Impact of Terrorism on Capital Investment by Firms: Evidence from Jammu and Kashmir

Rohit Duwadi[1], Prakarsh Singh[2], and Priyanshu Singhal[3]

[1]*Plaksha University: rohit.econ5470@gmail.com*
[2]*Plaksha University. Corresponding author: prakarsh.singh@plaksha.edu.in*
[3]*Plaksha University: priyanshusinghal223@gmail.com*

August 2025

Abstract

Terrorism imposes a tax on firm investment, hindering economic development, yet the causal impact of terrorism incidents on firm performance is under-explored. This is due to three reasons – first, a paucity of investment data on firms in high-conflict regions, and second, a lack of regional variation in terrorism over an extensive geographical area that is subject to similar political institutions. Third, it is challenging to obtain such data over long periods of time. This paper provides the first empirical evidence on the causal impact of terrorism on firms' capital investments in Jammu and Kashmir. We merge firm-level annual industry microdata from the Government of India's Ministry of Statistics and Programme Implementation (MoSPI) with district-wise terrorist incidence data from the South Asia Terrorism Portal (SATP) between 2000–2010 to investigate how terrorist incidents affect firm investments. After accounting for district, year, industry-fixed effects, and district-specific trends, we find that a one SD increase in terrorism incidents reduces new capital investment by 18%. These adverse investment responses are driven by the top quartile of capital-intensive firms. These effects are driven by incidents of killings and remain consistent even after controlling for terrorism spillovers from neighbouring districts.

1 Introduction

Terrorism remains one of the most pressing challenges to global economic stability, particularly in regions characterized by protracted conflicts. Beyond its devastating human toll, terrorism generates profound economic consequences by disrupting markets, eroding investor confidence, and curtailing capital flows. While the macroeconomic consequences of terrorism, such as reduced GDP growth and lower foreign direct investment (FDI) are relatively well documented, the microeconomic dimensions, especially at the firm level, remain less explored. Firms operating in conflict-affected regions face heightened uncertainty, disrupted supply chains, and increased costs of security and insurance, all of which can deter the long-term capital investments that are critical for sustained growth.

Jammu and Kashmir (J&K) provides a compelling context to study these dynamics. Situated at the geopolitical crossroads of South Asia, J&K has endured decades of armed insurgency and political instability since the late 1980s. The insurgency that escalated in 1989 triggered widespread violence, with militants frequently targeting civilians, infrastructure, and state institutions. The conflict has profoundly shaped the region's economic trajectory, contributing to weak industrial development, limited private investment, and chronic underemployment. These characteristics make J&K an important but underexamined setting for understanding how terrorism influences firm-level investment decisions.

At a global level, terrorism imposes significant economic costs. A recent (UNDP, 2023) report estimated that violent extremism reduced Africa's economic output by over $97 billion between 2007 and 2016, not only through direct destruction but also by eroding investor confidence, disrupting labor markets, and delaying infrastructure projects. These findings highlight that the costs of terrorism extend far beyond immediate physical damages, shaping long-term development prospects in conflict-affected regions.

The academic literature offers several insights into the economic impacts of terrorism. Much of this research has focused on macroeconomic indicators. For example, Abadie and Gardeazabal (2008) and Garriga and Phillips (2023) demonstrated that higher risks of terrorism deter FDI inflows to levels comparable with the effects of weak institutional quality. Similarly, Blomberg, Hess, and Orphanides (2004) and Gaibulloev and Sandler (2008) linked persistent terrorism to reduced GDP growth and increased fiscal pressures. Yet, while such studies underscore the broad macroeconomic consequences, they often overlook how terrorism affects firms' investment behavior.

Sector-specific studies suggest that vulnerabilities vary considerably. Drakos and Kutan (2003) showed that terrorism disrupted tourism flows in the Mediterranean, with effects spilling over to neighboring countries. In Pakistan, Bönte and Gill (2024) reported that ter-

rorism significantly reduced firms' export performance, although domestic sales were largely insulated by localized demand patterns. In agriculture, Singh (2013) found that terrorism in Punjab reduced long-term investments in durable assets such as tube wells, while leaving short-term inputs like fertilizers largely unaffected. Likewise, Amare et al. (2024) showed that farmers in Nigeria shifted from long-term crops to short-term alternatives under violent conflict, undermining sustainability. These studies highlight that terrorism tends to suppress long-horizon, capital-intensive investments, though short-term adjustments often persist.

At the firm level, evidence points to direct and persistent effects on investment and employment. Nguyen et al. (2021) used Indonesian firm-level data to show that a one standard deviation increase in terrorist incidents reduced corporate investments by 9.23%, with export-oriented and manufacturing firms most vulnerable. Greenbaum et al. (2007) found that terrorist incidents in Italian regions decreased both the number of active firms and employment, particularly in the immediate aftermath of attacks. In Northern Ireland, Besley and Mueller (2012) and Mueller (2016) observed that prolonged political violence discouraged long-term investments, with firms incurring substantial costs for protection and risk mitigation that eroded productivity over time. These studies collectively highlight that while some firms adapt through short-term strategies, many face persistent losses in competitiveness and investment capacity.

The mechanisms through which terrorism affects economic activity have also been widely examined. Frey and Luechinger (2007) argued that terrorism exacerbates market volatility and undermines investor confidence, especially in fragile markets. Eldor and Melnick (2004) showed that financial markets in countries with weaker institutions suffer disproportionately from terrorism-related shocks. Similarly, Guidolin and La Ferrara (2010) found that violent conflicts in Africa generated significant uncertainty, reducing investment and long-term market stability. Closer to the Indian context, Pattammal (2021) documented significant losses in J&K's agriculture and tourism sectors due to prolonged terrorism, though government interventions provided partial mitigation. Fielding (2003), examining Israel, further showed that political instability and terrorism produced sustained declines in investment demand. Yet, contrasting evidence from Miguel and Roland (2011) suggests that the long-term economic consequences of violence depend on local conditions, with some economies recovering more quickly than expected.

Despite these important contributions, significant gaps remain. Most existing research concentrates on macroeconomic outcomes (Abadie and Gardeazabal, 2003; Blomberg, Hess, and Orphanides, 2004; Meierrieks and Gries, 2013) or on sectoral performance (Gaibulloev and Sandler, 2008; Drakos and Kutan, 2003).In contrast, to the best of our knowledge, firm-level investment responses to terrorism, particularly in highly conflict-prone regions, remain

insufficiently examined. Moreover, little is known about the heterogeneity of these effects, such as whether larger, capital-intensive firms, export-oriented industries, or rural enterprises experience disproportionate impacts. The possibility that firms adapt their strategies over time by developing resilience mechanisms to cope with recurring violence also remains understudied.

