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Research Article

Economic Crises and Terrorism: Analyzing Competing Economic Pressures on Terrorism in Russia

Mariya Omelicheva[1] and Clayton Webb[2]

[1]National Defense University and [2]University of Kansas

Abstract

The prevailing academic consensus holds that economic hardship does not motivate terrorism. We argue that this academic consensus is misguided because it assumes a single causal pathway connecting the economy to terrorism. In addition, most tests rely on national-level macroeconomic measures of economic performance that are not well suited to capturing individual-level decision-making processes that motivate people to engage in political violence. We argue that shifts in economic performance have heterogeneous effects on terrorist activity. The suffering caused by economic hardship energizes pre-existing grievances and generates feelings of anger and resentment toward the government, making affected individuals susceptible to violent radicalization. Economic crises also increase opportunities for terrorist recruitment by weakening institutions for coping with the consequences of sharp economic downturns. On the other hand, the economic losses caused by crises reduce the resources available to terrorist groups. These competing pressures are difficult to observe at the national level and are not equally reflected in all measures of economic performance. We test these arguments using a novel dataset of terrorist attacks and terrorist crimes in the Russian federal subjects between 2008 and 2016. We find evidence to support opportunity- and resource-based arguments for terrorism. These findings suggest a need to rethink the academic consensus on terrorism and a need to problematize the theoretical and empirical approaches that brought us to the prevailing consensus.

Keywords: terrorism, political violence, grievance, relative deprivation

Do economic crises precipitate terrorist violence? The 2008 financial crisis rekindled an age-old debate among terrorism and political violence scholars. On the one hand, we know the crisis contributed to the destabilization of political systems and empowered extremists in countries around the world. Multiple European states saw marked increases in popular support for extreme far-right parties, increases in anti-government protests, and other forms of political radicalization (Funke, Schularick, and Trebesch 2016). On the other hand, the 2008 economic downturn had adverse impacts on prominent terrorist organizations. Al-Qaeda, for example, was reported to be experiencing revenue shortages in the wake of the 2008 financial downfall due to the plummeting private donations and strengthened regulations on financial flows (Barrett 2009; Bruno 2010). One could argue that the 2008 financial crisis contributed to violent radicalization, but there is also evidence that the crisis stripped organizations of their capacity to recruit and

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produce violence. How can we reconcile these competing claims?

Many governments around the world submit to a popular perception that terrorism, regardless of its nature, is a consequence of poverty and underdevelopment (Johnston 2001; Tyson 2001; Bush 2002). The scholarship on terrorism finds the opposite to be true. While there is some empirical support for the impact of economic conditions on the nature, type, and geography of terrorism (Blomberg, Hess, and Weerapana 2004b; Benmelech, Berrebi, and Klor 2012), the prevailing academic consensus deems any relationship between economic hardship and terrorism "indirect, complicated, and probably quite weak" (Krueger and Malečková 2003, 119; see also Krueger 2007; Krueger and Laitin 2012).

We argue that there are three problems with this academic consensus. First, from a theoretical standpoint, existing approaches tend to foreground a single causal pathway connecting economic factors to terrorism. These explanations typically feature *either* individual grievances *or* opportunity structures influencing collective behavior. These perspectives are not mutually exclusive. Economic hardship can influence individual behavior *and* organizational opportunities. Second, theoretical constructs often fail to match empirical measures. While theoretical explanations have been premised on individual grievances and relative deprivation, the majority of studies purporting to disprove these arguments rely on macroeconomic indicators that measure national productivity more than individual welfare. Finally, most empirical findings against grievance-based arguments rely on national-level data that only reflect country-level means. These data miss important within-country variation.

We suggest a theoretical framework of motives *and* opportunities that explains the competing pressures that economic crises have on individual radicalization and terrorist group behavior. At the individual level, the differential effects of economic crises can activate the pre-existing grievances and generate a range of powerful emotions—anger, frustration, and resentment—that can make individuals susceptible to extreme ideologies. By undermining the coping mechanisms, economic crises increase opportunities for some individuals' radicalization to terrorism. At the group level, economic crises can create costs for terrorist organizations by reducing the level of available resources that the groups receive from charitable donations or extort from legitimate businesses. There is not a single causal pathway that connects economic crises or economic hardship to terrorism; the pathways are multiple. Moreover, the casual mechanisms that actuate these various causal pathways are not deterministic. Economic crises will not affect all individuals in the same way and will not place the same kinds of constraints on all groups. Instead, our theoretical framework explains the various ways that economic crises can affect the probability of individual and group-level acts of terrorism.

We match the described causal mechanisms with the measures of economic crises at both the individual (micro-) and structural- (macro) level. We test our arguments using a new subnational dataset recording terrorist crimes. The recent economic crises in Russia caused by the decline in the global prices of commodities (2008–2009), falling energy prices, and economic sanctions (2014–2016) offer a unique opportunity to study the multiple causal pathways. We test the micro-motivational pathway using subject-level unemployment and inflation data. We test the macro-constraint pathway using subject-level production and financial data. We find that measures of economic performance related to individual hardship, which are consistent with the individual motive and opportunity arguments, are positively correlated with terrorism and that macroeconomic measures of performance, which are consistent with the cost-based opportunity argument for groups, are negatively correlated with terrorism.

This piece makes a number of important contributions to the literature on the economic determinants of terrorism. On a theoretical level, the competing causal pathways framework highlights how grievance models, which focus on individuals, and opportunity-based theories, which focus on groups, can complement, rather than contrast, with one another. These theories are not mutually exclusive. On an empirical level, we outline how different measures of economic hardship and crisis pertain to the different causal pathways outlined in the theory. Not all measures of economic performance should be treated as substitutes. We also present a new dataset that exploits subnational variation across the Russian federal subjects and captures terrorist activities beyond the acts of terrorist violence that are recorded in other popular data resources. The results presented in this paper stand in contrast to the traditional empirical case made against economic explanations of terrorism. While we would not presume that data from one country could be used to completely overturn a robust finding from cross-national analyses, we believe that the results generated at a higher level of spatial resolution suggest a need to revisit the supposed consensus on the nature of the relationship between economic hardship and terrorist violence. The findings suggest that the consensus may be overstated and offer avenues for future research on the economy–terrorism nexus.

Terrorism and the Economy

Terrorism is the premeditated or threatened use of violence by an individual or group in furtherance of political or ideological objectives through the incitement of fear in a larger audience beyond the immediate victims (Sandler 2015). Finding explanations for why some non-state actors turn to terrorism instead of alternative strategies has been the goal of terrorism scholars for decades. These efforts have generated a prodigious literature on individual attributes of terrorists and mechanisms of terrorist violence.

At the heart of the terrorism literature there is a debate about the economic determinants of terrorism. Famously, Gurr (1970) argued that poverty and inequality can produce feelings of relative deprivation that motivate political violence. When people feel a discrepancy between their "value expectations," the goods and conditions to which people feel entitled, and their "value capabilities," the goods and conditions they are capable of attaining, the resulting discontent motivates collective violence (Gurr 1970, 13). Moghaddam (2005) uses individual feelings of deprivation and discontent associated with lack of social mobility to explain why people are radicalized, why people join terrorist groups, and how groups select targets. This perspective has generated policy debates about the utility of economic policies as means of counterterrorism (Burgoon 2006). Economic deprivation has been a popular explanation for terrorism and other forms of political violence because the central thesis of the argument has an intuitive appeal: happy and productive members of society do not kill innocent people. Despite this, the economic explanation of terrorism has fallen out of favor with academics and experts.

Most terrorism scholars dismiss the economic explanation for terrorism on empirical grounds. Piazza (2006) offers a preliminary look at the economic statistics for the countries with the highest rates of terrorism between 1986 and 2002 to motivate his study of the "rooted-in-poverty" hypothesis (160). He notes that the gross domestic product (GDP) and human development index (HDI) for a majority of the countries are at medium levels or higher. These observations are born out in his statistical findings and he concludes that, "contrary to popular opinion, no significant relationship between any of the measures of economic development and terrorism can be determined" (159). Similar empirical analyses have failed to find a link between terrorism and economic conditions at the national, subnational, or individual levels (Krueger and Malečková 2003; Abadie 2006; Berrebi 2007; Krueger 2008; Choi 2010; Kruger and Laitin 2012; Piazza 2008; Piazza and Hippel 2009). It has also been reported that economic growth can either mediate economic inequality (Hegre et al. 2003) or invite more suicide attacks (Choi 2015). Other research demonstrates that moderate-to-high income countries also experience high levels of politically motivated violence. De la Calle and Sanchez-Cuenca (2012) show that non-territorial insurgencies are more likely to occur in intermediate developed states than in the poorest countries. Enders and Hoover (2012) produce a similar result, showing that acts of transnational and domestic terrorism are more likely to occur as countries develop, particularly when development is accompanied by increases in inequality.

