

The Effect of Capital Punishment on Terrorism in Saudi Arabia

Mohammed Alqahtani¹, Stewart J. D'Alessio¹, Lisa Stolzenberg^{1*}

¹Department of Criminology and Criminal Justice, Florida International University, Miami, FL, USA

DOI: [10.36348/sijlcrj.2022.v05i03.003](https://doi.org/10.36348/sijlcrj.2022.v05i03.003)

| Received: 03.02.2022 | Accepted: 10.03.2022 | Published: 15.03.2022

*Corresponding author: Lisa Stolzenberg

Department of Criminology and Criminal Justice, Florida International University, Miami, FL, USA

Abstract

Numerous studies investigate the deterrent effect of capital punishment on homicide levels, but no published study conducted to date focuses explicitly on the impact of capital punishment on terrorist activity. In addition, no research evaluates the possible deterrent effect of a mass execution. This study examines the influence of the mass execution of 47 terrorists by the Saudi government, which took place on January 2, 2016, on the frequency of terrorist attacks originating from within Saudi Arabia. Using missile and drone attacks that were launched from outside of Saudi Arabia as a statistical control variable, results generated in an interrupted time-series analysis show that the mass execution decreased the frequency of within-country terrorist attacks by approximately two attacks per month. Results further reveal that the Saudi military intervention in Yemen amplified within-country terrorist activity by nearly five attacks per month. These findings suggest that the use of capital punishment may prove to be useful in deterring terrorist attacks.

Keywords: Capital punishment, death penalty, mass execution, terrorism, Saudi Arabia.

Copyright © 2022 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

BACKGROUND

Although numerous studies investigate the deterrent effect of capital punishment on homicide levels (Yang & Lester, 2008), no published study to our knowledge has concentrated directly on the impact of the death penalty on terrorist activity. As Shepherd (2004a) noted in her testimony before the U.S. Congress, "No research has yet focused specifically on whether capital punishment deters terrorism." While there remains a lacuna regarding research on capital punishment and terrorist activity, such inquiries are essential because a government's use of capital punishment may prove to be beneficial by enhancing deterrence, eliminating the bargaining power of incarcerated terrorists, and decreasing budgetary outlays.

This study addresses Shepherd's comment by investigating the relationship between capital punishment and terrorist activity in Saudi Arabia. Saudi Arabia is a country that comprises most of the Arabian Peninsula and has more than 34 million people living in 13 provinces (General Authority of Statistics, 2019), with Riyadh as the capital and Islam the main religion. Saudi Arabia's economy had a gross domestic product of approximately 700 billion USD in 2020 and is based

chiefly on producing and exporting petroleum (World Bank, 2021).

Terrorism is especially problematic in the Kingdom of Saudi Arabia. The country experienced an average of 73 attacks between 2017 and 2018, with a world high of 124 attacks in 2016 (Global Terrorism Database, 2019). Three different organizations, Al-Qaeda, the Islamic State of Iraq and the Levant (ISIL or ISIS), and the Houthi Movement (Ansar Allah), are responsible for most of these attacks. Each of these groups has unique goals and motivations that fuel their terrorist activities.

Al-Qaeda was founded in 1988 to combat the Soviet invasion of Afghanistan and has a reported 70,000 members scattered in 60 countries worldwide (Gomes & Mikhael, 2018). However, following the establishment of U.S. military bases in Saudi Arabia, Al-Qaeda shifted its focus and began to employ terrorism in a concentrated effort to dissolve the Western-Muslim alliance.

ISIL is a newer group founded in Iraq in 2003. It has about 200,000 members scattered in various countries throughout the world (Cockburn, 2015). Its main goal is to restore the caliphate system throughout

the Middle East by forcing Sunni Islamism on other subgroups of Islam throughout the world (McCants, 2015).

The third terrorist organization is the Houthi Movement (Ansar Allah), with a reported 100,000 members. This organization emerged in northern Yemen during the 1990s and is believed to be responsible for launching 254 terrorist attacks against Saudi Arabia, with 20 of these attacks occurring in 2018 (Global Terrorism Database, 2019). Unlike Al-Qaeda and ISIL, the Houthi Movement's objectives are mainly political rather than religious (Almasmari, 2011). Its primary goals are to fight corruption, underdevelopment, imperialism, and gain political control of Yemen (Riedel, 2017).

Terrorism and Capital Punishment in Saudi Arabia

Like many other countries throughout the world, Saudi Arabia uses various general strategies to attenuate terrorism. These strategies include increasing the severity of punishment, enhancing security at potential terrorist targets, fracturing terrorist groups, and denying the benefits and goals sought by the terrorists like publicity and political negotiation (Trager & Zagorcheva, 2006; Kroenig & Pavel, 2012). Saudi Arabia's acute problem with terrorism has prompted them to take several additional countermeasures to reduce their vulnerability. These measures include focusing on black markets, modifying their educational system, establishing solid international collaborations, monitoring financial transactions and banks, implementing new law enforcement programs, and altering their criminal justice system (Gendorn, 2010).

In addition to all these measures, the Saudi government also emphasizes capital punishment to deter terrorists. Saudi authorities favor capital punishment as a deterrence strategy because Sharia law, which is derived from both the Qur'an (the book of Allah) and the Sunnah (The sayings of Prophet Muhammed PBUH), authorizes its use for people who commit terrorist acts (Dammer & Albanese, 2013). More specifically, Sharia law categorizes the punishment for a crime into three distinct categories that are usually meted out in public to deter future crimes. The first punishment category is called the "Hudod" or limits in English, which is a fixed set of punishments written in the Qur'an dedicated to specific crimes such as theft of illicit sexual activities.

