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MSc Economics & Business
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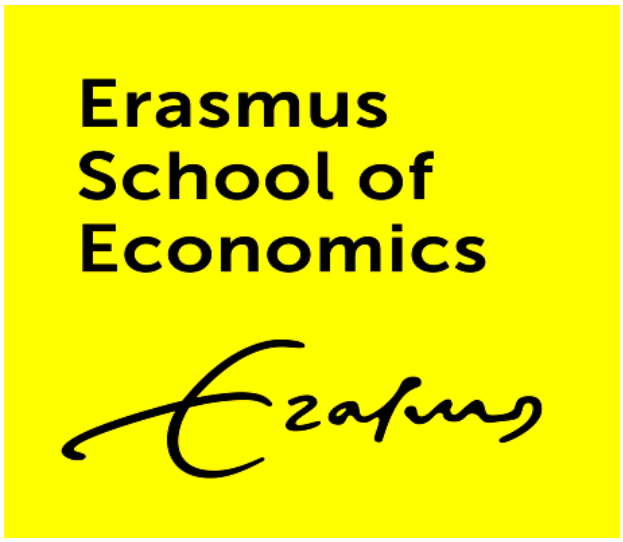
The Financial Imprint of Terror:

The Effect of Terrorism on Firms' Investment and Employment Decisions



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ABSTRACT

I examine whether overall terrorist activity exerts any systematic effect on US firms' real economic decisions over the period 1980-2010. Motivated by prior evidence that costly external finance exogenously time-varies with investor sentiment and this variation affects firms 'investment and hiring decisions, I ask whether terrorism (taken as a mood variable) can alter the nature or the direction of this relation. Building upon McLean and Zhao (2014) methodology, I let terrorism, sentiment, and investment fundamentals interact with each other to explore their linkages. I initially find that terrorist activity adversely impacts the effect of sentiment on corporate investment and labor. It seems managers become more reluctant to invest and hire in the presence of a greater terrorist threat. I further ask whether costly external finance drives this counter-effect and show that managers issue less equity/debt to finance investment and labor in the presence of a greater terrorist threat, even if issuing conditions are relatively more favorable due to the optimist markets. Considering the potential of a contagion or spillover effect triggered by the international terrorism activity, I conclude that it is the level of terrorist threat in the US that mostly captures the attention of managers.

Keywords: investor sentiment, costly external finance, terrorism, corporate investment, employment growth, risk management, financial constraints, contagion effect

JEL Classification: E22, G30, G31, G32, G41

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1. Introduction

The answer to the broad question of what constitutes terrorism requires theory and research that embed human behavior in ethical, political and cultural contexts. That is one of the reasons why there is no single definition of terrorism and why the international community, legal systems, and government agencies use several definitions across different cases over time.[1] Despite its self-evident vagueness, the "definition problem" is not central for economists to the extent that they can avoid confusion and focus on the economic consequences of terrorism. Remarkably, it seems there is a burgeoning consensus that terrorism exerts an adverse effect on the economy (Sandler and Enders, 2008). However, to date, very little is known about the relationship between terrorism and business operations in this highly complex, interrelated and globalized world.

Scholars typically split the economic costs of terrorism into direct and indirect costs. The first category impacts a negligible proportion of the population and obviously involves immediate costs associated with actual terrorist incidents, such as human losses, injuries, and property or infrastructure damages. On the contrary, the indirect costs of terrorism are not so apparent and deal with a wide range of economic consequences triggered by the psychological impact of terrorism on the population. It is these indirect costs that hold the greatest importance for firms, since they are associated with significant declines in buyer demand (Eckstein and Tsiddon, 2004) and FDI (Abadie and Gardeazabal 2003; Enders and Sandler 1996; Frey et al. 2007), interruptions in international supply chains (Czinkota et al. 2005) and increases in international business (IB) transactions costs (Barnes and Oloruntoba 2005; Liesch et al. 2006), to name a few. Terrorism, or more precisely, the threat of terrorism has the potential to generate and spread emotions of fear and uncertainty and thus affect individuals' economic behavior. In this spirit, investors' emotional response to terrorism deteriorates sentiment and exerts a downward pressure on stock prices (Drakos, 2010). Inspired by prior evidence that external financing costs time-vary with investor sentiment and this variation, in turn, affects the real economy, this study examines whether terrorist activity impacts firms' real economic decisions.

A number of empirical studies argue that financial markets and market agents react to exogenous events, such as natural or human-made disasters, social agitations and political turmoil (Guidolin and Timmermann 2006; Kaplanski and Levy 2010). Plausibly, these exogenous events are associated with factors provoking prominent and highly correlated mood swings within a population. Following Drakos' (2010) remark that terrorist events by default are unforeseen exogenous shocks to the stock

[1] For example, Title 22 (Chapter 38) of the United States Code defines terrorism as "premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience." However, this definition is flawed since it does not distinguish between domestic and international terrorism. The latter is defined in Title 18 of the United States Code, while domestic terrorism is defined in USA PATRIOT Act of 2001.

market and thus can serve as a mood proxy, I pose the following research question: "*Does overall terrorist activity affect US firms' investment and hiring decisions?"* In an attempt to address this question, I assume a world with noise traders and financial frictions, where rational managers rely on cues from the market to plan their investment and hiring policy. To the best of my knowledge, there is no other research linking terrorism to corporate resource allocation. I further distinguish between domestic and international terrorist activity to account for a contagion or spillover effect. The latter refers to shock diffusions from foreign stock markets to the US stock market. These market shocks are typically triggered by unusual international terrorist events and diffused through a transmission mechanism that involves economic and financial linkages as well as behavioral channels (Drakos, 2011).

Before proceeding to my formal "terrorism" tests, I first investigate if the empirical evidence found in the US by Mclean and Zhao (2014) hold up for my sample. Mclean and Zhao (2014) make use of a standard "q-theory" investment model with financial constraints, letting sentiment (as a state variable) and fundamental variables interact with each other. They conclude that external financing costs time-vary with investor sentiment and have an impact on investment and hiring. Building upon their methodology, I examine a 30-year period (1980-2010) by exploiting a large, unbalanced panel dataset of 89,626 observations from 9,737 US firms. I take the US as my reference country for three main reasons: (1) The US maintains one of the most developed financial sectors, thus offering greater access for US firms to external finance, (2) The US represents a considerably large share of international trade, a fact suggesting that it is well integrated with the globalized world markets and (3) there is a broadly accepted measure of investor sentiment for the US (Baker et al. 2012). To avoid causality issues, I employ the orthogonalized $^{\perp}$ Baker and Wurgler (2006) index. The latter is a composite index of six independent sentiment proxies, each of which are regressed on a set of macroeconomic indicators to remove effects of systematic factors and business cycle effects.

By establishing a potential link of significance between investor sentiment, corporate investment, and terrorism, I test whether the nature of the relationship between sentiment and corporate investment alters as the severity of terrorist threat changes. In order to capture terrorist threat, I utilize a metric proposed by Eckstein and Tsiddon (2004). This metric uses the total number of terrorist incidents, casualties and injuries occurred in a given year to develop a composite index of terrorism regarding physical and psychological harmfulness. I draw terrorism data from the Global Terrorism Dataset (GTD), the largest and most comprehensive open-source database of terrorist incidents.

My preliminary findings lend support to an extant literature arguing that sentiment-driven mispricing influences corporate investment and labor. I find that investment, employment and external finance sensitivities to stock prices (Tobin's q) increase with investor sentiment by approximately 69% (*t*-stat= 4.78), 26% (*t*-stat=6.90) and 11% (t-stat=7.04) respectively. On the other hand, investment,

employment and external finance sensitivities to cash flow (CF) decline with investor sentiment by approximately 43% (t-stat= 4.11), 19% (*t*-stat=3.07) and 31% (*t*-stat=4.00), respectively. In other words, firms with valuable growth opportunities and low internally generated funds (ceteris paribus, firms in greater need of external finance) issue more equity/debt to invest and hire over bullish periods.

I further extend this strand of literature by linking it to empirical evidence found in terrorism studies. Specifically, my formal "terrorism" tests show that the effect of sentiment on firms' investment and hiring decisions becomes weaker in the presence of a greater terrorist threat. In additional tests, I verify the robustness of my results to alternative investment and sentiment specifications. To shed light on the underlying mechanism explaining these findings, I further examine whether the counter-effect of terrorism on the investment-sentiment relation is driven by costly external finance. I find that a one-standard-deviation increase in the global terrorism index drops down the q-sentiment coefficient by approximately 7% (*t*-stat=7.39), thus making total external finance (equity and debt issuance) less sensitive to q. More importantly, I show that a one-standard-deviation increase in domestic terrorist activity (US terror index) *decreases* q-sentiment coefficient by approximately 18% (*t*-stat=8.57) and *increases* CF-sentiment coefficient by 14% (*t*-stat=2.92). That is to say, firms become more reluctant to issue shares and debt in the presence of a greater terrorist threat (even if issuance conditions are more favorable due to the optimistic market). This reluctance, in turn, makes managers more conservative in their investment and hiring decisions. I also find mixed evidence of a contagion or spillover effect caused by international terrorist activity. Overall, it seems that it is the level of terrorist threat in the US that mostly captures the attention of managers.

This paper contributes to the existing body of knowledge in several other ways. First, the investment and financing findings are in line with literature providing support to an "imperfect market" interpretation of the (significant) role of cash flow in linear investment models (Fazzari et al. 1988, 2000; Gilchrist and Himmelberg 1995).[2] Secondly, the finding that the investment sensitivity to cash flow (CF) is lower by approximately 43% (*t*-stat=4.11) in bullish periods than that of bearish periods, is consistent with survey evidence in Campello et al. (2011). The latter shows that more than one in two CEOs rely on internally generated cash to finance investment when external financing is costly. In the same vein, Bolton et al. (2011) indicate that investment sensitivity to internal funds increases as external financing becomes costlier. Moreover, unlike Mclean and Zhao (2014), I only find weak evidence of a sentiment effect on the debt issuance-q sensitivity. It is possible that firms prefer alternative sources of financing (e.g., share issuance) more than debt during periods of high sentiment. This interpretation is at odds with the predictions of the pecking order theory, which argues that equity

[2] Overall, the financing results lend support to a branch of corporate finance literature that assigns a central role to financial market imperfections. Among others see Ritter (1991), Loughran and Ritter (1995, 1996), Graham and Harvey (2001), Baker and Wurgler (2000, 2002), Daniel and Titman (2006), Pontiff and Woodgate (2005), Hirshleifer and Jiang (2010), and McLean and Zhao (2018).

issuance only serves as the option of last resort in the financing hierarchy.[3] Finally, in additional debt issuance regressions, I find that a one-standard-deviation increase in the domestic terrorism index decreases the q-sentiment coefficient by approximately 20% (*t*-stat= 4.18), suggesting that firms issue less debt in the presence of a greater terrorist threat (even if issuance conditions are more favorable due to high sentiment). This finding is consistent with Procasky and Ujah (2016), who examine the long-term impact of terrorism on the sovereign risk of 102 countries and find that terrorism increases the cost of debt for sovereigns and consequently for their firms.

My findings carry far-reaching implications for investors, corporate managers, and policy-makers. Gauging the magnitude of the terrorism effect on financial markets, for example, may assist investors to incorporate terrorism-induced risk into portfolio allocation decisions or design arbitrage trading strategies. Additionally, managers in anticipation of higher discount rates -imposed by the higher perceived risk and subsequently the higher market volatility- should devise strategies to sufficiently address the increased cost of capital, which reduces the value of future growth opportunities, thus discouraging investment and hiring. Finally, my investment and labor findings could be duly taken into account by governments and international institutions when designing and implementing anti-terrorist policies and regulations. It is likely that such counter-measures alter the economic environment (and thus investor sentiment) in a way more harmful to business interests than the terrorist events that actually engendered them. In light of new evidence provided here, policy-makers could revise or extend security measures and regulations to account for terrorism-induced distortions of firms' operations. Public-private partnerships, particularly in the most vulnerable sectors, such as transportation (e.g., airline), hospitality, oil/gas, etc., may be useful in this direction.

The remainder of the paper is organized as follows: next section (Section 2) explains the motivation for conducting this exercise and briefly reviews related strands of literature. Section 3 discusses some general facts about the challenges of modelling terrorist activity and presents the construction of the terrorist index. In a further step, Section 4 describes the data and provides descriptive statistics as well as some stylized facts of the sample. Next, Section 5 proceeds with the methodology and my hypotheses development. Section 6 reports the main results and findings, while Section 7 presents additional tests for robustness check. Finally, Section 8 concludes by discussing limitations and future research ideas.

[3] According to Myers (1984) and Myers and Majluf (1984), firms finance their investments first with retained earnings, then with debt and lastly with equity. This preference order mainly stems from high associated equity issuing costs.

2. Theoretical Background

In this section, I first outline a theoretical framework to unfold the rationale behind the reasons motivating me to conduct this research. Afterwards, I present and discuss in detail the most relevant literature with respect to my research question. This discussion is organized in two main parts. The first part focuses on corporate behavioral finance and specifically on this line of research that links investor sentiment with firms' investment and hiring decisions. The second part discusses the relationship between terrorism, sentiment and financial markets. Appendix A provides tables summarizing the most relevant papers reported in this section.

2.1 Motivation

The motivation for this research comes from the potential of establishing a three-way system, in which sentiment, terrorism, and real economic activity can be jointly modelled in an attempt to explore their linkages. There is irrefutable evidence that terrorism exerts an adverse (significant) effect on a set of economic variables (such as FDI, stock returns, per capita GDP growth, tourism share etc.).[4] However, this effect remains theoretically ad hoc. The extant behavioral finance literature takes us away from the Efficient Market Hypothesis (hereafter EMH) to a world in which behavioral biases, cognitive heuristics, and sentiment play a central role in explaining market anomalies. Given that peoples' prevailing feelings and emotions significantly influence individual decision-making, especially under conditions of high risk and uncertainty, as in the case of terrorism, it is plausible to question whether sentiment can indirectly channel the economic consequences of terrorism.

Based on EMH, traditional finance paradigm basically suggests that market participants are rational and there are no frictions in financial markets. Even in the presence of some noise traders -who can cause stock prices to deviate from their fundamental values- rational arbitrageurs will immediately exploit the opportunity, thereby eliminating the mispricing (Fama, 1965). Unlike EMH, behavioral finance posits that the arbitrage concept does not always keep the markets efficient since mispricing is not automatically a riskless profitable arbitrage opportunity. In reality, arbitrage strategies can be both risky and costly, allowing the mispricing to survive (Barberis and Thaler, 2002). Thus, asset prices can be affected by investors' systematic irrationality, a fact leading to possible explanations for aggregate market behavior (Baker and Wurgler 2006; De Long et al. 1990; Shleifer and Vishny 2007).

In this framework, terrorism can be seen as a series of unexpected exogenous events rattling financial markets and market agents. Remarkably, these shocks can also be diffused from one stock market to another resulting in the so-called spillover or contagion effect. Prior empirical studies indicate that markets and market participants respond to exogenous events, such as natural or human-made disasters, social agitations, and political turmoil. Since events like these are mainly unforeseen, the

[4] For a detailed review of the economic consequences of terrorism see Sandler and Walter (2008)

probability of their occurrence is scant, but constant accompanied by a potentially disastrous impact. Given the psychological imprint of terrorism on population, the level of concern about terrorism is also affected by individual characteristics. That is, individuals' perceptions of terrorism risk (the subjective probability) can substantially deviate from the actual risk (objective probability) of whether a certain terrorist event will happen. This deviation possibly stems from incidental cognitive responses that are subject to several behavioral biases, such as probability neglect (Sunstein, 2003), availability heuristic (Tversky and Kahneman, 1974), illusion of control (Slovic, 2000), and familiarity bias (Slovic and Weber, 2002), to name but a few. Taking the above into account, one could plausibly argue that sentiment driven decisions triggered by terrorist attacks exert a downward pressure on market prices to the extent that terrorism deteriorates investor sentiment.

Scholars have utilized a variety of exogenous factors that capture mood and affect asset prices. Indicative examples in literature are variables like sunshine (Hirshleifer and Shumway, 2003; Saunders, 1993), sleep patterns (Kamstra et al. 2000), non-secular holidays (Frieder and Subrahmanyam, 2004), temperature (Cao and Wei, 2005), Seasonal Affective Disorder (Kamstra et al. 2003), cyclic patterns of the moon (Yuan et al. 2006), and international football results (Edmans et al. 2007). Edmans et al. (2007) report three criteria that must be fulfilled in order to link the selected mood variable with stock returns, namely: (i) the selected variable must drive mood in a standard and clear-cut manner, so that its effect is strong enough to sprout up in asset prices (ii) the selected variable must drive mood of a considerable part of the population in order to increase the probability of the variable to affect investors and (iii) the effect must be correlated across the majority of individuals within a country's population. According to Drakos (2010), it is hard to find public events, other than terrorist attacks, that could generate so prominent and highly correlated mood swings across the majority of a country's population and at the same time fulfill the other two criteria. Unlike other scholars who focus on specific mega-terrorist events, Drakos (2010) treats terrorism as a continuous mood variable to examine whether the overall terrorist activity exerts any systematic effect on stock prices. In my study, I follow the same approach but with a different scope. My main goal is to investigate whether the deteriorating effect of terrorism on sentiment can influence firms' resource allocation decisions. To this purpose, I also utilize empirical evidence found in a strand of literature concerning corporate behavioral finance.

There is a line of research in corporate behavioral finance arguing that sentiment positively affects firms' investment and labor. In this vein, Mclean and Zhao (2014) treat sentiment as a state variable, letting it interact with fundamental variables in a standard investment model with financial frictions. They find that external financing costs time-vary with investor sentiment and have an impact on corporate investment and hiring. In my study, I extend their innovative empirical design by incorporating terrorism to examine whether the sentiment effect on firms' investment and labor decisions alters with changes in the level of threat caused by overall terrorist activity.

2.2 Literature Review

2.2.1 Investor Sentiment and Firms' Investment Decisions

In recent years, an increasing number of scholars have begun to study the effects of sentiment-driven mispricing on firms' real economic decisions. This emerging literature suggests several channels, through which sentiment affect firms' investment and hiring. In an early study, Morck et al. (1990) outline three of them: (1) the equity-dependence channel (2) the catering channel and (3) the false signals channel. Although they show a positive and significant correlation between stock returns and investments, they only document a weak incremental explanatory power of stock returns on investment over and above fundamentals. Building upon Morck's et al. (1990) two first channels, Stein (1996) develops a simple theoretical model, in which market inefficiencies and managerial horizons play a central role in explaining corporate investment distortions.

According to Stein (1996), rational managers with long investment horizons "time" the market by issuing overvalued equity (buying back undervalued equity) to gain from the lower (higher) cost of capital and increase (decrease) investments (equity dependence channel).[5] This argument is empirically tested in Baker et al. (2003) for an unbalanced panel of 52,101 US firm-year observations over the period 1980-1999. They find that investment of firms' ranking in the top quantiles of the Kaplan and Zingales (1997) equity-dependence index exhibit a higher sensitivity to stock prices (Tobin's q) vis-à-vis investment of firms' ranking in the bottom quantiles. In additional tests, they use (three-year) future realized stock returns to proxy for mispricing and overcome the usual specification problem of measurement error in q. Their empirical results show an increasingly negative investment-future returns sensitivity. Stein (1996) also argues that mispricing distorts investments even if firms do not rely on external equity to finance marginal investments. In particular, rational managers with short investment horizons are willing to exploit the mispricing in order to cater to the current investor sentiment (catering channel). That is, firms with ample cash holdings and debt capacity may undertake projects with negative NPV if their stock is overvalued (or forgo projects with positive NPV if their stock is undervalued. In this spirit, Polk and Sapienza (2009) develop testable hypotheses for the catering channel by using discretionary accruals to proxy for mispricing. They document a positive and significant relation between mispricing and corporate investment. Importantly, the "catering" effect is more pronounced for more opaque firms (higher R&D intensity) and firms with shorter shareholder horizons (higher share turnover).

Other relevant studies investigate several other aspects of the mispricing-corporate investment relation. For example, Hertzel and Li (2010) decompose pre-issue market-to-book ratio into fundamental and misvaluation components to examine the behavior of seasoned equity issuing firms.

[5] This finding is consistent with Baker and Wurgler (2002), who provide evidence of market timing in firms' equity issuance decisions.

They show that firms with a higher misvaluation component experience more negative post-issue abnormal returns and use the proceeds not only to invest but also to save cash and pay off debt. Using a novel method to extract bottom-up information from corporate balance sheets, Arif and Lee (2014) investigate the relationship between investor sentiment and aggregate investment of US firms over the years 1980–2009. By controlling for news concerning aggregate fundamentals, they initially show that aggregate investment peaks during bullish periods and is negatively correlated with future market-wide stock returns. They also extend their empirical analysis to international markets and find that these findings hold for Germany, France, Canada, Japan, and the UK.

