Spring 5-2013

Terrorism and Illicit Drug Prices: Does a Drug-Terror Nexus Exist? A regression analysis of the relationship between illicit drug prices and terrorist events

Abigail Burnette
University of Lynchburg

Terrorism and Illicit Drug Prices: Does a Drug-Terror Nexus Exist? A regression analysis of the relationship between illicit drug prices and terrorist events

Abigail Burnette

Senior Research Project

May 2013

Dr. Alina Klein, Chair

Dr. Eric Kyper, Committee Member

Dr. Dan Messerschmidt, Committee Member

Abstract

Since the September 11th, 2001 terrorist attacks on the United States, global counterterrorism policies have increasingly targeted terrorist financing sources. These increased financial counterterrorism regulations have diverted the traditional sources and methods of terrorist funding, including illicit drug revenue streams. The purpose of this paper is to measure the relationship between terrorist events (both domestic and transnational) and the prices of cocaine and heroin. Using regression analysis, I find that the annual U.S. illicit drug prices of heroin are statistically significant with domestic and transnational terrorist events. These results suggest that future counterterrorism policies should continue to be used in conjunction with counter narcotic policies.

1. Introduction

The purpose of this research is to measure the relationship between illicit drug prices and terrorist events, in order to determine the likelihood that terrorist organizations are using revenues from narcotics trafficking for violent means. Regression analysis is used to determine the link between U.S. cocaine and heroin prices with domestic and transnational terrorist events from 1981-2007. While numerous types of illicit drugs are consumed, cocaine and heroin are chosen for this research because the terrorist groups who are believed to benefit from the drug trade are speculated to mainly capitalize from cocaine and heroin trafficking. Furthermore, cocaine and heroin are produced from plants are only grown in certain regions. Due to the illicit nature of narcotics, data on narcotics in general is limited; despite these limitations, cocaine and heroin have the most complete and reliable data out of all illicit drugs.

Current counterterrorism policies are used in conjunction with counter narcotic policies. For instance, in 2008 the United States spent approximately $1.54 billion in counter narcotic operations (Bennett, 2010). Bennett (2010) argues that using counter narcotic policies in conjunction with counterterrorism policies is counterproductive. Therefore, it is important to determine the legitimacy and ultimately the effectiveness of counter narcotic policies use in combating terrorism.

The nature of modern day terrorism has changed drastically from the traditional state-sponsored terrorism model, leaving counter terrorism officials and the government to predict terrorists' sources of funding. Terrorist attacks are decreasing; however, they are becoming more lethal (Campos and Gassebner, 2013). As democratic governments persistently thwart

terrorist activities, it is important that they continue including the correct multipronged policies and adjust policies to diminish alternative funding sources as terrorist groups adapt.

In the next section, I discuss the determinants of terrorism, types of terrorism, the nature of the illicit drug market for cocaine and heroin, and the nexus of illicit drugs and terrorism. The third section presents the regression models used and explains the independent variables used in the regressions. Section 3.1 provides an explanation of the intial regression used and the independent variables utilized. After conducting my initial regressions, I expanded my model to test country specific terrorism data; section 3.2 explains the model expansion. In the fourth section, I present the regression results and provide analysis of the results for the initial regression in Section 4.1. Section 4.2 details the regression results and analysis from the expanded model. The last section details conclusions based on the regression results and the policy implication of these results.

2. Literature Review

Young and Findley (2011) notice that terrorism literature prior to the September 11th, 2001, terrorist attacks are plentiful; however, after the attacks terrorism literature, mainly qualitative in nature, surged (Young and Findley, 2011). Although terrorism has become a hot-topic in research throughout the past decade, basic disputes over the definition of terrorism still exist. Currently, there are over 100 different definitions for terrorism; most terrorism definitions merely employ a change in vocabulary or the inclusion of additional criteria. Differing definitions cause issues for researchers, analysts, and especially data gatherers.

Enders and Sandler (2006) provide the definition of terrorism commonly used throughout terrorism literature: "Terrorism is the premeditated use or threat to use violence by individuals or

subnational groups in order to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims" (Enders and Sandler, 2006, 3). The most widely disputed aspect of terrorism is centered on the determinants of terrorism and what makes an individual more prone to terrorism.

In general, economists view every individual's choices as rational choices, in which one evaluates his or her costs and benefits of action, and acts on what benefits him or her most. The rational assumption is oftentimes applied to terrorist decisions, as well. Turek (2009) prescribes to the rational assumption for terrorist actions and states that other disciplines, such as political science, utilize a similar 'rational-choice theory'. Krieger and Meierrieks (2008) list additional causes of terrorism cited throughout terrorism literature: "economic deprivation, modernization, political and institutional order, political transformation and instability, identity and cultural clash, globalization, and contagion."

2.1 Determinants of Terrorism

It is important to remember that determinants have different implications and meanings depending on which aspect of terrorism one is referring to- the perpetrator, the victim, the targeted audience, the location, or the type of attack. Gassebner and Luechinger (2011) run regressions on sixty-five previously cited variables using three different terrorism datasets in order to test determinants of terrorism. They assess the many conflicting terrorism research papers which mostly cite democracy and poverty as causes of terrorism. Both the presence of democracy and lack of democracy can contribute to terrorism. Enders and Sandler (2006) suggest that the liberties present in democratic countries can provide more freedom for terrorists to plan and carry out attacks, while the lack of democracy can fuel political frustrations.

Gassebner and Luechinger's (2011) results show that terrorism is not positively related to democracy and that terrorism is not associated with economic development, leading one to assert that poverty does not cause terrorism. Interestingly, they found that a negative relationship does exist between economic freedom and terrorism, implying that economic opportunities are more significant that economic development.

2.2 Types of Terrorism

Enders, Sandler, and Gaibulloev (2011) argue that terrorist events should be further categorized into national and transnational events for proper evaluation purposes. National events are those events in which the location, target(s) (person or place), and the terrorist(s) are in or from the same country. Transnational events are terrorism events in which the target(s), perpetrator(s), and victim(s) are from different countries. The distinction between transnational and national terrorist events is important because both types of terrorist events have different implications, such as modus operandi, motivation, and cost. For instance, domestic terrorist attacks on average represent a struggle for independence, while transnational terrorist attacks may represent a different frustration. Most terrorist attacks are national terrorist attacks, referred to as 'domestic terrorist attacks' by Enders, Sandler, and Gaibulloev (2011).

2.3 Illicit Drugs

The illicit drug market has historically served as a source of funding for terrorist organizations. The illicit drug market is comprised of several different types of illegal narcotics: marijuana, cocaine, heroin, and amphetamine-type stimulants (ATS), prescription medications, and various forms derived from these narcotics. Three of these drugs are plant-based; marijuana is derived from the hemp plant, cocaine from the coca bush, and heroin from the poppy plant

(UN World Drug, 2012). Marijuana can be cultivated anywhere in the world due to improved indoor hydroponic systems. The coca bush is grown only in Peru, Bolivia, and Colombia (Mejia and Posada, 2008). The poppy plant is cultivated mainly in Afghanistan and Burma (Myanmar); however, in the past it has been grown in other regions (UN World Drug, 2012).

According to the UN World Drug Report (2012), marijuana and ATS, with the exception of 'ecstasy,' are the most consumed narcotics globally. In the United States, cocaine consumption is second to marijuana, and in Europe, heroin consumption is second to marijuana and cocaine ranks third (Mejia and Posada, 2008). Mejia and Posada (2008) state that despite the popularity of cocaine and heroin, consumption of these illicit drugs does seem to fluctuate similar to a 'life-cycle.' For instance, the demand for cocaine in the U.S. decreased from 1985-1993, but has stabilized since 1993. According to Caulkins (2004) the prices of cocaine and heroin have dramatically decreased since the 1980s; the majority of the decrease in prices took place during the 1980s. In respect to cocaine, there was an initial 55% decrease in prices in the 1980s, a 30-50% increase in prices from 1989-1990, and a steady decrease in prices throughout the 1990s. Overall, heroin prices have decreased 85% since 1981 (also see Table 2 and Figure 3 for U.S. cocaine and heroin annual prices). There has been a relative stabilization in the price and consumption of cocaine and heroin in the 'mature markets' (North America, Europe, and typically, Oceania). Not much data is known about the emerging illicit drug markets; however, the data gathered during illicit drug seizures suggests that consumption for cocaine is expanding in Eastern Europe, East Africa, Oceania, and South America; heroin consumption is increasing in both Asia and Africa (UN World Drug, 2012).

Why did the prices of cocaine and heroin decrease so drastically in the 1980s? Storti and De Grauwe (2009) find that globalization is the reason for the sharp decreases in prices. The

wave of globalization brought about cheaper transportation costs, reduced risk and increased competition. This resulted in a reduction of the intermediation margin, which is the difference in the retail price and the price of the farmer's supply, essentially referring to profit. For both heroin and cocaine, the intermediation margin decreased by at least 50% between 1990 and 2005-2006, except for the intermediation margin for U.S. heroin, which reduced by 32%. Storti and De Grauwe (2009) also note that because of globalization certain regions had a comparative advantage in illicit drug production.

It is important to note the price elasticities of demand for cocaine and heroin, because elasticity exhibits how much quantity demanded for a product will change given a one percent increase/decrease in price for that product. Due to the addictive nature of cocaine and heroin, one may assume that even as prices increase, consumption will remain the same, thus meaning that narcotics are perfectly inelastic. However, most studies find that illicit drug users are sensitive to price. According to a 2000 report by Abt Associates, the price elasticity of demand for cocaine is -0.26 and heroin is -0.17(Storti and De Grauwe, 2009). Many drug users consume more than one type of illicit drug at a time, so if the price of a certain type of drug increases the user can substitute for a cheaper type of drug or reduce the number of different drugs they are consuming (UN World Drug, 2012).