This paper addresses these gaps by combining district-level terrorism data from the South Asia Terrorism Portal (SATP) with industry-level firm data from the Annual Survey of Industries (ASI) for 2000–2010. We pose three guiding research questions:

1. How does terrorism affect firms' capital investment decisions in conflict zones?
2. What firm and region-specific factors, such as size, location, and sector, amplify or mitigate these effects?
3. Do firms exhibit adaptive investment behaviors over time, indicating resilience to persistent conflict?

This study contributes to the literature in three ways. First, it provides new empirical evidence on the microeconomic impacts of terrorism in J&K, a region where firm-level dynamics remain largely undocumented. Second, it demonstrates the heterogeneity of these effects, showing that larger firms and capital-intensive industries are particularly vulnerable. Third, it examines potential adaptive responses, offering insights into how firms develop resilience mechanisms under protracted instability. Taken together, these contributions extend the understanding of terrorism's economic effects beyond the macro level and offer actionable implications for policymakers and development practitioners concerned with fostering resilience in conflict-affected regions.

The rest of the paper is organized as follows. Section 2 presents the historical and geopolitical context of Jammu and Kashmir. Section 3 outlines the theoretical framework linking terrorism to firm-level investment. Section 4 describes the data and variable construction. Section 5 details the empirical methodology. Section 6 discusses the main results and heterogeneity analyses. Section 7 concludes with key findings and policy implications.

2 Background: Terrorism in Jammu & Kashmir

Since the late 1980s, Jammu and Kashmir has experienced persistent insurgency characterized by recurrent militant attacks. This prolonged violence has profoundly shaped the region's social, political, and economic landscape, making it one of the most enduring conflict zones in South Asia.

2.1 Timeline of Major Terrorist Incidents

Figure 1 illustrates the persistence of terrorism in the region between 2000 and 2010, marked by repeated large-scale attacks on civilians, religious pilgrims, political institutions, and security forces. The timeline shows that violence recurred at regular intervals rather than being confined to isolated years, underscoring the sustained nature of the insurgency. Attacks frequently targeted symbolic and high-visibility sites such as the Amarnath Yatra (2000–2001), the J&K State Legislative Assembly (2001), and bustling marketplaces (2006), reflecting the dual intent of inflicting mass casualties and disrupting public life. Minority groups were particularly vulnerable, as seen in massacres at Chittisinghpora (2000) and Nadimarg (2003). Later years witnessed major strikes on highways and military convoys, such as the Pulwama (2006) and Srinagar–Baramulla highway (2008) attacks, indicating a tactical shift toward crippling mobility and security infrastructure. Collectively, the timeline demonstrates that terrorism remained a consistent and evolving threat throughout the decade, fundamentally shaping the region's socio-economic trajectory.

2.2 District-Wise Intensity of Terrorism

Figure 2 provides a district-wise heat map of terrorism intensity. Baramulla, Poonch, and Anantnag emerge as persistent hotspots, while relatively lower-intensity districts such as Kathua and Kargil still recorded recurrent incidents. This spatial variation underscores the heterogeneity of conflict exposure across the state. Firms located in high-intensity districts faced not only direct risks of physical destruction but also indirect risks such as supply chain disruptions, labor migration, and increased operating costs. Prior studies suggest that such geographic clustering of violence has disproportionate economic consequences, amplifying uncertainty in precisely those areas most dependent on private investment Abadie and Gardeazabal (2003); Greenbaum et al. (2007).

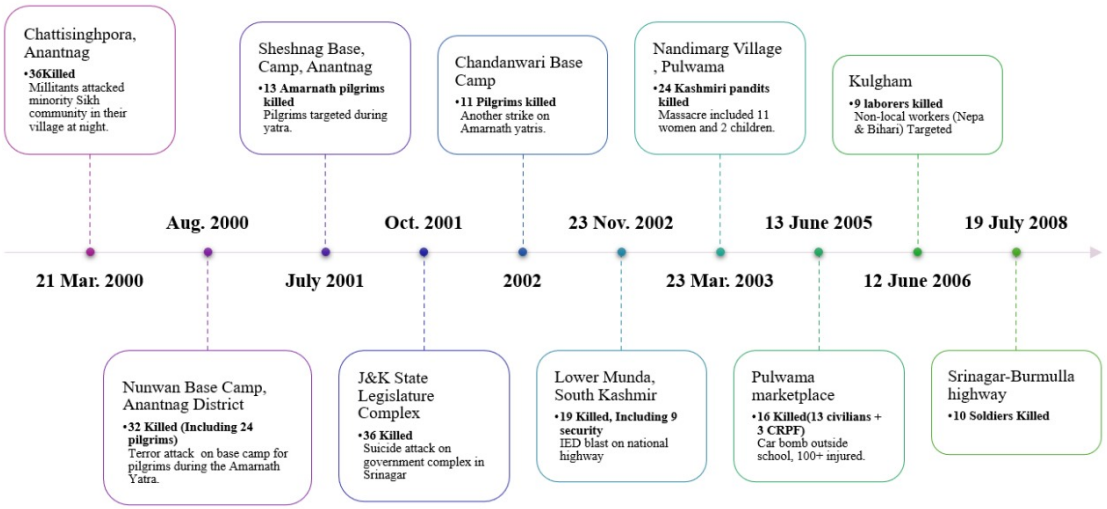

Figure 1: Timeline of Major Terrorist Incidents in Jammu & Kashmir, 2000–2010

Figure 2: District-Wise Intensity of Terrorism in Jammu & Kashmir, 2000–2010

2.3 Trends Across Districts

Figure 3 illustrates district-level trends in annual terrorism incidents. The graph highlights both the scale and variability of violence across districts. The sharp spike in incidents in 2001 is particularly noteworthy, with Baramulla and Pulwama recording over 400 attacks that year. While the overall intensity of terrorism declined after the mid-2000s, several districts continued to experience recurrent violence. This temporal pattern is crucial for understanding firm behavior: investment is highly sensitive to these surges of risk, as sudden escalations deter long-term projects and delay planned expansions Nguyen et al. (2021); Drakos and Kutan (2003). The persistence of lower but recurrent levels of violence even in later years also suggests that the economic effects are not limited to "shock years" but extend through prolonged uncertainty.