In a study that is closest to mine, Mclean and Zhao (2014) attempt to explore the relationship between business cycles, investor sentiment, and US firms' investment and hiring decisions over the period 1965-2010. To this purpose, they first examine whether access to external finance time-varies with both investor sentiment and business cycles and, if so, whether or not this variation affects firms' real economic decisions. They examine both effects jointly, letting sentiment, business cycles (these two as state variables) and fundamental variables interact with each other in a standard q-theory investment model with financial constraints.[6] They find that investment, employment growth, share and debt issuance are more sensitive to stock market and less sensitive to cash flow during expansions and bullish periods, a fact suggesting that both investor sentiment and business cycles have significant and independent effects on the costs of external finance (with share issuance playing a greater role) and also on investment and labor.

In this line, Montone and Zwinkels (2014) investigate the global impact of US investor sentiment on employment. They show that US firms, following high investor sentiment in the stock market, find it optimal to issue more equity and increase its investments and labor. To the extent that foreign countries attract FDIs from the US, the former experience more employment growth over periods with higher US investor sentiment. However, this over-hiring is inefficient, leading to lower labor productivity and negative wage growth in countries with a lower proportion of high-skilled labor.

2.2.2 Terrorism and Financial Markets

Since the 9/11 terrorist attacks on the US, the impact of terrorism on financial markets has substantially drawn scholars' attention. It seems there is a growing consensus that terrorist attacks exert a negative and immediate effect on the stock markets. However, the magnitude and the duration of this effect differ across countries, sectors and over time.

In an event study, Abadie and Gardeazabal (2003) use the 1998-99 ceasefire between ETA and the Basque government as a natural experiment by comparing rates of return from two different stock

[6] To ensure that the effect of sentiment is orthogonal to business cycles, they control for the latter using the orthogonalized $^{\perp}$ version of Baker and Wurgler (2006) index.

portfolios. The "Basque" portfolio includes common stocks of firms with strong business ties to the Basque region, whereas the benchmark portfolio consists of firms with negligible business dealings with the Basque region. They show that the "Basque" portfolio significantly outperforms its benchmark over the ceasefire period (with a relative gain of 10% in 22 trading sessions) and underperforms it afterwards (with a relative loss of 11% in 66 trading days), thus making the truce credible. Carter and Simkins (2004) study the impact of the 9/11 attacks on airline stocks by testing whether the stock price reaction the first trading day after the attack was the same for each airline regardless of their firm-characteristics. They find that airlines with low levels of liquidity (measured by their ability to cover short-term obligations) suffer the most. In a broad event study, Karolyi and Martell (2006) examine the stock price reaction of 75 firm-targeted attacks occurred in 11 different countries over the period 1995- 2002. They document a significant stock price reaction of -0.83% around the event day, resulting in average losses of $401 million in market capitalization. Their analysis of the abnormal returns in the cross-section reveals that the impact of terrorist attacks differs across the home country of the target firm and the country in which the attack took place. In addition, the adverse impact of these attacks is found more pronounced in wealthier and more democratic countries.

Using outlier detection methodology and GARCH modeling techniques Charles and Darné (2006) investigate the impact of the 9/11 attacks on international stock markets. They show that 10 daily stock market indexes experienced large and permanent (negative) shocks in the wake of the attacks, thus providing evidence in favor of a contagion effect. In the same spirit, Nikkinen et al. (2008) use daily stock indices from 53 countries to examine the short-term impact of the 9/11 attacks on markets' returns and volatility. They find that the attacks were followed by significant increases in markets' volatility across all regions, while stock returns experienced significant negative returns and recovered quickly afterwards (within 5-10 days). However, the magnitude of the effects on financial markets was smaller among the least integrated regions, namely in the Middle East and North Africa, Latin America and Asia. Arin et al. (2008) use a daily terror index to examine the effects of terrorism on the stock market (and the stock market volatility) in Israel, Thailand, Spain, Indonesia, Turkey, and the UK over the period 2002 –2006. They show that terrorism exerts a significant and adverse effect in all of the aforementioned countries, with its magnitude being larger in emerging markets.

The unfavorable effect of terrorist events on financial markets is also documented by other scholars.[7] Some of them, however, argue that it is generally short-lived and often not so pronounced compared to other exogenous market shocks (Goel et al. 2017; Gulley and Sultan 2006; Kollias et al. 2011). For example, Chen and Siems (2004) use traditional event-study methodology to examine the reaction of

[7] E.g. Becker and Rubinstein (2011), Hon et al. (2004) Berrebi and Klor (2010), Johnston and Nedelescu (2006), Barros and Gil-Alana (2009), Haque and Kouki (2009), Kollias et al. (2010), Chesney et al. (2011) and Hippler and Hassan (2015).

global and US capital markets to 7 memorable military events and 7 major terrorist attacks. They document a significant, but often transitory, effect (lasting from 1 to 3 days) of terrorism on global markets with the US market being relatively more resilient compared to others. Contrary to the trend, in the case of the 9/11 attacks, the rebound of the Dow Jones values to normal levels took almost 40 days. Eldor and Melnick (2004) focus on the ongoing Arab-Israeli conflict by examining the impact of 639 Palestinian attacks on Israeli stock and foreign exchange markets over the period 1990-2003. Given the continuous nature of this conflict, they use daily time-series data and model terror with a usual zero-one dummy variable. They conclude that during the intensification of the conflict (Second Intifada 2000-2003) Israeli stock market lost approximately 30% of its value, whereas the foreign exchange markets remained basically unaffected. In addition, they find that only suicide attacks exert a permanent effect on both markets, suggesting that the latter do not become desensitized to terror over time.

The majority of the aforementioned papers uses event study methodology to uncover abnormal returns in the short-run. One particular study of Procasky and Ujah (2016), though, examines for the first time the long-term effects of terrorism on debt markets of both developed and developing countries. They proxy for the cost of debt by utilizing S&P issued sovereign's credit ratings and find that a two-point increase in a 10-scale terrorism index of a country is followed, on average, by a half notch downgrade in sovereign's credit rating. This effect is found even more pronounced in developing countries, in which the same increase in terrorist activity results in an entire notch degradation in the sovereign credit rating, e.g., from B to B-.

2.2.3 Terrorism and Sentiment

The quintessence of terrorism consists of its potential to generate prolonged emotional states of fear and uncertainty. Motivated by a string of psychological studies focusing on the impact of emotions on individuals' decision-making process, Levy and Galili (2006) examine the impact of terrorism on individuals' volume of trade. Specifically, they utilize real data from 3282 Israeli households, including 112,086 buy and sell transactions of common stocks, throughout the period 1998-2002. They document a negative and significant correlation between the intensity of terrorist activity and the volume of trade. This correlation is, in turn, attributed to several psychological mechanisms, such as ambiguity aversion, illusion of control, probability neglect, etc. This finding is in line with the notion that -given the high liquidity of the stock markets- individual investors will flee the market for safer securities in the face of higher levels of terrorist threat (Sandler and Enders, 2008).

Taking all the above into account, one could argue that the unfavorable impact of terrorism on the stock markets can be moderated through an investor sentiment channel. Indeed, a growing number of studies provides empirical support to a deteriorating effect of terrorism on both economic and market sentiment. Burch et al. (2003) perceive 9/11 attacks as a natural experiment for investor sentiment.

Using closed-end mutual fund discounts to proxy for investors' prevailing feeling, they show that the former increased dramatically in the wake of the attacks (from 3.3% on September 7, to 7.7% on September 27) and recovered to normal levels over the ensuing month. Both the surge in the discounts and the subsequent rebound was in conjunction with the overall market performance, a fact suggesting a negative shift in investor sentiment over this period. In the same spirit and inspired by a strand of literature using option-implied density functions to capture changes in market sentiment, Nikkinen and Vähämaa (2010) examine the impact of three mega-terrorist attacks on stock market sentiment by focusing on the behavior of the expected probability density functions of the FTSE 100 index.[8] They find that the 9/11 attacks in the US (2001), the 3/11 attacks in Madrid (2004) and the 7/7 attacks in London (2005) may exert a prolonged, though, transitory (negative) effect on stock market sentiment.

In an influential paper, Drakos (2010) investigate the impact of terrorism on daily stock market returns of 22 countries over the period 1994–2004. The innovation of this study lies in the fact that Drakos (2010) treats terrorism as a continuous mood variable to examine whether the overall terrorist activity exerts any systematic effect on stock markets. Assuming that the terrorist activity follows a stochastic (Bernoulli) process, he measures a country's terrorist intensity with a dummy variable and further breaks down the terrorist activity into a minor, moderate and major component according to its psychological imprint on a country's population. Remarkably, he concludes that terrorist incidents indeed lead to significantly lower stock returns around the day a terrorist attack occurs**.** More importantly, this effect increases monotonically with the level of deterioration in investor sentiment as captured by the degree of the psychological imprint of terrorist attacks. In an ensuing study, Drakos (2011) seeks to identify behavioral channels, through which market shocks (caused by terrorist attacks) are diffused from one stock market to another. He posits that the ability of terrorist attacks to deteriorate investor sentiment and thus trigger behaviorally driven decisions is capable of explaining in part the underlying shock-transmission mechanism. Considering mega-terrorist incidents as mood indicator, Drakos (2011) investigates whether 29 European countries' markets response to mega-terrorist attacks occurred in another country throughout the period 2002–2005, and if so, whether the cross-country variation in abnormal returns around the days of mega-terrorist attacks is correlated with the cross-country variation in two behavioral factors, namely: (1) the concern about terrorism risk (social amplification of risk) and (2) the past terrorist activity (memory-based utility/availability bias). He finds that both behavioral factors exhibit strong explanatory power over both the magnitude and the direction of the response.

Apart from the deteriorating effect of terrorism on investor sentiment, there is also recent evidence of a deteriorating effect of terrorism on economic sentiment. Two striking contributions to this line of

[8] FTSE 100 is a capitalization-weighted index including the 100 largest companies traded on the London Stock Exchange. Nikkinen and Vähämaa (2010) use only European-style options to measure implied probability density functions of the FTSE 100 index.

research are those of Kollias and Papadamou (2014) and Drakos and Kallandranis (2015). The former asks whether and to what extent mega-terrorist attacks affect the Economic Sentiment Indicator (ESI) of France, Germany, Spain, and the UK over the years 1988-2008.[9] They provide supportive evidence for the first two countries and no evidence for the latter two, with the effect of terrorism on ESI being more pronounced for domestic terrorist incidents as compared to transnational incidents. Drakos and Kallandranis (2015) extend this analysis to a larger sample of 27 European countries during the period 1985–2009. They conclude that terrorist activity has an adverse effect on ESI -and particularly on its consumer confidence subcomponent-, albeit this effect is statistically significant only in the post-9/11 era.

[9] The ESI is a composite index which is constructed by the Directorate General for Economic and Financial Affairs (DG ECFIN) and is the product of regular surveys concerning five different economic sectors of the EU countries. The ESI is composed of five confidence indicators of those sectors, but with different weights on each one.

3. Modelling Terrorist Activity

3.1 Quantifying Fear: Some General Facts

Undoubtedly, quantifying fear is a very elusive task and any measure that attempts to capture the impact of such a latent variable is fated to suffer from severe methodological drawbacks. Bearing that in mind, I assume that the risk implied by the probability of a terrorist event to occur exerts an adverse psychological effect on the behavior of economic agents. For research purposes, however, it remains tough to estimate the actual probability that a country faces at a given point in time. In addition, prior research indicates that perceptions of terrorism risk (the subjective probability) can substantially deviate from the actual risk (objective probability). This possibly happens because such perceptions typically involve risks of exceptionally low probability, but with a potentially pernicious impact (Drakos and Mueller, 2014). This phenomenon can also be attributed to a plethora of behavioral biases, such as probability neglect, availability heuristic, illusion of control, and familiarity bias.

Given the complexity of estimating this probability, most terrorism studies simply rely on pure realizations of terrorist activity in order to capture terrorism risk (e.g., the total number of terrorist events occurred in a given period). These kinds of rather simplistic metrics, however, fail to grasp the potential harmfulness and the emotional distress that typically follows an attack. Arguably, a one-dimensional index of terrorism inevitably ignores other critical dimensions. Consider, for example, a yearly index that is exclusively based on the total number of fatalities caused by terrorism in a given region. Such an index would be flawed for my research because it runs the risk of being biased towards fatal incidents at the expense of other terrorist events. The same is true for an index exclusively based on the number of injuries because people also suffer from terrorist attacks even if there are no injuries at all. More importantly, people suffer from terrorism even in the absence of terrorist incidents. It is precisely the psychological impact of the continued threat of terrorism which constitutes the quintessence of terror.

3.2 The Construction of a Terrorist Index

Taking the above into consideration, I basically follow a metric proposed by Eckstein and Tsiddon (2004) and has widely been used in terrorism studies. Eckstein and Tsiddon (2004) develop a composite index of terrorist activity that captures the severity of an attack regarding physical and psychological harmfulness. More specifically, this index combines three variables in order to develop a yearly composite score for a given country, namely:

i. the total number of terrorist incidents occurred in a given year,

ii. the total number of casualties caused by terrorism in a given year, and

iii. the total number of injuries caused by terrorism in a given year.

The composite score thus accounts for the severity of the attacks and subsequently reflects, in part, the emotional distress followed. Specifically, I employ the following formula to construct the terror variable:

$$TerIndx_t = \log(1+Avg_t)$$

$$\text{where, } Avg_t = (TotalKills_t + TotalWounds_t + TotalAttacks_t)/3$$

The terror variable, $TerIndx_t$, is defined as the natural log of an index that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured, and the number of terror events, all occurred in a given year. Thus, terrorist activity is treated as a time series variable that potentially impacts investors' mood.

The flexibility of this metric lies in its adaptability to be estimated for different countries/regions (by merely disaggregating the information set on terrorist activity). Hence, I break down the global terrorist activity into the *US* and *non-US* components. These components, in turn, can be used, both jointly and separately, in a regression analysis framework. Domestic terrorist activity is defined as all the terrorist incidents that took place in the US, while international terrorist activity is defined as all the terrorist incidents occurred on the non-US soil. Distinguishing between domestic and international terrorist activity and their potentially differential effects on corporate investment can be particularly interesting. In fact, this decomposition enables to test for the existence of a contagion or spillover effect caused by the international terrorism activity on the US firms' investment and labor decisions. To this purpose, I construct three terrorist variables:

a) *UsTerr*, which accounts for domestic terrorist activity in a given year,

b) *NonUsTerr*, which accounts for international terrorist activity in a given year and

c) *GlobTerr*, which accounts for both domestic and international terrorist activity in a given year.

Importantly, I take these indicator variables as continuous variables, since they are constructed from the observed terrorist activity over time, which in turn, corresponds to realizations of a stochastic process. Below, I present stylized facts of this metric and discuss some of its limitations.

Figure I plots time-series of terrorism variables throughout the sample period. Overall, domestic terrorist activity (*UsTerr* Index) does not exhibit a monotonic trend over these years. Noticeably, the spike (attributed to 9/11 attacks) at the dawn of the millennium suggests a clear distinction between the pre-9/11 and the post-9/11 era. The 9/11 attacks constitute a tremendous catalyst in public perceptions and attitudes, not only in the US but worldwide. The global turmoil caused by the 9/11 attacks is also clearly represented by the sharp increase in the *GlobTerr* index over the respective year.

The pre-9/11 era is generally characterized by moderate terrorist activity in the U.S., except for the years 1984 and 1995. In 1984, the first and largest bioterrorist attack in the history of US took place, while in 1995 occurred the second deadliest (after the 9/11 attacks) terrorist attack on American soil.[10] In the wake of the 9/11 attacks, counter-terrorism legislation and new security measures imposed by the US government dramatically decreased the number of domestic attacks to remarkably low numbers.[11] However, from 2007 onwards the trend reversed, with the *UsTerr* Index score rising from 1 to 3 within a two-year period. This rise coincides with a gradual increase in the observed international activity (*NonUsTerr* index) over the same period. This upward trend can be partly attributed to the rise of religious radicalism. By the end of the decade, religious extremism attacks had overtaken attacks motivated by national separatism and thus becoming the primary driver of terrorism around the world.[12] Prior research indicates that, on average, international terrorism activity is intercorrelated with domestic, suggesting that the latter should not be treated independently. Enders et

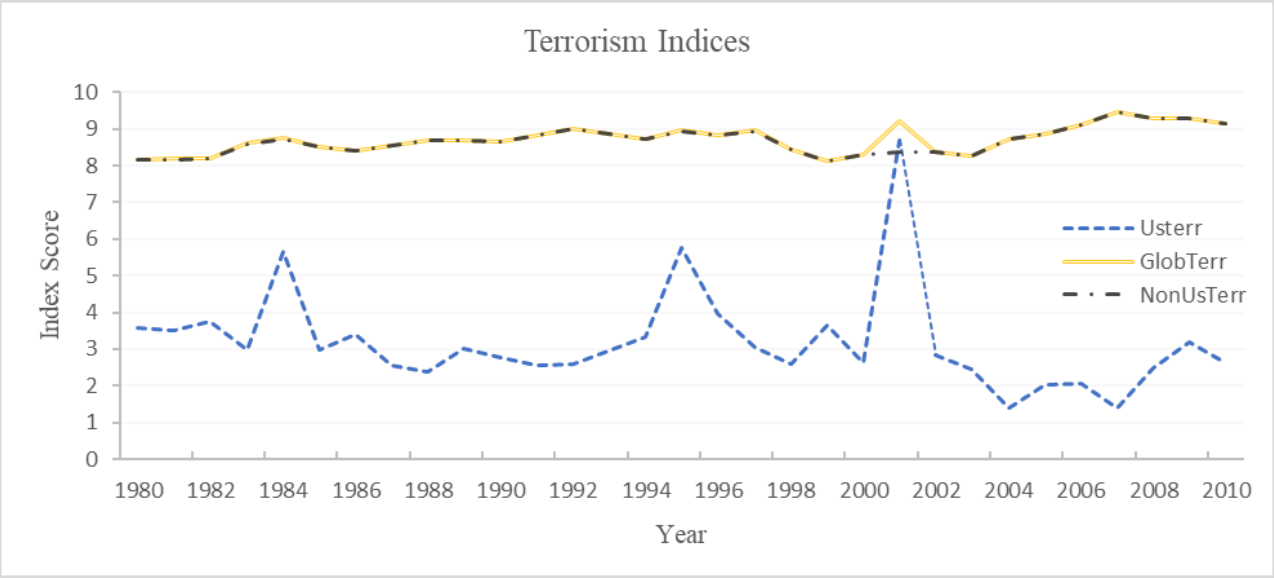


Figure I Time series plots of terrorist indices over the sample period 1980 to 2010. Global Terrorism index is decomposed into a domestic and an international terrorism index which captures the flow and the severity of the recorded terrorist activity in a given year. Domestic terrorist activity is defined as all the terrorist incidents that took place in the U.S., while international terrorist activity is defined as all the terrorist incidents occurred on the non-U.S. soil**.**

[10] Rajneeshee bioterror attack was the food poisoning of 751 individuals in The Dalles, Oregon, through the deliberate contamination of salad bars at ten local restaurants with Salmonella. The attack is one of only two confirmed terrorist uses of biological weapons to harm humans since 1945, the other being the 2001 anthrax attacks across the USA. Oklahoma City bombing resulted in 168 casualties, including 19 children. More than 500 people were injured. It remains the deadliest incident of homegrown terrorism in United States history.

[11] GTD reports a total of nine terrorist incidents and no casualties in U.S. for the year 2007.

[12] See more detailed information in GTI (2017) report: http://visionofhumanity.org/app/uploads/2017/11/Global-Terrorism-Index-2017.pdf

al. (2011) who study time-series dynamics of domestic and international terrorism patterns show that they are interrelated not only contemporaneously but also retrospectively. Thus, international terrorism may exert a demonstration effect on domestic terrorism and vice versa.

Like every other terrorism index used in relevant literature, my metric also exhibits shortcomings. A major methodological drawback is that the three totals used to develop the composite score carry the same weight, while it is plausible that they affect individuals' perception unevenly. That is, an injury is treated as if it causes the same impact with a casualty. Additionally, it fails to account for past experienced events that possibly generated a persistent psychological trauma on the population. Think of the 9/11 attacks, for example, the lingering effect of these attacks arguably lasted for many years to come. Finally, it ignores the direct economic loss caused by terrorist attacks in terms of property damage. It is therefore evident that such a metric cannot fully capture neither the overall social impact of terrorist activity nor the direct economic costs caused by.[13]

[13] A more sophisticated index using a similar methodology is the GTI score, which is annually published by the Institute for Economics and Peace (IEP). In addition to the three-dimensional composite score used in this study, GTI also accounts for a fourth dimension, namely the approximate level of total property damage from terrorist incidents in a given year. These factors were weighted differently by an expert panel to capture the different impacts of these indicators. Unfortunately, GTI score are available only from 2012 onwards. The reports are accessible here: http://economicsandpeace.org/reports/

4. Data and Variables Description

This section is split into six main parts. The first part gives some basic information about my sample selection, while the next three parts describe in depth how I obtained the data used to conduct my empirical research. I also discuss data idiosyncrasies and their following limitations. The fifth part describes the variables' construction. The remainder presents some preliminary results such as descriptive statistics, simple correlations and stylized facts of investor sentiment over the sample period.

