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The Opium Trade and Patterns of Terrorism in the Provinces of Afghanistan: An Empirical Analysis

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Contemporary terrorist movements in Afghanistan are frequently alleged to be fueled, in part, by the country's voluminous opium trade. Experts argue that terrorist groups currently active in Afghanistan, like the Afghan Taliban, the Islamic Movement of Uzbekistan, Hizbul Islami, and various al-Qaeda affiliates, use drug trade profits to recruit and pay cadres, acquire weapons and equipment, and bribe officials while becoming more powerful, and deadly, in the process. This study empirically examines the relationship between the opium trade and terrorism in Afghanistan by conducting a series of negative binomial regression estimations on terrorist attacks and casualties in the 34 Afghan provinces for the period 1996 to 2008. The analysis also considers various economic development, infrastructure, geographic, security, and cultural factors when examining causes of terrorism in the provinces. The study determines that, across all model specifications, provinces that produce more opium feature higher levels of terrorist attacks and casualties due to terrorism, and that opium production is a more robust predictor of terrorism than nearly all other province features. Furthermore, tests indicate that the direction of causation runs from opium production to higher rates of terrorism, not otherwise. The study concludes with a brief discussion of the policy implications of the findings.

Keywords Afghanistan, analysis, drugs, empirical, Taliban

Currently Afghanistan produces around 90 percent of the world's supply of illicit opium[1] and nearly 85 percent of global supplies of heroin and morphine originate in Afghanistan.[2] Opium is Afghanistan's largest cash crop. In 2006 local export revenues from opiates totaled over U.S. $3 billion—constituting nearly 35 percent of the country's gross national product that year—while opium production employed 500,000 Afghan households or nearly 14 percent of the population, including seasonal farm workers.[3] Furthermore, while indicative gross income per hectare from wheat in Afghanistan languished at U.S. $546 in 2007, indicative gross income per hectare from opium poppy was U.S. $5,200. The total area of farmland under opium cultivation in Afghanistan now exceeds the total hectares of coca cultivation in all Latin American countries, while the burgeoning "opium economy" has created a nouveaux riche class of producers.[4] Afghanistan solidified its status as the top world opium producer—holding what the United Nations Office of Drug Control

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(UNODC) refers to as a "near monopoly" on the illicit opiate trade—after the 2001 United States ouster of the Taliban movement, though Makarenko explains that opium has deep roots in Afghanistan.[5] Poppy has been indigenously cultivated in Central Asia since ancient times, but the 1979 Soviet invasion and the turbulent three decades thereafter nurtured the illegal opiates industry by providing opportunities for trans-border trafficking and by degrading Afghan living conditions, social and political institutions, and policing capacity. This legacy has left Afghanistan as ground zero for the heroin, morphine, and opium trade, supplanting the Golden Triangle in Southeast Asia.

Today the illicit opiate trade in Afghanistan is widely portrayed by politicians, policy analysts, academics, and media commentators as an important contributor to terrorist activity in the country.[6] A 2001 report to the U.S. Congress written shortly after the 9/11 terrorist attacks in New York and Washington, DC reflects this consensus, maintaining that the Afghan Taliban movement—as well as the Northern Alliance, which the U.S. would eventually decide to support—used opiate drug revenues to fund themselves, primarily by taxing drug crop cultivation and stocks of harvested poppy and refined products, and by charging drug traffickers for protection.[7] The Hizbul-Islami (HI) movement led by Gulbuddin Hekmatyar has a long history of involvement in the narcotics trade in Afghanistan, and HI's reliance on illicit drugs to finance its activities has become increasingly more pronounced with the 2001 toppling of the Taliban regime.[8] Northern Alliance factions—particularly the Shura-i Nazar faction and Jumbush-i Milli[9]—and figures such as Muhammad Fahim, Abdul Rashid Dostum, and Burhanuddin Rabbani, all of whom were later appointed to ministerial positions in the Karzai government, are also alleged to have been fueled by narcotics smuggling and protection rackets.[10]

The Taliban briefly curtailed poppy cultivation with remarkable effectiveness in 1994–95 in the territory it controlled, ostensibly to conform to Islamic prohibitions against narcotics, and later in a bid to gain greater international recognition banned all opium production throughout Afghanistan in 2000. Because of this, many commentators came to depict the Taliban as a force dampening the Afghan drug trade.[11] However, other scholarship observes that Taliban officials continued to tax storage of opiates during the brief prohibition periods and that the movement's capacity to recruit and launch attacks even benefitted from the higher prices caused by eradication efforts.[12] The 2001 CRS report also claimed that the Taliban used drug revenues to finance the Islamic Movement of Uzbekistan, inserting an international dimension to the illicit drugs–terrorism nexus in Afghanistan.[13] Other scholars draw similar transnational linkages, arguing that the drug trade sustains both domestic terrorist movements in Afghanistan, such as the Taliban, and international terrorist movements like the Al Qaeda network, as well as jihadist groups active in Central Asia, the Middle East, Eastern Africa, and Western Europe.[14]