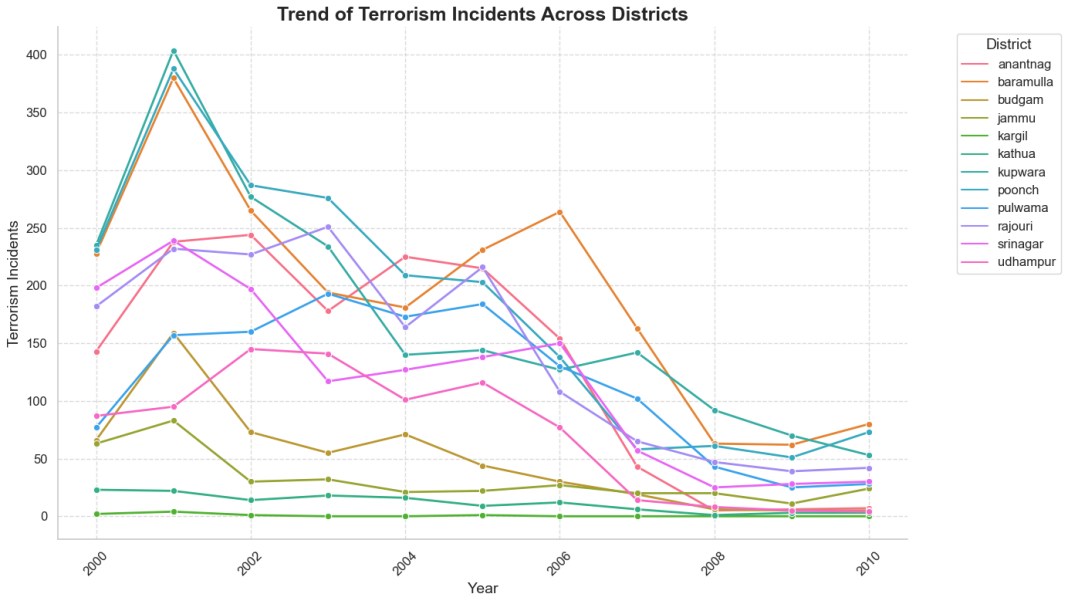

Figure 3: Trends of Terrorism Incidents Across Districts of Jammu & Kashmir, 2000–2010

Together, these descriptive figures provide essential context for the empirical analysis. The evidence suggests that terrorism in J&K was not a uniform phenomenon but instead exhibited sharp spikes, strong geographic clustering, and persistent long-run effects, all factors that plausibly shape firm-level investment decisions.

2.4 Economic Implications of Terrorism in J&K

The persistent violence in Jammu and Kashmir between 2000 and 2010 generated profound economic consequences, consistent with broader patterns identified in the literature on terrorism's adverse effects on growth and investment (Abadie and Gardeazabal, 2008; Gaibulloev and Sandler, 2008). The recurrence of militant attacks, as documented in the timeline of incidents above, created an environment of chronic uncertainty that undermined fiscal stability, industrial development, and household welfare.

At the macroeconomic level, the conflict placed sustained pressure on public finances. The Comptroller and Auditor General (CAG) reported that the state's fiscal liabilities rose from 9,224 crore in 2000–01 to 16,801 crore in 2005–06, while fiscal deficits nearly doubled during this period. The primary deficit, for example, increased from 216 crore in 2002–03 to 1,528 crore in 2005–06, reflecting both rising expenditure demands and weak revenue mobilization (Talib, 2007). These imbalances were compounded by chronic losses in the power sector and inefficient allocation of public spending, features often associated with conflict-driven fiscal mismanagement.

The industrial sector also faced persistent disruptions during this decade. Recent empirical evidence by Vaibhav and Verma (2025) demonstrates that terrorism significantly contracted the flow of formal credit in J&K, with agricultural, personal, and industrial lending all declining, and the Kashmir Valley experiencing the steepest contraction. They estimate that, in the absence of persistent violence, the state economy would have been more than one and a half times larger—equating to an average annual growth reduction of 2.4 percent and a per capita decline of 3.7 percent. This contraction in financing directly impeded industrial development by restricting firms' ability to maintain operations or invest in new capacity, exacerbating long-term structural weaknesses in the regional economy.

Tourism, traditionally a cornerstone of J&K's economy, also suffered heavily. Repeated terrorist attacks on pilgrimage routes, marketplaces, and transport infrastructure eroded perceptions of safety and deterred both domestic and international visitors. Pattammal (2021) documents how these incidents led to sharp declines in tourist arrivals, with severe spillover effects on hospitality, handicrafts, and transport services.

J&K experienced intensified welfare losses as insecurity suppressed tourism and economic activity. An econometric study quantifies this: each additional conflict-related fatality was associated with a decline of approximately 0.065 billion in Net State Domestic Product and a reduction of about 232 tourist arrivals, indicating diminished employment and income opportunities for households (Islam, 2014). The April 2025 Pahalgam terrorist attack further illustrates this dynamic, as tourist arrivals collapsed, hotels faced near-zero occupancy, and businesses sought government bailouts (Times of India, 2025; Financial Times, 2025). These developments collectively suggest that protracted terrorism deeply restricted household consumption and income-generating prospects.

Taken together, the evidence highlights how terrorism in J&K constrained fiscal capacity, weakened industrial and tourism performance, and aggravated household-level vulnerabilities. The persistence of these effects over the decade underscores the deep structural costs of conflict, extending beyond immediate physical destruction to long-term developmental stagnation.

3 Economic Mechanisms of Terrorism and Investment

Terrorism, defined as the "threatened or actual use of illegal force and violence by a non-state actor to attain political, economic, religious, or social goals through fear, coercion, or intimidation" (Institute for Economics & Peace, 2022), has been persistent in Jammu & Kashmir (J&K). Its unpredictability and the fear it instills disrupt not only social order but also economic activity, particularly firms' capital investment decisions. Since investment is inherently forward-looking, requiring stability and predictable returns (Modigliani and Miller, 1958), the pervasive risk of violence alters the environment in which firms allocate resources. In J&K, terrorism introduces multiple economic distortions that collectively function as a "tax" on investment.