4.1 Sample Selection

I employ an unbalanced panel that combines both cross-sectional and time series data to examine US firms' investment and employment decisions over a 30-year period, starting from 1980 to 2010. This time span stems from the merging of three different datasets used in this study and thus depends on their corresponding availability/reliability. I take the US as my reference country for three main reasons: (1) the US maintains one of the most developed financial sectors, suggesting greater access for US firms to external finance, (2) the US represents a considerably large share of international trade, a fact suggesting that it is well integrated with the globalized world markets and (3) the US provides a well-accepted measure of investor sentiment (Baker et al. 2012). To construct my time-series variables for terrorist activity, I utilize the Global Terrorism Database (hereafter GTD), which is an open-source platform including both domestic and international incidents. Even though GTD covers a period from 1970 through 2017, I omit the decade of the 1970s because Pinkerton Global Intelligence Services (hereafter PGIS) - which supplied the original dataset to GTD- was using an inadequate number of data sources over this decade.[14] Hence, the 1970s inclusion could raise serious concerns about the reliability/exploitability of the sample and lead to selectivity bias issues. Thus, my sample period starts from 1980 onwards. Note, in addition, that even though accounting and terrorism data are available for more recent years, the limited availability of market-wide measures of sentiment restricts my sample period to the fiscal year 2010. Unfortunately, this is the last year that I can obtain an *annual* value of the updated Baker and Wurgler sentiment index. In appendix A, I thoroughly report the sample construction process.

4.2 Accounting Data

My source of annual data for firms' financial statement items comes from the Center for Research in Security Prices (CRSP)/Compustat Merged Database, which is accessible via Wharton Research Data

[14] According to Lafree and Dugan (2007) who both analyzed and digitalized the original PGIS dataset, only 6 sources (mainly government reports and Foreign Broadcast Information Service [FBIS]) are reported in 1970, whereas 53 different sources are reported in 1976. Moreover, Enders et al. (2011) claim that initially the PGIS trained primarily retired Air Force personnel as data recorders, and then gradually acquired a larger and more sophisticated coding staff.

Service (WRDS)[15]. The one-period lag structure in the methodology implies that US firms' accounting data covers the fiscal years 1979-2010. As common in investment literature, I exclude financial firms (Standard Industrial Classification [SIC] codes between 6000 and 6999) and firms in the utility industry (SIC codes between 4900 and 4999).[16] I also exclude firms whose fiscal year does not end in December and drop all duplicates observed to purge the usual problems caused by the use of overlapping observations.[17] Next, only firms which provide accounting data for at least two consecutive years have been taking into consideration. Regarding the manipulation of my basic accounting variables, I basically follow Mclean and Zhao (2014), ignoring firm-years with negative book values of equity and firm-years with book assets less than $10 million. Finally, all financial and accounting variables are winsorized to the 1st and the 99th percentile to reduce the effect of extreme outliers. Overall, my filtering process yields an unbalanced panel of 89.626 firm-year observations from 9737 unique firms.

4.3 Investor Sentiment Data

It is not unusual in corporate investment literature to proxy for investor sentiment at the firm-level.[18] However, regarding my methodological requirements, a market-based (or aggregate) measure of sentiment seems much more practical. To this purpose, I employ the broadly used Baker and Wurgler (2006) sentiment index. Annual data are downloaded from professor's Wurgler personal website.[19] As previously mentioned, the year 2010 is the last one available for annual values of the Baker and Wurgler sentiment index. The latter is a composite index of six independent sentiment proxies, namely: Closed-end fund discount, NYSE share turnover, daily mutual fund flow, 1st day return on IPOs, Dividend Premium and Equity share on new issues. However, these single proxies reflect macroeconomic fundamentals to a certain extent, and thus they are highly correlated with business cycles. For this reason, Baker and Wurgler (2006) first regress each of these variables on a set of six macroeconomic indicators to get the orthogonalized values and then take the first principal components to construct the orthogonal sentiment index (hereafter orthogonalized B&W$^{\perp}$ index).

To establish a link of significance between terrorism, investor sentiment, and corporate investment, I interact with each other in a panel regression framework. To this purpose, I first have to adjust the raw values of the orthogonalized B&W$^{\perp}$ sentiment index. Recall that the B&W$^{\perp}$ sentiment index takes both

[15] https://wrds-www-wharton-upenn-edu.eur.idm.oclc.org/pages/

[16] The demarcation between operating, investing, and financing activities is ambiguous for these financial firms and utility firms are heavily regulated.

[17] Fiscal-year-ends often change because of mergers and acquisitions. Data for the years surrounding reconstructions are not comparable.

[18] These studies typically use firm-level measures of mispricing. Recently, many scholars employ Market-to-Book decomposition techniques to capture the non- fundamental price component that is driven by the general prevailing attitude of investors.

[19] See Baker and Wurgler (2006) for more details on the construction of this market-based sentiment index. The yearly series of the orthogonalized index$^{\perp}$ of investor sentiment is available from 1965 to December 2010 at http://people.stern.nyu.edu/jwurgler/

positive and negative values just like firm-level accounting variables (Tobin's q and cash flow) do, whereas terrorist activity index takes exclusively nonnegative values by default. Following Mclean and Zhao (2014) I estimate nonnegative "rank values" based on the raw values of the orthogonalized B&W$^{\perp}$ index. More specifically these "rank values" ($Sent_1$) are calculated as the rank of the B&W$^{\perp}$ index divided by the maximum rank. For robustness tests, I further construct a second sentiment index ($Sent_2$) by simply adding a constant term to each yearly value of the orthogonalized B&W$^{\perp}$ sentiment index. This constant term is nothing more than the absolute value of the B&W$^{\perp}$ index's minimum value. By the same token, this ensures that all the values of the adjusted index ($Sent_2$) are also nonnegative. Finally, note that when I calculate the rank values to construct the $Sent_1$ index, I take as reference years my sample period (1980-2010) and not the whole timespan covered by the orthogonalized B&W$^{\perp}$ sentiment index (1965-2010). The latter would yield different rankings and subsequently different sentiment index values. Similarly, when I calculate the $Sent_2$ index, I take the minimum yearly value of the orthogonalized B&W$^{\perp}$ sentiment index over my sample period.

4.4 Terrorism Data and Limitations

4.4.1 Open-Source Terrorism Datasets

Unlikely studies using data on criminal violence -which traditionally comes from official (e.g., the US State Department), victimization or self-report sources- the vast majority of published terrorism research is based on secondary data sources.[20] These typically include a variety of unclassified open sources, such as electronic media (or media derived databases), local police reports, world's newsprints or other published documents.

All open-source terrorism databases, including GTD, are subject to several biases. Among others, the most well-documented one is the under-reporting bias (Drakos and Gofas 2006). In a nutshell, this bias can be described as follows: a terrorist incident can only be recorded if it is already covered by media, which in turn are often inherently biased towards events deserving press coverage. Thus a gap between actual and reported terrorist activity can arise (Rohner and Frey, 2007). This gap also depends on other parameters, such as the "definition problem" of terrorism, the level of press freedom, the inclusion criteria and the list goes on.[21] This incompleteness of recording/reporting activity can lead to the statistical phenomenon of thinning, which in turn yields empirical results vulnerable to systematic

[20] The three "traditional" data sources, which are used broadly in criminology, present serious limitations to the documentation of terrorist incidents (LaFree and Dugan, 2007)
[21] Schmid (2004) reports an extended list of major problems incurred in the reporting procedure.

errors.[22] According to Drakos (2007), who attempted to quantify the size of the under-reporting bias in terrorist activity, it is impossible to fully get rid of this statistical problem. Drakos (2007) documents that the under-reporting bias is slightly more pronounced for countries without free press (21%) compared to countries with a partly free press (18%). Thereby, it is possible that the political environment and (reported) terrorist activity are correlated to a certain extent.

There are also other common problems arising from the existing data collection methods. Enders and Sandler (2006), for example, claim that all datasets that include time-series of threats and hoaxes -like GTD- include noise. Thus, they tend to overlook these incidents at the expense of more deadly and unmerciful incidents in the context of compiling a chronology of terrorist activity. Another common issue is the "intercoder reliability". That is, different coders make different judgments regarding the same opaque incident. Arguably, this issue worsens with the fact that open-source databases typically lack information on many of the attributes of the attacks and the underlying political conflict.[23]

4.4.2 The Global Terrorism Dataset (GTD)

I draw terrorism data from the GTD, the largest and most comprehensive open-source database of terrorist incidents[24]. GTD furnishes information on terrorist events around the world from 1970 onward and it is annually updated. Access to GTD is provided by The National Consortium for the Study of Terrorism and Responses to Terrorism (START), which is a research-education center at the University of Maryland, hosting GTD via an online interface.[25] GTD defines terrorism as follows: "the intentional act of violence or threat of violence by a non-state actor to attain a political, religious, social, or economic goal through fear, compulsion, or threating. In addition, two of the following three inclusion criteria has to be met:

a) The act of violence aims to attaining a political, religious, social or economic goal
b) The act of violence includes evidence of an intention to coerce, threaten, or convey some other message to a broader audience(s) other than the direct victims, and
c) The act of violence lies outside of the precepts of International Humanitarian Law.

It is also of great importance to highlight that each open-source database bears its own idiosyncrasies and flows, thereby suffering from database-specific biases. In this case, GTD also exhibits certain idiosyncratic weaknesses, namely: (1) the inconsistency of its data collection methodology over the years and (2) the lack of 1993 data. In the latter case, PGIS- which was the provider of the original

[22] The so-called thinning is nothing more than the broadly known statistical phenomenon of incomplete count data, denoting that the recorded process is an understatement of the true underlying process. See more in Solow (1993) and Yannaros (1993).
[23] LaFree et al. (2009) point out the shortage of data on terrorist organizations and terror utilized by states against their own citizens.
[24] For reviews on existing open-source databases see Schmid (2004) and Bowie (2017).
[25] https://www.start.umd.edu/gtd/

dataset - lost the data for 1993 during the submitting of the original dataset to the GTD. However, START reconstructed the corresponding data year and made an incidental total (including the number of attacks, injuries, and fatalities) available. Since these totals are the only ones required for the construction of my terrorism measures, the data used for the year 1993 do not raise any concern. On the contrary, the inconsistency of data collection methodology should not be ignored. GTD is collected in three different phases.[26] This discontinuity implies that different inclusion criteria are used throughout my sample period. In particular, a broader-based definition of terrorism is adopted for the first phase (1970-1997), but there is no documentation offered on how exactly this definition differs from the one used afterwards. The first-phase database was designed by PGIS to provide risk assessments to its clients, thus it tends to err on the side of inclusiveness. For example, it includes criminal (and no terrorist) events if they were carried out by a terrorist group. Certainly, the "definition problem", that causes differences in the levels of attacks, injuries or casualties, calls for several adjustments by the researchers when modeling the data. However, this is an extremely complicated task that apparently cannot be undertaken in this endeavor.

Overall, collecting and reporting terrorism data is undeniably a very challenging task with serious shortcomings. However, for the purpose of creating a terrorism index across time and regions, these open-source datasets are quite useful. The methodology used to proxy for the terrorist activity is thoroughly discussed in the next section.

4.5 Variables Description

This subsection briefly describes both firm-level and time series variables used in this study. Appendix A provides more details on the construction of these variables.

Investment: To account for the heterogeneity across different types of investments I construct five different measures of investment spending. Following Mclean and Zhao (2014), I choose as my baseline measure the broadest possible measure of corporate investment *Inv*, which is defined as the sum of total asset growth and R&D spending, all scaled by beginning-of-the-year book value of assets. The alternative measures are based on Baker et al. (2003), and they are presented here from the broadest to the narrowest. Inv_2 is the percentage change in book value of assets over the fiscal year. Inv_3 is defined as the sum of capital expenditure, R&D spending, and SG&A, all scaled by beginning-of-year book value of assets. Inv_4 is defined as the sum of capital expenditure and R&D spending, all scaled by beginning-of-year book value of assets. Finally, Inv_5 is defined as capital expenditure scaled by beginning-of-year book value of assets.

[26] The first phase of data for the GTD (GTD1: 1970-1997) was collected in real time by the PGIS—a private security agency-. The second phase of data (GTD2: 1998-2008) was gathered retrospectively by the Centre for Terrorism and Intelligence Studies (CETIS), in partnership with START. The third phase of data (2008 -2011) was made in real time by the Institute for the Study of Violent Groups (ISVG) at the University of New Haven, while from 2011 onwards data collection is done by START staff at the University of Maryland.

Employment growth: In line with Mclean and Zhao (2014) and Montone and Zwinkels (2015), the employment variable, *Emp*, is designed to capture the employment growth in a given firm using the annual change in the log number of its employee.

Tobin's q: *Q* is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets.

Cash Flow: *CF* is defined as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets.

External finance: Following Mclean and Zhao (2014) I gauge *EqtIss* as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. Similarly, I measure *DebIss* as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the sum of *EqtIss* and *DebIss.*

Terrorism: is defined as the natural log of an index that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. *Usterr* index captures the impact of the flow of the domestic terrorist activity, while *NonUSterr* index captures the impact of the flow of the international terrorist activity. In addition, *GlobTerr* index captures the flow of both domestic and international activity

Investor Sentiment: $Sent_1$ is defined as the rank values of the annual orthogonalized B&W$^{\perp}$ sentiment index and is calculated as the rank value of annual orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. $Sent_2$ is the adjusted orthogonal B&W$^{\perp}$ sentiment index and is calculated by adding the minimum value of the orthogonal B&W$^{\perp}$ sentiment index to its yearly value so that it will always be positive.

4.6 Descriptive Statistics and Simple Correlations

Panel A of Table I reports descriptive statistics for the variables used in this study. It is notable that I do not delete a firm-year observation simply because a particular variable is missing. Listwise deletion would reduce the number of observations used in the model and thus weaken the statistical power of the tests. For instance, there are only about 57% as many R&D spending observations as capital expenditures observations, and thus I do not delete a firm-year observation simply because the R&D spending observation is missing for that year. That is also the reason that the number of observations differs across alternative investment measures. The mean values of the independent variables Tobin's Q and cash flow are 46.6% and 5% respectively, which are slightly different from the mean values of 38.1% (*Q*) and 7.2% (*CF*) reported by Mclean and Zhao (2014) for a sample of US firms over the years 1965-2010. Importantly, the mean values of the dependent variables investment and employment

(22.5% and 5.45%) are very close to those reported by Mclean and Zhao (2014) (25.3% and 6% respectively). Recall that both investor sentiment indices ($Sent_1$, $Sent_2$) are based on the raw values of the annual B&W$^{\perp}$ sentiment index, which contains positive and negative values. The adjustments made to ensure that investor sentiment indices contain nonnegative values are thoroughly described in the Subsection 4.3.

Panel B of Table I presents simple correlations among the key variables. Overall, I do not find an extreme correlation (≥55%) between any of the predictor variables used in the same regression, and therefore I do not detect any sign of multicollinearity.[27] The baseline measure of corporate investment (*Inv*) is positively correlated with Tobin's Q and negatively correlated with cash flow. In addition, investor sentiment exhibits a weak but positive correlation with both Tobin's Q and cash flow. More interestingly, the US terrorism index is positively correlated with investor sentiment (0.346 with $Sent_1$ and $Sent_2$ with 0.344), whereas both international and global terrorism indices are negatively correlated with investor sentiment. Finally, all terrorism indices are negatively correlated with both cash flow and corporate investment.

Figure II illustrates time-series of market-based investor sentiment proxies in the U.S. over the full sample period. The "Raw" line depicts time series of the raw values of the orthogonalized B&W$^{\perp}$ sentiment index. As can be seen clearly, the orthogonalized B&W$^{\perp}$ sentiment index takes both positive and negative values, whereas $Sent_1$ and $Sent_2$ take exclusively nonnegative values by default.[28] More details for the construction of these nonnegative sentiment proxies can be found in section 3.3. The ups and downs of these indices capture movements in investor sentiment during the sample period. Generally speaking, over the period as a whole, investor sentiment fluctuates erratically, while also showing signs of mean reversion. $Sent_1$ and $Sent_2$ exhibit a high degree of co-movement with one another, with the latter being relatively more volatile. In particular, there is a steadily decreasing trend during the 1980s followed by a moderate recovery in the next decade. The sudden dips noted in sentiment over these years reflect times of remarkably economic uncertainty, such as the Black Monday crash in 1987 and the Oil price shock in 1990. The burst of the dot.com bubble in 2000 and the recent financial crisis of 2008 also drop investor sentiment down and thus protracting the recovery trend observed in the 2000s.

[27] Unlike time-series studies, panel data studies are much less likely to be plagued with multicollinearity issues, because the cross-sectional dimension adds more variability, more degrees of freedom and more efficiency. This is particularly true for short panels with a relatively large number of entities and a relatively small number of time periods. (My panel includes 89.626 firm-year observations from 9737 unique firms across a 31-year period). In fact, the variation in the panel data can be decomposed into variation between entities and variation within entities, with the former variation being usually bigger. Thus, additional and more informative data can produce more reliable parameter estimates by pressing the coefficients' standard errors downwards. (Baltagi, 2008)

[28] The Nonnegative values enable me to interact investor sentiment with other continues variables that have both positive and negative values.

Table I
Descriptive Statistics and Simple Correlations

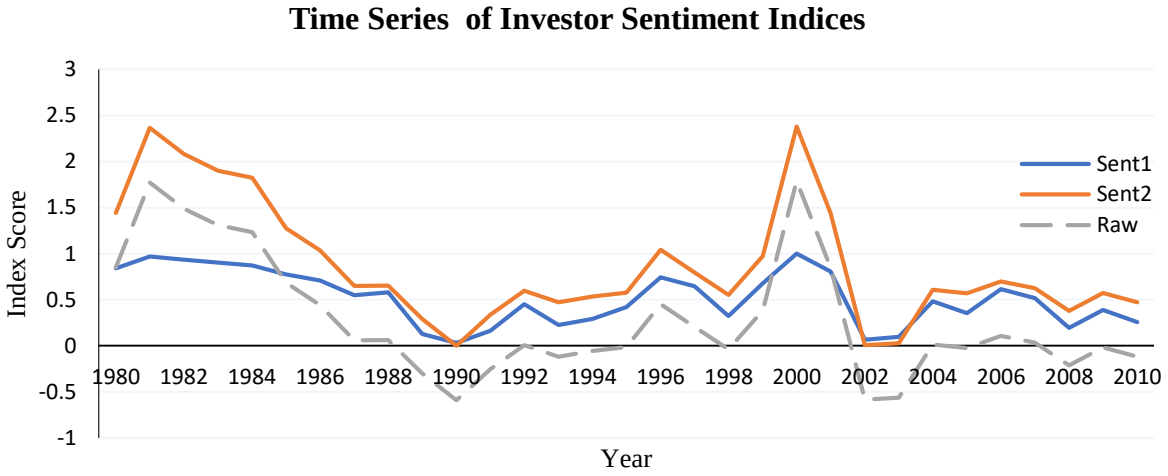
Panel A reports descriptive statistics for the variables used in this study, while panel B reports simple correlations among variables. Data is drawn from merged CRSP–Compustat, GTD and professor's Wurgler personal website. The sample period is from 1979 to 2010. Tobin's q (*Q*) is calculated as the log number of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. Cash Flow (*CF*) is defined as the sum of net income plus depreciation & amortization, all scaled by lagged assets. *Inv* is defined as the primary measure of investment and it is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Alternative measures of corporate investment: Inv_2 is the percentage change in book value of assets over the year, Inv_3 is measured as the sum of capital expenditure, R&D spending, and SG&A, all scaled lagged assets, Inv_4 is calculated as the sum of capital expenditure and R&D spending, all scaled by lagged assets and Inv_5 is defined as the sum of capital expenditure and R&D spending, scaled by lagged assets. Assets. Employment *(Emp)* is the yearly change in the log of the number of employees. Equity issuance (*EqIss)* is the change in book equity, plus the change in deferred taxes, minus the change in retained earnings, all scaled by lagged assets. Debt issuance *(DebtIss*) is the change in assets, minus the change in book equity, minus the change in deferred taxes, all scaled by lagged assets. *TotExtFin* is the sum of *EqIss* and *DebtIss. Sent*$_1$ is calculated as the annual rank value of orthogonal B&W$^{\perp}$ sentiment index divided by the maximum rank. $Sent_2$ is the adjusted orthogonal B&W$^{\perp}$sentiment index and is calculated by adding the absolute minimum value of the orthogonal B&W$^{\perp}$sentiment index to its each yearly value. *Usterr*, *NonUSterr*, and *GlTerr* indices are calculated as the natural log of an index that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. They capture the flow of domestic, international and global terrorism activity respectively. More details for variables' definition are provided in the Appendix. All variables are winsorized to the 1st and the 99th percentile.