We contend that there are compelling theoretical and methodological reasons for revisiting the prevailing consensus. From a theoretical perspective, the same micro-foundations of mobilization grounded in the deprivation–frustration–aggression thesis typically inform both the socioeconomic and political explanations of terrorist activity. Gurr (1970) argues that human frustration triggered by perceptions of injustice over the distribution of resources *can* give rise to peaceful social movements *or* acts of social disorder, including riots, civil wars, and terrorism. This probabilistic nature of the argument is critical. Proponents of the deprivation–frustration–aggression thesis do not argue that frustration always leads to political violence. People may find alternative outlets for their frustration in criminal acts of social disorder or conventional forms of protest. Some people, on the other hand, can turn to terrorism. In this light, it becomes clear that the absence of terrorism during a period of economic hardship is not sufficient to dismiss deprivation-based arguments. This would be an over-interpretation of the null hypothesis. Instead, we should look for the effects of economic crisis on patterns of terrorism.

The empirical evidence on the impact of different types of grievances is also mixed. While some have found economic measures of individual deprivation to be insignificant predictors of terrorist violence (Thompson 1989), others reported that socioeconomic deprivation at an individual level is a significant factor in explaining terrorism (Blomberg, Hess, and Weerapana 2004a, 2004b). Furthermore, most studies overlook the possibility of multiple causal pathways connecting economic performance to terrorism. The decision-making by terrorist groups cannot be easily reduced to the motivations of individuals.

Extant research on the economic determinants of terrorism also faces a number of empirical limitations. First, many studies use macroeconomic indicators to capture the effects of economic hardship instead of tapping individual-level grievances with more direct

measures. Macro-indicators often do not reflect the material conditions of individuals. Simon Kuznets, one of the first economists to develop comprehensive measures of nations' economic health, argued in 1934 that a country's "[e]conomic welfare cannot be adequately measured unless the personal distribution of income is known."[1] This admonition presaged the ongoing concerns with GDP as a poor substitute for more direct measures of living standards. Second, most studies testing the link between economic performance and terrorism are carried out at the national level. This level of spatial aggregation masks important variation within countries.

Finally, the empirical case is just overstated. Recent decades have produced a number of studies demonstrating a link between economic conditions and terrorism. Economic hardship raises political tensions, increases feelings of injustice, and accentuates social deprivation (Blomberg, Hess, and Weerapana 2004b; Benmelech, Berrebi, and Klor 2012). Poverty becomes a strong predictor of terrorism if it disproportionately affects ethnic minorities (Piazza 2011). The targeting literature also shows that economic underdevelopment can motivate terrorist groups to launch international attacks against more developed states (Hoffman and McCormick 2004; Sandler and Enders 2004; Crenshaw 2007). There has been a strong consensus on the impact of economic crises on other types of violent and "deviant" behavior, such as crime and all-cause mortality (Box and Hale 1988; Deflem 2011; Falagas et al. 2009; Gili at al. 2012). Lastly, the null effects observed in many models of economic performance and terrorism may also be a consequence of incorrect model specification. Enders and Hoover (2012) show that the null effects between poverty and terrorism observed in linear, additive, models are a result of the non-linear relationship between poverty and terrorism. Efforts to dismiss economic explanations of terrorism based on null findings are an exercise in a classic statistical fallacy: a null finding is not evidence *for* the null hypothesis. We believe that alternative measurement strategies and model specifications informed by theory can give us additional leverage on the economy–terrorism nexus.

Economic Crises: Windows of Opportunity for Radicalization to Terrorism

We consider the effects of economic crises on the motives of individuals and opportunity structures of groups involved in terrorist activity. We begin with two critical premises. First, terrorism is an individual- and group-level activity carried out by purposeful actors. There are some "lone wolf" acts of terrorism but most attacks are carried out on behalf of terrorist organizations. Terrorism as an act is typically preceded by the process of radicalization to terrorism, whereby an individual begins accepting the use of violence as a means to reach a specific political/ideological objective. Terrorism, therefore, includes preparation for, recruitment, assistance to, and participation in the perpetration of violent attacks. Many models of sociopolitical instability rely on the concepts of motive and opportunity to describe the range of considerations that influence decisions to engage in political violence. We use these concepts to bridge the gap between the individual and the group and identify the varied causal pathways that link economic crises to terrorism.

Second, terrorism, like all interesting forms of social behavior, is a probabilistic phenomenon. Terrorist recruitment, organizational decision-making, and terrorist attacks are subject to variation, so our theory about terrorism is a story about shifting distributions of possible outcomes rather than a linear, deterministic, story about the consequences of economic crises for all individuals living in communities affected by economic crises or all groups operating within and outside of these societies. What follows should not be interpreted as an exercise in divination: if one experiences economic crisis, they will commit acts of terrorism. Rather, economic hardship increases the probability of terrorism. Some people will never join terrorist organizations or commit acts of terrorism and some people already have. Some terrorist organizations are already resource poor and others have almost unlimited access to resources from state sponsors and illicit economies. It is the distributions of people and groups between these extremes that we are interested in understanding. Our contention is that different forms of economic hardship experienced during economic crises can cause these distributions to shift. With these premises in mind, we outline multiple causal pathways through which terrorism can precipitate and constrain terrorist activity.

The first causal pathway between economic crises and terrorism occurs at the individual level. Individual terrorist behavior is purposeful and driven by a motive—a need or a desire—for engaging in violence. Economic crises can be conceived as a kind of catalyst that energizes the process of violent radicalization. Crises can activate existing grievances or create new stimuli for engaging in violent behavior.

There is evidence from existing research that shows that sudden economic hardship can exacerbate extant

1 Simon Kuznets, 1934. "National Income, 1929–1932." 73rd US Congress, 2nd session, Senate document no. 124, pp. 5–7.

social and political grievances that exist within a society. It has been shown that effects of economic crises are not evenly distributed across society. Economic crises reinforce uneven development and make social and economic inequalities more pronounced. Although, these consequences are partly a result of differences in the resilience of regions affected by economic hardship, the uneven geographies of economic crises are exacerbated by states' austerity policies that affect struggling regions the most. In this way, the sudden changes to individuals' levels of well-being can accentuate their perceptions of injustice making the pre-existing grievances against the state and other socioeconomic and majority groups more salient. Economic crises are man-made disasters. People often blame governments for failing to prevent and adequately respond to them. Alienation arising from discontent over state policies and disconnection from the socioeconomic mainstream has been a consistent source of grievance-driven violence. The acute feeling of injustice attributed to state anti-crises measures and resentment toward the better-off groups can make individuals more vulnerable to the recruitment calls by terrorist organizations. Choi and Luo (2013), for example, show that sudden changes in poverty levels caused by economic sanctions energize economic grievances and motivate acts of international terrorism. A related, cross-national analysis of 152 countries shows a robust relationship between economic sanctions and acts of domestic terrorism through the effect that sanctions have on changes in poverty levels (Choi 2014).

Economic crises can also generate a range of new feelings making individuals more susceptible to terrorist recruitment and radicalization. Sudden and severe changes in individuals' levels of well-being brought about by the loss of economic resources and feelings of uncertainty about their economic futures can generate anxiety and anger. Research in psychology of terrorism underscores that most would-be perpetrators of violence bear feelings of anger and alienation, and a desire for revenge (Horgan 2005, 2009). Such frustrations can affect any walk of life. The pool of potential terrorists is not limited by economic or social status. Our argument is not that poor people are more likely to become terrorists but that sudden changes in economic conditions brought on by economic crises can affect an individuals' states of mind, making them more susceptible to not only "deviant" behavior, including radicalization and terrorist recruitment, but also certain types of crime and all-cause mortality (Deflem 2011; Falagas et al. 2009). Research demonstrates that criminal and terrorist groups have been recruiting from the same pool of people and some individuals may turn to more conventional criminal behavior rather than terrorism (Deflem 2011; De Blazio, Maggio, and Menon 2016; Dix-Carneiro, Soares, and Ulyssea 2018). Former criminals have also been targeted by terrorist organizations. The profiles and pathways of jihadists in Europe suggest that terrorist propaganda—as articulated by the Islamic State—has been aligned with the personal needs and desires of former and current criminals (Basra, Neumann, and Brunner 2016).