International organizations and governments use counternarcotic programs to reduce crop cultivation, despite these efforts, narco- traffickers have adapted. Mejia and Posada (2008) report that between 2000 and 2003 there was a decrease in coca crop cultivation, yet, cocaine prices remained stable. Some believed narco- traffickers were using previously saved stock piles of drugs to counter the crop reduction. However, crop productivity per hectare had increased due to genetically modified coca plants and improved planting techniques, resulting in a stable

supply despite government predictions. In addition, narco- farmers simply changed growing locations to avoid aerial spraying and planted their illicit crops sporadically throughout licit crops to prevent detection. Arguments against these counternarcotic policies exist, citing that a reduction in supply will bolster prices, in turn leading to more production. Others question the effectiveness of development programs designed to encourage farmers to cultivate alternative licit crops because the success of these programs is undermined by cocaine refiners who will likely increase the amount paid to farmers for their coca crop (Mejia and Posada, 2008). This adaptability is also present in poppy cultivation. According to the UN World Drug Report (2012), in 2010 a plant disease destroyed half of the opium crop in Afghanistan; however, the opium production has already returned to the 2009 production level. Supply shortages in the heroin market were experienced in 2010, resulting in a decrease in heroin purity. The supply shortage is attributed to the 2010 poppy plant disease, increased law enforcement along main narcotics trafficking routes, and increasing heroin demand in Asian markets. By 2011, the supply shortage had been reversed, due to illicit drug traffickers finding alternative routes that were not policed. In 2010, cocaine production is believed to have decreased. Since 2005, the production of cocaine in Colombia has been decreasing; however, increased cocaine production in Bolivia and Peru has compensated for the decrease in Colombia production. These examples show the adaptability of the illicit drug market and that despite government efforts, large profits are still obtainable.

2.4 Terrorism and Illicit Drugs

Bjornehead (2004) discusses how mostly organized crime groups capitalize on profits that can be made through narcotics trafficking; however, other groups stand to profit from the narcotics trade, as well. Numerous armed terrorist groups have profited from the illicit drug trade

in the past. The term "narcoterrorism" was historically used to describe the Revolutionary Armed Forces of Columbia's (FARC) use of drug revenue to finance their terrorist activities. "Narcoterrorism" is expanding to include other terrorist organizations involved in the drug trade. Scholars attribute the shift in funding sources to the decline in state-sponsored terrorism after the Cold War (Global Overview, 2002); although Acharya and Marwah (2010) argue that passive state sponsored terrorism still exists. Prior to the end of the Cold War era, many terrorist groups received funding from state governments, such as Hezbollah and Iran, which is still accused of participating in state sponsored terrorism. Terrorist groups were then left to find alternative funding in order to survive. After the September 11th, 2001, terror attacks, terrorist organizations had to again shift their funding sources due to the influx of counter terror financial regulations, some of which allow for the freezing of assets.

Groups that are known, or are speculated, to participate in the drug trade are as follows: Taliban, Al Qaeda, FARC, Liberation Tigers of Tamil Eelam (LTTE), Hezbollah, Kosovo Liberation Army (KLA), Kurdish Workers Party, (PKK), Islamic Movement of Uzbekistan (IMU), Nepalese Insurgent Groups, Sendero Luminoso ("Shining Path"), and the Abu Sayyaf Group (ASG) (Hutchison and O'Malley, 2007). Most of these groups either cultivate illicit drug crops or are situated amongst minor and major drug trafficking routes. Ciluffo (2000) reports that terrorist groups benefit from taxing growers and/or traffickers in their regions of control; they may also sell drug crops themselves. Sometimes instead of receiving money as revenue, they barter for weapons (Global Overview, 2002). According to Hutchinson and O'Malley (2007), drug trafficking appears to be the largest source of funding for terrorists and organized crime groups. In addition to its viable revenue source, drug trafficking helps terrorists by creating or maintaining chaos and instability in their regions, which is important for maintaining control

(Kleiman, 2004). Piazza (2011) finds that cocaine and opiate wholesale prices are significant forecasters of domestic and transnational terrorist events.

Some scholars are fearful of terrorist groups collaborating with organized crime groups (Dishman, 2005); however, others believe that their relationship is not sustainable (Hutchinson and O'Malley, 2007). Hutchinson and O'Malley (2007) argue that whenever terrorists and organized crime groups temporarily work together it is usually due to pressure from organized crime groups, meaning that organized crime groups who are already involved in drug trafficking initiate the relationship with the terrorist organizations and have the most control over the trafficking. They further assert that organized crime groups and terrorists have differing motivations; those being profit and the desire to remain unseen for organized crime, while terrorists are motivated by a political ideology and desire attention. These major differences and the potential for competition will likely make long term collaboration improbable. It is more likely that they will copy one another's techniques rather than collaborate. While Hutchinson and O'Malley (2007) believe that the organizational structure of terrorist organizations makes it difficult for organized crime groups and terrorist organizations to cooperate, Dishman (2005) argues that the removal of hierarchical structures within both terrorist organizations and criminal organizations (which Dishman refers to as a "Leaderless nexus" of networks) may result in long term collaboration between terrorists and organized crime. Acharya and Marwah (2010) argue that terrorist organizations are not leaderless; they are well organized and pursue sophisticated terror plots. Hutchinson and O'Malley (2007) note that sometimes terror organizations turn into organized crime groups such as the Irish Republican Army (IRA) and FARC.

3. Empirical Model

Regression analysis is used to calculate the relationship between illicit drug prices and terrorism. According to Enders, Sandler and Gaibulloev (2010) the nature of terrorism can differ depending on whether it is a domestic or transnational terrorist attack. For the purpose of this research, domestic terrorist events and transnational terrorist events are dependent variables in my model. Data limitations exist for both terrorism data and illicit drug data. The nature of secrecy required to successfully carry-out terrorist events and sell illicit drugs makes data scarce. Terrorism data is referred to as count data and has limited variability, because it cannot accurately reflect all 'planned' terrorist events that never happened.

3.1 Initial Regression

The initial regression examines the relationship between illicit drug prices and terrorist events by region of attack; therefore for the purposes of this research, terrorist data is aggregated by year and region. Table 3 represents the domestic terrorist event data aggregated by year in which the event took place and the region where the attack happened from 1981-2007. Table 4 displays the transnational terrorist event data aggregated by year and region of attack from 1981-2007. Table 2 represents the annual U.S. illicit drug prices at the dealer level. Table 5 exhibits the summary statistics of the terrorist event data and illicit drug price data. The summary statistics encapsulate the maximum and minimum values, the total number of observations used, the mean value, standard deviation and skewness of the data based by variable.

If illicit drug revenue is increasingly used as additional revenue source for terrorist organizations it is believed that an increase in both heroin and cocaine prices will increase

terrorist funds. An increase in funds will likely result in increased terrorist attacks; therefore it is hypothesized that the coefficients of heroin and cocaine prices will be positive.

According to Kleiman (2004), participation in the illicit drug market allows terrorist organizations to earn cash as a revenue source and to create 'chaos' in the area surrounding their location. The chaos and instability in their areas is a result and/or cause of failed governments. Dummy variables based on location of attacks were included in the theoretical model. The following regions were chosen due to frequency of attack. (For domestic attacks: South America, South Asia, Middle East and North Africa; Transnational attacks: South America, Western Europe, Middle East and North Africa).These locations are also producers of plant-based illicit drug coca and opium crops. The North American dummy variable is included to measure the relationship between U.S. drug prices and North American terrorist incidents. North America is one of the largest consumers of illicit drugs; therefore, it is predicted that the coefficient of North American terrorist attacks is positive in relation to U.S. illicit drug prices (refer to Table 1 for expected coefficients).

The following regressions are used:

Domestic Terrorist Events

DOMESTIC TERRORISM (DOM) = $\beta_0 + \beta_1$ U.S. COCAINE PRICE (PCOKE) + β_2 NORTH AMERICAN DUMMY (DUMNA) + β_3 SOUTH AMERICA DUMMY (DUMSA) + β_4 SOUTH ASIA DUMMY (DUMSAS) + β_5 MIDDLE EAST & NORTH AFRICA DUMMY (DUMME)

DOMESTIC TERRORISM (DOM) = $\beta_0 + \beta_1$ U.S. HEROIN PRICE (PHER) + β_2 NORTH AMERICAN DUMMY (DUMNA) + β_3 SOUTH AMERICA DUMMY (DUMSA) + β_4 SOUTH ASIA DUMMY (DUMSAS) + β_5 MIDDLE EAST & NORTH AFRICA DUMMY (DUMME)

Transnational Terrorist Events

TRANSNATIONAL TERRORISM (TRAN) = β_0 + β_1 U.S. COCAINE PRICE (PCOKE) + β_2 NORTH AMERICAN DUMMY (DUMNA) + β_3 SOUTH AMERICA DUMMY (DUMSA) + β_4 MIDDLE EAST & NORTH AFRICA DUMMY (DUMME) + β_5 WESTERN EUROPE DUMMY (DUMWEU)

TRANSNATIONAL TERRORISM (TRAN) = β_0 + β_1 U.S. HEROIN PRICE (PHER) + β_2 NORTH AMERICAN DUMMY (DUMNA) + β_3 SOUTH AMERICA DUMMY (DUMSA) + β_4 MIDDLE EAST & NORTH AFRICA DUMMY (DUMME) + β_5 WESTERN EUROPE DUMMY (DUMWEU)

3.2 Expanded Regression

The regression is expanded in order to include independent variables for control purposes and to better address the effects of illicit drugs on terrorism in smaller areas, countries as opposed to regions. For the purpose of the expanded regression, terrorist events (both domestic and transnational) are sorted by country of attack and year from 1984- 2007; excluding terrorist events from 1993 (refer to Table 11). Terrorist events that took place in 1993 are excluded from the dataset because the 1993 data was lost in transport. Enders, Sandler, and Gaibulloev (2010) try to correct for this missing year of data; however, I decide to exclude this year. Table 11 represents the annual U.S. illicit drug prices at the dealer level for cocaine and heroin from 1984-2007. Nine independent variables are added as control variables, meaning that these variables are used to account for other variables that may influence terrorist events. The following variables are used as control variables: natural log of gross national income per capita, natural log of population, and natural log of area. Other control variables are indexes provided by the *International Country Risk Guide* (ICRG): corruption, external conflict, internal conflict, law and order, political riskiness, and socioeconomic conditions (refer to Table 12 for specifics). Previous research suggests that a country's level of corruption, conflict, governance, and socioeconomic conditions may affect terrorist events. Kleiman (2004) asserts that illicit drugs

create chaos in the areas of illicit drug production, due to increased opportunities for corruption, conflict, and ineffective governance. Table 13 presents an example of the panel data used for two countries, Colombia and the United Kingdom. The summary statistics for all of the variables used are listed in Tables 14 and 15.

