0.33)	-0.66* (0.34)	-0.66** (0.32)	-0.63* (0.33)	-0.58* (0.35)	1.02 (0.97)	0.94 (1.00)	0.99 (0.99)	0.97 (0.99)	1.00 (0.96)
Abnormal Returns ($t - 1$)		-0.06** (0.03)	-0.07** (0.03)	-0.10* (0.05)	-0.11* (0.06)		-0.24** (0.10)	-0.26** (0.11)	-0.31*** (0.11)	-0.27** (0.12)
Abnormal Returns ($t - 2$)			-0.01 (0.03)	-0.03 (0.03)	-0.02 (0.04)			-0.10*** (0.03)	-0.11*** (0.04)	-0.09** (0.05)
Abnormal Returns ($t - 3$)				-0.10*** (0.03)	-0.11*** (0.03)				-0.01 (0.04)	-0.01 (0.03)
Abnormal Returns ($t - 4$)					-0.10*** (0.03)					-0.04 (0.04)
Constant	0.01 (0.07)	0.003 (0.07)	-0.04 (0.08)	-0.06 (0.10)	-0.05 (0.11)	-0.23* (0.13)	-0.26* (0.15)	-0.52*** (0.17)	-0.51*** (0.20)	-0.09 (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 A.7: Effect of the leakage of the encyclical on *Abnormal Returns* to firms in the clean energy industry. Alternative lag specifications, comparison of US and non-US firms

	<i>Dependent variable:</i>									
	US					Non-US				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 15 onward	-0.41** (0.18)	-0.42** (0.18)	-0.33 (0.21)	-0.34 (0.23)	-0.41* (0.24)	-0.09 (0.19)	-0.10 (0.24)	-0.18 (0.26)	-0.48 (0.34)	-0.52 (0.33)
June 15	0.62 (0.50)	0.65 (0.50)	0.65 (0.50)	0.58 (0.52)	0.53 (0.53)	-0.37 (1.12)	-0.13 (1.15)	0.08 (1.17)	0.13 (1.18)	0.004 (1.19)
Abnormal Returns ($t - 1$)		-0.06** (0.02)	-0.07** (0.03)	-0.10* (0.05)	-0.11* (0.06)		-0.24** (0.10)	-0.26** (0.11)	-0.31*** (0.11)	-0.27** (0.12)
Abnormal Returns ($t - 2$)			-0.01 (0.03)	-0.03 (0.03)	-0.02 (0.04)			-0.10*** (0.03)	-0.11*** (0.04)	-0.09** (0.05)
Abnormal Returns ($t - 3$)				-0.10*** (0.03)	-0.11*** (0.03)				-0.01 (0.03)	-0.01 (0.03)
Abnormal Returns ($t - 4$)					-0.10*** (0.03)					-0.04 (0.04)
Constant	0.01 (0.09)	-0.001 (0.10)	-0.06 (0.12)	-0.08 (0.15)	-0.05 (0.16)	-0.20* (0.10)	-0.25** (0.13)	-0.50*** (0.14)	-0.45** (0.18)	-0.0001 (0.19)
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	0.04	0.08	0.04
F Statistic	1.24	1.30	1.35	1.77***	1.92***	0.34	2.49***	2.57***	3.71***	2.33***

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 A.8: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* of renewable energy firms. Extended sample.

	<i>Dependent variable:</i>					
	Abnormal Returns			Cumulative Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
June 18 onward	−0.26** (0.13)	−0.25** (0.12)	−0.25** (0.12)	−2.18 (1.41)	−2.09 (1.40)	−2.09 (1.40)
June 18	0.19 (0.39)	0.19 (0.38)	0.20 (0.38)			
Abnormal Returns ($t - 1$)	−0.16** (0.07)	−0.14** (0.07)	−0.14** (0.07)			
Constant	1.03*** (0.08)	−0.01 (0.06)	0.24 (0.20)	−0.85 (0.66)	−5.78*** (0.72)	−3.43 (5.35)
Firm FE	Yes			Yes		
Headquarter FE		Yes	Yes		Yes	Yes
Sector FE			Yes			Yes
Number of firms	51	51	51	51	51	51
Observations	2,139	2,139	2,139	2,175	2,175	2,175
Adjusted R ²	0.02	0.02	0.02	0.69	0.11	0.17
F Statistic	1.77***	3.27***	2.91***	97.82***	19.03***	24.21***

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 A.9: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* of renewable energy firms. Comparison of US and non-US firms. Extended sample.