The significance of the opium economy to terrorism and insurgent activity in Afghanistan also drives U.S. coalition and Afghan government security policy in the country. The strategy of enhancing counterterrorism efforts by using counternarcotics tools is a frequent theme in U.S. Afghan security policy briefings.[15] NATO and United Nations analyses note that Afghan provinces with high levels of opium poppy cultivation, such as Helmand, Kandahar, Nimroz, Oruzgan, and Zabul, are also those with the highest levels of terrorist and insurgent attacks.[16] In early 2010, NATO forces collaborated with the Afghan National Army to conduct a joint military offensive called *Moshtarak* ("unity" in Pashto) in Helmand to clear the

province of Taliban forces, which had set up quasi-governing institutions, and to strengthen Kabul's control over the area. A key component of Moshtarak was the disruption of Taliban taxation of poppy cultivation and opiate trafficking, which constituted the mainstay of Taliban revenues in Helmand and helped finance arms purchases and payment for Taliban footsoldiers.[17] *Time* magazine correspondent Tim McGirk depicts Operation Moshtarak as the largest counternarcotics operation in history.[18]

The argument that Afghanistan's drug problem fuels terrorism is, therefore, buttressed by substantial qualitative observation, and seems to have imprinted itself in U.S. counterterrorism policy. But can this popular contention withstand empirical scrutiny? More specifically, do patterns of illicit drug production in Afghanistan predict patterns of terrorist activity? Also, given that experts root the origins of the Afghan drug trade in the economic, social, and political disruption brought on by the Soviet invasion and three subsequent decades of domestic turmoil and foreign occupation[19]—a factor discussed in greater detail below—to what degree might any observed relationship between drugs and terrorism in Afghanistan be complicated by spuriousness or questions about direction of causation? That is to say, do the underlying security, socioeconomic, or political problems of Afghanistan drive both the drug industry and terrorism and does terrorism, as a source of instability, help to sustain or increase drug activity, rather than the other way around?[20] These are the main research questions of this study. The results of the study help to fill an important gap in the empirical literature on the root causes of terrorism. With the exception of one preliminary study indicating that opiate cultivation and opiate product wholesale prices in the Western markets are significant positive predictors of global terrorist attacks,[21] and scant ancillary findings that opium production is a positive predictor of the onset of civil wars and internal armed conflicts[22] or that narcotics extend the duration of conflicts,[23] the effects of illicit drugs on terrorist groups and terrorist activity have not been empirically studied and are poorly understood.

The rest of the article proceeds in the following order: The next section discusses in more detail how the opiate drug trade might increase terrorist activity in Afghanistan. In particular, this section examines both direct links between the illegal opium industry—for example, whereby illicit drug profits enable terrorist groups to recruit cadres and purchase weapons—and more indirect and complex relationships. Following this, the article lays out the hypotheses tested and the empirical models and results. The concluding section summarizes the scholarly and policy implications of the findings.

Opium and Terrorism in Afghanistan

How exactly does the illicit drug trade in Afghanistan drive terrorist activity? The illegal opium economy has both direct and indirect effects on terrorist group vitality and behavior. In terms of direct effects, the trade in illicit narcotics generates enormous revenues: monies that terrorist movements can use to recruit, train and pay members, acquire weapons and equipment, set up networks of safe houses or establish training and command bases, bribe officials and obtain fraudulent legal documents, travel, forge alliances with other terrorists and, ultimately, become more effective and deadly.[24] Scholars examining civil wars observe a similar relationship between the availability of "lootable" natural resources and the onset and duration

of internal armed conflicts.[25] There is quite a bit of controversy over exactly how profitable the global drug trade is—UNODC figures estimate it to generate between U.S. $300 and $500 billion in sales per year[26] while a much more conservative estimate of U.S. $20 to $25 billion is derived by Reuter and Greenfield[27]—but even lower estimates position illicit drugs as a promising, and growing, source of financing for armed movements, including terrorist groups.[28] This is especially so as the post-Cold War period has seen a dramatic reduction in the amount of state financial support available to terrorist movements,[29] which has compelled groups to seek alternative sources of funding and has enabled them to act more autonomously.[30]

Moreover, in addition to being lucrative, the nature of the product traded in illicit narcotics markets easily lends itself to exploitation by terrorist movements in places like Afghanistan. In examining the influence of different types of natural resources on the onset and intensity of internal armed conflicts, Ross finds that natural resources that are easily "lootable," that are not "obstructable," and that are illegal are more centrally linked to political violence.[31] Narcotics are like alluvial diamonds, according to Ross, in that they have a high monetary value but are compact and easy to appropriate, store, and transport by small movements like terrorists, thereby proving to be convenient financial resources. Unlike timber or oil—which have been used by rebel movements in Burma and most recently in Libya—and which require more complicated and involved extraction methods, illicit drugs require little control over infrastructure or time to process and are therefore simpler to exploit by terrorist groups. Finally, the illegality of narcotics is suited to movements that already occupy the sphere of illegality. This provides a relative strategic advantage to terrorist movements that face states unable to benefit from the drug trade due to international legal prohibitions and norms. Illegal activities, like engagement in the drug trade, enable terrorists to challenge the state's monopoly over the projection of force and its control over territory and individuals.[32]