The second category is Qisas, which refers to retaliation (Van Eijk, 2010). According to Sharia Law, offenders sentenced under Qisas have one of two possible punishments chosen for them by the victim or by the victim's family in the case of murder. The first punishment option is Diyah (blood money), which refers to monetary compensation paid by the offender to the victim or the victim's family for physical injury. The second option is retaliation, which encompasses

inflicting a similar injury on the offender as sustained by the victim or the death penalty in case of murder (Dammer & Albanese, 2013).

The third category is Tazir pertains to punishments decided by judges for crimes not mentioned in Sharia law (Dammer & Albanese, 2013). These crimes include offenses from the first two categories that fail to meet all requirements, along with crimes such as bribery, money laundering, and drug trafficking.

The Saudi government believes that capital punishment can play a helpful role in deterring terrorism because the typical terrorist is assumed to be a rational actor (Reid, 2016; Caplan, 2006). There is some research supporting this view. For example, Reid (2016) advanced the concept of "procedural rationality." He reasoned that terrorists are rational actors because they deliberate their actions. Calculated cost-benefit analysis actions, such as maintaining social and political images, financing, recruiting, and training, all show a rational thought process. Reid claims that the media is primarily responsible for disseminating the false idea that terrorists are irrational actors.

Mudgett (2020) views terrorists as rational actors who consider a multitude of different factors before selecting their targets. These various factors include ideology, weapon types, and other factors. Islamic extremism usually aims to weaken foreign governments by attacking governmental rather than civilian targets. Human targets are also favored over non-human targets. Weapon sophistication also influences target selection. The more sophisticated a weapon, the more training its use requires and the additional damage inflicted on the target. The use of ideology and weapon types in selecting targets points to the rationality of terrorist organizations.

The salience of physical distance on target selection also suggests that spatial awareness likely plays a role in the planning and execution of terrorist attacks. Research finds that terrorists, much like conventional criminals, tend to travel short distances from their residences to their targets (Badi *et al.*, 2020). This distance decay effect implies that terrorists prefer to attack readily available targets near where they live because they are familiar with the target. In contrast, traveling a greater distance to attack a less known target dramatically increases the risk for the terrorist.

Ghatak and Karakaya (2020) also explain how terrorists are rational by providing examples of the relationship between terrorist organizations and public acceptability. More specifically, terrorist organizations often engage in an armed conflict with the state to increase their acceptability with the public. The type of terrorist attack also depends on the organization's resources like recruits and weapons. Securing financing

sources such as oil reserves can strengthen a terrorist organization financially (Lee, 2018). These funds can then be used to bribe law enforcement personnel and public officials, leading to more weapon smuggling and arrest evasion (Ghatak & Karakaya, 2020).

Despite the findings generated in these studies, many remain unconvinced that the use of capital punishment will deter terrorists. Greene *et al.*, (2017) point out that it is difficult for the death penalty to deter someone already motivated by martyrdom. Thus, because most suicide bombers are mentally prepared to sacrifice their lives, the death penalty merely serves as a motivating factor because the terrorists yearn to become martyrs. The use of the death penalty might also weaken international anti-terrorist alliances with European democracies since some of these countries resent capital punishment (Greene *et al.*, 2017). This situation could result in a weaker defense against terrorism and foster more attacks.

Nalbandov (2013) analyzed the relationship between rational choice theory and terrorism. He examined the difference between “old” terrorism (before the end of the Cold War) and “new” terrorism (after the end of the Cold War). He found that older terrorist groups could potentially be deterred because they usually had clear and tangible goals that were predictable. In contrast, newer terrorist groups were more difficult to deter because their objectives were vaguer and more unpredictable. Additionally, while the degree of rationality differs among the various classes and ranks within a terrorist organization and most new terrorist groups’ main goal is fighting and spreading their violent image to gain publicity, most terrorist attacks still have unquantifiable and unknown outcomes. Thus, it is unlikely that terrorists can be deterred by capital punishment because their actions cannot be determined to be entirely rational.

Others also remain unconvinced that capital punishment will deter terrorists because executing terrorists might motivate future terrorist actions. For example, the city of Quetta in Pakistan was closed by authorities due to rioting following the U.S. execution of Aimal Khan Kasi for attacking the Central Intelligence Agency headquarters in 1993 (McDonnell, 2004). The rioting led the U.S. State Department to issue a formal warning that Kasi’s execution might result in more terrorist attacks against the U.S. and other nations as retaliation for his death. Moreover, the execution of terrorists who follow religious ideologies under Islam may amplify support for terrorism and weaken international cooperation against terrorist activity by inciting outrage in the Arab and Islamic worlds (McDonnell, 2004).

The Deterrent Effect of a Mass Execution

The principal strategy adopted in previous deterrence research on capital punishment has been to

use execution frequency to predict the homicide rate. While many of these studies fail to find that capital punishment reduces homicide levels, some researchers argue that the number of individuals executed in the U.S. and most other countries is too small and infrequent to elicit a robust deterrent effect (Donohue & Wolfers, 2005; Katz, Levitt, & Shustorovich, 2003). To illustrate, while there were 8,466 death sentences handed down in the U.S. from 1973 to 2013, only 16% percent of these offenders were eventually executed (Snell, 2014).