	<i>Dependent variable:</i>							
	Abnormal Returns		Cumulative Abnormal Returns US		Abnormal Returns		Cumulative Abnormal Returns Non-US	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 18 onward	-0.41*** (0.13)	-0.40*** (0.12)	-4.33** (1.83)	-4.33** (1.81)	-0.003 (0.22)	0.0001 (0.22)	0.50 (2.11)	0.56 (2.07)
June 18	-0.49 (0.31)	-0.49 (0.30)			1.05 (0.73)	1.07 (0.71)		
Abnormal Returns ($t - 1$)	-0.05* (0.03)	-0.03 (0.03)			-0.22** (0.09)	-0.20** (0.09)		
Constant	-0.01 (0.06)	0.39*** (0.11)	-0.09 (0.89)	6.98* (3.96)	0.92*** (0.13)	-0.18 (0.18)	-2.10** (0.98)	-5.51*** (1.96)
Firm FE	Yes		Yes		Yes		Yes	
Sector FE		Yes		Yes		Yes		Yes
Number of firms	28	28	28	28	23	23	23	23
Observations	1,200	1,200	1,204	1,204	939	939	971	971
Adjusted R ²	0.01	0.01	0.74	0.12	0.04	0.03	0.63	0.06
F Statistic	1.39*	2.34**	123.59***	34.46***	2.37***	6.57***	73.76***	17.75***

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 A.10: Sample of firms considered in the non-clean energy industry

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

Table A.11: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* to firms in the non-clean energy industry

	<i>Dependent variable:</i>			
	Abnormal Returns		Cumulative Abnormal Results	
	(1)	(2)	(3)	(4)
June 18 onward	86.93 (90.67)	85.41 (89.05)	−657.24 (678.90)	−656.23 (666.91)
June 18	−71.09 (158.30)	−70.46 (156.74)		
Abnormal Returns ($t - 1$)	0.29*** (0.02)	0.29*** (0.02)		
Constant	−40.00 (38.41)	−41.23 (39.79)	−9.18 (331.55)	303.38 (325.70)
Firm FE	Yes		Yes	
Headquarter FE		Yes		Yes
Number of firms	47	47	47	47
Observations	1,905	1,905	1,980	1,980
R ²	0.09	0.09	0.78	0.77
F Statistic	3.62***	12.04***	142.85***	495.91***

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 A.12: Effect of the publication of the encyclical on *Abnormal Returns* and *Cumulative Abnormal Returns* to firms in the clean energy industry, by sector

	<i>Dependent variable:</i>									
	Abnormal Returns					Cumulative Abnormal Returns				
	Wind	Hydro	Solar	Biofuel	Other	Wind	Hydro	Solar	Biofuel	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
June 18 onward	0.17 (0.47)	0.15 (0.29)	-0.46* (0.24)	-0.28 (0.22)	-0.69** (0.31)	3.39 (2.61)	-2.38 (1.94)	-3.75 (3.02)	-2.60 (2.10)	-6.11* (3.24)
June 18	-1.28 (0.80)	-1.95 (1.92)	0.65 (0.89)	-0.38 (0.68)	0.58 (0.61)					
Abnormal Returns ($t - 1$)	-0.03 (0.02)	-0.10*** (0.01)	-0.21** (0.10)	-0.16 (0.10)	-0.12 (0.11)					
Constant	0.33 (0.25)	-0.01 (0.10)	-0.77*** (0.13)	-0.14 (0.13)	0.04 (0.16)	15.76*** (1.27)	2.83*** (0.95)	-21.41*** (1.47)	-4.49*** (1.17)	10.22*** (1.58)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	3	3	17	13	6	3	3	17	13	6
Observations	127	128	709	549	254	129	130	713	553	258
Adjusted R ²	-0.03	-0.03	0.03	0.03	0.01	0.80	0.08	0.58	0.86	0.41
F Statistic	0.34	0.32	2.12***	2.15***	1.37	169.48***	4.91***	58.75***	260.44***	30.71***

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 A.13: Effect of the announcement of the encyclical (January 24, 2014) on *Abnormal Returns* and *Cumulative Abnormal Returns* to firms in the clean energy industry.