I expect the following independent variables to have a positive coefficient: price of cocaine (PCOKE), price of heroin (PHER), natural log of gross national income per capita (LOGGNIPC), natural log of population (LOGPOP), and natural log of area (LOGAREA). If terrorists use illicit drug sales as revenue it is hypothesize that as the price of illicit drugs increases, terrorist events will increase. I hypothesize that the higher the gross national income per capita the more likely the country is to experience terrorist attacks. Domestically, it could be the result of dissatisfaction with large income gaps and transnationally due to terrorists attacking more powerful, wealthier nations, in order to receive media attention. I also hypothesize that the larger the physical area and population of the country, the more likely the country is to experience terrorist attacks, because there are more people to commit attacks and more possible targets.

I expect the six ICRG index variables to have a negative coefficient. The higher the country score, the better the country is in terms of the indexes. For example, if country A scores a 0 and country B scores 12 for internal conflict, country A has very high risk of internal conflict and country B has very low risk of internal conflict (please refer to Table 11 for index specifics). Again, these variables control for possible additional factors of terrorist events other than illicit drug prices (refer to Table 10for a complete list of expected coefficients)

The following regressions are used for the expanded version:

Domestic Terrorist Events

DOMESTIC TERRORISM (DOM) = $\beta_0 + \beta_1$ U.S. COCAINE PRICE (PCOKE) + β_2 LOG GROSS NATIONAL INCOME PER CAPITA (LOGGNIPC) + β_3 LOG POPULATION (LOGPOP) + β_4 LOG LAND AREA (LOGAREA) + β_5 CORRUPTION (COR) + β_6 EXTERNAL CONFLICT (EXT) + β_7 INTERNAL CONFLICT (INT) + β_8 LAW AND ORDER (LAO) + β_9 POLITICAL RISKINESS (POL) + β_{10} SOCIOECONOMIC CONDITIONS (SOC)

DOMESTIC TERRORISM (DOM) = $\beta_0 + \beta_1$ U.S. HEROIN PRICE (PHER) + β_2 LOG GROSS NATIONAL INCOME PER CAPITA (LOGGNIPC) + β_3 LOG POPULATION (LOGPOP) + β_4 LOG LAND AREA (LOGAREA) + β_5 CORRUPTION (COR) + β_6 EXTERNAL CONFLICT (EXT) + β_7 INTERNAL CONFLICT (INT) + β_8 LAW AND ORDER (LAO) + β_9 POLITICAL RISKINESS (POL) + β_{10} SOCIOECONOMIC CONDITIONS (SOC)

Transnational Terrorist Events

TRANSNATIONAL TERRORISM (TRAN) = $\beta_0 + \beta_1$ U.S. COCAINE PRICE (PCOKE) + β_2 LOG GROSS NATIONAL INCOME PER CAPITA (LOGGNIPC) + β_3 LOG POPULATION (LOGPOP) + β_4 LOG LAND AREA (LOGAREA) + β_5 CORRUPTION (COR) + β_6 EXTERNAL CONFLICT (EXT) + β_7 INTERNAL CONFLICT (INT) + β_8 LAW AND ORDER (LAO) + β_9 POLITICAL RISKINESS (POL) + β_{10} SOCIOECONOMIC CONDITIONS (SOC)

TRANSNATIONAL TERRORISM (TRAN) = $\beta_0 + \beta_1$ U.S. HEROIN PRICE (PHER) + β_2 LOG GROSS NATIONAL INCOME PER CAPITA (LOGGNIPC) + β_3 LOG POPULATION (LOGPOP) + β_4 LOG LAND AREA (LOGAREA) + β_5 CORRUPTION (COR) + β_6 EXTERNAL CONFLICT (EXT) + β_7 INTERNAL CONFLICT (INT) + β_8 LAW AND ORDER (LAO) + β_9 POLITICAL RISKINESS (POL) + β_{10} SOCIOECONOMIC CONDITIONS (SOC)

4. Presentation and Analysis of Data

Both the initial regression and expanded regression's results calculate similar results in terms of illicit drug prices. The expanded regression corrects for some limitations of the initial

regression by including additional control variables and sorting terrorist event data by country, instead of by region. According to both regressions, cocaine price has a positive coefficient for both domestic and transnational terrorist events; however, these coefficients are not statistically significant. Heroin price has a positive coefficient for both domestic and transnational terrorist events and is statistically significant at the 90% confidence level for domestic terrorist events and transnational terrorist events.

4.1 Initial Regression Results

Four separate regressions are used to measure the relationship between the dependent variables of domestic terrorist events or transnational terrorist events and the listed independent variables: price of cocaine (PCOKE), price of heroin (PHER), North American region (DUMNA), South American region (DUMSA), South Asia region (DUMSAS), Middle East and North African region (DUMME), and Western Europe (DUMWEU) (see also Table 1). Heroin and cocaine prices are used in separate regressions in order to avoid multicollinearity issues, due to the high correlation between drug prices (refer to Tables 6 and 7). The U.S. illicit drug price data represents the average prices of cocaine and heroin at the dealer level from 1981-2007; in 2007 dollars (refer to Table 2). The terrorism datasets for domestic and transnational terrorism from 1981-2007 are provided by Enders, Sandler, and Gaibulloev (2010). The terrorism datasets are aggregated by year and region prior to running regressions (refer to Tables 3 and 4). Dummy variables are used to represent regions in which terrorist attacks occurred. Refer to graph 1 for representation of different regions.

Overall, as previously hypothesized, most of the independent variables have positive coefficients except for the North American dummy variable DUMNA (refer to Table 8). All

other dummy regional independent variables were significant (refer to Table 8). Both coefficients for cocaine PCOKE and heroin PHER prices are positive; however, cocaine price PCOKE is not statistically significant in any regressions. Heroin price PHER is significant at the 95% confidence level in the domestic terrorist event regression model and statistically significant at the 90% confidence level in the transnational terrorist event regression model (refer to Table 8). Illicit drug prices have a stronger relationship with domestic terrorist events than transnational terrorist events, which is evident by PHER's larger and more statistically significant coefficient in the domestic terrorist event regression model (refer to Table 8).

Domestic Terrorist Event Regression Results

When analyzing both domestic terrorist event regression results, three regional variables (DUMSA, DUMSAS, DUMME) have positive coefficients and are significant at the 100% confidence level. These results are not surprising because these regions were chosen based on the frequency of attacks; however, two of these regions are major producers of illicit drug crops, South America grows coca bush and South Asia grows poppy plants. The Middle East and North African region is an active area for terrorist attacks. While illicit drug crops are not produced on a large-scale in this region, it is possible that terrorist organizations in drug crop producing regions or organized crime groups trafficking narcotics are partnering with Middle Eastern/North African terrorist organizations. Further analysis is needed to empirically test the reasons why these areas are more prone to attacks. Although PCOKE and PHER are highly correlated (refer to Tables 6 and 7), PCOKE is not statistically significant, while PHER is statistically significant at the 95% confidence level. It is unclear as to why PCOKE is not statistically significant while PHER is statistically significant in relation to domestic terrorist events.

Transnational Terrorist Event Regression Results

The regression results for transnational terrorist events are slightly different than the domestic terrorist events regression results. Three dummy region variables (DUMSA, DUMME, and DUMWEU) have positive coefficients and are significant at the 100% confidence level (refer to Table 8). Again, these results are not surprising because these three regions were chosen because they experienced the most transnational attacks; however, South America DUMSA does produce the coca bush. Further empirical analysis is needed to determine why Western Europe DUMWEU and the Middle East and North Africa DUMME are frequent targets for transnational attacks. Cocaine price PCOKE and heroin price PHER have positive coefficients; however, they are not statistically significant.

The coefficient for the North American region DUMNA was opposite of its hypothesized value for both domestic and transnational terrorist event regressions. Originally, it was hypothesized that DUMNA would have a positive coefficient; however, it was negative in every regression, although never statistically significant (refer to Table 8). Enders and Sandler (2006) argue that increased counterterrorism policies or defensive measures cause transference in attacks, whether it is type of attack or location of attack. Assuming that terrorists are rational actors, the terrorists will choose a weaker-link or 'soft-target' to attack if they believe that attacking a certain target is too costly or risky. For instance, if a country employs larger amounts of counterterrorism, relative to other countries, they will be better at deterring terrorist attacks as opposed to a country that does not enact counterterrorism policies or enacts fewer policies. The regressions in this research paper do not control for or measure transference; therefore, further empirical analysis is needed to measure U.S. counterterrorism policies and terrorist events.