The shockwaves of change not only make individuals more susceptible to extreme ideas, but can also make the part of their identity that is perceived to be under threat more salient (Hogg, Meehan, and Farquharson 2010; Maalouf 2011). This thesis has been used to explain a higher rate of homegrown terrorist attacks committed by the second and third generation immigrants and Muslim converts in Europe. Their personal convictions have been shaken by the growing anti-Muslim and anti-immigrant sentiments that arose in the wake of the global financial crisis (King and Taylor 2011). Economic crises have been shown to stimulate waves of xenophobia and feed into tendencies to scapegoat perceived out-groups, particularly in regions with high levels of in-migration. This, in turn, strengthened perceptions of social exclusion, making members of Muslim communities more vulnerable to extremist ideologies and terrorist recruitment. In the context of Russia, the marginalization of labor migrants, in addition to economic exploitation of illegal foreign laborers from Central Asia, has also been identified among the factors making these groups vulnerable to terrorist recruitment (Elshimi et al. 2018). This intuition is also supported by recent research looking at individuals that commit acts of terrorism. Choi (2019) analyzes 4,495 acts of suicide terrorism between 1981 and 2015. He finds that people were more likely to commit acts of suicide terrorism when they perceived national economic conditions as unfavorable.

Again, it is important to re-emphasize that, while these grievances and feelings of anger and resentment *may* facilitate radicalization of individuals, terrorist outcomes are not inevitable. Violence only arises in a subset of social contexts in which discontent can be mobilized and organized. These conditions create opportunities for translating individual motives into action or channeling frustration into acts of violence. Our contention is that acute economic grievances and feelings of frustration, anger, and resentment toward the state and other groups in the society brought on by sudden adverse economic shocks prompt people to behave in ways that they would not in the absence of economic shocks. For some, particularly those who already feel threatened and alienated within certain societies, this behavior can manifest as political violence. By decreasing opportunities for

mitigating grievances and alleviating the feelings of anger and frustration, economic crises can cause rates of political violence to increase. This is the basis for our first hypothesis.

H1: Individual economic hardship caused by economic crisis increases terrorist attacks.

At the group level, terrorist activity is a rational decision inspired by incentives and disincentives. While the direct costs of committing acts of terror may be low, building the infrastructures for recruitment of prospective members and maintaining terrorist networks are major expenses for terrorist groups (Hutchingson and O'Malley 2007). Financial Action Task Force (FATF) found that, in the context of Russia, the remuneration for each individual recruited by ISIS was between US$500 and US$800 (FATF 2019). Many groups promise monetary, or other tangible, benefits to prospective members in addition to funding recruitment networks. There can be costs associated with facilitating the initial steps of participation in a terrorist group (e.g., transportation, documents' forgery), establishing an independent cell affiliated with a terrorist organization, or procuring explosives.

Economic downturns affect capabilities of both legitimate and illegitimate groups to organize and carry out their operations. Macroeconomic hardships reduce disposable income of the capital owners that can be channeled (or extorted) to support the operations of terrorist groups in the form of charitable donations, front companies used in money laundering schemes, or taxation of legitimate businesses. The end of the Cold War led to a realignment of economic and political power across the globe that impaired state-sponsorship as a primary means of terrorist funding. While a handful of states around the world, most notably, North Korea and Iran, continue to fund terrorism, most terrorist groups and networks have turned to a range of illicit and criminal activities, charitable donations, and extortion to raise revenue for their operations.

Donations by diaspora and foreign support have been a common source of funds for terrorist groups worldwide. Foreign influence and funding also played a role during the Chechen wars. However, foreign support of insurgency and terrorism in Russia dwindled in the 2000s and did not constitute the main financial streams of terrorist groups during the period under study. The brutal, but effective, counterterrorism campaigns of the Russian government and the Moscow-backed regime of Ramzan Kadyrov in the Chechen republic have drastically reduced revenue streams from the sale of oil in illicit markets and drug trafficking. Events unfolding in the Middle East substantially reduced foreign financial support for Russian militant groups. These developments led to important changes in fundraising methods, turning the Russian militants toward greater reliance on extortions and blackmailing of businesses (Bolotnikova 2012).

The reduction in terrorist groups' revenues affects their capacity to procure arms, recruit and train new members, and supply services that substitute for state policies (Chen 2003; Gill and Lundsgaarde 2004). This diminishes community reliance on terrorist organizations and reduces the benefits for prospective members to join terrorist groups. Terrorist groups may respond to this reduction in capacity by scaling down or offshoring their operations to locations where their limited resources will have more effect. Again, not all terrorist organizations will be affected the same way but economic crises can put fiscal pressure on terrorist organizations that can affect their operations. This intuition informs our second hypothesis.

H2: Macroeconomic hardship caused by economic crises will reduce terrorist attacks.

To summarize, economic crises have mixed, and competing, effects on terrorist activity. Individual economic hardships can trigger grievances and psychological distress making individuals more susceptible to violent action. However, by diminishing terrorist groups' revenues, macroeconomic hardships will reduce their capacities to recruit and train new members. In the next section, we explain how the Russian case offers an opportunity to test these pathways, describe the data used in the analyses, and discuss our modeling strategy.

Research Design

Economic Crisis and Terrorism in Russia

We study the impact of economic crises on terrorism using pooled time series cross section (TSCS) data from the eighty-five Russian federal subjects between 2008 and 2016.[2] Russia is an ideal sample for our analysis because it experienced two major economic crises during this time period. The first economic crisis occurred in 2008–2009. The international financial crisis destabilized Russian financial markets. In 2008 alone, the Russian stock market lost more than $1 trillion (Faulconbridge 2008). At the same time, a collapse in world oil prices precipitated a sharp decline in Russian exports. Oil and gas account for 60 percent of Russian exports and 70 percent of Russian export income. This instability was exacerbated by

2 See the online appendix for details on federal subjects.

economic uncertainty created by Russia's invasion of Georgia in August 2008, which stimulated capital flight. Taken together, these factors produced a 7.9 percent contraction in GDP in 2009, the highest among the G20 countries (Sutela 2010). This was a shocking reversal for an economy that had been growing at 7 percent prior to 2008. According to the World Bank, this strong macroeconomic base likely prevented more severe economic and financial losses (World Bank 2008).

The second economic crisis occurred during the last three years of the sample, 2014–2016. This period was marked by a substantial amount of micro- and macroeconomic instability. The crisis was triggered by economic sanctions; Russia's counter-sanctions; and another collapse of global oil prices, which had marginally recovered over the intervening period. The decline in oil prices eroded the base of Russia's economic recovery. Russia's GDP declined by 0.6 percent in 2014 and by 2.8 percent the following year. The sanctions imposed against Russia by the United States, the European Union, Japan, Australia, and other European countries in 2014 triggered another large-scale exodus of financial capital from Russia. There was a $47 billion reduction in foreign direct investment (FDI) in 2014 and a further decrease of $16 billion in 2015. Russia's counter-sanctions on European and American foods put additional pressure on Russian exports. The value of the Russian ruble fell by 76 percent against the US dollar in 2015 and the prices of basic consumer goods increased by 30 percent.

These periods of economic crisis put significant strain on the Russian population. The economic shocks of 2008 and 2009 prompted economic intervention from the Russian government that softened the strain on the economy, but at substantial cost. The Russian government spent $118 billion, 75 percent of the available reserves, bailing out banks and aiding faltering companies (Stratfor 2018). These expenditures limited the ability of the Kremlin to respond to the second crisis. In 2014, Russia's economy plummeted in a more protracted and deeper recession. By 2015, the percentage of those living below the official subsistence level increased from 13.8 to 15.9 percent. During the same period, personal earnings dropped by 5.4 percent, real wages decreased by 9 percent, and wage arrears jumped by 11.3 percent (Interfax 2018). One quarter of Russian companies cut salaries in 2016 and many companies started skipping payments to their employees altogether (Stratfor 2017). These trends culminated in a significant, and sudden, increase in poverty levels across the country.