Panel A: Descriptive Statistics

Variables	Obs.(N)	Mean	Std. Dev.	Min	Max	25th pctl.	Median	75thpctl.
Q	78,141	0.464	0.563	-0.555	2.225	0.059	0.346	0.765
CF	78,167	0.050	0.182	-0.756	0.426	0.017	0.084	0.141
Inv	44,152	0.225	0.439	-0.409	2.554	0.006	0.114	0.285
Inv_2	78,541	0.141	0.387	-0.491	2.206	-0.036	0.061	0.198
Inv_3	39,406	0.485	0.322	0.062	1.766	0.256	0.408	0.627
Inv_4	43,739	0.152	0.144	0.005	0.806	0.059	0.108	0.192
Inv_5	77,605	0.078	0.0952	0	0.569	0.022	0.047	0.095
Emp	74,373	0.054	0.357	-7.120	8.642	-0.049	0.029	0.139
EqIss	73,504	0.087	0.264	-0.173	1.702	-0.001	0.010	0.051
DebtIss	74,856	0.074	0.224	-0.326	1.281	-0.027	0.023	0.105
TotExtFin	71,129	0.164	0.408	-0.313	2.456	-0.021	0.0448	0.175
$Sent_1$	31	0.505	0.278	0.032	1	0.290	0.484	0.742
$Sent_2$	31	0.837	0.618	0	2.379	0.535	0.606	1.043
USterr	31	3.242	1.451	1.386	8.695	2.485	2.890	3.654
NonUSterr	31	8.925	0.626	8.113	10.428	8.432	8.837	9.155
GlTerr	31	8.961	0.618	8.124	10.429	8.434	8.844	9.236

Panel B: Simple Correlation Matrix									
	Q	CF	Inv	Emp	Sent1	Sent2	USterr	NonUSterr	GlobTerr
Q	1								
CF	-0.035	1							
Inv	0.352	-0.026	1						
Emp	0.243	0.092	0.480	1					
Sent1	0.010	0.034	0.052	0.035	1				
Sent2	0.012	0.034	0.033	0.017	0.924	1			
Usterr	-0.021	-0.040	-0.041	-0.056	0.346	0.344	1		
NonUsTerr	0.051	-0.019	-0.002	0.036	-0.283	-0.374	-0.296	1	
GlobTerr	0.061	-0.070	-0.028	0.006	-0.152	-0.253	0.111	0.879	1

Figure II Time series plots of investor sentiment in the US over the sample period 1980-2010. The "Raw" line represents the raw values of the orthogonalized B&W$^{\perp}$ sentiment index, which is based on the first principal component of six sentiment variables, each adjusted to be orthogonal to the business cycle. I use these raw values to construct alternative sentiment measures which take nonnegative values. $Sent_1$ represents the rank variables of the orthogonal B&W$^{\perp}$ sentiment index. The rank variables are based on the yearly values of the orthogonalized B&W$^{\perp}$ sentiment index and they are calculated as Rank of Sentiment /Maximum Rank. $Sent_2$ represents the adjusted values of the orthogonalized B&W$^{\perp}$ sentiment index by adding a constant. I add the absolute minimum value of the orthogonalized B&W$^{\perp}$ sentiment index to its yearly value so that it will always have a nonnegative value.



5. Methodology and Hypotheses

5.1 Empirical Design

My model follows a large investment literature designed for a world with capital-market imperfections.[29] In principle, the absence of capital-market frictions implies that firm-level investment should exclusively depend on the profitability of its investment opportunities as captured by Tobin's q. However, empirical research shows that firms with more cash and less debt invest more (Stein, 2003). Asymmetric information and agency conflicts cause firms to face binding financial constraints, namely conditions that raise the cost of external finance (equity/debt) above the opportunity cost of internal finance. This gap, in turn, creates the potential for internally generated cash flows to extend the investment opportunity set further. The well-documented cash flow-investment sensitivity, however, has also been ascribed by some scholars to measurement error in q or endogeneity bias -that is to say, a firm's cash flow or debt level is correlated with investment opportunities-.[30] Although the literature has convincingly addressed these arguments, I discuss them in detail later with respect to my empirical results.[31]

Following Fazzari, et al. (1988) and Baker et al. (2003), I first consider the following baseline investment equation:

$$\frac{I_{i,t}}{A_{i,t-1}} = b_1 Q_{i,t-1} + b_2 \frac{CF_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \qquad (1)$$

The dependent variable is individual firms' investment, where investment, $I_{i,t}$, stands for my primary and alternative investment measures and $A_{i,t-1}$, is the beginning-of-the-year book value of assets. Tobin's q, $Q_{i,t-1}$, is measured at the start of the year (t-1) and captures the market's information about a firm's investment opportunities. Importantly, $Q_{i,t-1}$ cannot reflect accurately whether the firm will be financially constrained in year t. Thus, a contemporaneous term of cash flow, CF_{it}, is also included in the right side of the equation. This term is also scaled by beginning-of-the-year book value of assets $A_{i,t-1}$. I scale, both investment ($I_{i,t}$) and contemporaneous cash flow (CF_{it}), by lagged book assets because I want to keep a common scale factor for all regressions, including primary and alternative investment specifications as the dependent variables. Note that investment and cash flow are determined simultaneously by a firm's profitability, but since this study is not interested in testing any causal relationship between cash flow and investment, I only consider the most recent cash-flow

[29] Early literature is analytically surveyed by Hubbard (1998). See Bond and Van Reenen (2007) for recent literature.

[30] For criticism over the financial constraint interpretation of cash flow sensitivity see: Kaplan and Zingales (1997), Cleary (1999), Poterba (1988), Erickson and Whited (2000), Gomes (2001), Cooper and Ejarque (2003) Alti (2003) and Almeida et al. (2004).

[31] Gilchrist and Himmelberg (1995) document an "excessive" investment sensitivity to cash flow even after controlling for its predictive component for growth opportunities. Fazzari et al. (2000) also respond to Kaplan and Zingales (1997). See more for this open debate in Stein (2003).

information available. Nevertheless, according to Baker et al. (2003), this is the norm in the conventional literature involving linear investment models.

Now, in order to establish a link of significance between corporate investment and investor sentiment I follow Mclean and Zhao (2014) and regress the yearly b_1 and b_2 coefficients on investor sentiment measures[32]:

$$b_{1,t} = \alpha + b_3 Sent_t + \varepsilon_t \qquad (2)$$

$$b_{2,t} = \alpha + b_4 Sent_t + \varepsilon_t \qquad (3)$$

The b_3 and b_4 coefficients in equations (2) and (3) examine whether investor sentiment affects the cross-section of real investment by strictly estimating the marginal impacts of investor sentiment on the yearly $Q_{i,t-1}$ and CF_{it} coefficients (b_1 and b_2 respectively). This treatment takes into account the remark of Bernanke et al. (1996) that possibly the same factors that affect external financing also affect investment opportunities. For example, the corporate investment may be greater in bullish periods not necessarily because of lower financing costs but also because of greater growth opportunities. In addition, Petersen (2009) shows that in such a setting, data exhibits a persistent firm effect (both investment and Tobin's q are persistent). For instance, if some firms with low or negative cash flow are also firms with poor growth opportunities and subsequently invest less, then the coefficients resulting from time series regressions will be biased downward.[33] To address these concerns, I add year and firm fixed effects and by substituting equations (2) and (3) into equation (1) I get the following equation:

$$\frac{I_{i,t}}{A_{i,t-1}} = a_i + \alpha_t + b_1 Q_{i,t-1} + b_2 \frac{CF_{i,t}}{A_{i,t-1}} + b_3 Q_{i,t-1} \times Sent_t + b_4 \frac{CF_{i,t}}{A_{i,t-1}} \times Sent_t + \varepsilon_{i,t} \qquad (4)$$

I, therefore, use the above panel regression model with year and firm fixed effects to estimate equation (4) for a pooled sample of 9737 unique firms. The error term, ε_{it}, is assumed to be independent from the explanatory variables, while a_i is a firm-specific effect that controls for all time-invariant firm

[32] In addition to sentiment measures Mclean and Zhao (2014) also include measures of economic expansion in equations (2) and (3) to test whether business cycles affect the cross-section of firms' investments. However, such an inquiry is beyond the scope of this study.

[33] Fazzari et al. (2000) indicate that the presence of firms that are likely to end up underfunded biases the estimated cash-flow sensitivity downward because they inevitably undertake some projects in order to keep production technically feasible. Moreover, both Petersen (2009) and Thompson (2011) argue that, in this setting, panel regression standard errors clustered by year and firm are unbiased.

characteristics in the cross-section. Note that the coefficients of the interaction terms estimate the marginal effects of investor sentiment on the yearly $Q_{i,t-1}$ and CF_{it} coefficients just as the slope coefficients b_3 and b_4 in equations (2) and (3) do. Thus, they do not test whether the level of corporate investment varies over time with investor sentiment.

By the same token, I further incorporate a terrorism variable into equations (2) and (3) in order to examine a possible link of significance between corporate investment, investor sentiment and terrorism activity[34]:

$$b_3 = \beta + b_5 Terr_t + \varepsilon_t \qquad (5)$$

$$b_4 = \beta + b_6 Terr_t + \varepsilon_t \qquad (6)$$

By substituting equations (5) and (6) into equations (2) and (3), I get:

$$b_{1,t} = \alpha + \beta\, Sent_t + b_5 Terr_t \times Sent_t + \varepsilon_t \qquad (7)$$

$$b_{2,t} = \alpha + \beta\, Sent_t + b_6 Terr_t \times Sent_t + \varepsilon_t \qquad (8)$$

Finally, by substituting equations (7) and (8) into (4), I end up with equation (9):

$$\frac{I_{i,t}}{A_{i,t-1}} = a_i + \alpha_t + b_1 Q_{i,t-1} + b_2 \frac{CF_{i,t}}{A_{i,t-1}} + b_3\, Q_{i,t-1} \times Sent_t + b_4 \frac{CF_{i,t}}{A_{i,t-1}} \times Sent_t + b_5\, Q_{i,t-1} \times Sent_t \times Terr_t + b_6 \frac{CF_{i,t}}{A_{i,t-1}} \times Sent_t \times Terr_t + \varepsilon_{i,t} \qquad (9)$$

Note that the coefficients of the three-way interaction terms b_5 and b_6 in equation (9) estimate the marginal effect of terrorist activity on b_2 and b_3 coefficients, just as the slope coefficients in equations (5) and (6) do. They, therefore, test whether or not terrorist activity can change the direction or magnitude of the relationship between investor sentiment and corporate investment.

Once again, it is important to highlight that my models' specification does not allow to test whether the level of corporate investment varies over time with investor sentiment and terrorist activity. The

[34] The terrorism variable enters in equations (2) and (3) as a moderator variable, under the assumption that terrorism activity captures a portion of the variation in investor mood. Thus, the coefficients b_5 and b_6 in equations (5) and (6) test whether the nature of the relationship between sentiment and corporate investment alters as the values of the terrorism variable change.

inclusion of year fixed effects in equations (4) and (9) demeans each observation by its yearly average, making $Sent_t$ and $Terr_t$ -which are yearly time series variables- orthogonal to $I_{i,t}$, $Q_{i,t-1}$ and CF_{it} . I, therefore, develop hypotheses regarding how differences across firms in investment spending vary with investor sentiment and terrorist activity. For the sake of clarity, I omit the single factors of $Sent_t$ and $Terr_t$ from the regressions, since they do not have any explanatory power per se. Finally, to correct for within-firm serial correlation and heteroscedasticity, I estimate White's (1980) heteroskedastic-consistent standard errors, clustered by year and firm.

I further employ this specification model to investigate whether sentiment and terrorism affect firms' decision to hire or train employees. As reviewed by Hubbard (1998) there are at least two reasons as to why financial constraints determine firm-level employment. First, a potential mismatch between labor input and production, which entails that firms should finance additional labor payments to keep production feasible (Greenwald and Stiglitz, 1993). Second, the notion that labor has a fixed, or at least a quasi-fixed cost component, suggesting that labor is not merely a variable factor of production (Farmer 1985; Hamermesh and Pfann 1996; Oi 1962). Finally, another indirect reason is proposed by Benmelech et al. (2015). They claim that, since labor and capital are complementary, the availability of external finance affects employment implicitly through its impact on corporate investment. Hence, in the presence of binding financial constraints, firms adjust both capital and employment. Bearing that in mind, I test hypotheses regarding firms' employment growth based on equations (4) and (9) as well.

5.2 Hypotheses Development

As outlined in the previous sections, there is evidence that the costs of external finance time-vary with investor sentiment and this variation, in turn, can exert a real effect on the economy. Within this framework, McLean and Zhao (2014) show that, as issuing conditions become more favorable, financially dependent firms issue more shares/debt and use the proceeds to invest and hire. This finding provides empirical support to an extant literature arguing that mispricing affects corporate investment through certain behavioral channels (Stein 1996; Baker et al. 2003; Polk and Sapienza 2009). In the same spirit, the present study assumes a world with noise traders and financial frictions, where rational managers rely on cues from the market to plan their investment and hiring policy. This premise forms the point of departure for my research. The next step is to ask whether terrorist activity -which enters here as an exogenous mood factor- affects this relationship.

Taking the above into account, I first conjecture that, during high sentiment periods, investment and employment of US firms exhibit a higher sensitivity to market prices and a lower sensitivity to internally generated funds. Following McLean and Zhao (2014) I analyze this hypothesis under the notion that higher investor sentiment relaxes financing constraints. Hence, I posit that:

Hypothesis 1_a: *Firms in greater need of external finance invest and hire more during periods of high investor sentiment.*

To make my results more concrete, I attempt to uncover the rationale behind this relationship by linking investor sentiment to external financing costs. The reasoning behind Hypothesis(1_a) becomes fairly obvious if external finance drives this relationship. In this case, the equity and debt issuance of US firms should be more sensitive to the market's assessments and less sensitive to cash flow during high sentiment periods. According to Baker et al. (2003), equity-dependent firms issue shares when they are overvalued and increase investments accordingly. Montone and Zwinkels (2015) also show that US firms, following high investor sentiment in the stock market, find it optimal to issue more equity and increase their investments and labor. In fact, however, investments can also be financed by retained earnings or debt. The catering channel argues that firms plan their investment policy according to stock prices even if they do not issue equity to finance their investment (Polk and Sapienza, 2009). In either case, mispricing and its impact on firms' financing become central to the investment and hiring decisions. Hence, following McLean and Zhao (2014) intuition that external finance costs exogenously time-varies with sentiment, I conjecture that:

Hypothesis 1_b: *Firms in greater need of external finance issue more shares and debt during periods of high sentiment*.

Note, however, that this hypothesis does not per se entails that issuing firms will use the proceeds obtained to invest and hire. According to Covas and Den Haan (2011), who study debt and equity issuance, firms tend to both invest and accumulate financial assets when they issue external finance. Additionally, Hertzel and Li (2010) investigate post-issuance investments and show that firms time the market and issue equity with the purpose to pay back debt or/and increase cash.[35]Other recent studies also show that firms issue equity when prices are high and then save the proceeds to build precautionary cash reserves (Dang and Xu 2018; Eisfeldt and Muir 2016; McLean 2011). Thus, this additional hypothesis adds value to my research only to the extent that it complements my preliminary Hypothesis (1_a).

Taking now Hypothesis $1_{(a+b)}$ as a whole, I reach to the following proposition: as investor sentiment increases and external finance becomes less costly, firms with valuable growth opportunities and insufficient internal funds (i.e. ceteris paribus, firms in greater need of external finance) issue more equity and debt to invest and hire. Based on that, I further develop hypotheses regarding terrorist activity, corporate investment, and employment.

[35] According to Hertzel and Li (2010) issuing firms, on average, have greater mispricing and greater growth opportunities in the pre-issue period. Consistent with the behavioral explanation, these firms also experience low post-issue abnormal stock returns.

According to Drakos (2010), terrorist events are by default sudden exogenous shocks to the stock market, and as such can ideally serve as a mood proxy. In fact, it is hard to think of other public events provoking so prominent and highly correlated mood swings within a population. Hence, it is plausible to question whether the terrorist activity can play a significant role in determining US firms' investment and hiring decisions. To this purpose, I posit that to the extent that terrorist activity deteriorates investor sentiment, the former exerts an adverse effect on corporate investment and labor. To examine the aforementioned, I state:

Hypothesis 2_a: *Firms in greater need of external finance invest and hire less in the presence of a greater terrorist threat.*

In line with the notion that external finance time-varies with investor sentiment I assume that this relation stems from the underlying mechanism developed in Hypothesis (1_{a+b}). Thus, I develop complementary hypothesis regarding issuing conditions as follows:

Hypothesis 2_b: *Firms in greater need of external finance issue less equity and debt in the presence of a greater terrorist threat.*

Once again, Hypothesis (2_b) complements Hypothesis (2_a) to the extent that issuing firms use their proceeds to invest and hire. Finally, I distinguish between domestic and international terrorist activity to account for potential contagion or spillover effect. The latter refers to shock diffusions from foreign stock markets to the US stock market. These shocks are typically triggered by pronounced international terrorist events and diffused through a transmission mechanism that involves economic and financial channels/linkages, such as a country's degree of world integration or its bilateral trade relations. Remarkably, in a seminal study Drakos (2011) identifies additional behavioral channels that help explain this transmission. He argues that past terrorist activity (memory-based utility/availability bias) and concerns about risk (social amplification of risk) exhibit incremental explanatory power over stock market reactions. Consequently, in an attempt to isolate a potential spillover effect caused by international terrorist activity, I separately test Hypothesis $2_{(a+b)}$ for domestic, international and global (combined) terrorist activity.

Appendix A provides an overview of the conceptual framework developed here. In the following section, I proceed with the interpretation of my empirical results.

6. Empirical Results

6.1 Corporate Investment and Employment Growth

Following Mclean and Zhao (2014) I first run panel regressions of equations (1) and (4), in which corporate investment and employment growth are the dependent variables. I use two distinct measures of corporate investment to account for differences caused by the heterogeneity of investment composition.[36] My baseline measure of investment, *Inv*, captures the sum of total asset growth plus R&D spending and therefore it is the "broadest" measure possible. According to Brown and Petersen (2009), a "broad" investment measure may be more revealing regarding *q* and *CF* sensitivities, as it is less subject to the problem of changing investment composition. However, recall that *Inv* considers only firm-year observations with reported R&D data, which shrinks the sample to a great extent. On the other hand, taking Inv_2 -which ignores R&D spending by default- as the dependent variable almost doubles the sample.[37] Hence, I present my empirical results with respect to both aforementioned investment measures and discuss the implied differences accordingly.

Table II portrays estimates of two sets of panel regressions based on equations (1) and (4). In the first set of regressions [1] with year and firm fixed effects, I merely regress lagged *q* and contemporaneous *CF* on firms' investment (*Inv*, Inv_2) and employment growth (*Emp*). In the second set of tests [2], I also include the sentiment interaction terms on the right side of the equation to examine how sentiment affects investment and employment in the cross-section.

6.1.1 Q and CF Sensitivities

Beginning with the first string of tests [1], in columns 1-3 -Table II, I find that both coefficients on *q* and *CF* are positive and significant at 99% level of confidence. Overall, the investment findings are in line with prior investment literature and provide support for an "imperfect market" interpretation of the role of cash flow in linear investment models. More specifically, in column 1, the lagged *q* coefficient is 0.366 (*t*-stat = 43.50). This is very close to 0.403 (*t*-stat=14.03), which is reported by Mclean and Zhao (2014). A one-standard-deviation increase in lagged *q* implies a 0.206 increase in corporate investment, representing an increase of approximately 92% (the standard deviation of *q* in Table I is 0.563, while the mean value of *Inv* is 0.225). The *CF* coefficient is 0.193 (*t*-stat = 5.50).

[36] The most striking change in the composition of corporate investment: the absolute and relative importance of physical investment has declined substantially, and R&D intensity has risen dramatically for the typical publicly traded manufacturing firm.

[37] As it is well-documented R&D spending is subject to "cookie-jar" accounting. That is, many firms can manage earnings by expensing R&D in one period and then reversing part or all of the overstated expenses in future periods.

Table II

Corporate Investment, Employment Growth and Investor Sentiment

This table reports results from the investment and employment regressions (1) and (4). The dependent variables are *Inv*, $Inv_{2,}$ and *Emp*. [*1*] represents the first set of tests with lagged *Q* and contemporaneous *CF* as the independent variables, while the second set of tests [*2*] further includes two-way interaction terms with $Sent_1$. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of sentiment and it is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] Inv	[2] Inv_2	[2] Emp
Q_{t-1}	0.366***	0.298***	0.149***	0.323***	0.257***	0.109***
	(43.50)	(46.03)	(31.12)	(24.82)	(26.02)	(14.07)
CF	0.193***	0.563***	0.246***	0.418***	0.748***	0.344***
	(5.50)	(21.89)	(12.93)	(7.82)	(18.67)	(11.58)
$Sent_1*Q_{t-1}$	-	-	-	0.088***	0.089***	0.075***
	(-)	(-)	(-)	(4.78)	(6.53)	(6.90)
$Sent_1$*CF	-	-	-	-0.309***	-0.254***	-0.129**
	(-)	(-)	(-)	(4.11)	(4.23)	(3.07)
constant	0.189***	0.105***	0.034***	0.181***	0.099***	0.027***
	(19.43)	(14.56)	(4.47)	(17.46)	(12.89)	(3.41)
N	43,899	77,685	73,814	35,742	64,088	60,798
R^2 (within)	0.17	0.17	0.06	0.19	0.19	0.07

Similarly, a one-standard-deviation increase in *CF* results in a 0.035 increase in corporate investment, corresponding to an increase of 15.55% (the standard deviation of *CF* in Table I is 0.182). Column 2 - Table II illustrates the coefficients obtained when I employ Inv_2 as the dependent variable. In this regression, I also document positive and statistically significant q and CF coefficients at a 99% confidence level. The q coefficient stands at 0.298 (*t*-stat = 46.30). This means that a one-standard-deviation increase in q causes a 38% rise in investment. Likewise, the CF coefficient is 0.563 (*t*-stat= 21.89) and one-standard-deviation increase in CF results in an increase of 72% in investment.