Proponents of deterrence maintain that an execution threshold must be reached for a deterrent effect to be actualized. In an analysis of 3,054 counties and 27 U.S. states from 1977 to 1996, Shepherd (2005) found that six states showed a deterrent effect, thirteen states showed a brutalization effect, and the eight other states showed no deterrence or brutalization effect following the use of capital punishment. Shepherd claimed that this variation was related to the number of executions carried out in each state. Her results suggested that approximately nine executions within a relatively condensed time frame needed to occur for the use of capital punishment to produce a deterrent effect. Otherwise, there might be the manifestation of a brutalization effect. The underlying reason for this threshold effect is that potential offenders recognize how serious the state is in inflicting punishment. Moreover, because capital punishment is a very severe punishment, its frequent use instills fear among offenders by giving the impression that such punishment is inevitable.

In a concerted effort to deter terrorist activity, the Saudi government publicly executed 47 terrorists on a single day in January 2016. These executed prisoners included 45 Saudis, one Egyptian, and one Chadian (AlArabiya News, 2016). This mass execution provides an excellent opportunity to examine the potential deterrent effect of capital punishment because the number of individuals executed is large enough to produce a deterrent effect, as postulated by Shepherd. Suppose terrorists are rational actors who weigh costs and benefits before engaging in terrorist activity. In that case, there is an expectation of a marked negative relationship between the mass execution of terrorists and the frequency of terrorist attacks occurring within Saudi Arabia. However, if the brutalization thesis has merit, there should be an observed amplification in terrorist activity following the mass execution of the terrorists. Finally, it is plausible that the mass execution of the 47 terrorists had no substantial effect on terrorist activity transpiring from inside Saudi Arabia.

Data

Monthly data for seven years (January 1, 2012 to December 31, 2018) on terrorist incidents were obtained for Saudi Arabia from the Global Terrorism Database at the University of Maryland (LaFree *et al.*, 2006). This database, which is considered one of the

most comprehensive and accessible datasets available to the public on terrorism (Mahan & Griset, 2013), defines terrorism as "the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation" (Global Terrorism Database, 2019, p. 10). Although this definition is wide-ranging and includes bombings, armed assaults, and assassinations, it avoids classifying actions linked to governments as terrorism.

Dependent Variable

The dependent variable is the frequency of monthly terrorist incidents occurring within Saudi Arabia during the observation period. There were 216 terrorist incidents that satisfied this definition. The analysis distinguishes between terrorist acts occurring from within Saudi Arabia and those originating outside the country, like missile and drone attacks, because the Saudi government can only arrest and prosecute terrorists within their sphere of control. The threat of capital punishment should not deter terrorists operating in countries where they cannot be captured and prosecuted by the Saudi government.

Independent Variables

The variable of theoretical interest is the execution of the 47 terrorists in January of 2016. The effect of the mass execution is analyzed with a dummy variable coded zero before January 2016 and one otherwise.

The analysis also includes as a statistical control a variable measuring the monthly number of terrorist attacks ($N = 182$) originating from outside of Saudi Arabia. The out-of-country terrorist attack series acts as a critical statistical control. This variable is beneficial because it helps us avoid attributing significance to the mass execution that would more accurately be ascribed to another independent but coincidental event.

A third variable representing Saudi Arabia's military intervention in Yemen is also included in the analysis as a control. The Houthis living in Yemen have been in a domestic conflict with their government for many years. The motives underlying this domestic strife are fighting corruption, improving utility prices, lowering unemployment, and ending western-influenced politics (Dyson & Azerrad, 2015). The Houthi Movement began to organize their military vigorously and prepare their political positions in 2011 with the backing of Iran and the Lebanese Hezbollah (Elayah & Schuplen, 2017). This strengthening of the organization led neighboring tribes to join their organization. The Houthis then took over many areas in the northwest, including Amran and Sana'a, in their fight against the Yemen government (Elayah & Schuplen, 2017). This escalation of violence and Iran's involvement in the area motivated Saudi Arabia to

intervene militarily in Yemen in March of 2015 with Operation Decisive Storm, which initiated combat between Saudi Military personnel and the Houthi Movement in Yemen (Hokayem & Roberts, 2016). However, due to the Houthi Movement's personnel structure and motives, their strategy has been to launch terrorist attacks targeting civilians, the economy, and the infrastructure of Saudi Arabia. The Saudi Arabian Air Defense branch has been able to shoot down more than 300 ballistic missiles and over 340 Unmanned Aerial Vehicles that were targeting civilians, airports, and public/private entities. One of the most damaging terrorist attacks launched by the Houthi Movement targeted Saudi Aramco, the world's second-largest oil company. Two oil pumping stations were hit and severely damaged by UAV attacks, reducing global oil production by 5% and a 2.3% fall in the Saudi stock market (Turak, 2019). The conflict between Saudi Arabia and the Houthi Movement in Yemen is still ongoing.

The variable representing Saudi Arabia's military intervention in Yemen is coded zero before March 2015 and one otherwise because Saudi Arabia began carrying out airstrikes in Yemen in March 2015. The military intervention variable is expected to have a positive effect on terrorism activity inside Saudi Arabia. The means, standard deviations, and definitions for all the variables used in this study are reported in Table 1.