Following the broader literature on conflict and investment (Bernanke, 1983; Dixit and Pindyck, 1994; Fielding, 2003; Besley and Mueller, 2012), we classify the mechanisms through which terrorism influences capital accumulation into five interrelated channels: uncertainty and real options, direct destruction of capital and supply chains, financial constraints, labor market disruptions, and institutional responses.

Uncertainty and the Real Options Effect. Terrorism raises the volatility of expected returns, amplifying the option value of waiting before undertaking irreversible projects. Real options theory predicts that greater uncertainty delays investment until risks become clearer (Bernanke, 1983; Dixit and Pindyck, 1994). In J&K, where violence is recurrent and unpredictable, firms perceive a heightened likelihood of disruption, leading to postponement or

cancellation of otherwise profitable projects.

Destruction of Capital and Supply-Side Disruptions. Terrorist attacks inflict direct physical damage on infrastructure, transport, and production facilities, while also disrupting supply chains. Firms divert resources toward repairing damages, securing operations, or relocating activities, reducing funds available for expansion. Evidence from Israel and Northern Ireland shows that political violence leads to persistent reductions in investment demand (Fielding, 2003; Besley and Mueller, 2012), a dynamic that plausibly extends to J&K.

Financial Constraints and Cost of Capital. Persistent insecurity increases perceived default risk, prompting banks to tighten lending conditions. As Vaibhav and Verma (2025) demonstrate for J&K, terrorism significantly contracted formal credit flows across industrial, agricultural, and personal loans, particularly in the Kashmir Valley. Higher borrowing costs, rising insurance premiums, and the need for contingency reserves further raise the effective cost of capital, disproportionately affecting capital-intensive firms.

Labor Market and Human Capital Effects. Terrorism alters labor market dynamics by discouraging worker participation, inducing migration, and eroding human capital formation. Skilled workers and entrepreneurs often relocate to safer regions, leaving firms with shortages of qualified labor. This not only raises wage costs but also constrains firms' capacity to sustain long-term projects. In J&K, these dynamics are particularly salient, as recurrent violence has historically triggered out-migration (Pattammal, 2021).

Institutional and Policy Responses. Government counter-terrorism measures, while necessary, can inadvertently increase the cost of doing business. Heightened security protocols, regulatory checks, and conflict-related taxation impose additional burdens on firms. As noted by Gaibulloev and Sandler (2019), such institutional responses to terrorism often discourage private investment, especially in regions already marked by weak institutional quality.

In sum, terrorism undermines investment through uncertainty, destruction, financial frictions, labor market distortions, and institutional costs. These mechanisms are not mutually exclusive but reinforce one another, creating a high-risk environment that suppresses capital accumulation. This framework motivates our empirical analysis, where we assess how terrorism incidents, measured at the district-year level, translate into reduced firm-level additions to capital stock in J&K.

4 Data

This study combines firm-level, financial, and conflict-related datasets to examine the impact of terrorism on capital investment in Jammu and Kashmir (J&K) during the period 2000–2010. The analysis draws on multiple district-level data sources, summarized in Table 1. This time frame is chosen both for data availability and because it coincides with one of the most intense phases of insurgency in the region. The final dataset integrates information on firm operations, capital formation, credit conditions, and terrorism intensity across 12 districts, matched at the district–year level. The measures of terrorism are obtained from the South Asia Terrorism Portal (SATP), a widely used source on insurgency and political violence in South Asia. The dataset provides annual district-level counts of terrorism-related incidents, including killings, explosions, and injuries. We focus on indicators such as the total number of incidents, fatalities of civilians and security personnel, and injuries, which capture both the scale and severity of violence. These variables provide a granular measure of insecurity across districts and are well suited to analyzing how variation in violence shapes firm-level investment behavior.

Firm-level information is sourced from the Annual Survey of Industries (ASI), conducted annually by the Ministry of Statistics and Programme Implementation (MoSPI), Government of India. The ASI covers all registered manufacturing firms and provides detailed data on production costs, wages, and additions to fixed capital. We construct the dependent variable, the change in capital stock (ΔK_{ijt}), as the actual addition to fixed capital by firm i in district j and year t. Production cost (ProdCost_{ijt}) is included as a control variable, since higher operating costs reduce internal liquidity and limit reinvestment capacity (Fazzari et al., 1988; Hubbard, 1998). Because ASI employs different versions of the National Industrial Classification (NIC) codes across years, we harmonize all activities to the 2004 classification system. In cases of ambiguity, firms are aggregated at the two-digit (division) level. Since ASI does not assign persistent firm identifiers, each firm-year observation is treated independently.Financial data on borrowing costs are obtained from the Reserve Bank of India's Basic Statistical Returns (BSR1). From this source, we compute district-level average loan rates (LoanRate_{jt}) by aggregating bank lending rates across all banks within a district-year. Loan rates are a key determinant of capital formation, as higher borrowing costs increase the marginal cost of investment and are expected to discourage firm-level capital expenditure (Modigliani and Miller, 1958).

The merged dataset links each ASI firm-year observation with the corresponding district–year values of terrorism intensity from SATP and average loan rates from RBI–BSR1. This integrated structure allows us to examine how firm-level investment decisions respond to

varying levels of terrorist violence and credit conditions, while controlling for firm characteristics and district-specific financial environments. The final dataset contains 3,166 firm-year observations, capturing substantial geo-temporal variation in both investment and conflict intensity. Terrorism incidents range from as few as one to as many as 404 annually, while firm-level capital investment varies from 0 to over 2.16 billion. Table 2 reports descriptive statistics for terrorism variables, and Table 3 summarizes the financial variables used in the analysis.