The direct effects of the illicit drug trade on patterns of terrorism are observable in Afghanistan, where due to the prevalence of the opium economy and low levels of internal security terrorist movements are especially well-positioned to insert themselves into the drug trade and take advantage of drug trade revenues. The actual growing of opium poppy and trafficking of opiate products outside of Afghanistan to consumer markets is largely conducted by impoverished peasants and apolitical drug gangs—though Peters makes a controversial claim that since 2001 the Taliban has become more directly engaged in growing, producing, trafficking, and sales of opiates.[33] Groups like the Taliban, the Northern Alliance during the 1990s, and Al Qaeda levy taxes, known locally as *ushr*, on producers, storage agents, and traffickers.[34] Afghanistan's failed legal, security, and economic institutions, severely destabilized by more than thirty years of internal armed conflict, provide the opportunity for these practices. Peters argues that the illicit drug industry is the primary source of revenue for the Taliban and Al Qaeda in Afghanistan. These groups rely upon drug revenues for the recruitment and payment of foot soldiers.[35] A 2006 *New York Times* article claimed that the Taliban derived an estimated 70 percent of their revenue from opium protection rackets[36] and an *Atlanta Journal-Constitution* piece reported that drug profits allowed Taliban commanders to pay cadres U.S. $200 per month in a country where monthly police salaries averaged $70 per month.[37] This, presumably, enables terrorist movements to recruit and maintain the loyalty of relatively high-quality segments of the impoverished Afghan labor market.

But in addition to direct effects—providing easy revenue—illicit drug markets also affect terrorist groups and terrorist activities through more indirect means by generally fostering an environment favorable to terrorist activity but challenging for effective counterterrorism policies. There are multiple indirect factors by which the Afghan drug trade fuels terrorism. First, the opium economy contributes to the weakening of state capacity to police territory, guarantee internal security, and to conduct effective counterterrorism. The drug trade increases the scope of domestic criminal activity, taxing state security resources that could otherwise be used to fight terrorism, while "softening" targets for terrorist attacks.[38] For Afghanistan, and many other countries, interpreting such a relationship is complicated by the fact that a priori state weakness and poor domestic security itself fueled the development of the opium economy,[39] and that state weakness and state failure itself has been shown to be a robust predictor of terrorist activity.[40] However, there is evidence that cross-nationally the illicit drug industry drives terrorist activity independent of the effects of state weakness and state failure.[41] I therefore conduct appropriate tests below to control for the security picture in Afghanistan when evaluating the effects of the opium economy on terrorism.

Second, the Afghan opium economy fuels secondary illegal markets in weapons, illegal documents, illegal cross-border movement in persons, money laundering, and financial transactions that are exploited by terrorist movements.[42] The presence of these markets ensures that terrorists have ready access to cheap supplies of the tools they need to thrive.

Third, the drug trade is a destabilizing force that contributes to the weakening of political, civil, financial, and judicial systems and the increase of corruption in countries, thereby degrading popular legitimacy and eroding public trust. This alienates the Afghan population from government authorities and erodes the authority of the state. It leaves civilians prey to radicalization and increases their tolerance for armed movements fighting against the status quo.[43] For example, popular dissatisfaction with the Rabani government during the 1989–1996 period of extreme corruption and poor security—within which the burgeoning opium trade played a significant part—is widely credited as helping push the Afghan people into the arms of the nascent Taliban movement.[44] The Afghan narcotics economy also results in the degradation of healthy legal, civic, and economic infrastructures. This creates the opportunity for terrorist movements to substitute their own structures. For example, Felbab-Brown discusses at length the importance of money laundering, informal black market credit, and illegal transnational financial transactions to the vitality of the Al Qaeda movement in Afghanistan. While the Taliban concentrates on taxation and protection rackets to extract resources from the Opium economy, according to Felbab-Brown, Al Qaeda launders drug money through its network of *hawala* (sometimes called *hundi*) international financial transfer systems. These are traditional informal networks of creditors, found throughout the Islamic world, that allow customers to transfer funds transnationally without relying on written records or formal reporting. The absence of reliable banking, credit, wire transfer services, enforceable contracts, and communications has led to the prevalence of hawala networks, which are ripe for use by drug traffickers.[45]