ANALYSIS AND RESULTS

We began the analysis by examining the inside-country terrorism incident series over time. See Figure 1. The dotted lines represent the linear trend lines in terrorist attacks before and after the initiation of the Yemen War. A visual examination of Figure 1 suggests a positive linear trend between the pre-and post-Yemen War periods. Using the independent-samples t-test in IBM SPSS Statistics Version 27.0 (IBM Corp., 2020), the mean score increased significantly from 1.79 ($SD = 2.70$) monthly terrorist incidents before the mass execution to 3.61 ($SD = 2.83$) monthly terrorist incidents after the executions ($t = -2.990$, $P = .004$).

An examination of these preliminary data suggests that the mass execution had a brutalization effect on terrorist incidents occurring within Saudi Arabia. However, the figure also reveals that within-country terrorist activity was infrequent before Saudi Arabia's military intervention into Yemen. These low numbers produced a positive trendline, which is more reflective of the impact of the Yemen War on terrorist activity. Consequently, we added a second trendline to Figure 1 that only encompasses within-country terrorist incidents transpiring after the beginning of the Yemen War. This additional trendline shows that within-country terrorism incidents declined over time, which is more indicative of a deterrent rather than a brutalization effect of the mass execution on terrorism. The

independent-samples t-test also confirms a considerable reduction in mean scores between the pre- (mean =

5.80, SD = 3.46) and post- (mean = 3.61, SD = 2.83) intervention series ($t = 2.062, P = .045$).

Table 1: Description of variables used in the analysis

Variable	Mean	SD	Definition
Inside terrorist incidents	2.57	2.89	Frequency of monthly terrorist incidents originating from inside Saudi Arabia (N = 216).
Mass execution 2016	.43	.50	Public mass execution of 47 terrorists in January 2016; preintervention coded 0 and postintervention coded 1.
Yemen war	.55	.50	Saudi military intervention in Yemen in March 2015; preintervention coded 0 and postintervention coded 1.
Outside terrorist incidents	2.17	3.97	Frequency of monthly terrorist incidents originating from outside of Saudi Arabia (N = 182).

NOTE: N = 84 monthly time periods from January 2012 to December 2018.

Because these descriptive analyses are only suggestive, we undertook a more sophisticated intervention analysis to more clearly determine whether the observed decrease in within-country terrorist activity resulted from the mass execution of terrorists. The intervention analysis began by constructing a univariate ARIMA model for the within-country Saudi terrorist incident series for the 48 months preceding the mass execution of terrorists to model the stochastic processes associated with the series (McCleary, McDowall, & Bartos, 2017). Although independent variables are typically not incorporated in this preintervention model, we felt it appropriate to include the Yemen War variable because of the dramatic rise of within-country terrorist incidents following Saudi Arabia’s military involvement in Yemen.

Several factors should be considered when modeling the preintervention period. One important concern is whether the series has a single constant variance throughout its course. Dramatic fluctuations between observations in a series can engender a nonstationary variance. We consulted a rule-based expert system in IBM SPSS Statistics Version 27.0 to determine whether the series variance was stationary (IBM Corp., 2020). This system, which uses a goodness-of-fit measure (BIC) to compare competing models, indicated that the within-country Saudi terrorist incident series variance was stationary.

Another critical issue is whether a series has a single constant level throughout its course. In other words, a series should not trend or drift upward or downward over time. A visual examination of the Autocorrelation Function (ACF) plot indicated that within-country Saudi Arabia terrorist incident series was not trended and did not require first-order differencing.

A third concern is whether a series has any cyclical or periodic fluctuation that repeats itself each time at the same phase of the cycle or period. This repetitive variation, commonly known as seasonality, is most likely to occur yearly with monthly data. A visual examination of the within-country Saudi terrorist

incident series autocorrelation functions at lags of 12 months, 24 months, 36 months, and 48 months indicated that the series did not need to be differenced seasonally.

Once the terrorism incident series with the Yemen War variable was determined to have a stationary variance and level, we reexamined the ACF and partial autocorrelation function (PACF) plots to check for autoregressive and for moving-average processes. In an autoregressive process, an exponentially weighted sum of one or more previous values influences the current value in a series. That is, the effect of one or more prior observations on the current observation diminishes over time. In contrast, each value in a moving-average process is determined by the average of the current disturbance and one or more previous disturbances. The effect of a moving-average process lasts for a finite number of periods and then vanishes abruptly. Visual inspection of these plots revealed an ARIMA (0,0,0) process. A Ljung-Box Q statistic (Ljung & Box, 1978), which tests the null hypothesis that a set of sample autocorrelations is associated with a random process, indicated that the residuals for the model were uncorrelated and constituted white noise.

After modeling the preintervention series, we used the entire within-country terrorism incident series to test the null hypothesis of no statistical difference between the pre-and post-intervention mass execution periods while controlling for the beginning of Saudi Arabia’s military intervention in Yemen and the terrorist attacks originating from outside Saudi Arabia. The dummy coded mass execution variable is a zero-order transfer function, which views the mass execution as having an abrupt and permanent effect on terrorist activity inside Saudi Arabia. For example, if the intervention coefficient for the mass execution is negative and statistically significant, it would suggest support for the position that the mass execution of terrorists had a deterrent effect on terrorist activity. Conversely, if the intervention coefficient is positive and substantive, it would imply a brutalization effect because of the increase in terrorist attacks following the

mass execution. A nonsignificant intervention coefficient would indicate a null effect.

Table 2 presents the coefficients and t-values to evaluate statistical significance for the complete ARIMA (0,0,0) model. The residuals for this full model were uncorrelated and constituted white noise. A visual examination of Table 2 shows that the intervention parameter, which measures the degree of change in the within-country terrorist incident series level, is negative and statistically significant. This finding suggests that the mass execution of the 47 terrorists had a noteworthy deterrent effect on the frequency of the terrorist attacks carried out from within Saudi Arabia. More specifically, within-country terrorist attacks decreased by approximately two attacks per month following the mass execution.