Table 1: Variable description and data source

Variable	Description	Source
Firm level (ASI)		
New Capital Investment	Annual addition to fixed capital (dependent variable).	ASI (MoSPI)
Production Cost	Total production/operating cost; proxy for liquidity.	ASI (MoSPI)
Industry (NIC 2004)	Two-digit industry classification for fixed effects.	ASI (MoSPI)
Rural/Urban	Dummy for firm location.	ASI (MoSPI)
Firm size	Big/Medium/Small by capital stock percentiles.	Constructed from ASI
District finance		
Loan Rate	District–year average lending rate across banks.	RBI BSR1
District terrorism		
Terrorism incidents	Total terrorism-related incidents in district–year.	SATP
Lagged terrorism	One-year lag of incidents.	Constructed from SATP
Incidents of killing	Number of incidents involving fatalities.	SATP
Fatalities	Civilians, security personnel, and militants killed.	SATP
Explosion incidents	Number of bomb/explosion events.	SATP
Injuries	Total injured, disaggregated by category.	SATP
Controls and fixed effects		
District FE	Absorb time-invariant district traits.	Constructed
Year FE	Capture state/national shocks.	Constructed
District trend	District-specific linear trend in investment.	Constructed
Sample coverage		
Coverage	12 districts, 2000–2010.	ASI, SATP, RBI
Observations	3,166 firm–year observations.	Authors' computation

Table 2: Descriptive Statistics of Conflict Data

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Terrorism incidents	80	86.89	91.13	1	404
Total fatalities	80	94.34	133.36	0	845
Incidents of killing	70	55.51	70.12	0	339
Incidents explosion	80	12.54	16.08	0	69
Civilian killed in explosion	80	4.59	6.89	0	34
Security forces killed in explosion	80	2.78	4.47	0	24
Militant killed in explosion	80	0.84	1.53	0	7
Total killed in explosion	80	8.56	11.32	0	57
Civilian injured in explosion	80	47.96	72.29	0	297
Security forces injured in explosion	67	20.09	29.95	0	156
Militant injured in explosion	67	0.22	0.79	0	5
Total injured in explosion	80	74.68	109.92	0	426
Lag terrorism incidents	80	95.59	82.93	1	265
Lag total incident explosion	66	17.62	17.38	1	69
Lag civilian killed explosion	66	6.64	7.69	0	34
Lag total killed explosion	66	12.91	12.75	0	57

Table 3: Summary Statistics of Firms' Financial Variables

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Loan Rate	80	12.49	0.78	11.45	13.20
New Capital Investment (ΔK, in 100,000s)	3,166	106.3	737.4	0	21,680
Production Cost (in 100,000s)	3,166	1,322	4,153	0	103,500

5 Empirical Methodology

5.1 Baseline Model Specification

We begin by estimating a baseline specification for firm-level capital investment. The dependent variable, ΔK_{ijt}, denotes additions to fixed capital by firm i in district j during year t. The model controls for production costs and borrowing conditions, along with multiple layers of fixed effects:

$$\Delta K_{ijt} = \beta_0 + \beta_1 \,\text{ProdCost}_{ijt} + \beta_2 \,\text{LoanRate}_{jt} + \delta_j + \gamma_t + \eta_j t + \varepsilon_{ijt}. \tag{1}$$

Production costs (ProdCost_{ijt}) proxy for internal liquidity, with $\beta_1 < 0$ expected, as higher costs constrain reinvestment (Fazzari et al., 1988; Hubbard, 1998). Loan rates (LoanRate_{jt}) measure the local cost of capital, with $\beta_2 < 0$ anticipated, consistent with the cost of capital framework (Modigliani and Miller, 1958). District fixed effects (δ_j) absorb time-invariant heterogeneity, year effects (γ_t) capture common shocks, and district-specific linear trends ($\eta_j t$) allow for gradual local trajectories.

5.2 Model with Terrorism Incidents

To capture the impact of terrorism, we augment the baseline model with contemporaneous and lagged measures of terrorism intensity:

$$\begin{aligned}\Delta K_{ijt} = \beta_0 &+ \beta_1 \,\text{Terrorism}_{jt} + \beta_2 \,\text{Terrorism}_{j,t-1} \\ &+ \beta_3 \,\text{ProdCost}_{ijt} + \beta_4 \,\text{LoanRate}_{jt} + \delta_j + \gamma_t + \eta_j t + \varepsilon_{ijt}.\end{aligned} \tag{2}$$

Here, β_1 measures the immediate disruption of terrorism on ongoing projects, while β_2 captures persistent uncertainty that deters future investment. Both are expected to be negative. The inclusion of terrorism variables is motivated by evidence from conflict economies. Prior studies show that terrorism reduced investment in the Basque Country (Abadie and Gardeazabal, 2003), and lowered foreign direct investment in Spain and Greece (Enders and Sandler, 1996, 2006). Firm-level evidence also highlights how terrorism erodes investment by raising costs and deterring expansion (Greenbaum et al., 2007; Nguyen et al., 2021; Besley and Mueller, 2012).

The fixed-effects structure ensures that estimates exploit within-district, over-time variation in terrorism. Terrorism is treated as plausibly exogenous to firm-level investment once these controls are included, given that incidents are driven primarily by geopolitical and security dynamics rather than firm-specific decisions. This design is particularly relevant

for J&K, where recurrent terrorist violence has historically constrained private sector activity, as seen in patterns of delayed projects, higher transaction costs, and reduced capital accumulation (Fielding, 2003; Collier and Hoeffler, 2004).

6 Empirical Results

6.1 Main Effect of Terrorism on Capital Investment

We begin by estimating the impact of terrorism incidents on firm-level investment. Table 4 shows that a one standard deviation increase in terrorism incidents (approximately 97 attacks) reduces New Capital Investment (NCI) by 18 percent, relative to the mean. This effect is negative, statistically significant at the 5% level, and economically meaningful.[1] These findings are consistent with the hypothesis that terrorism depresses investment through heightened uncertainty, direct disruption of projects, and higher security costs, in line with prior evidence from Spain and the Basque Country (Abadie and Gardeazabal, 2003; Enders and Sandler, 2006).

Interestingly, the coefficient on lagged terrorism incidents is positive and significant at the 10% level. This suggests a partial recovery in capital expenditure following an initial decline, possibly reflecting adaptive responses by firms or increased public-sector investment in reconstruction and security-related sectors. Similar dynamics have been observed in conflict economies where firms adjust after shocks (Besley and Mueller, 2012; Nguyen et al., 2021). Nevertheless, the contemporaneous negative effect dominates, underscoring that terrorism operates as a strong short-run deterrent to private investment.

[1] Economic significance is computed by multiplying the coefficient on terrorism incidents from Model (2) of Table 4 with one standard deviation of terrorism intensity, and dividing by the sample mean of NCI.