A careful comparison between q and CF coefficients across different investment measures shows that the CF effect on investment dominates the q effect in column 2, whereas the opposite is true in column 1. This is mainly driven by a considerable increase in the investment-cash flow sensitivity in column 2 -when I replace *Inv* with Inv_2, the CF coefficient climbs from 0.193 to 0.563 (t-stat = 46.30)-. This rise can plausibly be attributed to sample-selection bias. Recall that regressions in which the *Inv* is taken as the dependent variable omit firm-year observations lacking R&D data.[38] In addition, R&D spending entails higher adjustment costs and higher informational asymmetries, suggesting that R&D spending may not respond much to temporary shifts in contemporaneous cash flow.[39]This, in turn, can substantially reduce the value of the estimated within-firm CF coefficient (Gilchrist and Himmelberg, 1995). The above arguments provide plausible reasons to explain why the correlation between cash flow and investment varies across subsamples.

Column 3-Table II illustrates regression coefficients on firms' employment growth based on equation (4). Both q and CF coefficients are positive and statistically significant at a 99% confidence level, suggesting that firms' investment in human capital exhibits a similar pattern with firms' total investment. The q coefficient is 0.149 (*t*-stat= 31.12), while the CF coefficient stands at 0.246 (*t*-stat= 12.93). That is, firms with greater investment opportunities and more cash holdings hire or train more employees.

[38] Brown and Petersen (2009), who study changes in investment-cash flow sensitivity for US firms over the period 1970–2006, argue that the dramatic increase in the R&D-to-assets ratio of young firms with persistent negative cash flows can cause a downward bias (e.g., negative cash flow coefficients) in the estimated R&D-cash flow sensitivity. In additional tests, I indeed find a negative R&D-cash flow sensitivity for my sample. However, after controlling for negative cash flow firm-year observations, I get a positive sign on the CF coefficient. For sake of brevity, I do not present these tests here. The corresponding tables are available under request.

[39] My cash flow measure can be burdened with error. Note that R&D spending is often expensed resulting to cash flow measure that is net of R&D expenditures. A more sophisticated measure of cash flow used in investment literature is cash flow before total investment, including R&D. By re-estimating regression coefficients in Table II column (1) with sophisticated CF, I find q and CF effects similar to those in column (2). The corresponding tables are available under request.

6.1.2 US Investor Sentiment

Columns 4-6 in Table II report estimates of equation (4), in which sentiment interaction terms are included in the right side of the equation, along with q and CF. Corporate investment and employment growth are the dependent variables. To get a first impression, all panel regressions in columns 4-6 yield positive q-sentiment interaction coefficients and negative CF-sentiment interaction coefficients. Remarkably, all sentiment interactions are statistically significant at a 99% confidence level. Both investment and employment sensitivities to q increase with investor sentiment, suggesting that high q firms invest and hire more in bullish periods. Conversely, both investment and employment sensitivities to CF decline with investor sentiment, suggesting that firms with low cash holdings invest and hire more in bullish periods.

More specifically, in column 4-Table II, the coefficient of sentiment-q sensitivity is 0.88 (*t*-stat= 4.78). Note also that the mean rank value of the orthogonalized B&W$^{\perp}$ sentiment index, $Sent_1$, is 0,505. This, in terms of economic significance, means that the aggregate q coefficient is equal to 0.323 + 0.88 × 0.505 = 0.767 in moderate sentiment periods. To gauge the marginal impact caused by investor sentiment on q and CF sensitivities, consider the 25th and 75th percentile values of the rank of the orthogonalized B&W$^{\perp}$ sentiment index in Table I (0.290 and 0.742 respectively). In this case, the aggregate q coefficient becomes 0.323 + 0.88 × 0.290 = 0.578 during periods of low investor sentiment and 0.323 + 0.88 × 0.742 = 0.975 during high sentiment periods. In other words, the investment sensitivity to q in bullish periods is approximately 69% higher than that of bearish periods.

By the same token, I estimate that the aggregate CF coefficient is 0.418 + (-0.309) × 0.290 = 0.328 during low sentiment periods and 0.418 + (-0.309) ×0.742 =0.188 during high investor sentiment periods. That is, the investment sensitivity to CF in bullish periods is lower by approximately 43% (*t*-stat=4.11) than that of bearish periods. This is consistent with survey evidence in Campello et al. (2011), showing that more than one in two CEOs report that they rely on internally generated cash to finance investment when external financing is costly. In the same vein, Bolton et al. (2011) indicate that investment sensitivity to internal funds increases as external financing becomes costlier.

Taken together, column 4-Table II, suggest that firms with high q and low CF invest more during periods of high investor sentiment. In Column 5 – Table II, I replace the baseline measure of corporate investment, *Inv*, with Inv_2 and re-estimate equation (4). Conspicuously, this treatment does not significantly alter the investment results, leading to similar coefficient estimates. Once again, I find that, ceteris paribus, firms which are in greater need of external finance (i.e., firms with valuable growth opportunities and insufficient internal funds) invest more during bullish periods. This is in line with Baker et al. (2003) who show that investment of equity-dependent firms exhibits a higher sensitivity to stock prices.

Column 6 – Table II indicates that sentiment exerts a statistically and economically significant effect on employment growth. Specifically, the employment sensitivity to q increases by approximately 26% (*t*-stat=6.90) with sentiment, while the employment sensitivity to CF declines by approximately 19% (*t*-stat=3.07) with sentiment.[40] This is consistent with McLean and Zhao (2014); Montone and Zwinkels (2015), both of whom document a positive and significant association between investor sentiment and employment growth.

On the whole, investment findings in Table II lend support to a strand of behavioral finance literature arguing that mispricing can distort corporate investments. As already mentioned in Section 2, Stein (1996) outlines two main behavioral channels, through which mispricing can affect corporate investment. The market timing channel argues that equity-dependent firms (i.e., firms that typically need external equity to finance marginal investments) exhibit a considerably higher investment sensitivity to stock prices compared to non-equity dependent firms. This is in line with my showing that investment sensitivity to q increases with investor sentiment and investment sensitivity to CF decreases with investor sentiment. Intuitively, one could interpret this as follows*:* to the extent that greater speculative demand implies higher prices and lower costs of capital, overvalued firms issue equity to exploit this "window of opportunity" and hence increase investments and labor. Conversely, when stock prices are below fundamental values, equity-dependent firms would rather forego some positive NPV project than issue undervalued equity.

In fact, however, investments can also be financed by retained earnings or debt. As Stein (1996) puts it, "the sensitivity of investment to q depends on the accessibility to other sources of financing". In light of this remark, the catering channel shows that firms plan their investment policy according to stock prices even if they do not issue equity to finance their investment (Polk and Sapienza, 2009).

Nevertheless, it still remains doubtful whether or not issuing firms use the proceeds obtained to invest and hire. As noted by Huang and Ritter (2009), it is possible for firms to issue equity or debt even in the absence of immediate financing needs, because "issuing overvalued securities is itself a positive NPV project". For example, firms may want to raise funds when the cost of capital is low in order to have sufficient cash in future periods with costlier external finance.[41] Indeed, some recent studies show that US firms issue equity when stock prices are high and then save the proceeds to build precautionary cash reserves (Dang and Xu 2018; Eisfeldt and Muir 2016; McLean 2011). In response to these concerns, Table II shows that greater access to external finance makes investment and

[40] These proportions are computed using the 25th and 75th percentile values of the rank of the orthogonalized B&W$^{\perp}$ sentiment index. The aggregate q coefficient during bearing periods is 0.13 (=0.109 + 0,075 × 0.290), while over bullish periods is 0.16 (=0.109 + 0,075 × 0.742). Similarly, the aggregate CF coefficient is 0.3 (=0.344 - 0.129 × 0.290) over bearish periods, while during bullish periods becomes 0.248 (=0.344 - 0.129 × 0.742).

[41] The incentive for firms with high growth opportunities and uncertain cash flow to build precautionary cash reserves is theoretically developed in Keynes (1936).

employment more sensitive to *q* and less sensitive to cash flow. Hence, the bottom line here is that: as investor sentiment drops the cost of equity down, firms issue shares and use the proceeds to invest and hire to the extent that they do not save them for future use.

Beneficially, building a stockpile of cash seems not to be the case for debt issues. McLean and Zhao (2018), who study a sample of firms from 32 countries, argue that generally, firms do not use debt proceeds to plan their cash policies since these proceeds are spent and invested very quickly. This is also consistent with McLean (2011), who argues that typically debt issues do not boost cash levels of US issuing firms.

Taking the above into consideration, it seems essential to scrutiny the firms' investment-financing behavior before proceeding to further interpretation. The cross-sectional results of Table II simply reveal the magnitude of the (marginal) effect of investor sentiment on corporate investment and therefore do not allow to identify the underlying mechanism driving this effect. To shed light on these issues, I further examine whether total external financing time-varies with investor sentiment in the next subsection.

6.2 External Financing Costs

To uncover the rationale behind the investor sentiment findings in Table II, I conduct additional tests using external finance (equity and debt issuance) as the dependent variable. The right side of the equation remains the same as the previous regressions. Coefficient estimates of these panel regressions are reported in Table III. Columns 1-3 contains q and CF coefficient estimates, whereas in columns 4-6 coefficient estimates of sentiment interaction terms are also included. I first examine equity and debt issuance decisions separately, and then I aggregate them to capture the big picture of external finance.

6.2.1 Q and CF Sensitivities

Starting from equity issuance regression in Column 1-Table III, I find that both q and CF coefficients are economically and statistically significant. Equity issuance is positively correlated with q and negatively correlated with CF, suggesting that firms with high growth opportunities and firms with low cash flow issue more equity. Intuitively, the negative share issuance-CF sensitivity mitigates concerns about measurement error in q. That is, if contemporaneous CF is correlated with investment opportunities, then firms with low investment opportunities issue more equity, which definitely is not the case here.[42] Hence, this finding favors my investment model specification, which ascribes the role of the investment-CF sensitivity to financial constraints.

[42] Poterba (1988), Erickson and Whited (2000), Gomes (2001), Povel and Raith (2001), Almeida and Campello (2002) and Alti (2003) argue that if q is not a proper statistic for growth opportunities cash flow significantly enters in investment equations as a predictor of investment opportunities rather than a measure of financial constraints.

Table III

External Finance and Investor Sentiment

This table reports results from external finance regressions based on the equations (2) and (4). The dependent variables are *EqtIss*, *DebtIss*, and *TotExtFin*. The first set of tests [1] includes lagged *Q* and contemporaneous *CF* as the independent variables, while the second set of tests [2] further includes two-way interaction terms with $Sent_1$. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of sentiment and is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. All regressions include firm and year fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both firm and year. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] EqtIss	[1] DebtIss	[1] TotExtFin	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.193***	0.099***	0.308***	0.152***	0.096***	0.259***
	(41.43)	(32.44)	(46.42)	(20.72)	(19.51)	(25.24)
CF	-0.348***	-0.018	-0.410***	-0.175***	-0.019	-0.216***
	(18.51)	(1.50)	(15.16)	(5.75)	(1.04)	(5.09)
$Sent_1*Q_{t-1}$	-	-	-	0.072***	0.016*	0.100***
	(-)	(-)	(-)	(7.11)	(2.39)	(7.04)
$Sent_1$*CF	-	-	-	-0.223***	-0.012***	-0.246***
	(-)	(-)	(-)	(5.13)	(5.44)	(4.00)
Constant	0.088***	0.078***	0.168***	0.087***	0.073***	0.163***
	(23.96)	(14.90)	(23.53)	(20.57)	(13.51)	(20.99)
N	72,902	74,162	72,902	60,543	61,373	60,543
R^2(within)	0.12	0.05	0.12	0.12	0.05	0.12

Debt issuance results in column 2, however, are not so clear-cut. Although the signs of q and CF coefficients are the same with that of the equity issuance, I document an insignificant association between debt issuance and CF. According to Mclean and Zhao (2014) firms with low cash flow - despite their excessive need for external finance- are less capable of borrowing because they are, on average, financially constrained (Fazzari et al. 1988; 2000). This is also compatible with prior literature arguing that firms with low levels of cash tend to have less leverage (Baker and Wurgler 2002; Rajan and Zingales 1995).

Taken as a whole, equity and debt issuance results drive the coefficient estimates in column 3, where total external finance (*TotExtFin)* serves as the independent variable. These findings suggest that ceteris paribus, firms with high investment opportunities and low cash flow are in greater need of external finance. The CF coefficient is also consistent with the notion that internal sources of financing, such as retained earnings, are in general less costly compared to external sources of finance (Bond and Meghir 1994; Calomiris and Hubbard 1990; Fazzari et al. 1988).

6.2.2 Costly External finance and Sentiment

As mentioned above, Columns 4-6 in Table III re-estimate equation (4) by taking external finance (equity and debt issuance) as the dependent variable. This string of tests [2] is more revealing for the reported investment sensitivities in Table II, in a sense that it tests whether or not sentiment exerts any effect on the cost of external finance. Recall that findings in Table II indicate that investment and employment sensitivities to *q* increase with investor sentiment, whereas investment and employment sensitivities to cash flow decline with investor sentiment. If this pattern is driven by external finance, I expect investor sentiment to improve issuing conditions and firms with high q/low cash to issue more equity and debt.

In equity issuance regression (Column 4), all of the interaction coefficients are statistically and economically significant, suggesting a positive effect of sentiment on equity issuance– q sensitivity and a negative effect on equity issuance – CF sensitivity. To be more specific, the aggregate q coefficient is higher by approximately 19% (*t*-stat =7.11) during periods of high investor sentiment compared to periods of low investor sentiment. Conversely, the aggregate CF coefficient becomes relatively smaller by roughly 42% (*t*-stat = 5.13) during high sentiment periods compared to lower sentiment periods.[43] In other words, firms with valuable growth opportunities and low cash flow raise

[43] Consider the 25th and 75th percentile values of the rank of the orthogonalized B&W$^{\perp}$ sentiment index in Table I (0.290 and 0.742 respectively) and the q and CF coefficients in column 4 - Table III. The aggregate q coefficient becomes (0.152 + 0.072 *0.290=0.173) during bearish periods and (0.152+ 0.072*0.742=0.205) during bullish periods. Thus, the marginal effect of sentiment on q coefficient is 0,033 (= 0.205 - 0.173). The aggregate CF coefficient becomes (-0.175 -0.223 * 0.290= -0.240) during bearish periods and (-0.175 -0.223 *

more capital through equity issues during bullish periods. This is in line with the notion that firms seek to minimize their cost of capital by exploiting "windows of opportunity" (Stein, 1996). In this spirit, Fama and French (2005) indicate that the majority of public firms in US issue equity almost every year and that some firms issue equity even if they maintain a large debt capacity or adequate internally generated funds. This is at odds with the predictions of the pecking order theory, which argues that equity issuance serves as the option of last resort in the financing hierarchy.

Debt issuance regression in Column 5 – Table III yields weak evidence of a sentiment effect on debt issuance -q sensitivity. In particular, the coefficient of the q-sentiment interaction term is 0.016 (*t*-stat=2.39) and statistically significant at a 90% confidence level. This is inconsistent with McLean and Zhao (2014), who document a greater and stronger statistical relation between sentiment and debt issuance. It is possible that firms prefer alternative sources of financing (e.g., share issuance) rather than debt during periods of high sentiment. This interpretation aligns well with surveys, such as Pinegar and Wibricht (1989) and Graham and Harvey (2001), which show that managers perceive the maintenance of financial flexibility as a priority when considering financing alternatives.[44] Furthermore, the coefficient of CF-sentiment interaction term is -0.012 (*t*-stat =5.44) and statistically significant at a 99% confidence level, suggesting that debt issuance sensitivity to CF declines even more in bullish periods. This implies that, on average, firms with low cash flow borrow more during bullish periods.

Column 6-Table III provides a broader pattern of firms' issuance decisions that are conditional on time-varying investor sentiment. I find a positive (marginal) effect of sentiment on q coefficient and a negative (marginal) effect of sentiment on CF coefficient. All coefficient estimates are statistically significant at a 99% confidence level. As expected, total external finance (i.e., equity and debt issuance) becomes increasingly sensitive to *q* and less sensitive to cash flow during periods of high sentiment. Specifically, external finance sensitivity to q increases with investor sentiment by approximately 11% (*t*-stat=7.04) and external finance sensitivity to CF declines with investor sentiment by approximately 31% (*t*-stat=4.00). That is, as investor sentiment becomes higher and issuing conditions more favorable, firms in greater need of external finance (high q and low CF firms) rely more on external finance sources. Given that I fail to find a robust effect of sentiment on debt issuance, I posit that this effect is mainly driven by equity issuance decisions. Moreover, as McLean and Zhao (2014) show in additional tests, the *q* and cash flow sentiment interaction coefficients for share issuance are larger (in absolute terms) than those for debt issuance, suggesting that share issuance plays a bigger role in explaining investment and employment sensitivities. This tends to favor

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0.742 = -0.340) during bullish periods. Thus, the marginal effect of sentiment on CF coefficient is -0.100 (= 0.340 - 0.240).

[44] Graham and Harvey (2001) further show that almost two-thirds of CFOs agree that "the degree of equity over- or undervaluation is (very) important for their equity issuance decisions".

the market timing theory over alternative theories as for the most appropriate candidate to explain why investment and employment sensitivities to *q* and to CF vary with financing costs (see Table II). In the next subsection, I further discuss this relation.

6.3 Linking Costly External finance to Firms' Investment and Employment Decisions

Overall, the financing results in Table III lend support to a branch of corporate finance literature that assigns a central role to financial market imperfections. The presence of time-varying external finance costs removes us from the Modigliani and Miller's (1958) paradigm of investment-financing independence to a world in which investor sentiment and market timing appear to influence firms' investment. Consistent with my financing predictions, I find that firms with valuable growth opportunities and low internally generated cash rely more heavily on external finance sources when issuing conditions become relatively more favorable (i.e., over periods with high investor sentiment). Following McLean and Zhao (2014), I interpret this finding as evidence that these firms use the proceeds obtained from share and debt issues to invest and hire. This interpretation complements findings in Table II, which shows that during bullish periods these firms invest and hire more. To make it more concrete, I reiterate some of the key findings in Table II and Table III and discuss them together.

In the first place, I focus my attention on q sensitivities. Table III shows that total external finance exhibits an increasing sensitivity to q during bullish periods, suggesting that investor sentiment loosens financial constraints by reducing the cost of capital. Further, Table II indicates that investment and employment sensitivities to q increase with investor sentiment, suggesting that firms with valuable growth opportunities invest and hire more during bullish periods. Taken as a whole, these findings suggest that, as issuing conditions become more favorable, high q firms issue shares and debt to cover their increasing financing and hiring needs.

As regards CF sensitivities, Table III denotes that total external finance becomes even less sensitive to CF during high sentiment periods. On top of that, Table II shows that investment and employment sensitivities to CF also decrease with sentiment. Taken as a whole, the above findings suggest that, as issuing conditions become more favorable, low CF firms access external finance to invest and hire. This is in line with a branch of investment literature summarized in Hubbard (1998) and Bernanke (2007), arguing that investment spending of financially constrained firms exhibits a higher sensitivity to CF.

Considering now Q and CF sensitivities at once, one could argue that, as it becomes less costly to raise external capital, firms with valuable growth opportunities and insufficient internal funds (i.e., ceteris paribus, firms in greater need of external finance) issue more shares and debt to invest and hire. Note that share issuance plays a more robust role in this relation. However, one has to bear in mind that

equity issuance decisions stimulated by sentiment impact investment only up to some threshold, as some issuing firms save share proceeds to plan their cash policies.

Overall, my investment results fit well with evidence in Rajan and Zingales (1998), Wurgler (2000), and McLean et al. (2012) showing that lower financial constraints result in more external finance and subsequently higher levels of investment. As regards my employment results, they are compatible with the notion that financial constraints are potentially an important determinant of firm-level employment decisions and that higher investor sentiment in the stock market leads to higher employment growth (Mclean and Zhao 2014; Montone and Zwinkels 2015).