Hypotheses

The argument that the illicit drug trade in Afghanistan fuels terrorism—an argument raised in the body of qualitative case studies, policy and journalistic work, and

theoretical and academic works—lends itself to empirically testable proposals. To test the purported relationship between drugs and terrorism in Afghanistan, this study analyzes annual levels of opium production and terrorist activity in the 34 provinces of Afghanistan for the period 1994 to 2008, the full range of years for which data is available. The design of the study employs Afghan province-years as the unit of analysis, in contrast to a more traditional cross-national analysis[46] involving multiple countries or a time series study of Afghanistan at the national level.[47] This yields three advantages. First, it allows a more complex and nuanced view into how the illegal drug industry might fuel terrorism in ways that could be obscured from view in other types of analyses. The utility of a design using subnational units is evidenced in work by Holmes, Gutierrez de Pineres, and Curtin[48] on human rights abuses, coca production, and FARC (Revolutionary Armed Forces of Colombia) guerilla activity in Colombia. Holmes et al. conduct sets of regression analyses to determine the effects of department-level (state-level) coca production, coca eradication efforts, displaced persons, government security spending, crime, and various economic development indicators on patterns of human rights abuses by guerrilla forces. They make an intriguing finding that would not otherwise reveal itself in a national or cross-national analysis: that local drug production does not predict patterns of guerrilla human rights violations within Colombia, but that homicides, department gross domestic product, and higher security spending and policing trends do. Holmes et al. also produce the highly counterintuitive finding that coca eradication efforts actually seem to worsen the human rights picture at the department level.

Second, it is a good remedy for omitted variable bias and other specification inefficiencies. Chhibber and Nooruddin, in their study of party politics and government delivery of public goods in the Indian states, argue that interpreting results produced in cross-national analyses is often complicated by highly specific institutional features of the individual cases in the study. Though these effects can be ameliorated by selection of proper control variables, or by using country-level fixed-effects, examining sub national units allows one to hold constant country-unique institutional features.[49] Chhibber and Nooruddin justify the effectiveness of sub-national analysis by pointing to Robert Putnam's work on the development of democracy in Italy.[50] This design strategy has also been used by scholars to examine terrorism and civil war.[51]

Third, the nature of opium production and terrorism within Afghanistan is well-suited to this analytical framework. The provinces of Afghanistan provide a unique opportunity to investigate the relationship between the opium economy and terrorism. This is illustrated in the data in the following tables. Table 1 ranks the Afghan provinces by their average annual hectares of opium production from 1994 to 2008 while also listing their average annual rates of terrorist attacks and casualties due to terrorism for that same period. Table 2 publishes the summary and descriptive statistics for the Afghan provinces, including total levels of opium production and terrorism and population, geographic statistics, levels of socioeconomic and infrastructure development, and dominant cultural-linguistic features.

What Tables 1 and 2 demonstrate is that the Afghan provinces are highly diverse in terms of opium production, prevalence of terrorism, level of social, infrastructure, and economic development, as well as geographic, demographic, and security features. This diversity permits cross-province analysis to determine which subnational features might predict terrorism. The data in Table 1 preliminarily suggest a link

Table 1. Annual opium production and terrorism in the Afghan provinces, 1994–2008

Province	Avg. annual opium production (hectares)	Production compared to average (high or low)	Avg. annual terrorist attacks	Avg. annual terrorist casualties
Helmand	42,400	High	9.6	58.2
Nangahrar	14,230	High	3.8	25.8
Kandahar	7,367	High	16.4	122.6
Badakhshan	5,951	High	2.4	17.4
Oruzgan	5,410	High	0.5	3.3
Farah	4,273	High	3.1	10.2
Daykundi	2,677	High	0.1	0.0
Balkh	1,929	High	1.4	4.3
Ghor	1,239	High	0.4	2.4
Nimruz	1,202	High	1.8	15.8
Zabul	1,068	High	1.1	6.8
Faryab	1,067	High	4.6	19.0
Baghlan	765	High	0.5	1.0
Bagdis	735	High	0.7	12.8
Jowzjan	681	High	0.3	1.1
Kunar	679	High	2.9	17.7
Sar-e Pol	590	High	3.0	16.2
Herat	558	High	0.3	0.9
Samangan	523	Low	0.1	0.1
Takhar	508	Low	0.3	2.2
Nurestan	502	Low	0.9	1.2
Laghman	500	Low	1.3	5.1
Kapisa	180	Low	0.6	1.6
Kabul	119	Low	10.6	86.8
Parwan	89	Low	0.7	8.1
Bamiyan	83	Low	0.1	0.2
Paktia	83	Low	3.8	17.9
Kunduz	72	Low	1.7	7.1
Wardak	70	Low	1.5	5.4
Khost	61	Low	8.6	45.8
Ghazni	23	Low	5.2	19.1
Logar	14	Low	1.7	10.2
Paktika	0	Low	4.2	13.2
Panjshir	0	Low	0.1	0.4
Median	574		1.5	7.6
Avg. for high (above median) opium production provinces	5,427		3.1	20.0
Avg. for low (below median) opium production provinces	199		2.5	13.0