Table 4: Effect of Terrorism Incidents on New Capital Investment (ΔK)

	(1)	(2)	(3)	(4)
Terrorism Incidents	-1.60*	-0.99	-1.70**	-2.05**
	(0.85)	(0.96)	(0.62)	(0.65)
1-Year Lag Terrorism Incidents	1.39	1.13	1.01	1.13
	(0.79)	(0.85)	(0.67)	(0.25)
District Time Trends	No	Yes	Yes	Yes
Neighbor District Terrorism Control	No	No	No	Yes
Other Controls	No	No	Yes	Yes
Year FE, District FE, Industry FE	Yes	Yes	Yes	Yes
R-squared	0.050	0.050	0.158	0.16
Observations	3,165	3,165	3,165	3,165

Standard errors in parentheses

** p<0.10, ** p<0.05, *** p<0.01*

Notes: (1)Terrorism Incidents refers to the annual number of terrorist attacks recorded in Jammu & Kashmir. The average number of incidents is 99, with a standard deviation of 96, a maximum of 404, and a minimum of 1. (2) There are twelve district dummies (one for each district) and ten year dummies (2000–2010). (3) Other controls include production cost and bank credit loan rate. Robust standard errors are clustered at the district level and are in parentheses.

6.2 Local Versus Spillover Effects

Next, we examine whether terrorism in neighboring districts influences investment. Table 4 column 4 results shows, even after controlling for spillover effects from terrorism in neighboring districts, the coefficient on local terrorism incidents remains negative and significant at the 5% level. This implies that firms reduce their investment in direct response to terrorism occurring within their own district, independent of violence in adjacent areas. The finding highlights that the impact of terrorism on investment is highly localized, and not merely a reflection of broader regional insecurity. This provides strong evidence of the direct deterrent effect of localized violence on capital formation in conflict-affected zones(Greenbaum et al., 2007).

6.3 Impact of Incidents of Killing

We further investigate whether the effect of terrorism is heterogeneous across different types of violence. Table 5 shows that incidents involving killings are the primary driver of reduced investment. The estimated coefficient is negative and significant at the 5% level, confirming that fatal attacks, which represent the most severe manifestation of terrorism, exert the strongest deterrent effect on firm capital formation. The lagged effect of killings is positive but statistically insignificant, suggesting that recovery after fatal shocks is limited. These results are consistent with Fielding (2003), who found that fatal violence during the Intifada significantly depressed private investment in Israel.

	New Capital Investment (in 100,000)
Incidents of Killing	-2.77**
	(88.20)
Lagged Incidents of Killing (t-1)	1.70
	(125.00)
Observations	2,716
R-squared	0.16
Year FE, District FE, Industry FE	Yes
District-Specific Time Trends	Yes
Standard errors in parentheses	
** p<0.10, ** p<0.05, *** p<0.01*	

Table 5: Impact of Incidents of Killing on New Capital Investment

6.4 Heterogeneous Effects Across Firm Sizes

We next assess whether terrorism affects firms differently depending on size. Table 6 indicates that the negative effect of terrorism on investment is concentrated among large firms (above the 75th percentile of capital stock). For these firms, terrorism incidents significantly reduce capital investment, consistent with their greater exposure to long-gestation projects and sunk costs. By contrast, medium-sized firms show mixed responses, negative and significant effects of lagged terrorism, but small firms exhibit no significant impact. These results suggest that terrorism primarily deters capital-intensive investment, while smaller firms, often less reliant on fixed capital and more flexible in operations, are relatively insulated. Similar heterogeneity is documented in Besley and Mueller's (2012) study of Northern Ireland, where larger firms bore the brunt of political violence.

	Big Firms	**Medium Firms**	**Small Firms**
Terrorism Incidents	-6.43**	0.56	0.18
	(2.81)	(0.36)	(0.17)
Lagged Terrorism Incidents (t-1)	6.63	-0.68**	-0.57
	(5.32)	(0.22)	(0.12)
Observations	853	1,540	772
R-squared	0.21	0.10	0.07
Year, District, Industry FE	Yes	Yes	Yes
District-Specific Time Trends	Yes	Yes	Yes
Standard errors in parentheses			
** p<0.10, ** p<0.05, *** p<0.01*			

Table 6: Heterogeneous Effects of Terrorism on Investment by Firm Size

6.5 Sectoral Impact of Terrorism on Investment

Table 7 explores the heterogeneous impact of terrorism across industrial sectors (2-digit NIC). Results show that terrorism significantly depresses investment in the Electrical Equipment (NIC 31) and Construction (NIC 36) sectors, consistent with their dependence on infrastructure and long-term planning, which are especially vulnerable to instability. By contrast, investment in Basic Metals (NIC 27) and Machinery (NIC 28) appears positively associated with terrorism incidents. These results may reflect adaptive responses, including government defense-related spending or contracts in these sectors. The lagged effect in Machinery

is positive and significant, suggesting partial recovery of capital expenditures. These findings highlight that terrorism's economic impact is uneven, disproportionately affecting industries reliant on physical infrastructure, while some sectors may benefit indirectly through substitution or state intervention (Drakos and Kutan, 2003; Guidolin and La Ferrara, 2010).

Table 7: Sector-wise Regression Results

	Textiles	**Chemicals**	**Electrical Equipment**	**Construction**
	NCI (in 100,000)	*NCI (in 100,000)*	*NCI (in 100,000)*	*NCI (in 100,000)*
Terrorism Incidents	0.29	0.35***	-0.31**	-0.49***
	(1.35)	(0.69)	(0.10)	(0.10)
1-Year Lag Terrorism	2.97	-0.15*	-0.48*	0.19**
	(2.78)	(0.061)	(0.17)	(0.062)
R-squared	0.861	0.198	0.312	0.316
Observations	163	158	224	184

** p<0.10, ** p<0.05, *** p<0.01*

Notes:
1) *Terrorism Incidents* refers to the annual number of terrorist attacks recorded in Jammu & Kashmir. The average number of incidents is 99, with a standard deviation of 96, a maximum of 404, and a minimum of 1.
2) All models include controls for production costs, loan interest rates, and fixed effects for year, district, industry, and rural/urban location.

6.6 Heterogeneous Effects Across Time Periods

Finally, we test for time heterogeneity by splitting the sample into two sub-periods: 2001–2005 and 2005–2010. Table 8 shows that terrorism reduced investment in both sub-periods, with somewhat stronger effects in the latter period, consistent with the escalation of violence in mid-2000s J&K. The robustness of results across sub-samples confirms that our findings are not driven by specific years. This stability reinforces the interpretation that terrorism had a sustained negative effect on capital investment throughout the decade.