6.4 Terrorism, Corporate Investment and External Finance

This subsection looks into the hypothesis that terrorist activity -seen here as a mood factor-can affect US firms' investment and hiring decisions. Reported results (in Tables II-III) show that external finance time-varies with sentiment, thereby leading to changes in corporate investment and labor. Based on that, I further examine whether terrorist activity can change the direction or the magnitude of this relationship. I run two sets of regressions based on equation (9). The first set of tests [1] takes corporate investment and employment as the dependent variable, while the second one [2] takes external finance. To get a first impression of possible correlations, I present results conditional on the global terrorist activity. Next, I distinguish between domestic and international terrorist activity to capture any potential contagion or spillover effect.

6.4.1 Global Terrorist Activity

Table IV portrays coefficient estimates of equation (9). The coefficients of interest are those of the three-way-interaction terms. One striking finding from the first set of tests [1], is that global terrorism activity counters the effect of sentiment on investment-q sensitivity. In particular, Columns 1-2 document negative and statistically significant coefficients on the triple q-interaction terms. This suggests that the relationship between sentiment and corporate investment weakens in the presence of a greater terrorist threat. The triple CF-interaction terms are insignificant, suggesting that global terrorism does not influence the effect of sentiment on investment – CF sensitivity. Column 3 exhibits a similar pattern for the employment. Overall, the effect of sentiment on the US firms' investment and employment decisions becomes weaker in the presence of a greater terrorist threat.

The above results are also economically meaningful. I start from Column 1. To gauge the marginal impact caused by a greater terrorist threat on q- sentiment sensitivities, consider the 25^{th} and 75^{th} percentile values of the global terrorism index (*GlobTer*). Note also that the coefficient of the triple q-interaction term is -0.191 (*t*-stat= 8.07) and statistically significant at a 99% confidence level. In this case, the q-sentiment coefficient becomes 0.111 (=1.722 - 0.191 ×8.434) during periods of low terrorist threat and -0.042 (=1.722 - 0.191×9.236), or 9% lower, during periods of high terrorist

threat.[45] Interestingly, when I employ the second investment measure (Column 2), I document an equivalent decrease in q-sentiment coefficient. Specifically, the q-sentiment coefficient drops down by almost 9% (*t*-stat=7.77) in the presence of a greater terrorist threat.[46]

Overall, the investment findings show that even if the firm faces an optimistic market, managers would be a little more reluctant to cater to their investment base in the presence of a greater terrorist threat. Furthermore, the coefficient of the triple q-interaction term in Column 3 is -0.035 (*t*-stat= 2.69) and statistically significant at a 95% confidence level. Economically speaking, the q-sentiment coefficient becomes 0.081 (=0.376-0.035 ×8.434) during periods of low terrorist threat and -0.053 (=0.376-0.035 ×9.236), or 7,5% lower, during periods of high terrorism threat. In line with investment results, managers seem to hire less in the presence of a greater terrorist threat, even if the firm faces an optimistic market.

The second set of tests [2] re-estimates (9) by replacing investment and labor with external financing as the dependent variable. One robust finding here is that all of the triple q-sentiment interaction coefficients are negative and statistically significant at a 99% confidence level. This becomes particularly interesting if one combines it with the above results. It seems that the terrorism effect counters the sentiment effect on equity issuance. That is, firms become more hesitant to raise external funds in order to invest and hire in the presence of a greater terrorist threat (even if issuance conditions are relatively more favorable due to optimist market).

Starting from Column 4, I find that both triple interactions are statistically significant at a 99% confidence level. A one-standard-deviation increase in the global terrorism index (*GlobTer*) drops down the q-sentiment coefficient by roughly 7% (0.809 – 0.086 × 0.618 = 0.756; *t*-stat= 6.96) and increases the CF-sentiment coefficient by approximately 6% (-2.019 + 0.209 × 0.618 = -1.890; *t*-stat= 3.88). Taking the above into account, it seems that firms issue fewer shares and rely more on internally generated funds in the presence of a greater terrorist threat (even if issuance conditions are relatively more favorable due to high sentiment).

Column 5 continues with the debt issuance findings. By the same token, a one-standard-deviation increase in the global terrorism index (*GlobTer*) decreases the q-sentiment coefficient by approximately 7% (0.290 - 0.032 × 0.618 = 0.270; *t*-stat=3.77), suggesting that firms issue less debt in the presence of a greater terrorist threat (even if issuance conditions are more favorable due to high

[45] Alternatively, a one-standard-deviation increase in the global terrorism index drops down the q-sentiment coefficient by approximately 7%. (1.722 - 0.191 × 0.618 = 1.602)

[46] The q-sentiment coefficient becomes 0.100 (=1.230 - 0.134 × 8.434) during periods of low terrorist threat and -0.001 (=0.270 - 0.134 × 9.236), or 8.78% lower, during periods of high terrorism threat. Alternatively, a one-standard-deviation increase in the global terrorism index drops down the q-sentiment coefficient by approximately 8.55%. (0.270-0.134× 0.618=0.187).

Table IV

Corporate Investment, Employment Growth, External Finance and Global Terrorist Activity

This table reports results from two sets of regressions based on equation (9). The first [1] takes investment and employment as the dependent variables, while the second one [2] takes external finance. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of sentiment and it is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. *GlobTer* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.338***	0.270***	0.111***	0.160***	0.099***	0.271***
	(25.32)	(26.64)	(14.11)	(21.44)	(19.44)	(25.97)
CF	0.414***	0.741***	0.344***	-0.192***	-0.013	-0.232***
	(7.71)	(18.48)	(11.20)	(6.29)	(0.70)	(5.47)
Q_{t-1}*$Sent_1$	1.722***	1.230***	0.376***	0.809***	0.290***	1.241***
	(8.31)	(8.15)	(3.32)	(7.48)	(3.94)	(7.84)
Q_{t-1}* $Sent_1$*GlobTer	-0.191***	-0.134***	-0.035**	-0.086***	-0.032***	-0.134***
	(8.07)	(7.77)	(2.69)	(6.96)	(3.77)	(7.39)
CF* $Sent_1$	-1.147	-1.092	-0.545	-2.019***	0.980*	-1.565*
	(1.38)	(1.64)	(1.07)	(4.31)	(2.28)	(2.36)
CF*$Sent_1$*GlobTer	0.098	0.097	0.047	0.209***	-0.112*	0.154*
	(1.03)	(1.29)	(0.80)	(3.88)	(2.27)	(2.03)
Constant	0.177***	0.099***	0.028**	0.094***	0.066***	0.165***
	(14.58)	(11.10)	(3.17)	(17.95)	(11.34)	(18.40)
N	34,719	62,205	59,000	58,779	59,576	58,779
R^2(within)	0.19	0.19	0.07	0.13	0.05	0.12

sentiment). This is consistent with Procasky and Ujah (2015), who examine the long-term impact of terrorism on the sovereign risk of 102 countries and find that terrorism increases the cost of debt for sovereigns and consequently for their firms. Finally, I find weak evidence for an effect of terrorism on sentiment- CF sensitivity.

Overall, total external finance results (Column 6) suggest that firms rely less on market valuations regarding their issuance decisions in the face of a greater terrorist threat. Specifically, a one-standard-deviation increase in the global terrorism index (*GlobTer*) is followed by an approximately 7% (1.241 - 0.134 × 0.618 = 1.158; *t*-stat=7.39)) decrease in the q-sentiment coefficient. In other words, firms become more reluctant to issue shares and debt in the presence of a greater terrorist threat (even if issuance conditions are more favorable due to the optimistic market). This, in turn, makes them more conservative in their investment and hiring decisions.

6.4.2 Domestic Terrorist Activity

In this part, I exclusively consider terrorist incidents that took place in the US over the period 1980-2010. Table V re-estimates equation (9) conditional on domestic terrorist activity. Generally speaking, the results here also illustrate a counter-effect of domestic terrorist activity on the sentiment effect. This is well-demonstrated by the negative coefficients on the triple interaction terms of both q and CF, suggesting that firms become more reluctant to cater to their investment base in the presence of a greater domestic terrorist threat (even if they face an optimistic market).

Starting from the investment regressions in Columns 1-2, I find a negative and statistically significant effect of domestic terrorism on both q-sentiment and CF-sentiment sensitivities. In particular, in Column 1, the coefficient of the triple q-interaction term is -0.032 (*t*-stat=7.96), while the coefficient of the triple CF-interaction term is 0.048 (*t*-stat=2.89). Both of them are statistically significant at a 99% confidence level. In terms of economic significance, a one-standard-deviation increase in the domestic terrorist activity (*USterror*) is followed by a *decrease* in the q-sentiment coefficient and an *increase* in CF-sentiment coefficient by approximately 20% and 13% respectively. Likewise, in Column 2, a one-standard-deviation increase in the domestic terrorist activity (*USterror*) *drives up* the q-sentiment coefficient by roughly 18% (*t*-stat= 8.42) and *decreases* the CF-sentiment coefficient by almost 14% (*t*-stat=3.21). This suggests that the sentiment effect on q and CF investment sensitivities is getting weaker in the face of a greater domestic threat. In other words, firms are more conservative regarding their investment spending in the presence of a greater terrorist threat than they would have been in the absence of it.

Table V

Corporate Investment, Employment Growth, External Finance and US Terrorist Activity

This table reports results from two sets of regressions based on equation (9). The first [1] takes investment and employment as the dependent variables, while the second one [2] takes external finance. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of sentiment and it is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. *USterror* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.312***	0.250***	0.107***	0.147***	0.094***	0.251***
	(23.05)	(24.37)	(13.32)	(19.62)	(18.37)	(23.74)
CF	0.438***	0.763***	0.366***	-0.163***	0.024	-0.208***
	(7.87)	(18.29)	(11.86)	(5.21)	(1.24)	(4.75)
$Sent_1*Q_{t-1}$	0.228***	0.191***	0.091***	0.151***	0.042***	0.212***
	(8.00)	(9.20)	(5.74)	(10.05)	(4.18)	(9.82)
$Sent1*Q_{t-1}$ * USterror	-0.032***	-0.024***	-0.004	-0.019***	-0.006***	-0.026***
	(7.96)	(8.42)	(1.47)	(8.48)	(4.13)	(8.57)
$Sent_1$*CF	-0.521***	-0.437***	-0.336***	-0.386***	0.037	-0.410***
	(4.59)	(4.80)	(5.33)	(6.06)	(0.96)	(4.56)
$Sent_1$*CF*USterror	0.048**	0.042**	0.045***	0.038***	-0.006	0.039**
	(2.89)	(3.21)	(4.19)	(3.93)	(0.97)	(2.94)
Constant	0.181***	0.101***	0.029***	0.087***	0.073***	0.163***
	(17.20)	(12.87)	(3.59)	(20.32)	(13.45)	(20.80)
N	34,719	62,205	59,000	58,779	59,576	58,779
R^2(within)	0.19	0.19	0.07	0.13	0.05	0.12

Column 3 exhibits a similar but weaker pattern for US firms' employment growth. More specifically, I find no evidence of a terrorist effect on q-sentiment sensitivity, but a strong counter-effect of domestic terrorism on CF-sentiment sensitivity. In the latter case, a one-standard-deviation increase in domestic terrorist activity (*USterror*) results in a rise of roughly 19% in CF-sentiment coefficient. This suggests that firms' hiring decision becomes more sensitive to their cash flow in the presence of a greater domestic threat.

Overall, the first set of regressions [1] documents a weaker effect of sentiment on US firms' investment and labor decisions in the presence of a greater domestic terrorism threat. That is to say, firms in greater need of external finance invest and hire less in times of greater terrorist threat, even if they face an optimistic market. To examine whether time-varying external finance costs drive these results, I conduct another set of tests [2] using external finance (share and debt issuance) as the dependent variable.

To begin with Column 4, the triple q- interaction coefficient is -0.019 (*t*-stat=8.48), while the triple CF-interaction coefficient is 0.038 (*t*-stat=3.93). Both of them are statistically significant at a 99% confidence level. Economically speaking, a one-standard-deviation increase in domestic terrorist activity (*USterror* index) *decreases* q-sentiment coefficient by approximately 18% and *increases* CF-sentiment coefficient by 14%. This implies that firms' decisions to issue equity become less sensitive to market's assessments and more sensitive to internally generated funds in the face of a greater domestic threat. In other words, firms in greater need of external finance issue fewer shares in the presence of a greater domestic threat even if issuance conditions are favorable (due to high sentiment).

Debt issuance results in Column 5 are also moving in the same direction, however, I fail to find a significant effect of domestic terrorism on the sentiment-CF coefficient. The triple q-sentiment coefficient is 0.042 (*t*-stat= 4.18) and statistically significant at a 99% confidence level. This means that a one-standard-deviation increase in domestic terrorist activity (*USterror*) drops down the q-sentiment coefficient almost by 20%. Alternatively, US firms issue less debt in the presence of a greater terrorist threat even if issuing conditions are relatively more favorable due to high sentiment.

Aggregating equity and debt issuance in Column 6 reveals the same pattern. US firms' external finance decisions depend less on market valuation and more on cash flow in the presence of a greater terrorist threat. Specifically, a one-standard-deviation increase in domestic terrorist activity (*USterror*) is followed by a *decline* in q-sentiment coefficient and a *rise* in CF-sentiment coefficient by approximately 18% (*t*-stat=8.57) and 14% (*t*-stat=2.92) respectively. To put it differently, firms in greater need of external finance raise fewer external funds to invest and hire in the face of a greater terrorist threat, even if issuing conditions are more favorable due to higher sentiment in the market.

6.4.3 International Terrorist Activity

Table VI re-estimates equation (9) by taking into account only international terrorist incidents that took place over the sample period. I find mixed evidence of a contagion effect of international terrorism. In particular, international terrorist threat counters the effect of sentiment on corporate investment but does not influence the effect of sentiment on external finance. In addition, I fail to document evidence of an international terrorism effect on employment. Hence, from a firm's perspective, it seems that managers become more reluctant to cater to their investment base in the presence of a greater international threat, even if issuing conditions become relatively favorable (due to high investor sentiment in the market).

In investment regressions (Columns1-2 of Table VI), both of the triple q-interaction coefficients are negative and statistically significant at a 99% confidence level. On the other hand, I find no evidence of an international terrorism effect on CF-sentiment coefficient. In terms of economic significance, in Column 1, a one-standard-deviation increase in international terrorist activity (*NonUsTerr* index) is followed by a 7% (*t*-stat=2.76) decline in q-sentiment coefficient. Likewise, in Column 2, a one-standard-deviation increase in international terrorist activity (*NonUsTerr* index) drops down the q-sentiment coefficient by approximately 6% (*t*-stat=2.67). Comparing these magnitudes with those in Table V, it seems that it is mostly the level of terrorist threat in the US that captures the attention of managers.

Interestingly, in the financing set of tests [2], I only find weak evidence of an international terrorism effect on US firms' external finance decisions. More specifically, when I employ total external finance (*TotExtFin*) as the dependent variable (in Column 3), the triple q-sentiment interaction coefficient is -0.046 (*t*-stat= 2.03) and statistically significant at a 90% confidence level. However, despite its weak statistical relation, this finding is economically meaningful. In particular, a one-standard-deviation increase in international terrorist activity (*NonUsTerr* index) drops down the q-sentiment coefficient by approximately 6%. That is to say, firms rely less on external sources to finance their investments in the presence of a greater international threat, even if they face more favorable issuing conditions (due to high sentiment).

Table VI

Corporate Investment, Employment Growth, External Finance and International Terrorist Activity

This table reports results from two sets of regressions based on equation (9). The first [1] takes investment and employment as the dependent variables, while the second one [2] takes external finance. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of sentiment and it is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. *USterror* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.333***	0.265***	0.110***	0.156***	0.098***	0.266***
	(23.86)	(25.28)	(13.64)	(20.13)	(18.58)	(24.61)
CF	0.440***	0.761***	0.373***	-0.188***	-0.004	-0.222***
	(7.86)	(18.22)	(11.76)	(5.90)	(0.22)	(5.05)
$Sent_1*Q_{t-1}$	0.765**	0.568**	0.225	0.240	0.125	0.478*
	(3.09)	(3.13)	(1.60)	(1.78)	(1.35)	(2.53)
$Sent1*Q_{t-1}$*NonUSterr	-0.081**	-0.058**	-0.018	-0.020	-0.013	-0.046*
	(2.76)	(2.67)	(1.07)	(1.26)	(1.17)	(2.03)
$Sent_1$*CF	1.240	0.753	1.534	-0.806	1.124	-0.099
	(1.33)	(1.00)	(1.72)	(1.46)	(1.17)	(0.13)
$Sent_1$*CF*NonUSterr	-0.184	-0.120	-0.200	0.070	-0.132	-0.016
	(1.67)	(1.34)	(1.98)	(1.07)	(1.15)	(0.18)
Constant	0.172***	0.094***	0.018*	0.089***	0.068***	0.161***
	(15.26)	(11.13)	(2.13)	(18.12)	(12.05)	(18.99)
N	34,719	62,205	59,000	58,779	59,576	58,779
R^2(within)	0.19	0.19	0.07	0.13	0.05	0.12

7. Robustness Tests

This section provides supplemental analyses to lend more credibility to the main findings of my research. A major concern for my setting is that of the endogeneity bias. Specifically, if investor sentiment in US increases (decreases) in anticipation of economic upturns (downturns), then the positive (negative) impact of sentiment on corporate investment and hiring might be due to business cycles. However, I use a US sentiment index ($Sent_1$) that is orthogonalized to US macroeconomic indicators. In this manner, my terrorism findings are unlikely to suffer from causality issues, since the coefficients of interest -b_5 and b_6 in equations (5) and (6) respectively- only capture the marginal effect of terrorism on the investment-sentiment relation. To put it differently, the reverse causality issue for my terrorism findings implies that: to the extent that changes in the cross-section of corporate investment and labor are due to economic cycles, then business cycles could be a root cause of terrorism and at the same time a consequence of terrorism. However, my terrorism coefficients measure the marginal effect of terrorism on q-sentiment and CF-sentiment sensitivities, in which sentiment is orthogonal to systematic factors and business cycle effects. To enhance the validity of my results though, I further use alternative sentiment specification.

Tables XII-XIV in Appendix B replicate Tables IV-VI, using the second measure of sentiment ($Sent_2$), which is adjusted to be nonnegative by adding a constant term. Recall that $Sent_1$ uses the ranks of the orthogonal B&W$^{\perp}$ sentiment index. Overall, the coefficient estimates in Tables XII-XIV are similar to those reported in Tables IV-VI, thereby making my main findings insensitive to alternative specifications of investor sentiment. One striking feature of Table XIV, however, is that it generally fails to provide supportive evidence of a contagion or spillover effect of international terrorism (none of the coefficients of the triple interaction terms are statistically significant in conventional levels). This further leads me to conclude that it is mostly the level of terrorist threat in the US that captures the attention of managers.

Tables XV-XVI in the Appendix B report regression results obtained using alternative investment measures, namely: Inv_3, Inv_4, and Inv_5. In particular, Table XV which is a replication of Table II shows that the sign and the magnitude of the q and CF effects depend on the nature of investment specification. This is probably the reason why the corresponding coefficient estimates vary across different subsamples.[47] For example, investment in tangibles assets (Inv_5) increase with sentiment, while no evidence is found for a sentiment effect when I include R&D expenses in investment specification (Inv_3 and Inv_4). Likewise, Table XVI in Appendix B reports results from alternative investment regressions for global, domestic and international terrorist activity. Overall, the coefficients

[47] Columns 1-2 of Table XV in appendix B document negative CF coefficients. When I exclude negative cash flow firm-year observations in unreported tests, the sign of these CF coefficients becomes positive. These tests are available under request.

of interest are in line with previous findings, albeit investment measures including R&D seem to be less responsive to changes in the level of terrorist threat.

8. Conclusion

In this study, I examine whether overall terrorist activity affects US firms' investment and hiring decisions over the period 1980-2010. Motivated by empirical evidence showing that costly external finance exogenously time-varies with investor sentiment and this variation, in turn, affects firms' investment and hiring decisions, I ask whether terrorism (taken as a mood variable) can alter the nature or the direction of this relationship. I capture terrorist threat by utilizing a metric proposed by Eckstein and Tsiddon (2004) in order to develop a composite index of terrorism regarding physical and psychological harmfulness. I further distinguish between domestic and international terrorist activity to account for a potential contagion or spillover effect. The data used for the construction of my terrorism indices are drawn from the Global Terrorism Dataset (GTD).

My preliminary hypothesis (1_a) posits that firms in greater need of external finance invest and hire more during periods of high investor sentiment. To test this conjecture, I basically follow McLean and Zhao's (2014) methodology and let sentiment and investment fundamentals interact with each other in a standard "q theory" investment model with financial frictions. By conducting panel data regressions and controlling for year and firm fixed effects in the data, I find that investment and employment sensitivities to q increase with sentiment by approximately 69% (*t*-stat= 4.78) and 26% (t-stat=6.90), respectively. Conversely, the investment and employment sensitivity to CF decline with investor sentiment by approximately 43% (*t*-stat=4.11) and 19% (t-stat=3.07), respectively. Hence, I accept my preliminary hypothesis (1_a) that firms with high q/low CF (i.e., ceteris paribus, firms in greater need of external finance) invest and hire more over periods of high sentiment. These findings lend support to a strand of behavioral finance literature arguing that sentiment-driven mispricing distorts corporate investments (Stein, 1996; Baker et al. 2003; Polk and Sapienza, 2009; McLean and Zhao, 2014; Montone and Zwinkels, 2015).