Further examination of Table 2 shows that Saudi Arabia’s military intervention into Yemen impacted terrorist activity originating inside Saudi Arabia above that expected from preexisting trends. The coefficient for this variable indicates that the number of terrorist acts originating from inside Saudi Arabia increased by approximately five incidents per month after the country’s military intervention into Yemen. Finally, the frequency of terrorist attacks launched from other countries against Saudi Arabia had little effect on the within-country terrorist incident series.

Table 2: ARIMA (0,0,0) model estimating terrorist incidents originating from inside Saudi Arabia

Predictors	B	SE	VIF
Intercept	.737	.369	
Mass execution 2016	-2.319**	.820	2.675
Yemen war	4.817***	.834	2.798
Outside terrorist incidents	.088	.073	1.356
Ljung-Box Q (18)	26.791		
R ²	.402		

NOTE: N = 84 monthly time periods from January 2012 to December 2018.

Supplemental Analyses

We conducted two supplemental analyses to help ensure that our original findings remained robust across different specifications. Binary variables controlling for month and year are included in these analyses. First, we employed a Poisson regression model to estimate the effect of the mass execution and the other variables on terrorist attacks occurring within Saudi Arabia. As shown in Model 1 of Table 3, the results for this model mirror the results generated in the ARIMA analysis. The coefficients for the mass execution and Yemen War variables are again substantive and in the appropriate directions. The frequency of outside terrorist attacks had little impact on within-country terrorist activity.

Second, we used a negative binomial regression model to estimate the effect of the mass execution and the other variables on within-country terrorist attacks. We estimated this model because a Lagrange Multiplier Test indicated that the negative binomial regression model was preferable to a Poisson regression model for the data (Breusch & Pagan, 1980). Negative binomial regression tends to furnish more efficient estimates than least squares models and is more commonly used than Poisson regression for count variables because it is less impacted by overdispersion and statistical dependence. This type of model has been used in previous research on the deterrent effect of the death penalty (Grogger, 1990; Shepherd, 2004b).

The negative binomial regression results appear in Model 2 of Table 3. The mass execution of terrorists again seems to have a deterrent effect on the frequency of within-country terrorist attacks, as indicated by the negative and significant coefficient for this variable. The coefficient for the Yemen War variable is also statistically substantive in the positive direction, whereas the variable measuring terrorist attacks originating from outside of Saudi Arabia fails to have a marked effect in the model.

Table 3: Poisson and negative binomial models estimating terrorist incidents originating from inside Saudi Arabia

Predictors	Model 1 Poisson		Model 2 Negative binomial	
	B	SE	B	SE
Intercept	-.923	.783	-1.575	1.244
Mass execution 2016	-1.287***	.257	-1.646**	.561
Yemen war	2.233**	.743	2.749*	1.180
Outside terrorist incidents	.035	.020	.045	.044
AIC	312.504		339.302	
BIC	361.120		387.919	
Log-likelihood	-136.252		-149.651	
Likelihood ratio chi-square	164.603***		56.470***	

NOTE: N = 84 monthly time periods from January 2012 to December 2018. Dummy variables reflecting year and month are included in the models.

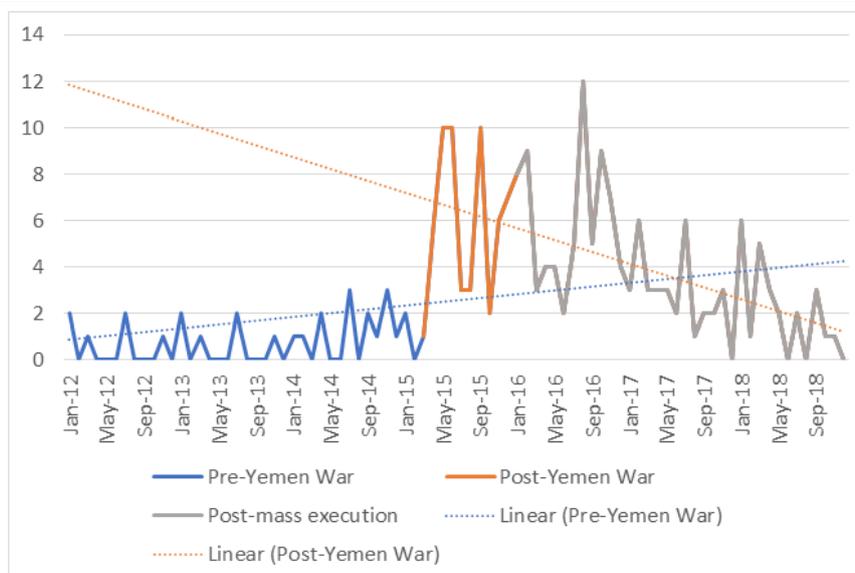


Figure 1: Inside-country terrorist incidents over time (January 2012 – December 2018)

CONCLUSION

Over 8,000 terrorist attacks worldwide in 2019 resulted in about 25,000 fatalities at the cost of around 26 billion in U.S. dollars (Statista, 2021). Terrorist attacks have severe economic, physiological, psychological, and social costs for a country (Ali, 2010). They can impact a country's financial situation adversely by frightening tourists away from affected areas (Lafree, Dugan, & Miller, 2014), stifling investment (Bandyopadhyay, Sandler, & Younas, 2014), increasing unemployment (Brodeur, 2017), decreasing personal savings (Eckstein & Tsiddon, 2004), and by forfeiting the income of persons killed or seriously maimed in a terrorist attack (Buesa *et al.*, 2007). There are also physiological and psychological costs associated with terrorism. Surveys readily show that about half of the U.S. population is "worried" about being victimized by terrorists, with 20% of these same individuals claiming that they were "very worried" about being targeted (Haner *et al.*, 2019). Some studies also suggest that the worry and stress engendered by terrorism can impact an individual's mental acuity (Shany, 2018) and physical health (Holman *et al.*, 2008) independent of demographic factors.