	2001–2005	**2005–2010**
Terrorism Incidents	-1.32	-1.74*
	(1.11)	(0.91)
Lagged Terrorism Incidents (t-1)	0.51	2.14
	(1.14)	(1.56)
Observations	1,283	1,882
R-squared	0.41	0.15
Year, District, Industry FE	Yes	Yes
District-Specific Time Trends	Yes	Yes
Standard errors in parentheses		
** p<0.10, ** p<0.05, *** p<0.01*		

Table 8: Impact of Terrorism on New Capital Investment Across Time Periods

7 Conclusion

This paper provides the first firm-level evidence on the impact of terrorism on capital investment in Jammu and Kashmir, combining data from the Annual Survey of Industries (ASI) with district-level conflict measures from the South Asia Terrorism Portal (SATP) for the period 2001–2010. The results demonstrate that terrorism exerts a significant and negative effect on private investment: a one standard deviation increase in terrorist incidents reduces new capital investment by approximately 18 percent. These findings are consistent with the broader literature showing that political violence acts as a substantial deterrent to capital formation (Abadie and Gardeazabal, 2003; Fielding, 2003; Besley and Mueller, 2012). The effects are particularly pronounced in infrastructure-intensive sectors such as construction and electrical equipment, and among large, capital-intensive firms that face greater exposure to project delays and sunk costs. In contrast, some manufacturing sectors

exhibit resilience, potentially reflecting adaptive strategies or government contracts, echoing findings from other conflict economies where selective sectors benefited from public spending or substitution effects (Guidolin and La Ferrara, 2010; Drakos and Kutan, 2003). We also find evidence of a partial recovery effect in lagged specifications, suggesting that firms may gradually resume investment once immediate disruptions subside, a dynamic consistent with adaptive responses documented in Indonesia and Northern Ireland (Nguyen et al., 2021; Besley and Mueller, 2012).

The broader implication of these findings is that terrorism functions as an implicit "tax" on private investment by raising uncertainty, destroying physical capital, and exacerbating financial constraints (Bernanke, 1983; Dixit and Pindyck, 1994; Vaibhav and Verma, 2025). For policymakers, several lessons follow. First, strengthening security and institutional stability is critical to reducing uncertainty and restoring investor confidence, in line with evidence that better governance moderates the economic impact of conflict (Gaibulloev and Sandler, 2008; Meierrieks and Gries, 2013). Second, targeted financial support mechanisms, such as concessional credit lines, investment guarantees, or tax incentives—can help firms overcome short-term liquidity shocks, consistent with the investment-finance literature emphasizing credit constraints in volatile environments (Fazzari et al., 1988; Hubbard, 1998). Third, sector-specific interventions are warranted: infrastructure-dependent industries require greater risk mitigation, while adaptive manufacturing sectors may benefit from policies that channel resilience into broader recovery. Finally, improving access to credit in conflict-affected districts is essential, since higher loan rates compound the adverse effects of terrorism on investment, as also shown in recent evidence for J&K by Vaibhav and Verma (2025).

Taken together, the evidence highlights the dual role of security and economic policy in mitigating the costs of conflict. Reducing violence alone may not be sufficient; complementary financial and institutional interventions are necessary to restore the trajectory of private sector growth. By integrating conflict dynamics into industrial and development policy, governments can better shield firms from the economic consequences of terrorism and promote more resilient patterns of investment in fragile regions.

References

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review*, 93(1), 113–132.

Abadie, A., & Gardeazabal, J. (2008). Terrorism and the world economy. *European Economic Review*, 52(1), 1–27.

Amare, M., Jensen, H. G., & Shiferaw, B. (2024). Conflict and agricultural investment in Nigeria. *World Development*, 165, 106243.

Ministry of Statistics and Programme Implementation (MoSPI). *Annual Survey of Industries (ASI)*, various years. Government of India.

Bandyopadhyay, S., Sandler, T., & Younas, J. (2018). The effects of terrorism on trade and FDI: A meta-analysis. *Journal of International Trade and Economic Development*, 27(6), 723–756.

Besley, T., & Mueller, H. (2012). The economic impact of political violence: Evidence from Northern Ireland. *American Economic Review*, 102(2), 810–833.

Bönte, W., & Gill, A. (2024). Terrorism and export performance: Firm-level evidence from Pakistan. *South Asian Journal of Business Studies*, 13(1), 34–51.

Camacho, A., & Rodriguez, C. (2009). Firm exit and armed conflict in Colombia. *Journal of Conflict Resolution*, 53(3), 363–389.

Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. *Oxford Economic Papers*, 56(4), 563–595.

Drakos, K., & Kutan, A. M. (2003). Regional effects of terrorism on tourism: Evidence from three Mediterranean countries. *Journal of Conflict Resolution*, 47(5), 621–641.

Eldor, R., & Melnick, R. (2004). Financial markets and terrorism. *European Journal of Political Economy*, 20(2), 367–386.

Enders, W., & Sandler, T. (1996). Terrorism and foreign direct investment in Spain and Greece. *Kyklos*, 49(3), 331–352.

Enders, W., & Sandler, T. (2006). *The Political Economy of Terrorism*. Cambridge University Press.

Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity*, 1988(1), 141–206.

Fielding, D. (2003). Political instability and investment in Israel during the Intifada. *Economic Inquiry*, 41(4), 620–632.

Frey, B., & Luechinger, S. (2007). How terrorism affects market volatility: Evidence from Europe. *European Journal of Political Economy*, 23(2), 387–400.

Gaibulloev, K., & Sandler, T. (2019). Terrorism and its impact on regional development and firm behavior. *Regional Science and Urban Economics*, 77, 285–296.

Garriga, A., & Phillips, A. (2023). Organized crime, terrorism, and foreign direct investment: A global analysis. *World Economy*, 46(7), 1802–1820.

Greenbaum, R., Dugan, L., & LaFree, G. (2007). The economic impact of terrorism in Italian regions. *European Journal of Political Economy*, 23(1), 50–75.

Guidolin, M., & La Ferrara, E. (2008). Diamonds are forever, wars are not: Is conflict bad for private firms? *American Economic Review*, 98(2), 197–202.

Guidolin, M., & La Ferrara, E. (2010). The economic effects of violent conflict: Evidence from Africa. *Journal of Economic Perspectives*, 24(3), 27–46.

Hubbard, R. G. (1998). Capital-market imperfections and investment. *Journal of Economic Literature*, 36(1), 193–225.

Institute for Economics & Peace. (2022). *Global Terrorism Index 2022*. Sydney: IEP Publications.

Indian Institute of Advanced Study (IIAS). (2023). *Fiscal impact of conflict in Jammu and Kashmir*. IIAS.