To further examine whether costly external finance drives the effect of sentiment on corporate investment and labor, I re-estimate my baseline regression model by replacing the dependent variable with the total external finance. The coefficient estimates obtained from these regressions show that total external finance sensitivity to q increases with investor sentiment by approximately 11% (*t*-stat=7.04), whereas total external finance sensitivity to CF declines with investor sentiment by approximately 31% (*t*-stat=4.00).[48] Remarkably, when I split total external finance into equity and debt issuance decisions, I find weak evidence of a sentiment effect on the debt issuance-q sensitivity. In particular, the coefficient of the q-sentiment interaction term is 0.016 (*t*-stat=2.39) and statistically significant at a 90% confidence level. I therefore do not accept my complementary hypothesis (2_b), namely that firms in greater need of external finance issue more shares and debt during periods of high

[48] These calculations are based on the 25th and 75th percentile values of the rank of the orthogonalized B&W$^{\perp}$ sentiment index.

sentiment. It is likely that firms prefer alternative sources of financing (e.g., share issuance), rather than debt, over high sentiment periods. Note also that hypothesis (1_b) does not per se entails that issuing firms will use the proceeds obtained to invest and hire. Thus, it adds value to my research only to the extent that it complements my preliminary hypothesis (1_a). Overall, the examination of my first hypothesis (1_{a+b}) boils down to the following proposition: as investor sentiment increases and external finance becomes less costly, firms with valuable growth opportunities and insufficient internal funds (i.e. ceteris paribus, firms in greater need of external finance) issue more equity to invest and hire. This proposition tends to favour the market timing theory over alternative theories as for the most appropriate candidate to explain why investment and employment sensitivities to q and to CF time-vary with costly external finance.

The effect of sentiment on US firms' investment and hiring decisions forms the point of departure for my "terrorism" tests. In a next step, I develop empirical hypotheses to test whether the magnitude or the direction of this effect alters as the severity of the terrorist threat changes. In particular, I posit that firms in greater need of external finance invest and hire less in the presence of a greater terrorist threat [hypothesis (2_a)]. By incorporating terrorism in the right side of my baseline model, I let terrorism interact with the other variables to explore their possible linkages. The first string of "terrorism" tests reveals that terrorist activity adversely impacts the effect of sentiment on corporate investment and labor, a fact suggesting that managers become more reluctant to invest and hire in the presence of a greater terrorist threat. More specifically, the investment regressions indicate that the q-sentiment coefficient drops down by approximately 9% (*t*-stat=7.77) during periods of higher (global) terrorist threat. Likewise, the employment regression documents a 7.5% (*t*-stat= 2.69) decrease in the q-sentiment coefficient over periods of higher (global) terrorism threat. Taken as a whole, it seems that firms with greater investment opportunities (i.e., ceteris paribus, firms in greater need of external finance) invest and hire less in the presence of a greater terrorist threat.

To shed light on the underlying mechanism driving this counter-effect, I also develop complementary hypothesis regarding costly external finance. In line with hypothesis (2_b), namely that firms in greater need of external finance issue less equity and debt in the presence of a greater terrorist threat, I find that a one-standard-deviation increase in the global terrorism index drops down the q-sentiment coefficient by approximately 7% (*t*-stat=7.39), thus making total external finance (equity and debt issuance) less sensitive to q. That is to say, managers rely less on external finance sources in the presence of a greater terrorist threat, even if issuance conditions are relatively more favorable due to the optimistic market. Considering also the potential of a contagion or spillover effect triggered by the international terrorism activity, I fail to document a robust statistical relation between the latter and the effect of sentiment on the costly external finance. Thus, I reject my hypothesis (2_b) for the international terrorist activity. On the contrary, I show that a one-standard-deviation increase in

domestic terrorist activity (US terror index) decreases the q-sentiment coefficient by approximately 18% (*t*-stat=8.57) and increases the CF-sentiment coefficient by 14% (*t*-stat=2.92). Hence, I conclude that it is the level of terrorist threat in the US that mostly captures the attention of managers.

Prior literature argues that terrorism exerts an unfavorable effect on a set of economic variables (e.g., FDI, stock returns, per capita GDP growth, tourism share). However, to the best of my knowledge, this is the first study that provides testable evidence for an indirect effect of terrorism on firms' economic decisions. Taking this into account, my findings carry far-reaching implications for investors, corporate managers, and policy-makers. For example, investors could incorporate terrorism-induced risk into portfolio allocation decisions or/and design arbitrage trading strategies. Managers should devise strategies to sufficiently address the increased cost of capital and mitigate the discouraging effect of terrorism on investment and hiring. Governments and international institutions should revise or extend anti-terrorist policies and regulations to account for terrorism-induced distortions of firms' operations.

All the above, however, should not be taken without prejudice. My study suffers from severe limitations and weakness that might distort estimates to a considerable degree. A more general limitation stems from my empirical design and concerns timing. Given that my model employs annual data, it fails to account for memory effects and potential delays in the reaction of investor sentiment to terrorist activity. It also ignores a potentially differential effect of the distribution of terrorist attacks across different units of time (e.g., quarters/months) in a given year. Dealing with such timing effects demands employing higher frequency data, albeit it would introduce many zero values in my dataset.

A further limitation of my study might result from common biases in terrorism datasets drawn from open-source databases. Among others, the most well-documented one is that of the under-reporting bias, which refers to the gap between the actual and recorded/reported terrorist activity. According to Drakos (2007), this incompleteness can lead to the statistical problem of thinning, thereby resulting in empirical estimates that are vulnerable to systematic errors. Although it is impossible to fully get rid of this bias, it is far less pronounced in datasets concerning more democratic countries (Drakos, 2007). Note, however, that there are also database-specific biases. In my case, the most critical problem with the GTD is the inconsistency of its data collection methodology. GTD is collected in three different phases, a fact suggesting that different inclusion criteria are used throughout my sample period. For example, a broader-based definition of terrorism is used over the first phase (1980-1997), thus making my dataset err on the side of inclusiveness. Unfortunately, cleaning the data is a gigantic and extremely complicated task that apparently cannot be undertaken in this endeavor.

Another weakness of my study stems from the challenging task of modelling terrorist activity. As thoroughly discussed in Section 4, my terrorism index is built upon at least three methodological drawbacks. First, the three components (total number of incidents, fatalities, and injuries) used to

develop the composite score carry the same weight, while it is plausible that they affect individuals' perception unevenly. The index also fails to account for past experienced events that possibly generated a persistent (e.g., lasted for over one year) psychological trauma on the population. Finally, it ignores the direct economic loss caused by terrorist attacks in terms of property damage. It is therefore evident that such a metric cannot fully capture neither the overall social impact of the terrorist activity nor the direct economic costs caused by.

Despite its limitations, the present study offers a unique contribution to a generally ignored strand of literature exploring the impact of terrorism on the economic behavior of the firm. Given that there is not an economic theory of terrorism, but rather a mosaic of research conducted in different, though related areas, scholars should make an early start on establishing a coherent body of theory. It is of great importance for academics to develop a theoretical framework that conceptualizes terror and lay the groundwork for further research.

Within this framework, future research might extend the present line of enquiry to develop management models that integrate terrorism-induced risk within corporate strategy, corporate real options and industrial organization (game theory). For example, firms can use game theory to assess the potential impact of terrorism in the (de/re)internationalization decision (Liesch et al. 2006). Especially firms that internationalize via FDI (a relatively inflexible type of investment) should account for interdependencies in key operations to handle terrorism-induced contingencies in the business environment. Considering prior evidence in Montone and Zwinkels (2015), that countries attracting FDIs from the US experience greater labor instability, future research should examine a potential effect of terrorism on global employment growth.

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APPENDIX A

Table VII
Literature Review Table: Investor Sentiment, Corporate Investment and Labor

This table briefly reviews studies concerning the relationship between investor sentiment, corporate investment and labor. GMM denotes Generalized Method of Moments method, while OLS stands for the Ordinary Least Squares method

Authors	Period/Sample	Research Question	Method	Findings
Morck et al. (1990)	Annual data 1960-1987/ US firm-level and aggregate data	The incremental power of stock returns on firm-level and aggregate investment.	Fixed Effects Panel Data Regressions	A weak incremental explanatory power of stock returns on investment over and above fundamentals
Baker et al. (2003)	Annual data 1980-1999/ 52,101 US firm-level observations	Do equity-depended firms issue overvalued equity to finance their investment?	Fixed Effects Panel Data Regressions	The nonfundamental component of stock prices exerts a stronger effect on the investment of equity-depended firms.
Polk and Sapienza (2009)	Annual data 1963–2000/ US firm-level observations	Does investor sentiment affect investment even if firms do not issue overvalued equity to finance their investment?	Fixed Effects Panel Data Regressions	Rational managers with short horizons may invest in projects with negative NPV to cater to the current investor sentiment. This is more likely to happen in more opaque firms and firms with shorter shareholder horizons.
Hertzel and Li (2010)	Annual data1970–2004 4,325 US firm-level observations	The stock price behavior of seasoned equity issuing firms.	Event-Study (Fama-French Calendar-Time Factor Regressions)	Firms with higher misvaluation component experience more negative post -issue abnormal returns and use the proceeds not only to invest but also to save cash and pay off debt.
Arif and Lee (2014)	Annual, Monthly and Daily data 1980–2009/	Examine the relation between investor sentiment and aggregate investment.	OLS and GMM estimation in Panel Data	US aggregate investment peaks during bullish periods and is negatively correlated with future stock returns. These findings also hold for Germany, France, Canada, Japan, and UK.

McLean and Zhao (2014)	Annual data 1965-2010/ 165,995 US firm-level observations	Examine the relation between business cycles, investor sentiment, and US firms' investment and hiring decisions.	Fixed Effects Panel Data Regressions	Firms in greater need of external finance issue more shares and debt to invest and hire during periods of high investor sentiment.
Montone and Zwinkels (2015)	Annual data 1970-2003/ 64,105 observations from 28 industries and 113 countries.	Investigate the global impact of US investor sentiment on employment.	Fixed Effects Panel Data Regressions	Foreign countries attracting FDIs from the US, experience more employment growth over periods with higher US investor sentiment. This over-hiring is inefficient, leading to lower labor productivity and negative wage growth in countries with a low proportion of high-skill labor.

Table VIII
Literature Review Table: The Impact of Terrorism on Financial Markets

This table briefly reviews studies concerning the impact of terrorism on financial markets. VAR denotes Vector Autoregression model, ARIMA stands for the Autoregressive Integrated Moving Average model, GARCH symbolizes the Generalized Autoregressive Conditional Heteroskedasticity model. GMM denotes Generalized Method of Moments method, and OLS stands for the Ordinary Least Squares method.

Authors	Period/Sample	Research Question	Method	Findings
Abadie and Gardeazabel (2003)	Daily data 1990-2003/ Madrid's stock exchange market.	Compare a "Basque" region portfolio with terrorism and a "synthetic" non-Basque portfolio without terrorism.	Event-Study	They show that the "Basque" portfolio significantly outperforms its "control" portfolio over the ceasefire period (1998-1999) between ETA and the Basque government.
Carter and Simkins (2004)	Daily data from May 1 to December 31, 2001/ 18 US airlines, 7 international airlines and 4 airfreight carriers.	The impact of the 9/11 attacks on airline stocks.	Event-Study	Airlines with low liquidity suffered the most. No statistical significance is found for other company characteristics.

Chen and Siems (2004)	Daily data 1915-2001/ 33 stock market indexes with the largest market capitalizations around the globe.	How many days are required for global stock markets to recover their value after mega-terrorist attacks and other military events?	Event-Study	Global markets' value is recovered in 1 to 3 days following mega-terrorist attacks. US markets found more resilient compared to others. For 9/11, the Dow Jones recovered in 40 days.
Eldor and Melnick (2004)	Daily data 1990-2003/ Tel Aviv Stock Exchange (TASE), Tel Aviv 100 index (TA100).	The influence of Palestinian terrorist attacks on the Israeli stock and foreign exchange market.	Time-Series (VAR model)	The intensification of the Palestinian attacks (2000-2003) lowered stock values on Tel Aviv 100 index by 30%. Only suicide attacks exert a permanent effect on foreign exchange markets.
Amelie and Darne (2006)	Daily data from January 3,2000 to May 17, 2002/ 3 US, 5 European, 1 Tokyo and 1 Pan-European stock market indexes.	The impact of the 9/11 attacks on international stock markets.	Time-Series (outlier detection from ARIMA model and GARCH)	10 daily stock market indexes experienced large and permanent (negative) shocks after the 9/11 attacks, thus providing evidence in favor of a contagion effect.
Karolyi and Martell (2006)	Daily data 1995-2002/ 43 US and international publicly-traded firms.	The stock price reaction of 75 firm-targeted (terrorist) attacks.	Event-Study	A significant stock price reaction of -0.83% around the event day, resulting in average losses of $401 million in market capitalization.
Arin et al. (2008)	Daily data 2002 – 2006/ Stock market indexes of Israel, Thailand, Spain, Indonesia, Turkey and UK.	How a daily terrorism index affects a country's stock market and its market volatility.	Time-Series (VAR–GARCH (1,1)-in-mean model)	Daily terrorist activity has a significant impact on both stock markets and the stock market volatility, with its magnitude being larger in emerging markets.
Nikkinen et all. (2008)	Daily Data from March 10, 2001 to March 12, 2002/ 53 stock markets around the globe	The short-term impact of the 9/11 attacks on international markets' returns and volatility.	Event-Study	The 9/11 attacks were followed by significant increases in markets' volatility across all regions, while stock returns experienced significant negative returns and recovered quickly afterwards (within 5-10 days). The magnitude of the effects was smaller among the least integrated regions.
Procasky and Ujah (2015)	Annual data 2002-2011/ S&P sovereign credit ratings from 102 countries.	The long-term effects of terrorism on the cost of debt of developed and developing countries.	OLS Panel Regression /Fixed Effects Panel, GMM, and Dynamic Panel estimations.	A two-point increase in a county's terrorism index is, on average, followed by a half notch downgrade in a sovereign's credit rating. The magnitude of the effect nearly doubles for developing countries.

Table IX

Literature Review Table: The Impact of Terrorism on Investor and Economic Sentiment

This table briefly reviews studies concerning the impact of terrorism on investor and economic sentiment. VAR denotes Vector Autoregression model. PP-GARCH stands for the Pooled Panel Generalized Autoregressive Conditional Heteroskedasticity model. GMM denotes Generalized Method of Moments method, and OLS stands for the Ordinary Least Squares method.

Authors	Period/Sample	Research Question	Method	Findings
Burch et al. (2003)	Weekly data from September 8, 2000 to October 31, 2001/ Friday premiums for 393 closed-end funds.	Examine the behavior of closed-end mutual fund discounts after the 9/11 attacks under the assumption that discounts reflect changes in investor sentiment.	Event-Study	Closed-end fund discounts increased dramatically in the wake of the attacks and recovered in conjunction with the market perfor-mance, indicating thus a negative shift in sentiment.
Levy and Galili (2005)	Daily data from July 1, 1998 to January 30, 2002/ 112,086 buy & sell transactions in com-mon stocks of 3282 individual Israeli investors.	Examine the impact of terrorism on individuals' volume of trade.	OLS Maximum likelihood binary of logit and probit models	There is a negative and significant correlation between the intensity of terrorist activity and the volume of trade. This is attributed to several psychological mechanisms.
Drakos (2010)	Daily data from January 3, 1994 to December 30, 2004/ 22 country broad stock market indices. .	Assuming that terrorist activity deteriorates investor sentiment, examine whether the overall terrorist activity exerts any systematic effect on stock markets.	Time-Series (PP-GARCH)	Terrorist incidents lead to significantly lower stock returns around the day a terrorist attack occurs, and this effect increases monotonically with the level of the psychological impact of the attack.
Nikkinen and Vähämaa (2010)	Daily data from January 4, 2000 to December 30, 2005/ FTSE 100 index of European-style options traded on the NYSE Liffe.	The impact of three mega-terrorist attacks on investor sentiment by focusing on the behavior of the expected probability density functions of	Nonparametric volatility-Smoothing	The three mega-terrorist attacks may exert a prolonged, though, transitory (adverse) effect on stock market sentiment.

the FTSE 100 index.

Drakos (2011)	Daily data from January 1, 2002 to December 30, 2005/ 29 country broad stock market indices.	Identify behavioral channels through which market shocks (caused by terrorist attacks) are diffused from one stock market to another.	Time-Series (PP-GARCH (1,1)-in-Mean)	Concerns about terrorism risk (social amplification of risk) and past terrorist activity (memory-based utility/availability bias) have strong explanatory po-wer for both the magnitude and the direction of the response.
Kollias and Papadamou (2014)	Monthly data from January 1, 1988 to February 1, 2008/ ESI for France, Germany, Spain, and the UK.	Whether and to what extent mega-terrorist attacks affect the Economic Sentiment Indicator (ESI).	Time-Series (VAR.and impulse response analysis)	Supportive evidence of an adverse effect of terrorism on ESI for France, Germany and no evidence for Spain and UK. More pronounced for domestic terrorist incidents as compared to transnational incidents.
Drakos and Kallandranis (2015)	Annual data 1985-2009/ ESI for 27 European countries.	Whether and to what extent overall terrorist activity affects the Economic Sentiment Indicator (ESI).	Time-Series (GMM)	Terrorist activity exerts an adverse effect on ESI and particularly on its consumer confidence subcomponent, albeit this effect is statistically significant only in the post-9/11 era.

Table X
Sample Construction: The Filtering Process

This table illustrates the filtering process of my merged dataset, which includes data drawn from three different sources and covers the time spam 1980-2010. Firm-level accounting data comes from the CRSP/Compustat Merged Database. Time-series data of US investor sentiment is downloaded from Dr. Wurgler's website. Time-series data on global, domestic and international terrorist activity is drawn from the GTD.

Sample Construction	**Observations**
Merged dataset 1980-2010	243,315
Less no December fiscal-year-end firms	152,497
Less non-available 2 consecutive years firm data	151,275
Less financial firms	108,883
Less utility firms	102,131
Less firm-years with negative book values of equity	93,561
Less firm-years with book assets less than $10 million	89,626

Table XI
Variables Definition

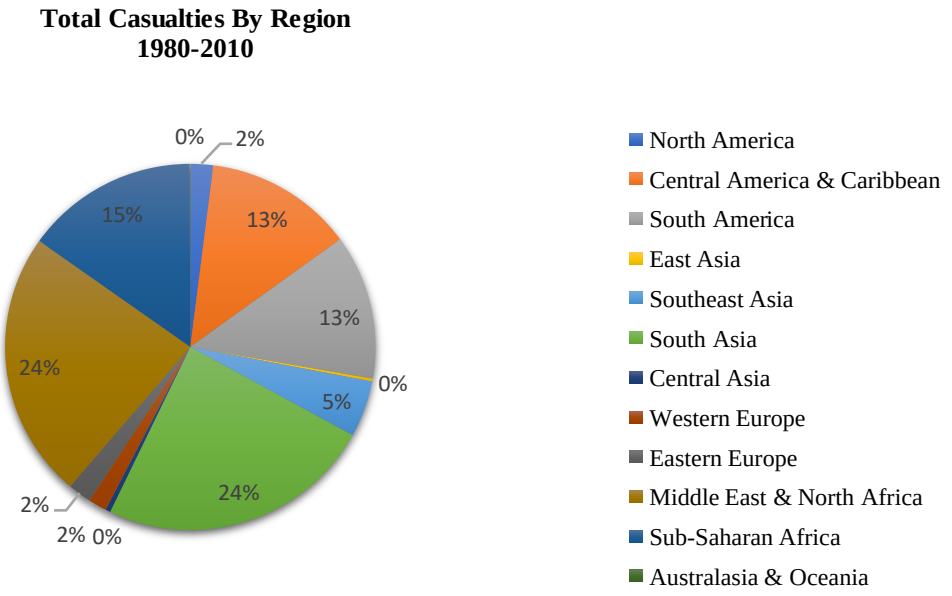
This table depicts and explains all the variables used in this study. Firm-level accounting data comes from the CRSP/Compustat Merged Database. Time-series data of US investor sentiment is downloaded from Dr. Wurgler's website. Time-series data of global, domestic and international terrorist activity is drawn from GTD.