Countries employ many strategies to deter terrorist activity, including the use of capital punishment. However, some countries are more willing than other countries to use capital punishment. Saudi Arabia is an example of one such country. Despite the use of capital punishment by Saudi Arabia and a few other countries, no empirical research to our knowledge specifically evaluates the deterrent effect of the death penalty on terrorist activity.

Against this backdrop, we analyzed time-series data drawn from the Global Terrorism Database to determine the effect of capital punishment on terrorist activity in Saudi Arabia. The results from an interrupted

time-series analysis showed a substantive negative effect of the mass execution of 47 terrorists by the Saudi government on the frequency of within-country terrorist attacks, after accounting for out-of-country terrorist attacks and the onset of the conflict in Yemen.

It is commonly argued that the number of executions must reach a high threshold for capital punishment to have a deterrent effect. Otherwise, individuals will view the possibility of facing execution for their offense as highly improbable. The problem with testing this thesis is that executions occur with relative infrequency. Our finding that the mass execution of terrorists decreased within-country terrorist attacks must be somewhat reassuring to proponents of deterrence theory. The negative effect of the mass execution also furnishes some indirect support for the view that most terrorists are likely rational actors.

Despite the deterrence effects engendered by the Saudi's government use of capital punishment, other deterrence policy initiatives to deter terrorists should still be considered. One possibility is to focus energies on improving what is commonly referred to as deterrence by denial (Stein & Levi, 2020). Deterrence by denial means that a government makes it clear to terrorists that any attack launched has a high likelihood of failure (direct denial) and that the primary goal of the terrorists will not be achieved even in case of success (indirect denial) (Kroenig & Pavel, 2012). Direct denial can be achieved by increasing defenses at a country's border and hardening potential targets such as oil reserves, airports, and governmental buildings. Moreover, target hardening can also be strengthened by improving intelligence and counterintelligence operations. Deterrence by indirect denial can be actualized by informing terrorist groups that their goals will not be attained regardless of the success of their

attack. An example would be to inform Al-Qaeda that Middle Eastern and Western relationships will not be dissolved any time in the immediate future. It can also be applied by informing Houthi militias that their terrorist activities have little chance of overthrowing the Yemeni government.

Finally, as a last resort, authorities can resort to applying collective responsibility for a terrorist attack. Collective responsibility involves pursuing punitive measures and punishments against the families and accomplices of terrorists. The Israeli government is a proponent of this strategy. However, while the Israeli government believes that the punitive sanctioning of the families and accomplices of terrorists effectively attenuates terrorist activity, both the United Nations and the international community regard this approach a violation of international law (Smith, 2005).

Another noteworthy finding generated in the ARIMA analysis is that the war in Yemen has a robust positive effect on terrorist attacks. The Yemen War increased the number of within-country terrorist attacks by about five per month. This finding must be particularly disturbing for advocates of Saudi Arabia's military incursion into Yemen. Although Saudi Arabia's Operation Decisive Storm was ostensibly meant to help placate the volatile situation in Yemen, it appears that this operation resulted in a dramatic rise in the number of within-country terrorist attacks. Even more problematic is that out-of-country missile and drone attacks increased dramatically following Saudi Arabia's military intervention in Yemen. This observation helps to reinforce the notion that Houthi forces are using terrorism as a form of warfare.

A reading of military history argues that terrorism is an unconventional form of warfare employed by militarily disadvantaged combatants (Wheeler, 1991). Terrorism is often perceived as a type of warfare because it attempts to achieve a political objective, intends to destroy an enemy's will to resist, and involves armed engagement between contending political entities (Hanle, 1987). The inflicting of damage by terrorist acts engenders physical and psychological harm to the enemy, which can ultimately help terrorists achieve their goals. When applying these concepts and criteria to the motives and activities of Houthi militias, it seems reasonable to speculate that the organization is employing terrorism as a form of warfare against Saudi Arabia.

When evaluating our findings, readers fully need to appreciate the potential limitations of this study. One issue of relevance relates to the small number of out-country terrorist incidents originating from outside of Saudi Arabia during the pre-intervention period. The preintervention period mainly encompasses the time before the war in Yemen. The lack of variability in this variable during the preintervention period can be

problematic in an ARIMA analysis because it tends to attenuate the variable's impact. Thus, one may argue that the weak out-country terrorist attack effect is due primarily to the lack of variability in the number of out-country terrorist incidents occurring during the preintervention period. Not much can be done to address this issue.

Second, because we focus solely on Saudi Arabia, sample representativeness may be problematic. An appreciable change in the country or countries analyzed could potentially alter the negative effect of capital punishment on terrorist activity observed in this study. Future investigations might wish to consider replicating this analysis in other countries, although finding countries that frequently use executions to deter terrorists may prove burdensome. Nevertheless, despite this difficulty, additional research on this topic will undoubtedly allow us to place greater confidence in the generalizability of our findings.