Expanded Regression Results

Four separate regressions are used to calculate the relationship between terrorist events and the following independent variables: price of cocaine (PCOKE), price of heroin (PHER), natural log of gross national income per capita (LOGGNIPC), natural log of population (LOGPOP), natural log of land area (LOGAREA), corruption (COR), external conflict (EXT), internal conflict (INT), law and order (LAO), political riskiness (POL), and socioeconomic conditions (SOC). Due to multicollinearity issues, cocaine and heroin prices are measured in separate regressions. The expanded regression uses U.S. illicit drug prices for cocaine and heroin at the dealer level from 1984-2007, in 2007 dollars (refer to Table11). Enders, Sandler, and Gaibulloev (2010) provide the terrorism datasets separated into domestic and transnational terrorist attacks. Only terrorist event data from 1984-2007 (excluding 1993 events) are used in the regression. Prior to running the regression, the terrorist event data is aggregated by country of attack and year (refer to Table 13 for an example).

In general, most independent variables have the expected coefficients; however, the coefficients and statistical significance changed across the model contingent to the dependent variable and illicit drug price being tested. Several independent variables' coefficients are opposite of the originally expected sign and are statistically significant. Overall, cocaine prices have a positive coefficient for both domestic and transnational terrorist events, but are not statistically significant. Heroin prices have a positive coefficient and are statistically significant when tested with domestic and transnational terrorist events (refer to Table 18).

Domestic Terrorist Event Regression Results

The price of cocaine (PCOKE) has a positive coefficient, but is not statistically significant when tested with domestic terrorist events. Heroin price (PHER) has a positive coefficient and is statistically significant at the 90% confidence level. It is unclear why heroin is statistically significant while cocaine is not statistically significant. A possible explanation for these results is that terrorist groups situated along heroin trafficking routes or cultivating poppy plants could be more violent and active in terms of terrorist events, as opposed to terror groups involved in cocaine trafficking and production. It is also possible that groups who are in the cocaine illicit drug trade identify as an organized crime group instead of a terrorist organization. As an organized crime group, their motivations and actions would be profit driven and thus, not against a particular group or ideology, commonly seen in terrorism. Further analysis is needed to test these interpretations.

Several independent variables being used as control variables are opposite of their expected coefficients and are statistically significant (refer to Table 10 for expected coefficients). The natural log of the land area (LOGAREA) has a negative coefficient, but is not statistically significant. When tested with the price of heroin, political riskiness (POL) has a positive coefficient, but is not statistically significant. Corruption (COR) not only has a positive coefficient, but is statistically significant. A potential explanation could be that while the domestic government is not extremely corrupt, some within that country that would benefit from destabilizing the country. These individuals or groups would be desperate to try violent means, since bribing officials is not a viable option. External conflict (EXT) also has a positive coefficient and is statistically significant. A conceivable reason for this relationship is that a government may be better at dealing with foreign governments than meeting the needs of their

own citizens. In essence, a state could be manipulated as a 'puppet' of foreign government(s), at the expense of its own citizenry. Further research is needed to test these deductions.

Transnational Terrorist Event Regression Results

As hypothesized cocaine price (PCOKE) has a positive coefficient, but is not a statistically significant. Heroin price (PHER) has a positive coefficient and is significant at the 90% confidence interval. Again, it is unclear why heroin is statistically significant, while cocaine is not statistically significant. A possible explanation is that terrorist groups who may be benefiting from heroin trafficking are more active and/or more violent than groups who are benefiting from cocaine trafficking. Additional research is needed to test this presumption.

Two independent variables used as control variables have the opposite signs than previously expected and are statistically significant. The natural log of land area has a negative coefficient, but is not statistically significant. Corruption (COR) has a positive coefficient and is statistically significant. A probable explanation for this relationship is that a non-corrupt country could be targeted by foreign nations and individuals who could be jealous of the non-corrupt government and frustrated with their government. There are numerous reasons as to why a foreign entity may target a sound government, which is likely a stronger government. External conflict (EXT) has a positive coefficient and is statistically significant. It could be reasoned that the easiest target for a transnational attack would be a state that has the least risk of external conflict. It is likely that a fairly peaceful government may be unsuspecting of a foreign attack. Also, a peaceful government may be a popular foreign tourist attraction due to its perceived safety. Popular tourist locations that are relatively unguarded are the perfect targets for terrorists wanting global attention. Further research is needed to test these theories.

A limitation of the expanded regression is the issue of multicollinearity. Several independent variables are highly correlated with one another (refer to Tables 16 and 17). Despite the high correlations, it was important to include each variable not only as a control, but to also scrutinize Kleiman (2004) argument that illicit drugs will contribute to corruption and eventual government failure.

Overall, significant limitations, including data limitations and the inability to control for counterterrorism/counter narcotic measures, are issues that can affect the validity of this research. The regional classifications are drastically different in size geographically and in terms of population that should be standardized (refer to Table 9). Data on emerging illicit drug markets, where narcotic prices have not stabilized, is nonexistent. It is possible that terrorist organizations are gaining a higher amount of revenue from emerging markets, not the mature Western markets. In addition, the timing of carrying out terrorist attacks can differ depending on the terrorist organization or by attack type; therefore, it is difficult to accurately state that high drug revenues will result in higher amounts of terrorism in the short-run. Terrorists can also use drug revenues to fund non-violent means of their organizations, not only violent means. Lastly, it is difficult to measure which 'terrorist' events are spillovers from regional conflicts or other historical reasons. These limitations should be addressed in future research endeavors.

5. Conclusions and Policy Implications

Regression results indicate that U.S. heroin prices are statistically significant positive predictors of domestic and transnational terrorist events. The regressions further illustrate that U.S. cocaine prices are positive forecasters for domestic and transnational terrorism, and U.S. heroin prices are positive predictors of transnational terrorist events; however, these results are

not statistically significant. Certain regions are statistically significant positive predictors of domestic terrorist events (South America, South Asia, and Middle East/North Africa), while other regions are statistically significant positive predictors of transnational terrorist event locations (South America, Middle East/North Africa, and Western Europe). The North American region is a negative predictor of both domestic and transnational terrorist attacks; however, this finding is not statistically significant. As the saying goes, correlation does not prove causation. While terrorist events and illicit drug prices have decreased over the past several decades it is uncertain as to what definitely caused the decrease in both.

The expanded regression results also find that U.S. heroin prices are statistically significant positive predictors of domestic and transnational terrorist events; however, U.S. cocaine prices are not statistically significant positive predictors. Statistically significant control variables also provide further information on other factors that are correlated with terrorist events. These control variables relate to the theories of the multiple benefits of the drug-terrorism nexus. Kleiman (2004) asserts that terrorists benefit from narco-trafficking by receiving cash and creating chaos, which allows for increased corruption. According to the results, the less corrupt a country is, the more likely it will have either a domestic or transnational terrorist attack. Future research would be needed to determine whether or not corruption is a catalyst for increased terrorism or a result of increased terrorism.

Terrorists and narcotraffickers are constantly improving and perfecting their operations in spite of continuous government efforts to thwart their activities. If terrorist organizations are receiving funding from narcotrafficking, government officials could promote a more targeted counternarcotic approach for certain regions or certain parts of the illicit drug supply chain. It is argued that drug traffickers and terrorist organizations operate similarly to large corporate

companies. It would perhaps be most beneficial to eliminate the most profitable parts to the supply chain for these illicit businesses.

The policy implications of these findings suggest that counterterrorism policies should continue including counter narcotic policies in order to effectively combat domestic terrorism in regions where domestic terrorism occurs frequently. It is likely that reducing domestic terrorism in these breeding grounds of terrorism will result in a decrease of international terrorism, especially if transnational terrorism is a spillover of domestic terrorist events as some scholars suggest. If policy makers are looking to reduce costs of counterterrorism policies, they should focus counter narcotic efforts more so on opium crops and not cocaine crops only in the short-run. Once policies are aimed at opium producers, they will switch to other illicit activities that will generate revenue.

Table 1

Variables Used	
Domestic	Expected Sign of Coefficient
Heroin Prices	+
North America	+
South America	+
South Asia	+
Middle East and North Africa	+
Cocaine Prices	+
North America	+
South America	+
South Asia	+
Middle East and North Africa	+
Transnational	
Heroin Prices	+
North America	+
South America	+
Western Europe	+
Middle East and North Africa	+
Cocaine Prices	+
North America	+
South America	+
Western Europe	+
Middle East and North Africa	+

Table 2

Average Price of Cocaine and Heroin in the United States (1981-2007) for purchases at the dealer level		
	Price per pure gram ($ 2007 Dollars)	
Year	Cocaine[1]	Heroin[2]
1981	327.15	1795.72
1982	310.97	1353.59
1983	249.3	1719.25
1984	197.21	1634.64
1985	197.73	1326.64
1986	151.04	1202.41
1987	114.07	1206.14
1988	85.32	985.05
1989	77.55	786.14
1990	98.13	1005.35
1991	77.99	943.26
1992	72.19	700.26
1993	73.84	501.3
1994	64.46	471.44
1995	67.19	449.12
1996	58.75	420.53
1997	60.6	362.43
1998	55.02	327.39
1999	58.05	297.18
2000	63.97	299.88
2001	62.47	270.39
2002	54.9	270.31
2003	51.89	264.56
2004	48.22	297.02
2005	42.8	253.8
2006	39.11	265.32
2007	48.32	222.76

[1]Cocaine "dealer" level-purchases of 10-50 grams.
[2]Heroin "dealer" level- purchases greater than 1 gram, up to 10 grams.