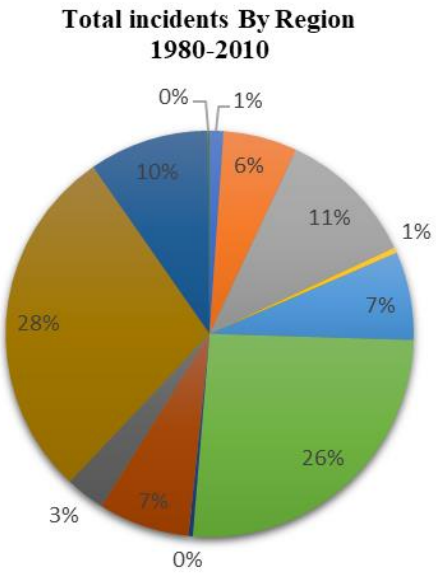
Dependent Variables	
Inv	Baseline measure of corporate investment calculated as the sum of total asset growth and R&D spending, all scaled by beginning-of-the-year book value of assets. This variable is winsorized at the 1% and 99% level.
Inv_2	Alternative measure of corporate investment calculated as the percentage change in book value of assets over the fiscal year. This variable is winsorized at the 1% and 99% level.
Inv_3	Alternative measure of corporate investment calculated as the sum of capital expenditure, R&D spending, and SG&A, all scaled by beginning-of-year book value of assets. This variable is winsorized at the 1% and 99% level.
Inv_4	Alternative measure of corporate investment calculated as the sum of capital expenditure and R&D spending, all scaled by beginning-of-year book value of assets. This variable is winsorized at the 1% and 99% level.
Inv_5	Alternative measure of corporate investment calculated as capital expenditure scaled by beginning-of-year book value of assets. This variable is winsorized at the 5% and 95% level.
Emp	Employment growth calculated as the annual change in the log number of firm's employee. This variable is winsorized at the 1% and 99% level.
EqtIss	Equity issuance calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. This variable is winsorized at the 1% and 99% level.
DebIss	Debt issuance calculated as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. This variable is winsorized at the 1% and 99% level.
TotExtFin	Total external finance calculated as the sum of Equity (EqtIss) and debt (DebIss) issuance. This variable is winsorized at the 1% and 99% level.
Independent Variables	
Q	Tobin's q calculated as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. This variable is winsorized at the 1% and 99% level.
CF	Cash Flow calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. This variable is winsorized at the 1% and 99% level.
Control Variables	
$Sent_1$	First measure of US investor sentiment defined as the "rank" of the annual orthogonalized B&W$^{\perp}$ sentiment index and calculated as the rank value of annual orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank.
$Sent_2$	Second measure of US investor sentiment defined as the "adjusted" orthogonal B&W$^{\perp}$ sentiment index and is calculated by adding the minimum value of the orthogonal B&W$^{\perp}$ sentiment index to its yearly value so that it will always be positive.
Usterr	Domestic terrorist activity (on US soil) calculated as the natural log of an index that is equal to one plus the equal weighted sum of the total number of the fatal victims of terrorism, the total number of injured and the total number of terrorist events, all occurred in a given year.
NonUSterr	International terrorist activity (on non-US soil) calculated as the natural log of an index that is equal to one plus the equal weighted sum of the total number of the fatal victims of terrorism, the total number of injured and the total number of terrorist events, all occurred in a given year.
GlobTerr	Global terrorist activity (domestic and international) calculated as the natural log of an index that is equal to one plus the equal weighted sum of the total number of the fatal victims of terrorism, the total number of injured and the total number of terrorist events, all occurred in a given year.

Figure III

Regional Overview of Global Terrorist Index 1980-2010

This figure illustrates a regional overview of the global terrorist index over the years 1980-2010. The illustration accompanies three pie-charts showing regional percentages of the total number of terrorism-related casualties, injuries, and incidents. Data is obtained from the GTD.





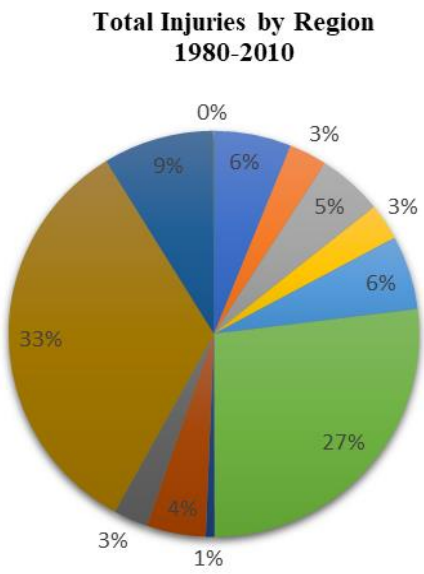
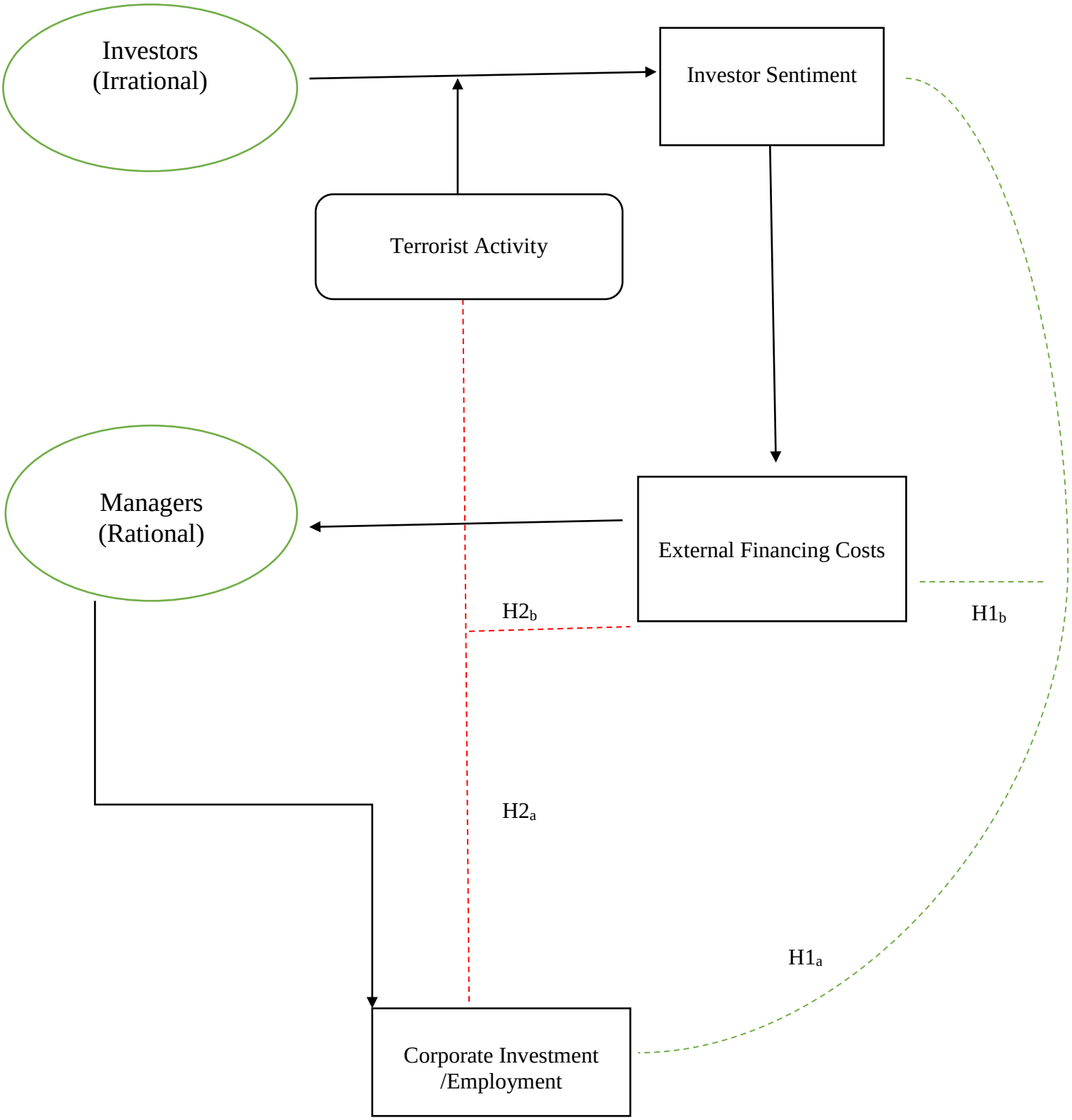


Figure IV

Conceptual Framework



APPENDIX B [Robustness]

Table XII

Corporate Investment, Employment Growth, External Finance and Global Terrorist Activity: Second Measure of Sentiment

This table reports results from two sets of regressions based on equation (9). The first [1] takes investment and employment as the dependent variables, while the second one [2] takes external finance. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_2$ is the second measure of sentiment and it is calculated by adding the minimum value of the orthogonal B&W$^{\perp}$ sentiment index. *GlobTer* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.363***	0.290***	0.126***	0.177***	0.103***	0.292***
	(29.51)	(30.99)	(17.58)	(25.74)	(21.97)	(30.24)
CF	0.339***	0.692***	0.296***	-0.240***	-0.011	-0.279***
	(6.84)	(18.57)	(10.35)	(8.69)	(0.62)	(7.16)
$Sent_2*Q_{t-1}$	0.946***	0.667***	0.138*	0.435***	0.166***	0.672***
	(8.33)	(8.13)	(2.15)	(7.20)	(4.07)	(7.71)
$Sent_2*Q_{t-1}$ * GlobTer	-0.108***	-0.075***	-0.013	-0.049***	-0.019***	-0.075***
	(8.12)	(7.82)	(1.70)	(6.81)	(3.93)	(7.35)
$Sent_2$*CF	-0.665	-0.608	-0.402	-1.072***	0.502**	-0.844*
	(1.39)	(1.63)	(1.33)	(3.96)	(2.92)	(2.22)
$Sent_2$*CF* GlobTer	0.066	0.060	0.044	0.116***	-0.058**	0.088*
	(1.18)	(1.37)	(1.21)	(3.64)	(2.87)	(1.97)
constant	0.175***	0.098***	0.027**	0.091***	0.067***	0.164***
	(15.22)	(11.64)	(3.22)	(18.79)	(12.03)	(19.30)
N	34,719	62,205	59,000	58,779	59,576	58,779
R^2(within)	0.19	0.19	0.07	0.13	0.05	0.12

Table XIII

Corporate Investment, Employment Growth, External Finance and US Terrorist Activity: Second Measure of Sentiment

This table reports results from two sets of regressions based on equation (9). The first [1] takes investment and employment as the dependent variables, while the second one [2] takes external finance. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_2$ is the second measure of sentiment and it is calculated by adding the minimum value of the orthogonal B&W$^{\perp}$ sentiment index. *USterror* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.334***	0.270***	0.122***	0.164***	0.098***	0.272***
	(28.32)	(29.77)	(17.46)	(24.94)	(21.61)	(29.09)
CF	0.357***	0.708***	0.311***	-0.209***	-0.027	-0.256***
	(7.20)	(19.05)	(11.49)	(7.72)	(1.60)	(6.67)
$Sent_2*Q_{t-1}$	0.106***	0.088***	0.035***	0.068***	0.020***	0.098***
	(8.03)	(9.13)	(4.73)	(9.54)	(4.38)	(9.71)
$Sent_2*Q_{t-1}$ * USterror	-0.018***	-0.013***	-0.0016	-0.010***	-0.003***	-0.015***
	(8.06)	(8.54)	(1.19)	(8.39)	(4.26)	(8.64)
$Sent_2$*CF	-0.204***	-0.188***	-0.122***	-0.171***	0.028	-0.181***
	(3.66)	(4.23)	(4.10)	(5.66)	(1.50)	(4.20)
$Sent_2$*CF * USterror	0.024*	0.022**	0.022***	0.020***	-0.004	0.021**
	(2.57)	(3.00)	(3.63)	(3.72)	(1.15)	(2.75)
constant	0.178***	0.099***	0.026**	0.086***	0.073***	0.162***
	(17.12)	(12.87)	(3.26)	(20.70)	(13.52)	(21.07)
N	34,719	62,205	59,000	58,779	59,576	58,779
R^2(within)	0.19	0.19	0.07	0.13	0.05	0.12

Table XIV

Corporate Investment, Employment Growth, External Finance and International Terrorist Activity: Second Measure of Sentiment

This table reports results from two sets of regressions based on equation (9). The first [1] takes investment and employment as the dependent variables, while the second one [2] takes external finance. *Inv* is defined as the primary measure of investment and is calculated as the sum of total asset growth and R&D spending, all scaled by lagged assets. Inv_2 is the alternative measures of corporate investment and is calculated as the percentage change in book value of assets over the year. *EqtIss* stands for equity issuance and is calculated as the change in book equity and the change in deferred taxes, minus the change in retained earnings, all scaled by beginning-of-year book value of assets. *DebIss* represents debt issuance and is computed as the change in book value of assets, minus the change in book value of equity, minus the change in deferred taxes, all scaled by lagged beginning-of-year book value of assets. *TotExtFin* is the total external finance and is calculated the sum of *EqtIss* and *DebIss*. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_2$ is the second measure of sentiment and it is calculated by adding the minimum value of the orthogonal B&W$^{\perp}$ sentiment index. *NonUSterr* index captures the impact of the flow of the international terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include year and firm fixed effects. R^2 statistics reflect within firm variations. *N* reports the number of observations. Standard errors are clustered on both year and firm. Absolute *t*-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.

	[1] Inv	[1] Inv_2	[1] Emp	[2] EqtIss	[2] DebtIss	[2] TotExtFin
Q_{t-1}	0.346***	0.277***	0.121***	0.165***	0.100***	0.277***
	(25.62)	(27.25)	(15.93)	(22.26)	(19.73)	(26.56)
CF	0.402***	0.742***	0.352***	-0.220***	0.003	-0.245***
	(7.23)	(17.75)	(11.30)	(7.10)	(0.15)	(5.66)
$Sent_2*Q_{t-1}$	0.453*	0.306*	0.029	0.090	0.076	0.223
	(2.57)	(2.36)	(0.29)	(0.93)	(1.14)	(1.67)
$Sent_2*Q_{t-1}$ * NonUSterr	-0.050*	-0.032*	0.001	-0.007	-0.008	-0.022
	(2.35)	(2.07)	(0.02)	(0.62)	(1.02)	(1.35)
$Sent_2$*CF	1.177	0.863	1.238	-0.389	0.813	0.194
	(1.64)	(1.52)	(1.86)	(0.92)	(1.02)	(0.33)
$Sent_2$*CF * NonUSterr	-0.156	-0.118	-0.155	0.0354	-0.097	-0.036
	(1.81)	(1.71)	(1.96)	(0.69)	(1.98)	(0.52)
constant	0.169***	0.092***	0.017*	0.087***	0.068***	0.160***
	(15.26)	(11.12)	(2.00)	(18.19)	(12.20)	(19.19)
N	34,719	62,205	59,000	58,779	59,576	58,779
R^2(within)	0.19	0.19	0.07	0.13	0.05	0.12

Table XV

Corporate Investment, Employment Growth and Investor Sentiment: Alternative Investment Measures

This table reports results from alternative investment regressions. The dependent variables are Inv_3, Inv_4, and Inv_5. Inv_3 is defined as the sum of capital expenditure, R&D spending, and SG&A, all scaled by beginning-of-year book value of assets . Inv_4 is defined as the sum of capital expenditure and R&D spending, all scaled by beginning-of-year book value of assets. Inv_5 is defined as capital expenditure scaled by beginning-of-year book value of assets. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of sentiment and it is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. All regressions include firm and year fixed effects. R^2 statistics reflect within firm variations. Standard errors are clustered on both firm and year. Absolute t-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%

	(1)	(1)	(1)	(2)	(2)	(2)
	Inv_3	Inv_4	Inv_5	Inv_3	Inv_4	Inv_5
Q_{t-1}	0.150***	0.083***	0.046***	0.138***	0.081***	0.041***
	(29.04)	(38.10)	(37.49)	(17.44)	(23.33)	(22.11)
CF	-0.116***	-0.142***	0.051***	-0.029	-0.123***	0.037***
	(5.83)	(15.67)	(14.58)	(0.96)	(9.36)	(7.09)
$Sent_1*Q_{t-1}$	-	-	-	0.019	0.006	0.014***
	(-)	(-)	(-)	(1.85)	(1.44)	(5.68)
$Sent_1$*CF	-	-	-	-0.058	-0.008	0.035***
	(-)	(-)	(-)	(1.40)	(0.48)	(4.24)
constant	0.552***	0.186***	0.116***	0.543***	0.182***	0.112***
	(68.47)	(52.67)	(44.73)	(70.18)	(52.29)	(44.77)
N	39,253	43,526	76,946	31,903	35,373	63,374
R^2(within)	0.16	0.20	0.15	0.16	0.20	0.15

Table XVI

Corporate Investment, Investor Sentiment and Terrorist Activity: Alternative Investment Measures

This table reports results from alternative investment regressions for global [1], domestic[2] and international [3] terrorist activity. The dependent variables are Inv_3, Inv_4, and Inv_5. Inv_3 is defined as the sum of capital expenditure, R&D spending, and SG&A, all scaled by beginning-of-year book value of assets. Inv_4 is defined as the sum of capital expenditure and R&D spending, all scaled by beginning-of-year book value of assets. Inv_5 is defined as capital expenditure scaled by beginning-of-year book value of assets. *Q* is a proxy for Tobin's q and is defined as the log of the sum of market value of equity plus the book value of assets, minus the book value of equity, all scaled by book value of assets. *CF* is cash flow and is calculated as the sum of net income plus depreciation & amortization, all scaled by beginning-of-year book value of assets. $Sent_1$ is the first measure of US investor sentiment and it is calculated as the annual rank value of orthogonalized B&W$^{\perp}$ sentiment index divided by the maximum rank. $Sent_2$ is the second measure of US investor sentiment or the "adjusted" orthogonal B&W$^{\perp}$ sentiment index and it is calculated by adding the minimum value of the orthogonal B&W$^{\perp}$ sentiment index to its yearly value so that it will always be positive. *USterror* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. *NonUsterr* index captures the impact of the flow of the international terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. *GlobTer* index captures the impact of the flow of the global terrorist activity and is calculated as the natural log of a score that is equal to one plus the equal weighted sum of the number of fatal victims of terror, the number of injured and the number of terror events, all occurred in a given year. All regressions include firm and year fixed effects. R^2 statistics reflect within firm variations. Standard errors are clustered on both firm and year. Absolute t-statistics are reported in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%

	[1] Inv_3	[1] Inv_4	[1] Inv_5	[2] Inv_3	[2] Inv_4	[2] Inv_5	[3] Inv_3	[3] Inv_4	[3] Inv_5
Q_{t-1}	0.144***	0.083***	0.042***	0.135***	0.078***	0.039***	0.143***	0.081***	0.042***
	(18.25)	(24.40)	(23.03)	(16.79)	(22.72)	(21.34)	(17.67)	(23.77)	(22.82)
CF	-0.034	-0.121***	0.038***	-0.024	-0.122***	0.034***	-0.006	-0.114***	0.036***
	(1.14)	(9.25)	(7.30)	(0.77)	(9.14)	(6.38)	(0.18)	(8.50)	(6.95)
$Sent_1 * Q_{t-1}$	0.683***	0.305***	0.196***	0.063***	0.031***	0.024***	0.359**	0.066	0.117***
	(6.85)	(7.20)	(8.16)	(4.61)	(5.21)	(7.63)	(2.60)	(1.17)	(3.74)
$Sent_1 * CF$	0.424	0.342	0.290***	-0.185**	-0.024	0.054***	2.008**	0.666**	0.067
	(0.89)	(1.92)	(3.40)	(3.07)	(1.02)	(4.84)	(3.24)	(2.98)	(0.65)

$Sent_1$*Q_{t-1} *GlobTer	-0.078***	-0.039***	-0.021***	-	-	-	-	-	-
	(6.85)	(7.26)	(7.83)	(-)	(-)	(-)	(-)	(-)	(-)
$Sent_1$*CF *GlobTer	-0.054	-0.040*	-0.029**	-	-	-	-	-	-
	(1.00)	(2.00)	(3.08)	(-)	(-)	(-)	(-)	(-)	(-)
$Sent_1$*Q_{t-1}*USterror	-	-	-	-0.010***	-0.005***	-0.002***	-	-	-
	(-)	(-)	(-)	(5.26)	(6.57)	(5.35)	(-)	(-)	(-)
$Sent_1$*CF*USterror	-	-	-	0.030**	0.004	-0.004*	-	-	-
	(-)	(-)	(-)	(3.22)	(1.20)	(2.50)	(-)	(-)	(-)
$Sent_1$*Q_{t-1}*NonUSterr	-	-	-	-	-	-	-0.041*	-0.007	-0.012***
	(-)	(-)	(-)	(-)	(-)	(-)	(2.50)	(1.05)	(3.33)
$Sent_1$*CF *NonUSterr	-	-	-	-	-	-	-0.245***	-0.080**	-0.004
	(-)	(-)	(-)	(-)	(-)	(-)	(3.34)	(3.05)	(0.29)
constant	0.535***	0.177***	0.109***	0.544***	0.181***	0.111***	0.532***	0.178***	0.111***
	(63.86)	(48.44)	(43.35)	(69.77)	(51.92)	(44.61)	(64.99)	(49.44)	(44.27)
N	31,005	34,365	61,523	31,005	34,365	61,523	31,005	34,365	61,523
R^2(within)	0.16	0.21	0.15	0.16	0.21	0.15	0.16	0.21	0.15