Third, our analysis lacks a variable measuring thwarted terrorist attacks. The Saudi government has implemented a variety of stealth strategies unknown to the public to combat terrorism. One or more of these stealthy anti-terrorist operations might have coincided with the mass execution of terrorists, thereby amplifying the impact of the mass execution on within-country terrorist activity. However, there simply is no way to know whether this situation transpired because much of Saudi's efforts at combating terrorism are shrouded in secrecy.

In conclusion, despite our findings regarding the effectiveness of capital punishment, it is still important that the Saudi government focus on implementing both defensive and offensive policies to combat terrorism as a type of unconventional warfare. These strategies are necessary because it is highly improbable that terrorists launching missiles and drones into Saudi Arabia from bases in other countries will ever be arrested and prosecuted by the Saudis for their actions. In addition to target hardening, defensive policies should emphasize national and international intelligence with other countries to anticipate any potential attacks, especially in Yemen. Regarding offensive policies, the Saudi military should collaborate with the Yemeni military to initiate attacks and raids against the Houthi headquarters and bases to disrupt their planning and impede their ability to launch further terrorist attacks. Such directed actions should help attenuate the amount of terrorism experienced in Saudi Arabia.

REFERENCES

- Alarabiya News. (2016). *Saudi Arabia executes 47 terrorism convicts*. Accessed on September 10, 2021: <https://english.alarabiya.net/en/News/middle-east/2016/01/02/Saudi-interior-ministry>

- Ali, A. (2010). Economic cost of terrorism. *Strategic Studies*, 30(1/2), 157-170.
- Almasmari, H. (2011). *Medics: Militants raid Yemen town, killing dozens*. Cable News Network (CNN): Accessed on March 03, 2021: <https://edition.cnn.com/2011/11/27/world/meast/yemen-clashes/index.html>
- Hasisi, B., Perry, S., Ilan, Y., & Wolfowicz, M. (2020). Concentrated and close to home: the spatial clustering and distance decay of lone terrorist vehicular attacks. *Journal of quantitative criminology*, 36(3), 607-645.
- Bandyopadhyay, S., Sandler, T., & Younas, J. (2014). Foreign direct investment, aid, and terrorism. *Oxford Economic Papers*, 66(1), 25-50.
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and its applications to model specification in econometrics. *The Review of Economic Studies*, 47(1), 239-253.
- Brodeur, A. (2017). The effect of terrorism on employment and consumer sentiment: Evidence from successful and failed terror. *American Economic Journal: Applied Economics*, 10(4), 246-82
- Buesa, M., Valiño, A., Heijts, J., Baumert, T., & Gomez, J. (2007). The economic cost of March 11: Measuring the direct economic cost of the terrorist attack on March 11, 2004 in Madrid. *Terrorism and Political Violence*, 19(4), 489-509.
- Caplan, B. (2006). Terrorism: The relevance of the rational choice model. *Public Choice*, 128(1-2), 91-107.
- Cockburn, Patrick. (2015). *The rise of Islamic State: ISIS and the new Sunni revolution*. Verso Books.
- Dammer, H., & Albanese, J. (2013). *Comparative criminal justice systems*. Cengage Learning.
- Donohue, J., & Wolfers, J. (2005). Uses and abuses of statistical evidence in the death penalty debate. *Stanford Law Review*, 58(3), 791-845.
- Dyson, M., & Azerrad, D. (2015). *Rise of the Houthis*. Accessed on September 23, 2021, from <https://www.newsweek.com/photo-essay-rise-houthis-305511>
- Eckstein, Z., & Tsiddon, D. (2004). Macroeconomic consequences of terror: Theory and the case of Israel. *Journal of Monetary Economics*, 51(5), 971-1002.
- Elayah, M., & Schuplen, L. (2017). *Yemen between the Impact of the climate change and the ongoing Saudi-Yemen War: A real tragedy*. Centre for Governance and Peace-building-Yemen, in Collaboration with Centre for International Development Issues Nijmegen, The Netherlands.
- Gendron, A. (2010). Confronting terrorism in Saudi Arabia. *International Journal of Intelligence and CounterIntelligence*, 23(3), 487-508.
- General Authority of Statistics. (2019). *General Authority of Statistics*. Kingdom of Saudi Arabia. Retrieved from <https://www.stats.gov.sa/en>
- Ghatak, S., & Karakaya, S. (2021). Terrorists as rebels: Territorial goals, oil resources, and civil war onset in terrorist campaigns. *Foreign Policy Analysis*, 17(1), 1-20.
- Global Terrorism Database. (2019). *Codebook: Inclusion criteria and variables*. College Park, MD: University of Maryland, National Consortium for the Study of Terrorism and Responses to Terrorism.
- Greene, N., Redlich, N., Bruck, D., Saunders, P., Weisberg, R., & Roth, K. (2017). Capital punishment in the age of terrorism. *The Catholic Lawyer*, 41(3), 187-236.
- Grogger, J. (1990). The deterrent effect of capital punishment: An analysis of daily homicide counts. *Journal of the American Statistical Association*, 85(410), 295-303.
- Haner, M., Sloan, M., Cullen, F., Kulig, T., & Cheryl, L. J. (2019). Public concern about terrorism: Fear, worry, and support for anti-Muslim policies. *Socius*, 5, 1-16.
- Hanle, D. (1987). *On terrorism: An analysis of terrorism as a form of warfare*. Monterey, CA: Naval Postgraduate School, Master's thesis.
- Hokayem, E., & Roberts, D. (2016). The war in Yemen. *Survival*, 58(6), 157-186.
- Holman, A., Silver, C., Poulin, M., Andersen, J., Gil-Rivas, V., & McIntosh, D. (2008). Terrorism, acute stress, and cardiovascular health: A 3-year national study following the September 11 attacks. *Archives of general psychiatry*, 65(1), 73-80.
- Katz, L., Levitt, S., & Shustorovich, E. (2003). Prison conditions, capital punishment, and deterrence. *American Law and Economics Review*, 5(2), 318-343.
- Kroenig, M., & Pavel, B. (2012). How to deter terrorism. *The Washington Quarterly*, 35(2), 21-36.
- LaFree, G., Dugan, L., & Miller, E. (2014). *Putting terrorism in context: Lessons from the Global Terrorism Database*. Routledge.
- LaFree, G., Dugan, L., Fogg, H., & Scott, J. (2006). Building a global terrorism database. *Washington, DC: National Institute of Justice*.
- Chia-yi, L. (2018). Oil and terrorism: Uncovering the mechanisms. *Journal of Conflict Resolution*, 62(5), 903-928.
- Ljung, G., & Box, G. (1978). On a measure of lack of fit in time series models. *Biometrika*, 65(2), 297-303.
- Mahan, S., & Griset, P. (2013). *Terrorism in perspective, 3rd ed*. Thousand Oaks, CA: Sage.
- McCants, W. (2015). *The ISIS apocalypse: The history, strategy, and doomsday vision of the Islamic State*. Macmillan.