Source: Office of National Drug Control Policy (July 2008). *The Price and Purity of Illicit Drugs: 1981-2007*. Washington, DC: Executive Office of the President. Report prepared by the Institute for Defense Analyses for ONDCP.

Table 3

Domestic Terrorist Data by Year and Region (1981-2007)														
Region	North America	Central America & Caribbean	South America	East Asia	Southeast Asia	South Asia	Central Asia	Western Europe	Eastern Europe	Middle East & North Africa	Sub-Saharan Africa	Russia & Newly Independent States	Australia & Oceania	Totals
1981	7	625	246	1	30	14	0	196	0	175	73	0	1	1368
1982	25	531	430	2	30	14	0	141	0	149	39	0	1	1362
1983	12	296	642	4	11	48	0	170	0	108	76	0	0	1367
1984	35	273	1166	6	28	171	0	224	2	70	90	0	1	2066
1985	19	332	737	8	67	95	0	172	0	61	99	0	3	1593
1986	15	187	714	6	44	116	0	127	0	66	145	0	1	1421
1987	14	314	918	9	78	239	0	135	0	99	135	0	4	1945
1988	9	333	733	16	145	567	0	291	0	122	274	0	2	2492
1989	17	277	1077	13	125	611	0	271	4	239	207	5	18	2864
1990	17	210	795	84	218	390	0	214	15	265	351	23	8	2590
1991	14	374	948	11	118	399	0	377	14	289	157	13	8	2722
1992	50	141	889	62	176	350	15	447	24	728	282	49	8	3221
1993	6	3	52	1	7	28	0	108	0	88	11	2	0	306
1994	68	101	250	22	64	234	14	192	13	578	188	69	5	1798
1995	53	84	138	25	100	564	11	74	13	391	85	42	6	1586
1996	63	69	354	67	97	375	15	115	50	223	89	51	9	1577
1997	92	70	456	27	114	259	14	116	78	337	165	43	5	1776
1998	31	1	75	2	22	104	8	101	19	134	44	29	1	571
1999	10	1	43	1	37	130	9	72	2	124	43	28	3	503
2000	9	2	59	12	115	168	4	115	6	118	51	63	0	722
2001	29	0	95	4	116	216	2	126	45	192	62	77	1	965
2002	5	1	73	1	55	165	0	55	7	157	35	51	0	605
2003	11	8	76	2	96	224	0	65	10	120	22	50	1	685
2004	3	4	28	0	48	210	3	28	0	172	15	27	0	538
2005	4	2	30	0	106	288	2	45	1	297	25	37	0	837
2006	6	3	33	2	160	452	2	47	3	560	50	23	1	1342
2007	11	2	33	0	263	507	1	27	1	831	125	41	1	1843
Grand Total	635	4244	11090	388	2470	6938	100	4051	307	6693	2938	723	88	40665

Table 4

Transnational Terrorist data by Year and Region (1981-2007)														
Region	North America	Central America & Caribbean	South America	East Asia	Southeast Asia	South Asia	Central Asia	Western Europe	Eastern Europe	Middle East & North Africa	Sub-Saharan Africa	Russia & Newly Independent States	Australia & Oceania	Totals
1981	29	100	58	3	5	4	0	173	4	67	11	0	2	456
1982	22	73	62	1	3	5	0	132	2	52	13	0	1	366
1983	4	61	94	4	6	11	0	162	1	55	13	0	0	411
1984	7	36	66	4	3	8	0	192	1	78	21	0	8	424
1985	7	40	91	2	7	12	0	152	1	53	10	0	4	379
1986	4	14	112	3	13	24	0	140	0	49	9	0	4	372
1987	1	29	82	0	12	13	0	127	0	44	18	0	0	326
1988	0	24	85	5	26	23	0	73	0	44	19	0	4	303
1989	2	35	130	3	20	37	0	60	3	57	27	0	10	384
1990	2	22	148	4	52	41	0	68	3	35	33	3	6	417
1991	9	54	164	5	26	114	0	199	30	134	33	18	2	788
1992	5	38	133	10	51	55	5	201	32	106	90	9	6	741
1993	1	3	17	1	6	18	1	53	3	55	12	3	0	173
1994	11	48	76	10	62	27	4	256	15	112	93	11	7	732
1995	8	32	39	7	34	37	3	228	8	40	65	14	8	523
1996	16	36	56	15	46	38	5	304	14	40	37	14	4	625
1997	34	29	182	6	27	20	11	179	58	54	38	33	3	674
1998	0	3	13	5	6	8	2	26	23	27	17	6	0	136
1999	1	2	27	0	11	18	1	62	34	24	21	8	0	209
2000	0	0	13	1	22	16	2	25	29	13	20	2	1	144
2001	1	0	11	2	14	7	0	21	25	13	14	1	1	110
2002	1	0	4	1	11	23	1	19	4	26	9	3	0	102
2003	0	0	11	1	5	58	0	29	4	53	9	1	2	173
2004	0	0	0	0	6	41	2	7	0	113	1	1	0	171
2005	0	0	11	0	7	53	0	25	7	92	6	2	0	203
2006	1	0	6	0	15	88	0	39	6	121	45	7	0	328
2007	1	0	3	0	6	63	0	28	4	69	55	2	0	231
Grand Total	167	679	1694	93	502	862	37	2980	311	1626	739	138	73	9901

Table 5

Summary Statistics- Initial Regression							
	Aggregates by year						
Variable	Obs.	Mean	Std. Dev.	Skewness	Min.	Max.	Total Events
Domestic Terrorist Events (DOM)	351	1506.111	794.200	0.433	306	3221	40665
Transnational Terrorist Events (TRAN)	351	366.704	204.023	0.661	102	788	9901
U.S. Heroin Prices (PHER)	27	727.106	511.695	0.813	222.760	1795.72	27
U.S. Cocaine Prices (PCOKE)	27	104.001	81.144	1.783	39.110	327.15	27

Table 6

Domestic Correlations

	DOM	PCOKE	PHER	DUMNA	DUMSA	DUMSAS	DUMME
DOM	1.0000	0.0304	0.1234	-0.1422	0.4540	0.2172	0.2033
PCOKE	0.0304	1.0000	0.8867	3.64E-17	-1.23E-17	4.89E-18	-1.66E-17
PHER	0.1234	0.8867	1.0000	1.24E-17	-6.96E-18	3.33E-18	-3.24E-17
DUMNA	-0.1422	3.64E-17	1.24E-17	1.0000	-0.0833	-0.0833	-0.0833
DUMSA	0.4540	-1.23E-17	-6.96E-18	-0.0833	1.0000	-0.0833	-0.0833
DUMSAS	0.2172	4.89E-18	3.33E-18	-0.0833	-0.0833	1.0000	-0.0833
DUMME	0.2033	-1.66E-17	-3.24E-17	-0.0833	-0.0833	-0.0833	1.0000

Table 7

Transnational Correlations

	TRAN	PCOKE	PHER	DUMNA	DUMSA	DUMME	DUMWEU
TRAN	1.0000	0.0505	0.1028	-0.1427	0.2237	0.2074	0.5322
PCOKE	0.0505	1.0000	0.8867	3.64E-17	-1.23E-17	-8.35E-19	2.50E-18
PHER	0.1028	0.8867	1.0000	1.24E-17	-6.96E-18	6.35E-18	-8.17E-18
DUMNA	-0.1427	3.64E-17	1.24E-17	1.0000	-0.0833	-0.0833	-0.0833
DUMSA	0.2237	-1.23E-17	-6.96E-18	-0.0833	1.0000	-0.0833	-0.0833
DUMME	0.2074	-8.35E-19	6.35E-18	-0.0833	-0.0833	1.0000	-0.0833
DUMWEU	0.5322	2.50E-18	-8.17E-18	-0.0833	-0.0833	-0.0833	1.0000

Table 8

Initial Regression Results				
	β Coefficients			
	1	2	3	4
Variable	Domestic	Domestic	Transnational	Transnational
PCOKE	0.07	-	0.03	-
PHER	-	0.05**	-	0.01*
DUMNA	-39.48	-39.48	-7.95	-7.95
DUMSA	347.74***	347.74***	48.61***	48.61***
DUMSAS	193.96***	193.96***	-	-
DUMME	184.89***	184.89***	46.09***	46.09***
DUMWEU	-	-	96.24***	96.24***
R^2	0.35	0.36	0.44	0.45
Adjusted R^2	0.34	0.35	0.43	0.44
Notes: *α=.10; **α=.05; ***α=.01				

Table 9

Regions	
North America	Canada, Mexico, St. Pierre and Miquelon, United States
Central America and Caribbean	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire (Netherlands Antilles), Cayman Islands, Costa Rica, Cuba, Curacao (Netherlands Antilles), Dominica, Dominican Republic, El Salvador, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Montserrat, Nicaragua, Panama, Puerto Rico, Saba (Netherlands Antilles), Sint Eustatius (Netherlands Antilles), Sint Maarten (Netherlands Antilles), St. Barthelemy, St. Kitts and Nevis, St. Lucia, St. Martin, St. Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos, Virgin Islands (British), Virgin Islands (U.S.)
South America	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela
East Asia	China, Hong Kong, Japan, Macau, Mongolia, North Korea, South Korea, Taiwan, Tibet
Southeast Asia	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, South Vietnam, Thailand, Timor-Leste, Vietnam
South Asia	Afghanistan, Bangladesh, Bhutan, India, Maldives, Mauritius, Nepal, Pakistan, Seychelles, Sri Lanka
Central Asia	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
Western Europe	Andorra, Austria, Belgium, Corsica, Denmark, Finland, France, Germany, Gibraltar, Great Britain, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Man, Isle of, Monaco, Netherlands, Northern Ireland, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, Vatican City, West Germany (FRG)
Eastern Europe	Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Czechoslovakia, East Germany (GDR), Hungary, Kosovo, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Serbia-Montenegro, Slovak Republic, Slovenia, Yugoslavia
Middle East and North Africa	Algeria, Bahrain, Cyprus, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, North Yemen, Oman, Qatar, Saudi Arabia, South Yemen, Syria, Tunisia, Turkey, United Arab Emirates, West Bank and Gaza Strip, Western Sahara, Yemen
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Brazzaville), Congo (Kinshasa), Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rhodesia, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe
Russia and the Newly Independent States	Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Russia, Soviet Union, Ukraine
Australasia and Oceania	Australia, Cook Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa (Western Samoa), Solomon Islands, Tonga, Tuvalu, Vanuatu, Wallis and Futuna