Table 2. Summary statistics for provinces of Afghanistan, 1994–2008

Province	Opium cultivation (avg. hecs)	Terrorism incidents (total)	Terrorism casualties (total)	Population (1000s)	Mountainous (%)	Literacy rate	Access to drinking water (%)	Below min. calories (%)	All-season roads (%)	Under 5 mortality (out of 1000)	Pashtun majority	Foreign troops (yr. avg.)
Badakhshan	5,733	7	50	739.4	75.7	25	13	40	25	210	No	1,225.0
Bagdis	779	17	103	499.4	43.7	9	15	40	33	300	No	1,000.0
Baghlan	784	11	193	741.7	38.2	20	19	33	42	300	No	1,225.0
Balkh	2,058	21	65	1,123.9	42.0	37	31	33	38	230	No	1,225.0
Bamiyan	89	2	3	343.9	77.5	24	8	25	21	270	No	4,256.2
Daykundi[1]	2,655	2	0	477.5	89.7	16	3	52	7	300	No	5,193.7
Farah	3,731	47	153	493.0	39.2	15	37	17	49	200	Yes	1,000.0
Faryab	816	7	15	833.7	33.7	18	23	27	43	250	No	1,225.0
Ghazni	25	78	287	1,080.8	41.0	29	35	25	38	240	Yes	4,256.2
Ghor	1,322	6	37	635.3	68.9	15	14	23	12	260	No	1,000.0
Helmand	40,572	144	874	1,441.8	15.8	4	28	49	62	190	Yes	5,193.7
Herat	593	45	244	1,762.2	25.4	29	31	33	56	180	No	1,000.0
Jowzjan	727	5	16	427.0	22.4	27	24	19	45	250	No	1,225.0
Kabul	119	160	1303	3,314.0	34.6	57	65	24	68	155	Yes	1,225.0
Kandahar	6,538	246	1839	913.0	2.6	13	64	33	77	200	Yes	3,593.7
Kapisa	193	9	24	358.3	37.0	32	27	9	58	240	No	4,256.2
Khost	65	129	687	638.8	47.4	23	34	28	59	240	Yes	4,256.2

Kunar	713	44	266	413.0	78.7	27	24	9	39	190	Yes	4,256.2
Kunduz	78	26	106	820.0	3.7	22	25	26	68	270	Yes	1,225.0
Laghman	524	19	77	382.3	42.2	12	39	42	61	270	Yes	4,256.2
Logar	15	25	154	322.7	21.3	17	45	27	78	190	Yes	4,256.2
Nangahrar	15,159	58	388	1,342.5	35.7	27	43	25	54	180	Yes	4,256.2
Nimruz	1,253	27	237	118.0	0.0	15	38	66	61	210	No	5,193.7
Nurestan	536	13	19	131.0	96.6	14	2	40	10	270	No	4,256.2
Oruzgan	5,733	37	262	320.6	47.2	7	8	38	61	300	Yes	5,193.7
Paktia	89	57	269	415.0	47.4	15	34	28	59	240	Yes	4,256.2
Paktika	0	63	199	809.8	31.9	2	28	42	33	220	Yes	4,256.2
Panjshir[1]	0	2	6	128.6	77.8	27	16	11	33	220	No	4,256.2
Parwan	96	11	121	491.9	56.8	30	32	9	61	250	No	4,256.2
Samangan	559	2	1	378.0	58.8	13	7	12	28	250	No	1,225.0
Sar-e Pol	595	4	14	442.3	14.2	11	45	46	12	260	No	1,225.0
Takhar	542	4	34	830.3	33.3	12	29	26	43	250	No	1,225.0
Wardak	75	23	81	529.3	63.4	21	22	41	27	180	Yes	4,256.2
Zabul	1,062	69	285	244.9	22.7	1	38	38	39	260	Yes	5,193.7
Median	594.0	22.0	113.5	496.2	40.1	17.5	28.0	28.0	42.85	240	16/34	0/1,749

[1]Province created in 2004, data from 2004–2008.

between drugs and terrorism in Afghanistan. The provinces ranked at the top of the list—designated as "high" opium producing provinces on a year-to-year basis—such as Helmand, Nangahrar, Kandahar, and Badakhshan also experience higher annual rates of terrorist attacks and terrorist casualties. At the lower ranks of the list on Table 1, provinces like Bamiyan, Samangan, and Panjshir produce little to no opium annually and also experience much lower levels of terrorism annually. Of course, there are also outliers: Oruzgan and Daykuni are major opium-producing provinces but have seen low levels of terrorism while opium production is low in Khosht and Gazni, but terrorist activity is robust during the period examined. When province data is aggregated, however, a pattern is more clearly visible. Overall, high opium production provinces—those with annual hectares of poppy cultivation over the median—experience 3.1 terrorist attacks per year and suffer 20 terrorism casualties while low opium producing provinces average 2.5 terrorist attacks and 13 terrorism casualties annually. Also, Pearson's R coefficients for opium production and terrorist incidents and terrorism casualties are .406 and .374 respectively, suggesting a significant correlation.