- McCleary, R., McDowall, D., & Bartos, B. (2017). *Design and analysis of time series experiments*. Oxford University Press.
- McDonnell, T. (2004). The death penalty-An obstacle to the war against terrorism. *Vanderbilt Journal of Transnational Law*, 37, 353-429.
- Mudgett, Evan. (2020). *Extreme Ideologies, situational factors, and terrorists' target selection*. Fayetteville, AR: University of Arkansas, Master's thesis.
- Nalbandov, R. (2013). Irrational rationality of terrorism. *Journal of Strategic Security*, 6(4), 92-102.
- Reid, D. (2016). Capital punishment is constitutional, and a cruel and unusual punishment: Now: For now. *Southwestern Law Review*, 46, 303-326.
- Riedel, B. (2017). *Who are the Houthis, and why are we at war with them?* Brookings Institution, Washington, DC. Accessed on December 18, 2017, from <https://www.brookings.edu/blog/markaz/2017/12/18/who-are-the-houthis-and-why-are-we-at-war-with-them/>
- Shany, A. (2018). *Too scared for school? The effects of terrorism on student achievement*. Working Paper: http://adishany.weebly.com/uploads/7/9/9/3/79932446/tss_oct2018.pdf
- Shepherd, J. M. (2004a). *Subcommittee on Crime, Terrorism, and Homeland Security, Committee on the Judiciary, House of Representatives, One Hundred Eight Congress, Second Session on the Terrorist Penalties Enhancement Act (H.R. 2934)*. <https://www.govinfo.gov/content/pkg/CHRG-108hhrg93224/html/CHRG-108hhrg93224.htm>
- Shepherd, J. M. (2004b). Murders of passion, execution delays, and the deterrence of capital punishment. *The Journal of Legal Studies*, 33(2), 283-321.
- Shepherd, J. M. (2005). Deterrence versus brutalization: Capital punishment's differing impacts among states. *Michigan Law Review*, 104(2), 203-255.
- Smith, J. (2005). *The effectiveness of Israel's counter-terrorism strategy*. Monterey, CA California. Naval Postgraduate School, Doctoral dissertation.
- Snell, T. (2014). Capital punishment, 2013 – statistical tables. *Washington, DC: Bureau of Justice Statistics*.
- SPSS. 2020. SPSS, Version 27.0. New York. SPSS, Inc.
- Statista. (2021). Terrorism: Facts and statistics. *Hamburg, Germany: Statista Research Department*.
- Stein, J., & Levi, R. (2020). Testing deterrence by denial: Experimental results from criminology. *Studies in Conflict & Terrorism*. DOI: 10.1080/1057610X.2020.1777710.
- Trager, R., & Zagorcheva, D. (2006). Detering terrorism: It can be done. *International Security*, 30(3), 87-123.
- Turak, N. (2019). *Saudi stock market dives, crude futures to jump after drone attack on oil plants*. Accessed on September 23, 2021 from <https://www.cnn.com/2019/09/15/saudi-stock-market-dives-crude-to-jump-after-attack-on-oil-plants.html>
- Van Eijk, E. 2010. Sharia and national law in Saudi Arabia. Pp. 139-180 in *Sharia Incorporated: A Comparative Overview of the Legal Systems of Twelve Muslim Countries in Past and Present*, edited by Jan Michiel Otto. Leiden University Press.
- Wheeler, E. (1991). Terrorism and military theory: An historical perspective. *Terrorism and Political Violence*, 3(1), 6-33.
- World Bank. (2021). *GDP - Saudi Arabia*. The World Bank Group. Accessed on September 23, 2021 from: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=SA>
- Yang, B., & Lester, D. (2008). The deterrent effect of executions: A meta-analysis thirty years after Ehrlich. *Journal of Criminal Justice*, 36(5), 453-460.