The cross-sectional variation among the federal subjects is an important feature of the data because the economic crises did not have uniform effects across the Russian provinces. While some provinces experienced substantial economic decline, others only experienced marginal economic volatility. As pressure on Russian budgets mounted during the second financial crisis, Russian spending became increasingly uneven. The largest budget cuts came to programs and to regions that have not been traditional bases of support for the Kremlin (Kluge 2019). In 2016, the government froze the indexation of pensions and locality payments to teachers and doctors in rural areas. The federal expenditures on housing maintenance and utility subsidies declined by 37.8 percent in 2016. Expenditures on education went down by almost 4 percent with primary education absorbing the largest cut, nearly 67 percent, in 2016 (The Center for Economic and Political Reforms 2015). Many federal subjects were also forced to make additional cuts to social, educational, and welfare programs on top of these federal spending reductions. By the end of 2016, only ten of the eighty-five federal subjects were classified as "financially stable" by the Russian finance ministry (Stratfor 2017). All of these districts were either major commodity production areas or metropolitan zones with large tax bases. Where one lived in Russia during the financial crises had important consequences for how one experienced those financial crises. This variability in economic performance, industrial output, and individual socioeconomic well-being is masked by country-level data. We exploit this variation in our sub-national analysis.

Russia also experienced a considerable amount of political instability during this period. According to the Global Terrorism Database (GTD), there were 1,079 unambiguous terrorist incidents in Russia between 2008 and 2016. According to the data from Russia's Office of the Prosecutor General, the number of registered crimes of "terrorist character" in 2014 was almost double the total from the previous three years. The number increased from 1,128 in 2014 to 1,538 in 2015 and again to 2,227 crimes in 2016. In a period where collapsing oil prices and economic sanctions put pressure on the Russian economy, we observed a striking increase in the rate of terrorist crime and terrorist violence. Prevailing wisdom would advise that these patterns are coincidental. Our hypotheses about the motives and opportunities for terrorism suggest that this surge in terrorist activity across Russia is associated with sudden changes in economic conditions. If this is true, we should observe higher rates of terrorist activity in the region's most adversely affected by Russia's twin financial crises.

Measuring Varieties of Terrorist Activity

We use two measures of terrorism. We contend that these measures reflect distinct classes of terrorist activity. The first measure captures terrorist violence. The acts of

violence catalogued in the GTD are collected based on news stories published by information agencies and media outlets. For a "media-worthy" incident to be regarded as an act of terrorism, it must meet three criteria: the act must have specific goals, it must be clear that the act is intended to intimidate or coerce a broader audience, and the violence must fall outside that which is permitted by international humanitarian law.

The GTD only records information about completed or attempted terrorist attacks. This is both a strength and a weakness. The utility of the GTD measure, for our purposes, is that an attack must be (1) carried out or attempted (and failed) and (2) subsequently covered by the national media such that the events can be perceived and processed by a broader audience. An attack is always an organizational output. Even the "lone wolf" perpetrators of terrorist acts get mobilized by the concerted efforts of terrorist groups spreading their violent propaganda. Attacks represent the outcome of a complex set of processes that begins with the radicalization of the individual, the resolution of collective action pressures, the mobilization of resources toward planning and targeting, and the eventual execution of the attack. If our argument about capacity is correct, these organizational outcomes should be positively related to macroeconomic measures of economic activity because firms, individuals, and organizations have more lootable resources on hand during periods of economic prosperity and are less flush with resources during periods of economic hardship.

The GTD data are particularly useful for the Russian case because they reflect several important developments that took place during this time period in Russia. By different estimates, between 900 and 2,800 Islamic fundamentalist fighters left Russia for Syria. The exodus of foreign fighters began as early as 2011 and continued throughout the duration of the crisis. Several cells within the Caucasus Emirate, an umbrella organization unifying various Islamist groups in the North Caucasus, pledged allegiance to ISIS. This fragmented and weakened the Caucasus Emirate. Furthermore, in advance of the economic crisis of 2014, the Russian government put in place heightened security measures associated with the Sochi Olympics. The terrorism trends captured by the GTD data are affected by these contextual factors. The GTD data, therefore, represent a conservative test for our argument.

The weaknesses of the GTD data, for our purposes, lie in the types of activity the data miss. The GTD does not record foiled terrorist incidents, assistance and abetting of terrorism, false threats of terrorism, or other forms of radicalization in the population. These are individual-level terrorist outcomes and behaviors that represent changes in individual attitudes about engaging in terrorist activity that have not been aggregated through organizations into successful acts of terrorist violence. It is not surprising, given the outcome-oriented nature of the GTD, that these micro-level activities are not always reflected in the GTD data. We endeavor to capture these micro-level phenomena by exploiting an alternative data resource.

The Russian government classifies statistics on terrorist activity into two broad categories. The first category, crimes of a "terrorist nature," includes criminal activities banned by Articles 205–208, 288, and 360 of the Russian Federation Criminal Code. These crimes include the commission of terrorist acts, abetting terrorist activity through involvement, inducement, and recruitment for terrorist activity, and attacks on political figures and individuals protected by international law. The acts recorded in the GTD conceptually correspond to crimes of a "terrorist nature." Another category, crimes of "terrorist character," is broader and includes organizing or participation in an illegal armed formation, making a public call for a terrorist act, funding terrorism, threatening terrorism, conspiring to commit terrorism, and planning a terrorist attack. These data also include incidents where the Russian government identified and detained foreign terrorist fighters. Given the broader range of activities, the annual rates of these crimes within the federal subjects are much higher than the rates of incidents coded in the GTD.[3]

Some have expressed concern about using data collected by the Russian government. The criticism rests on the belief that Kremlin officials would doctor these data for political purposes in the way that Soviet officials would willfully misrepresent economic and social conditions. This belief is misguided for a variety of reasons. First, the Russian government is not the Soviet government. While the Russian government has its problems, the notion that the bureaucratic systems in Russia have not evolved in the last forty years is an impudent belief based more on outdated superstitions than evidence. The key aggregate national statistics provided by major international organizations, such as the World Bank and the IMF, generally rely on official sources. If we dismiss Russia's official data out of hand, we should discontinue using measures of the population, the economy, and others commonly included in statistical analyses that are also provided by the Russian government. Beyond this, it is hard to imagine a scenario where the Russian government not only "cooked the books" but also generated

3 Overall, though, the GTD data and Russia's terrorism crime data are correlated at $r = .43$.

terrorism crime data that systematically co-varied with regional economic variables. This would require a truly vast conspiracy. If the data were misreported or misrepresented, it is more likely that this misrepresentation will produce null results rather than co-variation with our measures of regional economic performance.

Before moving forward, we think it is important to acknowledge one of the limitations of our measurement strategy. While the subject-level data used in our analyses represent a major improvement over extant research that relies on national-level aggregates, our measures are still not direct measures of individual radicalization or group level activity. We can only observe patterns in terrorism outcomes. We do not have access to data on the recruitment activities of specific organizations or accounting data relevant to their budgets and operations. As such, we cannot directly test whether individuals that joined terrorist organizations during the period of analysis did so as a consequence of frustration associated with economic hardship nor can we verify that economic hardship lead to revenue shortfalls for specific groups. We discuss the prospects for this kind of micro-level research below. For now, we think it is sufficient to acknowledge this limitation of our research design. To be sure, these criticisms apply to most, if not all, of the research described above. In the absence of recruitment and accounting data, we believe leveraging the subject-level attack and crime data can give us purchase on the causal mechanisms outlined in our theory.