Given this preliminary evidence, and the theoretical and qualitative work on drugs and terrorism in Afghanistan noted in the literature review, the study tests the following as its main hypothesis:

> *Hypothesis 1* (*H1*): Afghan provinces characterized by higher levels of opium production are more likely to experience higher levels of terrorist activity.

I also hypothesize that opium production is a robust predictor that *independently* contributes to terrorism in the provinces of Afghanistan. The study, therefore, evaluates opium as a predictor of terrorism while holding other potentially important socioeconomic, geographic, demographic, geographic, and security factors constant.

Previous cross-national studies of terrorism have identified macro-structural factors such as level of social and economic development as important factors determining patterns of terrorist attacks globally.[52] The theory underlying this proposed relationship is that poverty and poor socioeconomic development produce grievances within deprived populations that makes them more likely to support terrorism,[53] though there is considerable disagreement among terrorism experts surrounding the relationship between poverty and terrorism globally.[54] Qualitative case studies examining motivating factors for insurgency and terrorism in Afghanistan likewise identify poor economic development and socio-economic deprivation as important components in the origins, development, and sustenance of the Taliban movement, and as explanatory variables for the different levels of terrorism in parts of Afghanistan.[55] Others point to demographic, geographic, physical, and logistical features of the Afghan provinces—for example, the size of the population, the physical terrain and patterns of uneven infrastructure development—as determinants of terrorism and insurgency, and as impediments to counterinsurgency activites.[56] Furthermore, scholars have noted that the Taliban insurgency and the Al Qaeda terrorist movement has been mostly embedded in the Pashto-speaking population of Afghanistan, and that terrorist activity has been partially fueled by cultural and religious practices characteristic of the Afghan Pashtun community—for example, xenophobic tendencies in Deobandi Islam or within the cultural code of *Pashtunwali*.[57] This may explain the prevalence of terrorist violence and poor security in

the Pashtun-majority Southern provinces of Afghanistan, while other regions have experienced quiescence. Finally, scholars have also argued that foreign occupations and the stationing of foreign troops in countries like Afghanistan have consequences for terrorist activity.[58]

I recognize that all of these factors are likely significant predictors of terrorism in Afghanistan, but also expect that the drug trade remains a significant predictor of terrorist attacks and terrorist casualties while holding these constant. Therefore, I test as a second hypothesis:

> *H2*: The positive relationship between opium production and terrorist activity in the Afghan provinces is independent of, and robust to the inclusion of, social, economic, demographic, geographic, religious/cultural, and security factors that predict terrorism.

Finally, the study has an expectation regarding the direction of the causal arrow in the relationship between opium production and terrorism in the Afghan provinces. It posits that the essential nature of the relationship is that opium cultivation and production produces conditions under which terrorism is more likely to occur, and to result in higher casualties, rather than the other way around. It expects that opium production causes terrorism rather than terrorist activity making a province more likely to subsequently host opium production. Reversing the direction of the causal arrow is, of course, a logical possibility. Provinces plagued by a lot of terrorism and political violence could see their political, economic, and security status erode to the point that they become a more convenient locale for drug production because they have vast unpoliced territories and an impoverished, desperate peasantry. Indeed, scholars have argued that the erosion of stability in Afghanistan, due to the aftermath of the Soviet invasion and internal armed conflict of the 1990s, fueled the "relocation" of opiate production from more stable countries like Turkey, Iran, Thailand, and Burma.[59] However, I suspect that the drug trade in Afghanistan, though "created" by the long period of instability and mass political violence after the Soviet invasion, now is a sustaining force for terrorism, which is a smaller-scale and more specifically defined manifestation of political violence. A key issue here is the definition of terrorism used in the study—violence perpetrated by non-state actors against *civilians* with the intention of communicating a political message or influencing an audience—and how it differs from types of violence suffered in Afghanistan after the Soviet invasion during the period 1989 to 1996. This leads to the final hypothesis tested:

> *H3*: The relationship between opium production and terrorist activity in the Afghan provinces is causally linked, rather than merely correlational.

Analysis

To test these hypotheses, the study employs three different types of statistical tests that evaluate opium poppy production as a predictor of terrorist incidents at the Afghan provincial level: a set of six negative binomial regression estimations testing the main relationship between opium and terrorism in Afghanistan; Monte Carlo simulations of first difference substantive effects comparing opium production to other predictors of terrorism used in the study; and differently specified reruns of

the core regression estimations and Granger causality tests which are used to shed light on the causal direction of the relationship between opium production and terrorism. Terrorist activity is measured using two dependent variables, both of which are derived from the Global Terrorism Database (GTD). The first is an annual count of all terrorist incidents sorted by province in which the attack took place and the second is a tally of the total casualties due to terrorism—persons killed, wounded, or kidnapped in the course of a terrorist attack—each province-year. The purpose of fitting models with two dependent variables is to examine the effects of the Afghan opium economy on both the frequency and the intensity of terrorism at the province level. The GTD allows researchers to set criteria for type of terrorist events downloaded from the database. For the study, only terrorist events that are classified as "unambiguous" in terms of open source evidence, that are clearly aimed to achieve a "political, economic, religious or social goal"—sifting out attacks motivated by nonpolitical criminal intentions—that are conducted with the intent of communicating a message to a larger audience, and that are "outside the context of legitimate warfare activities" are included in the data.[60] Furthermore, only terrorist attacks that target civilians are included in the analysis. This helps to weed out events, such as attacks against on-duty U.S. or coalition forces, that might be more properly classified as interstate war or civil war events. Robust standard errors clustered by province are calculated for all coefficients.