	<i>Dependent variable:</i>					
	Abnormal Returns			Cumulative Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
January 24 onward	−0.46 (0.33)	−0.44 (0.32)	−0.44 (0.32)	2.49 (3.04)	2.47 (3.02)	2.47 (3.02)
January 24	−2.36*** (0.55)	−2.34*** (0.54)	−2.34*** (0.54)			
Abnormal Returns ($t - 1$)	0.001 (0.11)	0.03 (0.10)	0.02 (0.10)			
Constant	0.16 (0.18)	0.15 (0.17)	−0.23 (0.33)	12.17*** (1.44)	12.18*** (1.42)	9.34 (6.29)
Firm FE	Yes			Yes		
Headquarter FE		Yes	Yes		Yes	Yes
Sector FE			Yes			Yes
Number of firms	38	38	38	38	38	38
Observations	1,308	1,308	1,308	1,541	1,541	1,541
Adjusted R ²	0.01	0.01	0.01	0.64	0.05	0.10
F Statistic	1.49**	2.15**	1.81**	73.28***	8.48***	13.03***

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 A.14: Effect of the announcement of the encyclical (January 24, 2014) on *Abnormal Returns* and *Cumulative Abnormal Returns* to firms in the clean energy industry. Comparison of US and non-US firms

	<i>Dependent variable:</i>							
	US				Non-US			
	Abnormal Returns (1)	Cumulative Abnormal Returns (2)	Abnormal Returns (3)	Cumulative Abnormal Returns (4)	Abnormal Returns (5)	Cumulative Abnormal Returns (6)	Abnormal Returns (7)	Cumulative Abnormal Returns (8)
January 24 onward	-0.31 (0.44)	-0.29 (0.42)	8.27* (4.31)	8.27* (4.27)	-0.76* (0.40)	-0.76* (0.40)	-6.67*** (2.50)	-7.06*** (2.45)
January 24	-2.40*** (0.79)	-2.38*** (0.79)			-2.18** (0.85)	-2.14*** (0.83)		
Abnormal Returns ($t - 1$)	0.11 (0.09)	0.14 (0.09)			-0.19 (0.13)	-0.18 (0.12)		
Constant	-0.09 (0.27)	0.04 (0.29)	-11.38*** (2.21)	-3.74* (2.21)	0.30 (0.20)	0.88*** (0.25)	16.50*** (1.18)	17.08*** (1.35)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE								
Number of firms	23	23	23	23	15	15	15	15
Observations	804	804	943	943	504	504	598	598
Adjusted R ²	0.03	0.03	0.67	0.09	0.04	0.04	0.64	0.13
F Statistic	1.85***	4.05***	84.65***	19.05***	2.33***	4.76***	71.96***	23.86***

Note:

*p<0.1; **p<0.05; ***p<0.01

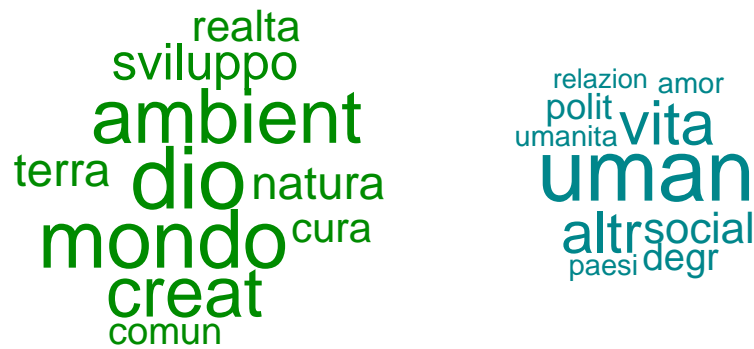
All models in the table are estimated using observations in the event window (May 18, 2015 - July 18, 2015). They are linear models estimated with ordinary least squares and manual inclusion of fixed effects. Standard errors are clustered at the firm-level.

B Text Analysis

Quantitative Analysis

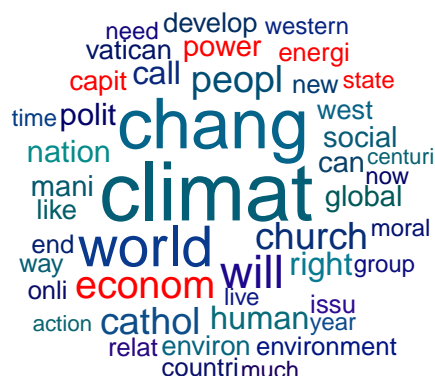
Figure B.1: This figure illustrates the top words' loadings estimated from the twotopic LDA model of the 2015 encyclical. Higher word font size corresponds to higher word frequency. Source: Genovese (2015).