Measuring Micro- and Macroeconomic Crises

Our theory rests on the argument that economic crises have heterogeneous effects on terrorist activities. To test our theory, we need to identify the measures of economic performance best suited to capture the various causal pathways outlined in our theory. There is a vast set of measures we could choose from to conduct our analyses. Measures like inflation, unemployment, and GDP are often treated as interchangeable by analysts working with national level aggregates. What the preceding discussion about the uneven consequences of the various economic crises makes clear, however, is that the different economic measures are likely to reflect different types of economic pressure that have different bearings on the various causal pathways outlined in our hypotheses. We use four variables of federal-subjects' levels of economic performance: unemployment, inflation, gross regional product (GRP), and financial result.[4]

4 All province-level data come from Russia's Federal State Statistics Service.

The first two variables, federal subject-level unemployment and inflation, are measures intended to capture individual economic hardship created by the different periods of economic crisis. Unemployment is the annual average rate of unemployment in each region relative to the working age population. Inflation is measured by the annual changes in the cost of a fixed set of Russian consumer goods and services.[5]

GRP and financial result are measures intended to capture macroeconomic hardship. GRP is the federal subject analogue to the log of population-weighted gross national product (GNP). GNP is equivalent to GDP but includes net income from abroad as well. GDP is the sum of individual consumption expenditures, investment, government expenditures, and net exports (exports− imports). We include GRP because it is the nearest available equivalent to the measure of national economic activity that could be developed for the federal subjects. Financial result is an alternative measure of aggregate economic activity that is less complicated. Financial result is the net profits (profits − losses) of all economic enterprises within a subject in a given year. Financial result is measured in billions of rubles.

Control Variables

In addition to our key dependent and independent variables, we have included a number of control variables to capture important political and demographic phenomena identified as contributors to terrorist activities. Political regime type has been identified as one of the determinants of terrorist activities. Democratic governments are more likely to be the target of, or are more likely to facilitate, terrorist activities than authoritarian regimes (Piazza 2013; Wilson and Piazza 2013). Threatened by terrorism, non-democratic regimes can claim unprecedented authority to regulate religious institutions and media and carry out extensive counterterrorism sweeps in the name of national security. In these circumstances, the disgruntled individuals may be deterred or precluded from engaging in political violence by the high opportunity costs of engaging in terrorist activities in non-democratic regimes. Although Russia, as a country, is often characterized as "non-democratic," there is significant variation in the levels of electoral *democratic-ness*

5 In Russia, the basket of goods used in calculating inflationary processes includes eighty-three items, including thirty food items (e.g., eggs, milk, chicken, flour, etc.), forty-one manufactured non-food items (clothing items, shoes, bedding items, gasoline, furniture, and personal hygiene items), and twenty-three types of services (e.g., heating and cooling, water, electricity, etc.).

across the federal subjects. We measure this variation with the democracy index (*Democracy*) developed by Titkov (2016). It is a modified Vanhanen democracy index adapted to the post-Soviet context (Vanhanen 1993a, 1993b). The index is calculated by the following formula:

$$Democracy = Contest \times ((Voice + Exit)/2), \quad (1)$$

where *Contest* is the level of political competition during elections calculated by Laakso and Taagepera (1979) as an effective number of parties; *Voice* is the measure of degree of electoral participation; and *Exit* is the percentage of votes "against all." The three measures of the index are converted into five-point scales and the ratings are combined to produce the *Democracy* measure. We calculated the index using the average scores from the regional parliamentary elections and elections to Russia's Duma. The elections outcome data were taken from the Central Election Commission of the Russian Federation.[6] The subject-level democracy measure also allows us to capture differences in the way the subjects are managed by the national government. If the rate of terrorist crimes is higher in subjects that are viewed unfavorably by Moscow, this variation will be captured by the measure of democracy.

We include a number of variables to account for demographic pressures that could influence the rate of terrorist attacks and terrorist crimes. In Russia as well as in other parts of the world, greater in-migration has been discursively linked to more crime and violence. This narrative has been fueled by the large numbers of the Central Asian labor migrants recruited from Russia by ISIS to fight in Syria and Iraq. The available details on the citizenship of the alleged perpetrators of violence in Russia are spotty. According to the EU Terrorism Situation and Trends reports, Central Asians perpetrated only one of the 153 recorded terrorist attacks in Russia. The GTD placed the number of terrorist acts committed by Central Asians in Russia at three (as reported in Lemon, Mironova, and Tobey 2018). We, therefore, remain agnostic about the relationship between net migration and terrorism in Russia's territories but include a variable to capture the potential effects of migration. *Migration* is the net ratio (inflows−outflows) of foreign nationals coming into the different districts. *Education* is the total number of people living within a federal subject that are students in a Russian university, *Sex-Ratio* is the number of women per 1,000 men in a subject, and *Urban* is the percentage of the population residing in cities.

6 The Central Election Commission of the Russian Federation, http://www.izbirkom.ru/region/izbirkom.

The rate of terrorist crimes is also likely to be related with the level of economic development. We include two measures of economic activity to proxy for levels of economic development. Unlike the aforementioned measures of economic performance that vary substantially during and between the periods of economic crises, these measures capture cross-subject variation in absolute deprivation. Both of these measures relate to the economic infrastructure within the different federal subjects. We include *Freight* turnover as a measure of preexisting levels of economic development and transportation infrastructure. *Freight* turnover measures the cargo turnover from all forms of automobile transport of all types of property and goods in millions of tons per kilometer. More developed regions have higher freight turnover. We also include a variable that captures access to the internet, *Internet*. More developed areas will have more bandwidth.

Modeling Varieties of Terrorist Activity

Our dependent variables are federal subject-year counts of terrorist events (GTD) and terrorist crimes (Russia). Ordinary least squares regression produces inconsistent and inefficient estimates of discrete event counts (King 1989). Poisson regression is a natural alternative to consider but Poisson regression models assume the means and variances of the outcomes are equal. Our data do not meet this assumption. The mean for the GTD variable is 1.54 and the variance is 82.22. The mean for the Russian crime variable is 21.58 and the variance is 11,230.[7] The data are overdispersed. A negative binomial model is usually the next best option to deal with this overdispersion, but the nature of the overdispersion creates additional complications.

The terrorism variables are overdispersed, in part, because of the large number of zeros in the data. In the GTD data, zeros are recorded for 86.63 percent (661 of 763) of the subject-years. In the Russian crime data, zeros are recorded for 39.15 percent (287 of 733) of the subject-years. This variation is consistent with dual-regime data generating processes. There is one set of factors that determines the likelihood that a subject-year will experience any terrorist activity and another set of factors that determines the rate of terrorist activity in a subject-year. A two-stage model can be used to capture this kind of variation. We use zero-inflated negative binomial regression models to model the rate of subject-year terrorist activity. The negative binomial distribution is selected for the second stage because, even when the zeros are removed from

7 See section 1 of the online appendix for more detailed information about the outcome variables.

the data, the variables are still overdispersed.[8] The two-stage formulation also accounts for the nonlinearities inherent in the data.[9] We are interested in the effects of economic hardship on the rate of terrorist activity. For the sake of simplicity, and because many of the controls are slow moving variables that should not affect that year-to-year rates of terrorist activity, we include the controls in the first-stage, probit, selection equation and include the economic crises variables in the second-stage count equations. The coefficients from the first stage can be interpreted as affecting the probability that a subject-year stays in the "perfect states" where terrorist events are extremely rare, so negative (positive) coefficients represent increasing (decreasing) probability of observing terrorist activity (Lambert 1992, 1). The results are presented in the next section.

Results

Table 1 presents the results for the zero-inflated negative binomial regression of GTD events on economic crises. Table 1 has four panels. The top panel shows the coefficients and standard errors for the five count equations in columns 2–6. The coefficients can be interpreted as the change in the log of the expected count associated with a one-unit change in the regressor. The seventh column displays the incidence rate ratios (IRR $= \exp(\beta)$) associated with the coefficients for the regression presented in column 5. These ratios can be interpreted as the proportional change in the rate of events associated with a one-unit change in the regressor. The second panel shows the probit coefficients and standard errors for the first-stage inflation model. The $\log(\alpha)$ parameters in the third panel are the logs of the dispersion parameters, α. If $\alpha = 0$ and $\log(\alpha) = -\infty$, the negative binomial count equation reduces to a Poisson count equation. We reject that null hypothesis in every model. The final panel gives the number of observations used in each regression and two measures of model fit, the Akaike information criteria (AIC) and Bayesian information criteria (BIC). The information criteria suggest that the first and fifth models are the best-fitting models among the group. The unemployment model provides the best prediction of GTD terrorism compared to the other single indicator models, but the model that includes all of the economic indicators performs as well or better than the model that only includes unemployment. Given the split in criteria, we defer to the fifth model for the substantive interpretations of the effects.