Li, D., Nguyen, Q., Petmezas, D., & Karampatsas, N. (2022). Uncertainty, terrorism, and firm investment behavior. *Journal of Corporate Finance*, 68, 102579.

Miguel, E., & Roland, G. (2011). Long-term impacts of wartime bombings: Evidence from Vietnam. *American Economic Review*, 101(6), 2358–2399.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, 48(3), 261–297.

Mueller, H. (2016). Predation, protection, and productivity: A firm-level perspective. *Working Paper*.

Nguyen, T., Pham, K., & Tran, V. (2021). Corporate investment in times of terrorism: Firm-level evidence from Indonesia. *Emerging Markets Review*, 47, 100761.

Pattammal, A. (2021). Economic impacts of terrorism in Jammu and Kashmir: A thematic analysis. *Journal of South Asian Studies*, 8(2), 150–165.

Reserve Bank of India. *Basic Statistical Returns of Scheduled Commercial Banks in India (BSR1)*, various years.

South Asia Terrorism Portal (SATP). (2023). Annual fatalities in J&K, 2000–2010. Retrieved from https://www.satp.org.

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review*, 93(1), 113–132.

Besley, T., & Mueller, H. (2012). The economic impact of political violence: Evidence from Northern Ireland. *American Economic Review*, 102(2), 810–833.

Fielding, D. (2003). Investment in conflict regions: The case of Northern Ireland. *Oxford Economic Papers*, 55(3), 512–535.

Nguyen, T., Pham, K., & Tran, V. (2021). Corporate investment in times of terrorism: Firm-level evidence from Indonesia. *Emerging Markets Review*, 47, 100761.

Drakos, K., & Kutan, A. M. (2003). Regional effects of terrorism on tourism: Evidence from three Mediterranean countries. *Journal of Conflict Resolution*, 47(5), 621–641.

Greenbaum, R., Dugan, L., & LaFree, G. (2007). The economic impact of terrorism in Italian regions. *European Journal of Political Economy*, 23(1), 50–75.

South Asia Terrorism Portal (SATP). Institute for Conflict Management. Retrieved from https://www.satp.org.

Singh, J. (2013). Terrorism and agricultural investments: Evidence from Punjab, India. *Journal of Economic Development*, 38(2), 55–78.

Talib, A. H. (2007). Fiscal challenges in J&K: A pre-budget review. *Indian Institute of Advanced Study*.

Times of India. (2023). Economic and industrial trends in conflict zones. Times of India.

United Nations Development Programme (UNDP). 2023. *Measuring the Economic Impact of Violent Extremism Leading to Terrorism in Africa*. New York: UNDP. Available at: https://www.undp.org/sites/g/files/zskgke326/files/publications/undp-rh-addis_Measuring_the_Economic_Impact_of_Violent_Extremism_Leading_to_Terrorism_in_Africa.pdf.

Blomberg, S. Brock, Gregory D. Hess, and Athanasios Orphanides. 2004. "The macroeconomic consequences of terrorism." *Journal of Monetary Economics*, 51(5): 1007–1032.

Gaibulloev, Khusrav, and Todd Sandler. 2008. "Growth consequences of terrorism in Western Europe." *Kyklos*, 61(3): 411–424.

Gaibulloev, Khusrav, and Todd Sandler. 2008. "Growth consequences of terrorism in Western Europe." *Kyklos* 61(3): 411–424.

Meierrieks, Daniel, and Thomas Gries. 2013. "Causality between terrorism and economic growth." *Journal of Peace Research* 50(1): 91–104.

Meierrieks, Daniel, and Thomas Gries. 2013. "Causal linkages between domestic terrorism and economic growth." *Defence and Peace Economics*, 24(5): 493–508.

Vaibhav, Vikash, and Akhilesh K. Verma. 2025. "Shrinking pie in times of conflict: evidence from India's Jammu and Kashmir." *Oxford Development Studies*, Published online 20 May 2025. DOI: 10.1080/13600818.2025.2507259.

Islam, Ajaz ul. 2014. "Impact of Armed Conflict on Economy and Tourism: A Study of State of Jammu and Kashmir." *IOSR Journal of Economics and Finance*, 4(6): 55–60. e-ISSN: 2321-5933, p-ISSN: 2321-5925. Available at: https://www.iosrjournals.org/iosr-jef/papers/vol4-issue6/F0465560.pdf.

Times of India. 2025. "Pahalgam attack leads to mass tourist exodus and economic slump in Kashmir." *The Times of India*, April 2025. Available at: https://timesofindia.indiatimes.com/.

Financial Times. 2025. "After Pahalgam massacre, Kashmir's tourism industry collapses." *Financial Times*, April 2025. Available at: https://www.ft.com/content/14f792d4-5807-419f-be9f-5680771b0a18.

Bernanke, Ben S. 1983. "Irreversibility, uncertainty, and cyclical investment." *Quarterly Journal of Economics*, 98(1): 85–106.

Besley, Timothy, and Hannes Mueller. 2012. "The economic impact of political violence: Evidence from Northern Ireland." *American Economic Review*, 102(2): 810–833.

Dixit, Avinash K., and Robert S. Pindyck. 1994. *Investment under Uncertainty*. Princeton: Princeton University Press.

Fielding, David. 2003. "Political instability and investment in Israel during the Intifada." *Economic Inquiry*, 41(4): 620–632.

Gaibulloev, Khusrav, and Todd Sandler. 2019. "Terrorism and its impact on regional development and firm behavior." *Regional Science and Urban Economics*, 77: 285–296.

Pattammal, A. 2021. "Economic impacts of terrorism in Jammu and Kashmir: A thematic analysis." *Journal of South Asian Studies*, 8(2): 150–165.

Modigliani, Franco, and Merton H. Miller. 1958. "The cost of capital, corporation finance and the theory of investment." *American Economic Review*, 48(3): 261–297.

Vaibhav, Vikash, and Akhilesh K. Verma. 2025. "Shrinking pie in times of conflict: evidence from India's Jammu and Kashmir." *Oxford Development Studies*, Published online 20 May 2025. DOI: 10.1080/13600818.2025.2507259.

Li, Dong, Quang Nguyen, Dimitris Petmezas, and Nikolaos Karampatsas. 2022. "Uncertainty, terrorism, and firm investment behavior." *Journal of Corporate Finance*, 68: 102579.

Institute for Economics & Peace. 2022. *Global Terrorism Index 2022*.