Word Clouds of Topics in 2015 Laudato Si Encyclical: Key Words



Topic 1 (left) and Topic 2 (right)

Figure B.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.

Qualitative Analysis

In this section we include excerpts from the list of newspaper articles selected for our media content analysis. Italics were added by the authors to highlight relevant passages corroborating the theory of the paper.

- - -

Christiana Z. Peppard (18/06/2015), ‘*What you need to know about Pope Francis’s environmental encyclical*’. The Washington Post.

[...] because of his skepticism of technological and economic utopianisms (see below) - Francis is wary of cap-and-trade or carbon-pricing proposals that would merely maintain the underlying systems of environmental exploitation, without the “radical change which present circumstances require” (171). There is, he maintains, an “ecological debt” that industrialized nations owe towards the planet and to nations less developed than our own. [...] Humanity is lost, says Francis, between hyperconsumptive and superdeveloped contexts, and regions where people lack the most fundamental of goods and opportunities. *Much blame lies with speculative finance and the contemporary economy*, whose values and functions are not inherently able to protect the most vulnerable members of society or to avoid environmental degradation. A new way is needed. [...] The encyclical is not a checklist of how to save the planet and, in so doing, each other. Instead, *Laudato Si* is a call to renewed, ecological humanism and moral vision *in a world beset by technological and economic temptation*.

Jim Yardley and Laurie Goodstein (18/06/2015), ‘*Pope Francis, in Sweeping Encyclical, Calls for Swift Action on Climate Chang*’. The New York Times.

Francis has been sharply criticized by those who question or deny the established science of human-caused climate change, and also by some conservative Roman Catholics, who see the encyclical as *an attack on capitalism* and as political meddling. [...] His most stinging rebuke is *a broad critique of profit-seeking* and the undue influence of technology on society. [...] The pope *rejects the belief that technology and ‘current economics’ will solve environmental problems*, or “that the problems of global hunger and poverty will be resolved simply by market growth.” [...] Francis sharply criticizes the trading of carbon credits – a market-based system central to the European Union’s climate policy – and says it ‘may simply become a ploy which permits maintaining the excessive consumption of some countries and sectors.’

Jim Yardley and Laurie Goodstein (19/06/2015), ‘*Pope urges nations to act on climate*’. International New York Times.

He described a relentless exploitation and destruction of the environment, for which he blamed apathy, the *reckless pursuit of profits*, excessive faith in technology and political shortsightedness. [...] Yet Francis has also been sharply criticized by those who question or deny the established science of human-caused climate change and also by some conservative Roman Catholics, who have interpreted the document as an attack on capitalism and as unwanted political meddling at a moment when climate change is high on the global agenda.

Jim Yardley (15/06/2015) ‘*Pope to talk about effects of climate on world’s poor*’. International New York Times.

And based on Francis’ prior comments, and those of influential cardinals, the encyclical is also likely to include an *economic critique of how global capitalism*, while helping lift millions out of poverty, has also exploited nature and created vast inequities. [...] “The Vatican and the pope should be arguing that fossil fuels are the moral choice for the developing world,” said Marc Morano, who runs the website Climate Depot and was once an aide to Senator James M. Inhofe, an Oklahoma Republican and climate change skeptic. Bishop Marcelo Sanchez Sorondo of Argentina, chancellor of the Pontifical Academy of Sciences, has sharply rebutted the criticism and postulated that many of the attacks have been underwritten by oil companies or influenced by conservative American interests, including the Tea Party.

Stephanie Kirchgaessner (18/06/2015), '*Pope calls for 'open spirit' towards climate change encyclical*'. The Guardian.

The release of the document was timed to precede the pope's visit to the US, where he will address the United Nations and seek to encourage climate-change negotiators in the leadup to the November climate summit in Paris. He will also address a joint session of the US Congress in September. [...] The encyclical has already been criticised by conservative Republican politicians who staunchly oppose action on climate change, and was politely but firmly dismissed by the presidential candidate Jeb Bush [...] According to a draft of the encyclical that was leaked by L'Espresso magazine on Monday, the roughly 200-page statement will include a theological examination of environmentalism, as well as a practical and technical evaluation of ways the church believes global warming should be tackled. For example, Pope Francis is expected to criticise cap and trade programmes to reduce greenhouse gas emissions, saying that *such "easy solutions" simply give rise to market speculation*.