The results presented in table 1 provide mixed evidence for our hypotheses. This is consistent with our expectations. The coefficient for unemployment is positive and statistically significant in the first and fifth models. According to the IRR, a 1 percent increase in unemployment was associated with a 28.9 percent $((\exp(\beta) - 1) \times 100)$ increase in terror events. The coefficient for inflation is negative and significant in the second model but does not reach conventional levels of significance in the fifth model. The GRP-PC coefficient is not significant in either model. Finally, the coefficient for financial result is positive and statistically significant in model 5. A one billion ruble increase in the net profits of the industries in a federal subject is associated with a 1.4 percent increase in the rate of GTD terror events. This effect is modest, but it is consistent with our second hypothesis.

The second panel of table 1 shows the probit coefficients from the inflation equation. These coefficients are interpreted as the effects of the variables on the probability of not observing any terrorist events. The variables in the inflation equation are included as controls. We did not outline specific hypothesis or expectations for these variables, but the results shed light on the factors that are related to terrorist activity in our sample. The coefficients for the democracy measure are positive and statistically significant in all of the models. The positive coefficients mean that more democratic subjects have a higher probability of experiencing zero terrorist incidents. The coefficient for the freight turnover variable, included as a proxy for economic development, is negative and statistically significant. This indicates that terrorist activity was more probable in more developed areas. This result is intuitive. There are more targets in more developed areas, attacks are more likely to draw a broad audience, and there are more means of transit terrorist agents can use to reach their targets. The other proxy for economic development, internet access, has the same sign in three of the five models but the effects are not significant. The coefficients for the demographic variables are mixed. The coefficients for migration and university students are negative and statistically significant. The migration result suggests that province-years with greater in-migration experience more terrorist activity. The university student result may reflect that youths are more likely to be radicalized, especially during periods of economic distress. One might

8 The mean for the non-zero GTD counts is 11.54 and the variance is 503. The standard deviation is 22.44, suggesting that a normal distribution is still inappropriate in this circumstance. The mean for the non-zero Russian crime counts is 35.47 and the variance is 17,979.

9 We discuss our approach to model selection and demonstrate the robustness of our inferences to alternative model specifications in section 4 in the online appendix.

Table 1. Economic Crises and Terrorism (GTD)

	(1)	(2)	(3)	(4)	(5)	IRR
Unemployment	0.156***				0.255***	1.289***
	(0.038)				(0.059)	(0.076)
Inflation		−0.227***			−0.143	0.866
		(0.057)			(0.091)	(0.079)
GRP-PC			−0.168		0.008	1.007
			(0.168)		(0.161)	(0.161)
Financial result				−0.002	0.015***	1.014***
				(0.003)	(0.005)	(0.005)
Constant	−0.389	3.695***	2.562**	1.603***	−0.353	
	(0.428)	(0.606)	(1.022)	(0.238)	(1.646)	
Democracy	0.170***	0.126**	0.135**	0.142**	0.171**	
	(0.064)	(0.052)	(0.057)	(0.056)	(0.078)	
Freight	−0.000***	−0.000***	−0.000***	−0.000***	−0.000**	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Urban population	0.046***	0.046***	0.048***	0.046***	0.050***	
	(0.014)	(0.013)	(0.013)	(0.013)	(0.019)	
Gender ratio	0.000	0.001	0.001	0.001	−0.000	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	
Migration	−0.006**	−0.005**	−0.005**	−0.005**	−0.007**	
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	
University students	−0.002**	−0.002**	−0.002***	−0.002***	−0.002**	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Internet	−0.001	−0.002	0.001	0.001	−0.007	
	(0.007)	(0.006)	(0.006)	(0.006)	(0.008)	
Constant	−3.070	−3.997	−3.870	−3.635	−2.927	
	(2.829)	(2.554)	(2.638)	(2.580)	(3.330)	
Log(α)	1.865***	1.752***	1.954***	1.952***	1.898***	
	(0.203)	(0.254)	(0.226)	(0.228)	(0.194)	
N	733	729	732	733	729	
AIC	1,058.632	1,077.994	1,089.255	1,090.848	1,050.197	
BIC	1,109.200	1,128.502	1,139.809	1,141.417	1,114.481	

Notes: The top panel shows the coefficients from the negative-binomial count equation. The final column shows the incidence rate ratios for the coefficients from the fourth equation in column 4. The bottom panel shows the results from the probit transition equation. The standard errors for the transition and count coefficients are shown in parentheses. The bottom panel shows the sample size and the fit criteria. $^{***}p < .01$, $^{**}p < .05$, $^{*}p < .1$.

argue that the significant effect of university students reflects that universities tend to be located in population centers, but this effect should be captured by the urban population variable. The effect of urban population is positive and statistically significant. This result is somewhat surprising. The positive coefficient in the inflation equation suggests that terrorist events were less likely to occur in the more urban subjects.[10] The effect of urban population is the partial effect of urban population controlling for the level of development in an area. That is, holding the level of freight transit at its mean, more urban areas were less likely to be targets of terrorist violence. The intuition behind the result is that, among the urban areas, terrorists are more likely to target locations with more transit opportunities. Another explanation has to do with the geography of terrorist incidents in Russia. Out of the total of 1,079 violent incidents registered by

10 This result also could reflect the increased security associated with the Sochi Olympics. We estimated a series of auxiliary models to determine whether these variables are picking up the same variation. The results can be found in section 2 of the online appendix. The correlation among the variables is modest, $r = .207$. When either freight turnover or urban population are removed from the model, the significance of the other variable falls out, suggesting that each variable is necessary to observe the effect of the other. The model fit is also best for the model that includes both variables.

Table 2. Economic Crises and Terrorism (Russia)

	(1)	(2)	(3)	(4)	(5)	IRR
Unemployment	0.252***				0.316***	1.371***
	(0.022)				(0.029)	(0.040)
Inflation		0.206***			0.268***	1.306***
		(0.043)			(0.040)	(0.051)
GRP-PC			−1.117***		−0.742***	0.476***
			(0.077)		(0.088)	(0.041)
Financial result				0.000	0.012***	1.012***
				(0.003)	(0.003)	(0.003)
Constant	0.620***	0.393	9.364***	2.974***	1.046	
	(0.182)	(0.457)	(0.487)	(0.103)	(0.897)	
Democracy	0.314***	0.186	225.692	0.268**	0.130	
	(0.087)	(0.141)	(9,714.468)	(0.108)	(0.140)	
Freight	−0.000	−0.002*	0.029	−0.000	−0.002**	
	(0.000)	(0.001)	(1.325)	(0.000)	(0.001)	
Urban population	0.017	0.054**	−22.054	0.034	0.059**	
	(0.018)	(0.024)	(941.202)	(0.025)	(0.028)	
Gender ratio	−0.004	−0.038**	2.246	−0.005	−0.027***	
	(0.004)	(0.015)	(94.221)	(0.005)	(0.010)	
Migration	−0.015***	−0.018**	−3.077	−0.015***	−0.024***	
	(0.004)	(0.007)	(129.536)	(0.005)	(0.009)	
University students	0.000	0.002	1.499	−0.000	0.001	
	(0.002)	(0.003)	(64.614)	(0.002)	(0.003)	
Internet	−0.036***	−0.029	−7.150	−0.035***	−0.034*	
	(0.011)	(0.020)	(303.617)	(0.012)	(0.018)	
Constant	0.801	35.732**	−4,071.919	1.935	25.126	
	(4.323)	(15.067)	(172,813.927)	(6.229)	(11.010)	
Log(α)	1.345***	1.617***	1.458***	1.610***	1.130***	
	(0.070)	(0.062)	(0.059)	(0.075)	(0.067)	
N	700	657	695	700	657	
AIC	3,735.035	3,382.158	3,655.269	3,874.795	3,124.611	
BIC	3,785.097	3,431.522	3,705.252	3,924.857	3,187.439	

Notes: The top panel shows the coefficients from the negative-binomial count equation. The final column shows the incidence rate ratios for the coefficients from the fourth equation in column 4. The bottom panel shows the results from the probit transition equation. The standard errors for the transition and count coefficients are shown in parentheses. The bottom panel shows the sample size and the fit criteria. $^{***}p < .01$, $^{**}p < .05$, $^{*}p < .1$.

the GTD in Russia between 2008 and 2016, 983 terrorist attacks took place in the republics of North Caucasus. The percentage of urban population in Chechnya, Dagestan, and Ingushetia—the three republics that account for the majority of terrorist incidents in Russia hovered between 34 and 44 percent between 2008 and 2016 (the mean for Russia's urban population is 69.8 percent). The gender ratio variable does not meet conventional levels of significance in any of the models.