The opium economy or illicit drug trade in Afghanistan—the main independent variable—is measured using the only available indicator of opiate activity at the province level: the scope of cultivation of opium poppies. The main independent variable is therefore the hectares of opium poppy production in the province, transformed into a natural log and derived from statistics published in various years of the United Nations Office of Drug Control's (UNDOCS) *World Drug Report*. The study is limited to the years 1986 to 2008, the full range of years for which data on opium production in the Afghan provinces is available.

Because the dependent variables are both count indicators with highly skewed distributions, both temporally and spatially, for which observations may not be independent of one another—terrorist attacks and terrorist casualties in one province in one year might be a predictor of attacks in a neighboring province or in a subsequent year—the study employs a negative binomial estimation technique.[61] Under or over-reporting bias is also likely to be minimal in the study, given that reporting on terrorism is unlikely to differ as dramatically from province to province as might be the case in a cross-national analysis. This further underscores the suitability of a negative binomial, rather than a zero-inflated negative binomial, modeling technique.[62]

The analysis also includes several covariates which facilitate the testing of the second hypothesis and comprise a sampling of the political, cultural, demographic, geographic, security, and socio-economic factors discussed previously as contributors to terrorism in Afghanistan and other countries. The first set are demographic and physical features of the province. These include the natural log of the physical size of the province in square kilometers, the natural log of its population, the percentage of its territory described as mountainous, and the percentage of its roads that are passable during all seasons. All of these factors are identified as precipitants of terrorist activity in Afghanistan,[63] and many are indicators that Eyerman[64] and Wade and Reiter[65] test as predictors of terrorism in their cross-national empirical studies. The expectation is that physically large, populous, and mountainous provinces with poor transportation infrastructures (few all-season roads) experience

higher levels of terrorism as these provinces are more difficult to police and pose more serious challenges for counterterrorism authorities.

Also included are a set of social and economic development indicators to determine the role played by poverty, socioeconomic underdevelopment, poor education, and poor public health in prompting terrorism in Afghanistan.[66] These include the literacy rate in the province, the percentage of the population with access to safe drinking water, the percentage of the population subsisting below the median caloric intake level, and the mortality rate of children under five years of age. The expectation is generally that Afghan provinces with low literacy, poor access to safe drinking water, higher levels of malnutrition, and high child mortality rates will experience more terrorist activity.

The study also controls for provinces with Pashtun majorities, with the expectation that these provinces will experience more terrorism than provinces dominated by the other major Afghan ethnic groups, the Tajiks, Uzbeks, and Hazara. The Taliban movement itself is a Pashtun-dominated movement that is embedded in the Pashtun-majority provinces in the Southern part of the country, and its ideology is attuned to the puritanical Deobandi interpretation of Islam familiar to Pashtun populations throughout South Asia.[67]

Finally, the study also controls for deployment of foreign troops within provinces. Highly specific and detailed statistics on foreign troop presence on a province-year basis is not available, partially due to security classification barriers. Because the study begins in 1994, no measurements of Soviet troop deployment are included in the analysis. NATO-supported ISAF (International Security Assistance Force) troops that constitute the sole foreign troop presence were originally limited to Kabul after the 2001 invasion—which mostly made use of indigenous Afghan Northern Alliance troops backed by NATO air support—and were then extended to the provinces in 2003. NATO and ISAF troops have since then been incrementally rotated between four zones, East, North, West, and finally South, and are tasked to counterinsurgency, counterterrorism, and patrol duties within provinces in these four zones. The specific location of activities of NATO and ISAF troops within these zones fluctuates throughout the year. Therefore, to operationalize foreign troop levels at the province level, I use figures for general troop deployments in the four zones per year divided by the number of provinces in each zone. This provides a rough estimate of typical foreign troop presence within a province in a given year.

The sources for the socioeconomic, demographic, infrastructural, and cultural indicators are the Afghanistan Ministry of Rural Rehabilitation and Development series of *Provincial Development Reports*[68] and the Afghanistan *Provincial Overviews* published online by the Naval Postgraduate School, Program for Culture and Conflict Studies.[69] Data for foreign troops was derived from a Brookings Institute report entitled *Afghanistan Index*.[70] Descriptive statistics for all variables used in the study are summarized in Table 2.[71]

Results

The results of the main regression models are presented in Table 3.