Table 10

Variables Used- Expanded Regression	
Domestic	Expected Sign of Coefficient
Cocaine price	+
Heroin price	+
Log of Gross National Income Per Capita	+
Log of Population	+
Log of Area	+
Corruption	-
External Conflict	-
Internal Conflict	-
Law and Order	-
Political Riskiness	-
Socioeconomic Conditions	-
Transnational	
Cocaine price	+
Heroin price	+
Log of Gross National Income Per Capita	+
Log of Population	+
Log of Area	+
Corruption	-
External Conflict	-
Internal Conflict	-
Law and Order	-
Political Riskiness	-
Socioeconomic Conditions	-

Table 11

Average Price of Cocaine and Heroin in the United States (1984-2007) for purchases at the dealer level		
	Price per pure gram ($ 2007 Dollars)	
Year	Cocaine[1]	Heroin[2]
1984	197.21	1634.64
1985	197.73	1326.64
1986	151.04	1202.41
1987	114.07	1206.14
1988	85.32	985.05
1989	77.55	786.14
1990	98.13	1005.35
1991	77.99	943.26
1992	72.19	700.26
~~1993~~	~~73.84~~	~~501.3~~
1994	64.46	471.44
1995	67.19	449.12
1996	58.75	420.53
1997	60.6	362.43
1998	55.02	327.39
1999	58.05	297.18
2000	63.97	299.88
2001	62.47	270.39
2002	54.9	270.31
2003	51.89	264.56
2004	48.22	297.02
2005	42.8	253.8
2006	39.11	265.32
2007	48.32	222.76

[1] Cocaine "dealer" level-purchases of 10-50 grams.

[2] Heroin "dealer" level- purchases greater than 1 gram, up to 10 grams.

Source: Office of National Drug Control Policy (July 2008). *The Price and Purity of Illicit Drugs: 1981-2007.* Washington, DC: Executive Office of the President. Report prepared by the Institute for Defense Analyses for ONDCP.

Table 12

International Country Risk Guide (ICRG) Data		
Variable	Description	Index 6 pt. Index (0= Very High Risk, 6= Very Low Risk) 12 pt. Index (0= Very High Risk, 12= Very Low Risk)
Corruption	Corruption within the political system	0-6
External Conflict	Risk to incumbent government of foreign action Three subcomponents: •War •Cross-Border Conflict •Foreign Pressures	0-12
Internal Conflict	Measure of political violence and its impact on governance. Three subcomponents: •Civil War/Coup Threat •Terrorism/Political Violence •Civil Disorder	0-12
Law and Order	Law- strength and impartiality of legal system Order- popular observance of law	0-6
Political Riskiness	Subcomponents and Max. Points: Government Stability 12 Socioeconomic Conditions 12 Investment Profile 12 Internal Conflict 12 External Conflict 12 Corruption 6 Military in Politics 6 Religious Tensions 6 Law and Order 6 Ethnic Tensions 6 Democratic Accountability6 Bureaucracy Quality 4	0-100 0- 49.9 = Very High Risk 50- 59.9 = High Risk 60- 69.9 = Moderate Risk 70- 79.9 = Low Risk 80 -100 = Very Low Risk
Socioeconomic Conditions	Socioeconomic pressures at work and in society. Three subcomponents: •Unemployment •Consumer Confidence •Poverty	0-12

Table 13

Panel Data Aggregation Example

Year	DOM Events	PCOKE	PHER	Log GNI pc	Log POP	Log Area	COR	EXT	INT	LAO	POL	SOC
Colombia												
1984	120	197.21	1634.64	7.154615	17.19513	13.91942	3	9	8	2	64	6
1985	235	197.73	1326.64	7.098376	17.21649	13.91942	3	9	5	1	59	6
1986	174	151.04	1202.41	7.114769	17.23752	13.91942	3	9	5	1	58	6
1987	235	114.07	1206.14	7.130899	17.2582	13.91942	3	8	4	1	56	7
1988	262	85.32	985.05	7.17012	17.27853	13.91942	3	8	4	1	50	5
1989	369	77.55	786.14	7.138867	17.29852	13.91942	3	10	5	1	53	5
1990	234	98.13	1005.35	7.138867	17.31816	13.91942	3	10	5	1	58	7
1991	278	77.99	943.26	7.114769	17.33745	13.91942	3	10	5	1	60	7
1992	392	72.19	700.26	7.185387	17.35639	13.91942	3	12	5	1	58	7
1994	136	64.46	471.44	7.489971	17.3934	13.91942	3	12	7	2	62	7
1995	68	67.19	449.12	7.696213	17.41154	13.91942	3	10	7	2	59	7
1996	276	58.75	420.53	7.835975	17.42947	13.91942	2	9	7	2	53	5
1997	363	60.6	362.43	7.882315	17.44716	13.91942	1	9	2	2	47	2
1998	64	55.02	327.39	7.847763	17.46459	13.91942	2	9	3	2	49	2
1999	38	58.05	297.18	7.749322	17.4817	13.91942	2	9	4	2	48	2
2000	56	63.97	299.88	7.762171	17.49848	13.91942	2	9	6	1	49	2
2001	85	62.47	270.39	7.749322	17.5149	13.91942	2	7.5	3.5	1	50.5	4
2002	67	54.9	270.31	7.766417	17.53099	13.91942	3	7.5	3	1	53	4
2003	67	51.89	264.56	7.762171	17.54678	13.91942	3	8.5	3.5	1	53.5	4
2004	23	48.22	297.02	7.859413	17.56232	13.91942	3	8.5	6	1	59	4.5
2005	30	42.8	253.8	7.986165	17.57765	13.91942	3	8.5	5.5	1	56.5	3.5
2006	28	39.11	265.32	8.143227	17.59278	13.91942	2.5	8.5	5.5	1.5	57	3
2007	20	48.32	222.76	8.311398	17.60768	13.91942	2.5	8	5.5	1.5	56.5	3
United Kingdom												
1984	53	197.21	1634.64	9.021598	17.84837	12.3964	6	10	11	5	86	9
1985	25	197.73	1326.64	9.006999	17.85064	12.3964	6	10	11	4	81	8
1986	17	151.04	1202.41	9.124782	17.85296	12.3964	6	10	11	4	78	7
1987	42	114.07	1206.14	9.338734	17.85508	12.3964	6	10	11	4	85	9
1988	88	85.32	985.05	9.574983	17.8573	12.3964	5	12	10	4	84	8
1989	80	77.55	786.14	9.651816	17.85991	12.3964	5	12	10	5	79	8
1990	73	98.13	1005.35	9.717158	17.8629	12.3964	5	9	9	5	76	6
1991	187	77.99	943.26	9.754407	17.86599	12.3964	5	12	10	5	77	6
1992	200	72.19	700.26	9.851141	17.86869	12.3964	5	12	10	6	76	6
1994	41	64.46	471.44	9.866305	17.87364	12.3964	5	12	12	6	80	7
1995	2	67.19	449.12	9.884305	17.87628	12.3964	5	12	12	6	80	7
1996	3	58.75	420.53	9.941265	17.87883	12.3964	4	12	10	6	85	8
1997	6	60.6	362.43	10.00514	17.8814	12.3964	5	12	11	6	90	10
1998	55	55.02	327.39	10.0639	17.88432	12.3964	5	10	10	6	89	10
1999	33	58.05	297.18	10.11739	17.88765	12.3964	5	10	9	6	90	11
2000	22	63.97	299.88	10.16238	17.89122	12.3964	5	9	10	6	90	11
2001	49	62.47	270.39	10.16007	17.89488	12.3964	4.5	7.5	10.5	6	89	11
2002	9	54.9	270.31	10.17275	17.89855	12.3964	4.5	8.5	9	6	87	11
2003	18	51.89	264.56	10.2809	17.9026	12.3964	4.5	8.5	10	6	86.5	10.5
2004	3	48.22	297.02	10.45074	17.90765	12.3964	4.5	7	10	5.5	84	10.5
2005	15	42.8	253.8	10.57209	17.91359	12.3964	4.5	7	9.5	5.5	82.5	10
2006	2	39.11	265.32	10.62595	17.91973	12.3964	4	7	9.5	5.5	82	10
2007	9	48.32	222.76	10.70302	17.92617	12.3964	4	7	9.5	5.5	82	10

Table 14

	Summary Statistics Domestic Events					
Variable	Obs.	Mean	Std. Dev.	Skewness	Min.	Max.
Domestic Terrorist Events (DOM)	1205	27.18	63.57	4.77	1	673
U.S. Cocaine Prices (PCOKE)	23	78.80	39.31	1.99	39.11	197.73
U.S. Heroin Prices (PHER)	23	626.78	388.03	0.91	222.76	1634.64
Log of Gross National Income Per capita (LOGGNIPC)	1205	7.72	1.56	0.21	4.25	11.14
Log of Population (LOGPOP)	1205	16.88	1.53	0.11	12.49	20.99
Log of Land Area (LOGAREA)	1205	12.77	1.79	-0.39	5.77	16.61
Corruption (COR)	1205	3.13	1.37	0.23	0.00	6.00
External Conflict (EXT)	1205	9.39	2.45	-1.03	0.00	12.00
Internal Conflict (INT)	1205	8.05	2.96	-0.59	0.00	12.00
Law and Order (LAO)	1205	3.51	1.57	0.00	0.00	6.00
Political Riskiness (POL)	1205	61.38	15.80	-0.16	15.00	97.00
Socioeconomic Conditions (SOC)	1205	5.59	2.14	0.07	0.00	11.00