Table 2 presents the results for the models of Russian terrorist crime. These results provide more support for our hypothesized relationships. The fifth and final model in table 2 is unambiguously the best-fitting model among the five. Unlike the GTD terrorism results, the inflation model (model 2) performs best among the single indicator models. For the sake of brevity, we will focus on the interpretation of the results from this final model. The coefficients for inflation and unemployment in the fifth model in table 2 are consistent with hypothesis one. Both measures of individual economic hardship are positively related with the rate of terrorist crime. A one percent increase in unemployment increases the rate of terrorist crime by 37 percent and a one unit increase in inflation increases the rate of terrorist crime by 30 percent. The fact that the effect size for unemployment is almost 10 percent greater than the effect size of unemployment in the GTD models reflects the importance of accounting for the other forms of terrorist activity in the Russian

crime data. This point is also reflected in the change in the sign and significance of the inflation variable. The effect of inflation on terrorist crime is robust to specification in table 2, the coefficient is positive and significant in models 2 and 5.

The coefficients for the GRP-PC and financial results variables in the fifth model of table 2 provide mixed evidence for our hypotheses. The financial result effect is positive and statistically significant. This finding is consistent with hypothesis 2 and the finding presented in table 1. While we had no expectation that levels of macroeconomic performance should be strongly correlated with individual levels of terrorism, it is not entirely surprising to see that these measures exhibit explanatory power across the causal pathways. The coefficient for GRP-PC is negative and statistically significant in models 3 and 5. Depending on the specification, a one unit increase in GRP-PC decreases the rate of terrorist crime between 52.4 percent (model 5, $(\exp(-.742) - 1) \times 100$) and 67.3 percent (model 3, $(\exp(-1.117) - 1) \times 100$). This result is consistent with hypothesis 1, but we included GRP-PC in the analysis to serve as an analogue for GNP, a measure of macroeconomic activity. What can we make of this finding? The negative effect likely reflects the difference between GRP and GNP. The components of the measure are the same, but the contribution of the components to the variation in the measure differs. Consumer and government spending in the federal subjects likely play a bigger role in the measure of GRP than the national analogues (GNP and GDP) because variation in net exports and income from investment are going to dominate the more modest personal and government capital expenditures at the national level. In this light, the GRP-PC result is consistent with what we know about the changes in Russian government spending and micro-level economic activity that we described above. We resolve that the result for GRP-PC may provide additional support for hypothesis 1 and that the inconsistency in the effect of GRP-PC between tables 1 and 2 has more to do with the peculiarities of the measure than shortcomings with our theory.

The results from the transition equations in table 2 are generally consistent with the transition equation results presented in table 1, with some notable exceptions. The results for democracy (positive), freight (negative), urban population (positive), and migration (negative) are consistent with the results presented in table 1. One difference between the two sets of results is that the coefficients for university students are negative in table 1 but do not meet conventional levels of statistical significance in any of the models presented in table 2. The results for the internet variable are also different. The coefficients do not meet conventional levels of significance in table 1 but are negative and significant in table 2. Internet is a proxy for economic development. The negative and significant coefficients are consistent with the results from the freight turnover variable; terrorist crimes are more probable in the developed federal subjects.[11] That both variables are negative and significant may also reflect that internet access facilitates some of the terrorist crime captured in the Russian crime data. The most notable difference in the inflation equations presented in table 2 is the set of results for the gender-ratio variable. Due to space constraints, we leave a nuanced discussion of this result to the online appendix.

The results presented in tables 1 and 2 are sufficient for hypothesis testing, but the substantive implications of the findings are not readily apparent from the presentation. Figure 1 presents the percent changes in the expected rates of terrorist events and crimes associated with changes over the range of our economic variables. There are four plots in the array. The two plots in the first row of the array show expected rates for unemployment and inflation. The two plots in the second row of the array show the expected rates for GRP and financial result. The x-axis of each plot shows the percent changes from the minimum of each variable. The y-axis of each plot shows the percent change in the rate of terrorist activity. The triangles are the expected changes in the rates of activity associated with the changes in the economic variables and the vertical lines are 95 percent confidence intervals for those expected changes. The expected rates of terrorist events (GTD) are shown in gray and the expected rates of terrorist crimes (Russia) are shown in black.

The patterns in figure 1 array reflect the results presented in tables 1 and 2. Changes in both measures of micro-level economic hardship, unemployment and inflation, produce positive increases in the rates of terrorist crimes. The rate of terrorist crime more than doubles, 122.65 percent increase, when the unemployment rate moves from its minimum in the sample to the 10th percentile and the percentage increases further as the change in the rate of unemployment increases. The pattern is the same for the GTD events variable but the magnitudes of the effects are smaller. The rate of GTD events increases by 95.67 percent when the unemployment rate goes from its minimum to the 10th percentile, by 168.15 percent when unemployment increases to its sample median, and by 289.91 percent when the unemployment rate increases from its minimum to the 90th percentile. The corresponding values for the Russian crime variable are 122.65,

11 The two variables are positively correlated but the correlation is relatively small, $r = .063$. The variable both reflect development but reflect different forms of development.

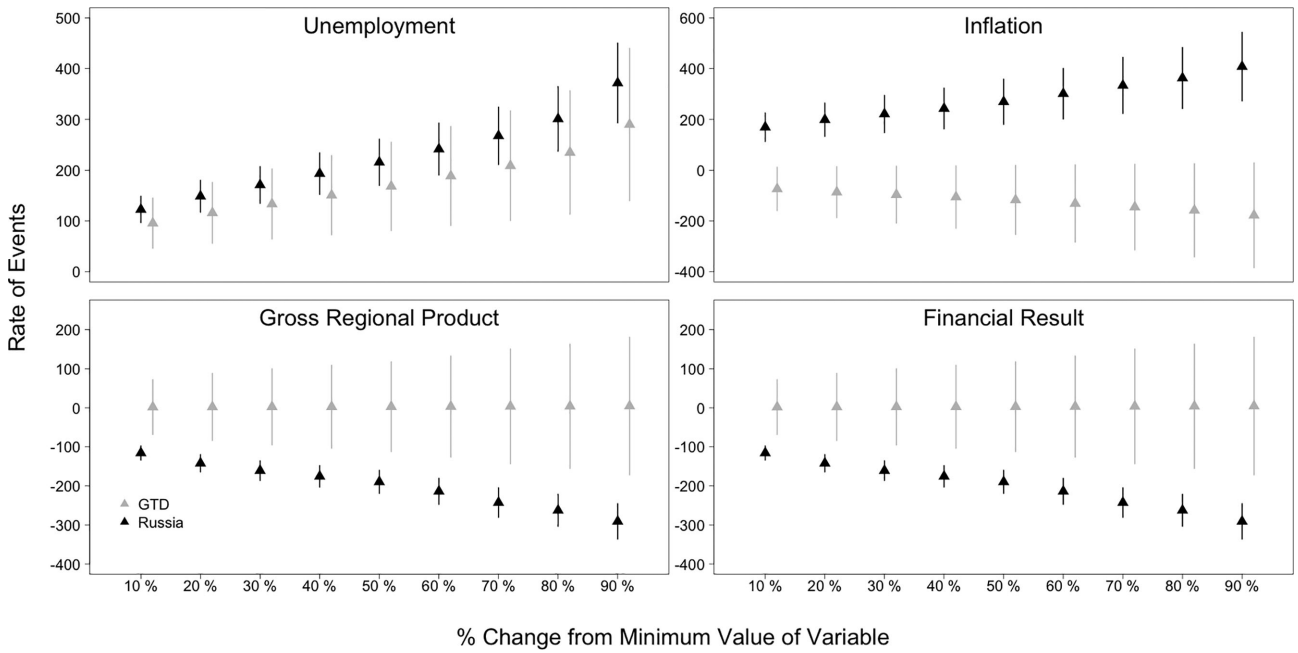

Figure 1. Effects of Economic Crises on Percent Change in Terrorist Events.
Notes: The plots depict the percent change in the outcome variable associated with changes in the economic hardship variables. The values on the *x*-axis are the percent change in each independent variable from the minimum values of the variables. The gray lines and triangles show the effects of changes in the measures of economic performance to the rates of GTD terrorism outcome. The black lines and triangles show the effects of changes in the measures of economic performance to the rates of Russia terrorism outcome. The vertical lines are 95 percent confidence intervals. The incidence rates are based on the results from model in table 1 and Model 5 in table 2.