Coral Davenport (20/06/2015) '*In name of environment, Pope hits at economy*'. International New York Times.

The encyclical on the environment that Pope Francis released on Thursday is as much an indictment of the global economic order as it is an argument for the world to confront climate change. It offers *blistering criticism of 21st-century capitalism, expressing skepticism about market forces*, criticizing consumerism and cautioning about the costs of growth. [...] While urging swift action to curb the burning of fossil fuels that have powered economies since the Industrial Revolution, he also condemns the trading of carbon-emission credits, saying it merely creates new forms of financial speculation and does not bring about "radical change." But carbon trading is the policy most widely adopted by governments to combat climate change, and it has been endorsed by leading economists as a way to cut carbon pollution while sustaining economic growth. [...] While environmentalists around the world praised the document, some of its core messages could give pause to environmental economists and negotiators who have sought to find a path to a new United Nations accord that is politically palatable to major economies and corporations. [...] In particular, environmental economists criticized the encyclical's condemnation of carbon trading, seeing it as part of a *radical critique of market economies*. "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 - carbon taxes and/or cap-and-trade systems," Robert N. Stavins, the director of the environmental economics program at Harvard, said in an email. [...] But *the encyclical's criticism of market forces, and its references to sacrificing economic growth to protect the environment, could have the unintended consequence of strengthening the arguments of opponents of climate change policy*. For years, opponents of climate change policy have argued that a global push to cut fossil fuel pollution will impede economic growth, particularly in poor countries that are heavily dependent on cheap fossil fuels. Francis' encyclical could give ammunition to that argument, which is being pressed by Republicans in Congress and on the presidential campaign trail. But some liberal policy experts say the document aims to weaken that case. [...] "He's rather brilliantly brought back a concept that has been lost for 30 years or so, [...] - he says profit-making can't be the sole criteria for decision-making," said Jay Hakes, a historian who focuses on energy issues [...]. "The pope's ideas will be jarring to a modern reader at first. He says that people should not ascribe to the market magical qualities that can solve all problems."

Stephanie Kirchgaessner (21/06/2015), '*Pope's climate change encyclical tells rich nations: pay your debt to the poor*'. The Guardian.

The Argentinian pontiff heaps praise on efforts made by scientists to find solutions to man-made problems, and lashes out at those who intervene in the *service of "finance and consumerism"*.

James Politi (16/06/2015), '*Pope's entry into climate debate set to split followers*'. Financial Times.

"The attitudes that are blocking paths to a solution, even among believers, range from denial of the problem, to indifference, to comfortable resignation, to blind faith in technical solutions," he says - later taking aim at the lack of global leadership on the issue and the *nefarious role of "economic powers", speculators and financial markets*. [...] But Mr Ivereigh says the document is bound to have an influence - and the closest encyclical to this one in terms of its message may be *Rerum Novarum*,

the 19th century papal letter in which Leo XIII lamented the poor working conditions and low wages of the Industrial Revolution. “That caused a lot of shock among the Catholic businessmen of Europe, and I think you’re seeing a similar reaction to this document,” Mr Ivereigh adds.

James Politi and Giulia Segreti (18/06/2015) ‘*Pope attacks political and business leaders for destroying planet.*’ Financial Times.

But it also seeks to make the moral and religious 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. [...] “The idea of infinite or unlimited growth, which proves so attractive to economists, financiers and experts in technology ... is based on the lie that there is an infinite supply of the earth’s goods, and this leads to the planet being squeezed dry beyond every limit,” Pope Francis writes. In a tweet on Thursday, the Pope added: “There is a need to seek other ways of understanding the economy and progress”. [...] But *there was little business reaction, in a sign that many companies may choose to disregard the Vatican’s message.* As well as criticising large multinationals, the Pope also took aim at media and technology companies for disconnecting people from nature, excessive consumption and fostering a culture of waste. [...] Conservative politicians in the US opposed to climate change legislation have already disavowed the encyclical’s political message, with Jeb Bush, the Catholic former governor of Florida and Republican presidential candidate, saying he would not set economic policy based on the views of the Pope