Table 15

	Summary Statistics Transnational Events					
Variable	Obs.	Mean	Std. Dev.	Skewness	Min.	Max.
Transnational Terrorist Events (TRAN)	988	6.90	15.04	6.70	1.00	223.00
U.S. Cocaine Prices (PCOKE)	23	81.30	40.49	1.87	39.11	197.73
U.S. Heroin Prices (PHER)	23	656.71	390.48	0.77	222.76	1634.64
Log of Gross National Income Per capita (LOGGNIPC)	988	7.74	1.56	0.17	4.38	10.99
Log of Population (LOGPOP)	988	16.92	1.47	0.14	12.57	20.96
Log of Land Area (LOGAREA)	988	12.76	1.76	-0.57	5.77	16.61
Corruption (COR)	988	3.21	1.35	0.29	0.00	6.00
External Conflict (EXT)	988	9.36	2.52	-1.03	0.00	12.00
Internal Conflict (INT)	988	7.94	3.03	-0.54	0.00	12.00
Law and Order (LAO)	988	3.50	1.57	-0.01	0.00	6.00
Political Riskiness (POL)	988	61.07	16.05	-0.14	13.00	94.00
Socioeconomic Conditions (SOC)	988	5.60	2.11	0.04	0.50	11.00

Table 16

	DOM	PCOKE	PHER	LOGGNIPC	LOGPOP	LOGAREA	COR	EXT	INT	LAO	POL	SOC
DOM	1.000000	0.114055	0.154808	-0.098817	0.167980	0.125005	-0.062175	-0.089277	-0.343180	-0.251446	-0.228787	-0.114288
PCOKE	0.114055	1.000000	0.897963	-0.063532	-0.114382	-0.053497	0.147597	-0.257371	-0.224646	-0.169500	-0.186106	0.040976
PHER	0.154808	0.897963	1.000000	-0.077272	-0.148489	-0.063049	0.199818	-0.278933	-0.271818	-0.224141	-0.247267	0.049964
LOGGNIPC	-0.098817	-0.063532	-0.077272	1.000000	-0.032059	-0.127450	0.595541	0.354459	0.553971	0.672673	0.765370	0.665446
LOGPOP	0.167980	-0.114382	-0.148489	-0.032059	1.000000	0.692754	-0.092102	0.105163	0.039421	0.060026	0.070073	0.037566
LOGAREA	0.125005	-0.053497	-0.063049	-0.127450	0.692754	1.000000	-0.109933	0.069029	-0.048948	-0.066438	-0.043584	-0.075403
COR	-0.062175	0.147597	0.199818	0.595541	-0.092102	-0.109933	1.000000	0.279079	0.454952	0.598528	0.636338	0.503571
EXT	-0.089277	-0.257371	-0.278933	0.354459	0.105163	0.069029	0.279079	1.000000	0.600661	0.450813	0.628274	0.303975
INT	-0.343180	-0.224646	-0.271818	0.553971	0.039421	-0.048948	0.454952	0.600661	1.000000	0.762647	0.846888	0.487163
LAO	-0.251446	-0.169500	-0.224141	0.672673	0.060026	-0.066438	0.598528	0.450813	0.762647	1.000000	0.833559	0.568284
POL	-0.228787	-0.186106	-0.247267	0.765370	0.070073	-0.043584	0.636338	0.628274	0.846888	0.833559	1.000000	0.716897
SOC	-0.114288	0.040976	0.049964	0.665446	0.037566	-0.075403	0.503571	0.303975	0.487163	0.568284	0.716897	1.000000

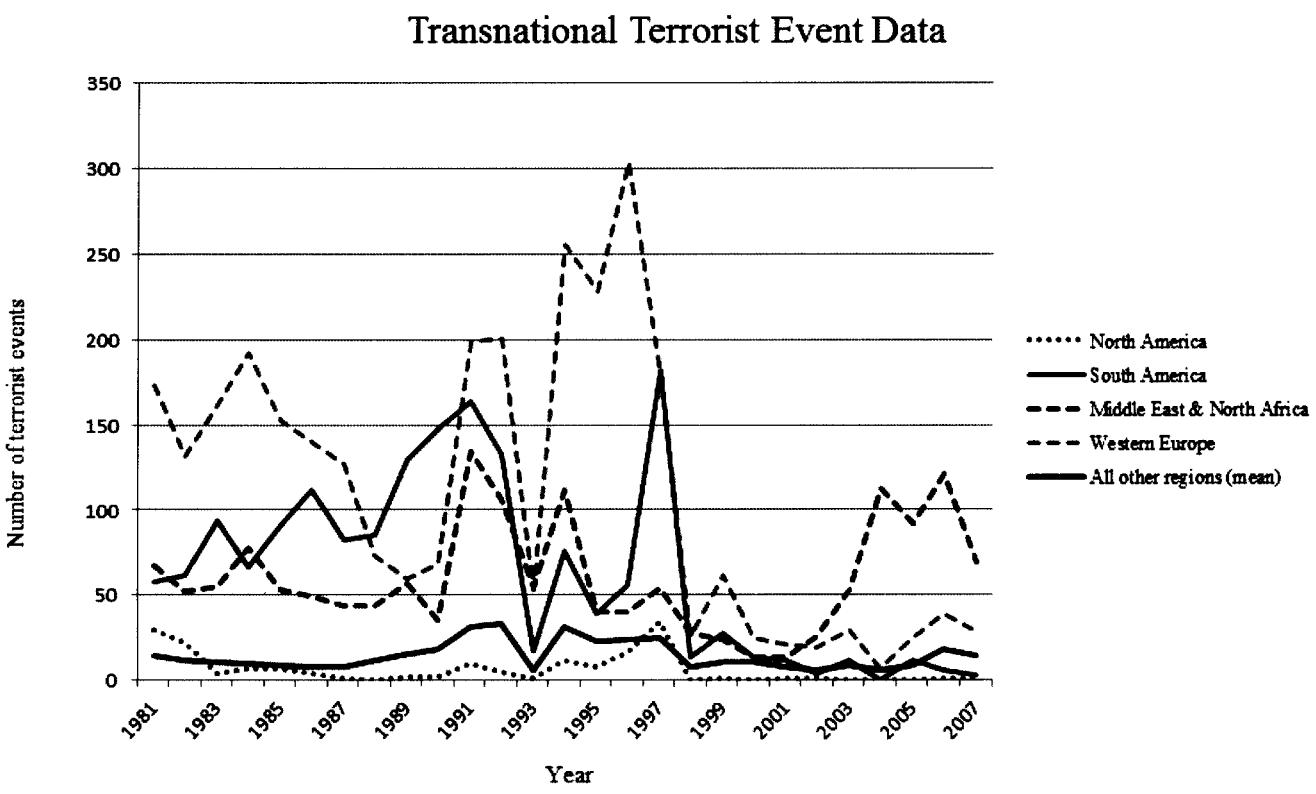
Table 17

	TRAN	PCOKE	PHER	LOGGNIPC	LOGPOP	LOGAREA	COR	EXT	INT	LAO	POL	SOC
TRAN	1.000000	0.044666	0.068705	0.092368	0.141460	0.078250	0.055830	0.072647	-0.060938	-0.007804	0.008571	0.005363
PCOKE	0.044666	1.000000	0.894435	-0.028421	-0.103764	-0.024463	0.144127	-0.257451	-0.217956	-0.155617	-0.166946	0.080407
PHER	0.068705	0.894435	1.000000	-0.035427	-0.152272	-0.059711	0.203168	-0.288391	-0.267051	-0.215125	-0.229745	0.084974
LOGGNIPC	0.092368	-0.028421	-0.035427	1.000000	-0.088412	-0.196689	0.594879	0.350320	0.554261	0.684951	0.753905	0.645154
LOGPOP	0.141460	-0.103764	-0.152272	-0.088412	1.000000	0.691552	-0.145445	0.111496	0.052719	0.047065	0.044731	0.012948
LOGAREA	0.078250	-0.024463	-0.059711	-0.196689	0.691552	1.000000	-0.173966	0.072341	-0.069087	-0.098423	-0.096543	-0.141134
COR	0.055830	0.144127	0.203168	0.594879	-0.145445	-0.173966	1.000000	0.305598	0.473435	0.587395	0.643877	0.488419
EXT	0.072647	-0.257451	-0.288391	0.350320	0.111496	0.072341	0.305598	1.000000	0.606204	0.473812	0.639111	0.309795
INT	-0.060938	-0.217956	-0.267051	0.554261	0.052719	-0.069087	0.473435	0.606204	1.000000	0.779130	0.851330	0.498403
LAO	-0.007804	-0.155617	-0.215125	0.684951	0.047065	-0.098423	0.587395	0.473812	0.779130	1.000000	0.841101	0.570044
POL	0.008571	-0.166946	-0.229745	0.753905	0.044731	-0.096543	0.643877	0.639111	0.851330	0.841101	1.000000	0.712861
SOC	0.005363	0.080407	0.084974	0.645154	0.012948	-0.141134	0.488419	0.309795	0.498403	0.570044	0.712861	1.000000