215.57, and 371.67 percent. A drastic change in unemployment makes a terrorist crime almost four-times more likely to occur. This is consistent with grievance-based models that consider the consequences of sudden economic changes for violence. The rate of terrorist crime increases by 169 percent following an increase in inflation from its minimum to its 10th percentile. The trajectory of the changes is similar to unemployment. Inflation is not related to GTD events. This is why the predicted rates of terrorist violence are not distinguishable from zero.

The responses to the changes in the macroeconomic variables provide additional evidence for the interpretation of the effects presented in table 2. The patterns in the financial result responses are similar and cannot be, statistically, distinguished over the range of the financial result variable. The effects are positive and appear to increase at a faster rate for bigger changes in the financial result variable. An increase in the financial result variable from its minimum to the 90th percentile produces a 45 percent increase in terrorist crimes (Russia) and a 53.47 percent increase in terrorist events. While the effects are not statistically distinguishable, this is the only case where the effect of the change is larger for the GTD variable than the Russia variable. This is consistent with the idea that this measure of macroeconomic performance is more relevant for terrorist organizations than for individuals. A financial windfall for the firms of a federal subject represents access to additional resources that terrorist organizations can use for the planning and execution of attacks. This pattern is not reflected in the GRP plot. The changes in GRP do not produce statistically significant responses to GTD events and the response in the Russian crime variable is negative and significant, which is more consistent with grievance-based models. The competing patterns in the financial result and GRP plots further suggest that the variation in the GRP variable is determined more by consumer and government spending than by industrial production.

Discussion and Conclusion

Popular accounts suggest the possibility of heterogeneous connections between economic crises and terrorism. The goal of this study was to examine the relationship and contribute to the ongoing debates about the nexus of economic performance and political violence. Using a statistical analysis performed on sub-national data from Russia's federal subjects, we explored the impact of different measures of economic performance on both the individual-level and group-level processes that determine terrorist activity. We have reached two broad conclusions.

First, economic crises influence terrorism through multiple causal pathways. At the individual level, economic crises generate motives for terrorism. Consistent with grievance-based explanations of political violence, we find that increases in unemployment and inflation increased the rate of terrorist activity. At the group level, economic crises influence incentives for terrorism. Consistent with opportunity-based explanations of political violence, we find that increases in available financial resources increase the rate of terrorism. The existence of these varied causal pathways explains the mixed empirical results in the terrorism literature. Despite being a bone of contention among terrorism scholars, grievance- and resource-based explanations of political violence are not mutually exclusive. We resolve the theoretical and empirical impasse in existing research by differentiating our expectations associated with the hypothesized relationships by the type of measure. If this approach works for terrorism, there may also be opportunities to disentangle the varied causal mechanisms that determine other forms of collective action and violence.

Second, the empirical case against grievance-based explanations of terrorism is overstated. The case relies heavily on empirical research using country-level aggregates of macroeconomic phenomena. There is a growing awareness that measures of macroeconomic activity fail to capture the way people experience changes in economic performance. This shortcoming is particularly stark for studies purporting to test individual psychological phenomena. Also, aggregating economic measures at the national level washes out important, within-country variation. This point is particularly salient for large, geographically and economically diverse countries such as Russia. The results suggest a need to systematically review the empirical evidence against grievance-based models of political violence. Rather than focusing on what the authors concluded, more attention should be paid to the type of data used by the authors and the appropriateness of those data for the tested hypotheses. What's more, given changes in our awareness of the complex data-generating processes that govern these rare events and the relative ease with which these processes can be modeled, it will also be useful to know how the hypotheses were tested and whether the empirical approaches used by these authors are capable of capturing relevant patterns in the data.

We believe it is important to reflect on the scope of the conclusions that can be drawn from the analyses presented in this paper. We do not argue, nor do we find evidence to support the conclusion, that terrorism can be explained by poverty. We do not conclude that all

previous research on poverty and terrorism is incorrect. The coefficients for our development proxies in the transition equations, freight, and internet, are consistent with extant findings that terrorist attacks are more likely in developing and developed regions. The evidence we present in the paper suggests a more nuanced relationship between economic performance and terrorist violence. Absolute levels of development do not explain terrorism, but sudden shifts in economic performance brought on by economic crises are related to terrorism. The relationships between subject-level inflation and unemployment and the rates of terrorist crimes are consistent with grievance-based explanations that focus on the motivation for terrorism. The relationship between subject-level financial results and terrorism are consistent with mobilization-based explanations that focus on access to resources. We do not conclude that either of these lines of argument is more correct but that both arguments explain important elements of the data-generating processes that produce support for terrorism and terrorist events.

We also want to caution readers against the overinterpretation of the results. While we have presented robust empirical evidence that militates against the perspective that there is no relationship between the economy and terrorism, it is important to remember that these data are taken from a single country. On the one hand, we think this is an important feature of our analyses. To date, much of the empirical work on the terrorism–economy nexus has relied on national-level aggregate data. We demonstrate that some of the conclusions that have been drawn from these analyses do not hold up when these national data are disaggregated at the sub-national level. On the other hand, we recognize that evidence from a single country does not necessarily serve as evidence that can be generalized to all contexts and all points in time. We think the novel nature of our findings demonstrates the utility of subjecting cross-national analyses to higher resolution tests. This is a necessary and productive means of developing a more sophisticated understanding of the causal processes surrounding terrorism. We believe that future research should endeavor to test these propositions in other countries and in other contexts.

That the country being analyzed is Russia also bears emphasis. As we mentioned above, the Russian government imposed a number of counterterrorism measures during the time period being analyzed. This could have also affected the ability of groups to procure funding. On the one hand, this could limit the generalizability of the results to situations where the population is only experiencing state repression. On the other hand, these measures may have diminished the observed effects. The effect of economic crises on terrorist attacks and terrorist crimes may be more pronounced in contexts where these kinds of counterterrorism measures are absent. Given that the counterterrorism measures are applied across the federal subjects, it stands to reason that the counterterrorism measures are present across many of the federal subjects. As such, we are confident that our inability to control for different counterterrorism measures cannot explain all of the variation observed in the data. Future research will require even higher resolution time series data to evaluate the effects of various counterterrorism strategies on the rate of terrorism within and across the federal subjects.

Finally, as we acknowledged earlier, we do not directly test the effects of economic crises on radicalization, recruitment, or group resource expenditures. Like the scholars who came before us, we do not have access to these high-resolution data. Efforts are being made to collect and analyze these data, but, for now, we are limited to the analysis of terrorist attacks and terrorist crimes. With that said, we view the inclusion of the crimes data as an important innovation over existing strategies. This innovation suggests an alternative means of measuring terrorism that could provide further leverage on understanding how economic crises affect patterns in the activities of terrorist organizations. If our theory about resource constraints is true, we should see variation in the types of tactics used by organizations during crisis. These strategies may also vary based on the location of the attack if there are differential implementations of counterterrorism strategies. We do not yet have access to these data, but we view it as a fruitful avenue for future research.

As academics, we are charged with the distillation and dissemination of knowledge. We naturally lean toward simple explanations for empirical findings because simplification is one of our primary tasks. In some cases, however, complex political and economic phenomena require more than an "*X* always causes *Y*" explanation. Rather than picking a side in the resources versus grievances debate that has seemed to define this literature over the years, we show that evidence for both theories of political violence can be found if one allows for a sufficient amount of nuance and applies sufficient attention to measurement. Terrorism scholars should not make it their goal to discard individual or group-based explanations of terrorism. Moving forward, we hope that our work will serve as an example of why academics should focus on distillation and dissemination of ideas rather than the dismissing and discarding of theories.

Supplementary Information

Supplementary information is available at the *Journal of Global Security Studies* data archive.

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