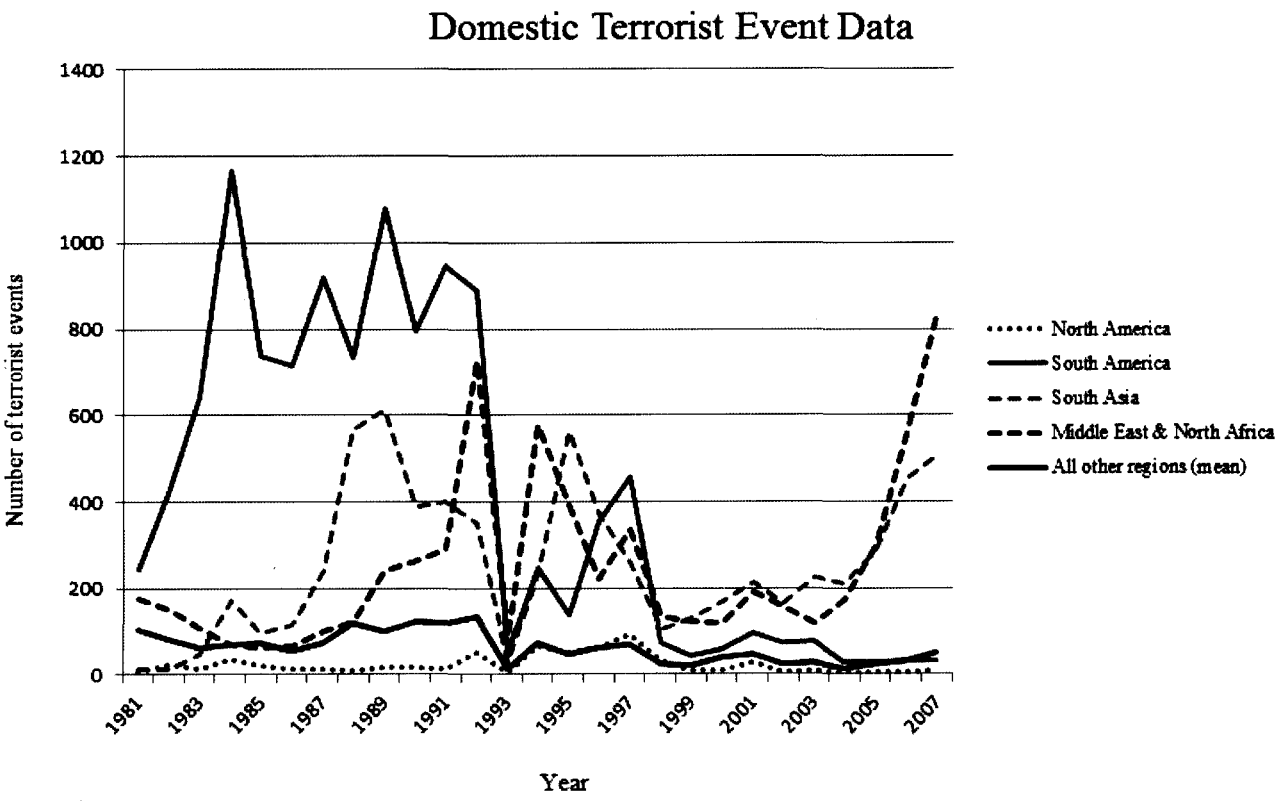
Table 18

Expanded Regression Results				
	β Coefficients			
	1	2	3	4
Variable	Domestic	Domestic	Transnational	Transnational
PCOKE	0.072	-	0.017	-
PHER	-	0.013*	-	0.003*
LOGGNIPC	6.074***	5.909**	2.398***	2.335***
LOGPOP	9.704***	9.817***	2.246***	2.271***
LOGAREA	-1.652	-1.723	-0.506	-0.524
COR	5.983***	4.684*	0.974*	0.658
EXT	4.375***	4.292***	1.057***	1.045***
INT	-9.483***	-9.751***	-0.998**	-1.056**
LAO	-5.195*	-4.847*	-0.402	-0.317
POL	-0.167	0.043	-0.091	-0.041
SOC	-0.771	-1.389	-0.528	-0.683*
R^2	0.197	0.199	0.081	0.083
Adjusted R^2	0.190	0.193	0.071	0.073
Notes: *α=.10; **α=.05; ***α=.01				

Graph 1


Transnational Terrorist Event Data
Number of terrorist events
350
300
250
200
150
100
50
0
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
Year
North America
South America
Middle East & North Africa
Western Europe
All other regions (mean)

Graph 2


Domestic Terrorist Event Data
Number of terrorist events
1400
1200
1000
800
600
400
200
0
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
Year
North America
South America
South Asia
Middle East & North Africa
All other regions (mean)

References

2012. World Drug Report 2012. New York: United Nations, 2012. eBook Collection (EBSCOhost), EBSCOhost (accessed May 6, 2013).

Acharya, Arabinda, and Sonal Marwah. 2011. "Nizam, la Tanzim (System, not Organization): Do Organizations Matter in Terrorism Today? A Study of the November 2008 Mumbai Attacks." Studies In Conflict & Terrorism 34, no. 1: 1-16. Academic Search Complete, EBSCOhost (accessed May 6, 2013).

Bennett, Elizabeth. 2009. "Overstating Poppy: The Counter Narcotics, Counter Terrorism and Development Policy Nexus in Afghanistan." Conference Papers -- Midwestern Political Science Association 1. Academic Search Complete, EBSCOhost (accessed May 6, 2013).

Bjornehead, Emma. 2004. "Narco-Terrorism: The Merger of the War on Drugs and the War on Terror." Global Crime 6, no. 3 & 4: 305-324.

Campos, Nauro F., and Martin Gassebner. 2013. "International Terrorism, Domestic Political Instability, and the Escalation Effect." Economics & Politics 25, no. 1: 27-47. Business Source Complete, EBSCOhost (accessed May 6, 2013).

Caulkins, Jonathan P. 2004. The price and purity of illicit drugs [electronic resource] : 1981 through the second quarter of 2003 / Executive Office of the President, Office of National Drug Control Policy. n.p.: Washington, D.C. : Executive Office of the President, Office of National Drug Control Policy, [2004], 2004. Government Printing Office Catalog, EBSCOhost (accessed May 6, 2013).

Ciluffo, F. 2000." The Threat Posed from the Convergence of Organized Crime, Drug Trafficking, and Terrorism." Center for Strategic and International Studies.

Cláudia Costa, Storti, and Grauwe Paul De. n.d. "Research paper: Globalization and the price decline of illicit drugs." International Journal Of Drug Policy 20, 48-61. ScienceDirect, EBSCOhost (accessed May 6, 2013).

Dishman, Chris. 2005. "The Leaderless Nexus: When Crime and Terror Converge." Studies In Conflict & Terrorism 28, no. 3: 237-252. Academic Search Complete, EBSCOhost (accessed May 6, 2013).

Enders, Walter. and Todd Sandler. *The Political Economy of Terrorism.* New York: Cambridge University Press, 2006.

Enders, Walter, Todd Sandler, and Khrushav Gaibulloev. 2010. Working Paper: Domestic versus Transnational Terrorism: Data, Decomposition, and Dynamics.

Enders, Walter, Todd Sandler, and Khrushav Gaibulloev. 2011. Domestic versus Transnational Terrorism: Data, Decomposition, and Dynamics. Journal of Peace Research 48: 319-337.

Gassebner, Martin, and Simon Luechinger. 2011. "Lock, stock, and barrel: a comprehensive assessment of the determinants of terror." Public Choice 149, no. 3/4: 235-261. Business Source Complete, EBSCOhost (accessed May 6, 2013).

"A global overview of narcotics-funded terrorist and other extremist groups." 2002. *The Library of Congress.*

Hutchinson, Steven, and Pat O'malley. 2007. "A Crime-Terror Nexus? Thinking on Some of the Links between Terrorism and Criminality." Studies In Conflict & Terrorism 30, no. 12: 1095-1107. Academic Search Complete, EBSCOhost (accessed May 6, 2013).

PRS Group, "PRS Group, "International Country Risk Guide Researchers Dataset"", International Country Risk Guide 1984-2007. 2009 ed. East Syracuse, New York.

Kleiman, Mark A. R. 2004. "Illicit Drugs and the Terrorist Threat: Causal Links and Implications for Domestic Drug Control Policy: RL32334." Congressional Research Service: Report 1. Publisher Provided Full Text Searching File, EBSCOhost (accessed May 6, 2013).

Krieger, Tim, and Daniel Meierrieks. 2011. "What causes terrorism?." Public Choice 147, no. 1/2: 3-27. Business Source Complete, EBSCOhost (accessed May 6, 2013).

Mejía, Daniel, and Carlos Esteban Posada. 2008. Cocaine production and trafficking : what do we know?. n.p.: Washington, DC, 2008. ECONIS, EBSCOhost (accessed May 6, 2013).

Office of National Drug Control Policy. July 2008. "The Price and Purity of Illicit Drugs: 1981-2007. "Washington, DC: Executive Office of the President. Report prepared by the Institute for Defense Analyses for ONDCP.

Piazza, James. 2011. "The illicit drug trade, counternarcotics strategies and terrorism." Public Choice 149, no. 3/4: 297-314. Business Source Complete, EBSCOhost (accessed May 6, 2013).

Turek, Joseph H. 2010. "Microeconomic Foundations of Terrorist Behavior." Oxford Journal 9, no. 1: 31-38. Business Source Complete, EBSCOhost (accessed May 6, 2013).

Young, Joseph K., and Michael G. Findley. 2011. "Promise and Pitfalls of Terrorism Research." International Studies Review 13, no. 3: 411-431. Academic Search Complete, EBSCOhost (accessed May 6, 2013).