The analysis fits six models to illustrate the robustness of the core finding: that opium production at the provincial level in Afghanistan is a significant predictor of both terrorist attacks and casualties due to terrorism, regardless of model specification. Models 1 and 2 show provincial opium production to be a significant, positive

Table 3. Regression analysis results: Opium cultivation and terrorism in the provinces of Afghanistan, 1996 to 2008

Characteristic	(1) Terrorist attacks		(2) Terrorist casualties		(3) Terrorist attacks		(4) Terrorist casualties		(5) Terrorist attacks		(6) Terrorist casualties	
Opium cultivation (log hectares)	.113	(.044)*	.173	(.048)***	.106	(.026)***	.150	(.038)***	.099	(.023)***	.144	(.038)***
Province population (log)	.675	(.141)***	.776	(.190)***	.621	(.164)***	1.178	(.250)***	.515	(.141)***	1.153	(.240)***
Province area (log)	−.116	(.209)	−.232	(.238)	.370	(.155)*	.253	(.232)	.316	(.134)*	.294	(.229)
Percent mountainous					−.000	(.007)	.009	(.010)	−.000	(.006)	.009	(.010)
Literacy rate					.018	(.013)	.000	(.017)	.014	(.011)	−.008	(.017)
Access to safe drinking water					.020	(.099)*	.031	(.016)	.011	(.009)	.029	(.017)
Percent below min. calories					−.001	(.010)	.012	(.013)	−.000	(.007)	.011	(.013)
Percent all-season roads					.003	(.008)	.027	(.009)**	.004	(.007)	.029	(.229)**
Under 5 mortality rate					.006	(.003)	.006	(.005)	.004	(.003)	.005	(.005)
Pashtun majority					.974	(.322)**	.168	(.351)	.909	(.266)**	.216	(.348)
Foreign troops					.000	(.000)***	.000	(.000)***	.000	(.000)***	.000	(.000)***
Previous terrorism									.042	(.020)*	−.000	(.002)
Constant	−7.442	(2.854)**	−6.258	(3.482)*	−16.363	(2.886)***	−23.106	(4.568)***	−13.558	(2.672)***	−23.053	(4.586)***
Wald χ^2	32.47***		27.98***		431.41***		298.85***		418.18***		346.09***	
n	490		490		490		490		458		458	

All models are negative binomial regressions, robust standard errors clustered by province in parentheses.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .000$.

predictor of terrorist attacks and casualties, while controlling only for the basic provincial demographic and physical indicators, province population and area. In these first two models, provinces that produce higher levels of opiates experience higher levels of terrorism and suffer higher civilian casualty rates due to terrorism, regardless of the population or physical size of the province. In models 3 and 4, the full compliment of covariates are added to the model and in these opium production remains a significant positive predictor of both attacks and casualties despite the fact that some of the covariates—especially the level of foreign troops present—are highly significant. In models 5 and 6, an indicator for previous incidents of terrorist attacks and casualties due to terrorism in the province is included. This variable is simply a one-year lag of the dependent variable and is included to underscore the robustness of the core findings, that opium production is a significant positive predictor of province-level terrorism, and to help to address questions of temporal autoregression. In models 5 and 6, opium production remains significant and the overall results remain much the same.

Few of the covariates in the models are consistently significant; the prominent exceptions being province population, which is significant in all model specifications and bears large coefficients, and the average number of foreign troops present in the province, which is significant but which has a small coefficient. In some model specifications, province area, access to safe drinking water, percent of province roads categorized as "all season," and Pashtun majority are significant positive predictors of terrorist attacks and casualties.

When they are significant, all have coefficients that are in the direction hypothesized with the exception of "access to safe drinking water" and "all season roads," which are positive rather than negative. This latter finding is curious in that it suggests that terrorist activity is more acute in provinces with better road transportation infrastructure. Rather than being a signifier of lower levels of economic development—thereby working as a motivation for terrorist support by increasing socioeconomic grievances among the locals as expected by Ross[72]—or an impediment to good policing and counterterrorism/counterinsurgency efforts, good road infrastructure seems to boost terrorist activity. I can suggest two explanations for this unanticipated finding: a) good road infrastructure might increase terrorist activity by serving as an efficient conduit for terrorist activity, such as transportation of cadres, weapons, and equipment in much the same way superhighways in developed and developing countries facilitate the movement of infectious diseases and criminal activities; b) or, conversely, provinces with good roads merely present terrorist groups with better targeting opportunities. However, as with the other covariates mentioned, the percentage of all-season roads in a province is not significant across all model specifications, though it is significant in models 5 and 6, which include all covariates. The issue of transportation infrastructure as a predictor of terrorism in Afghanistan begs further scrutiny in future studies.

Substantive Effects

In Figure 1, the results of Monte Carlo simulations of first-difference substantive effects of selected model predictors are graphed to show the amount of terrorist activity that opium economy in the Afghan provinces produces per year. Using the *Clarify* software package developed by Tomz, Wittenburg, and King,[73] I calculate and graph the effects of one quartile increases in raw hectares of opium poppy cultivation on the dependent variables and compare them with corresponding unit

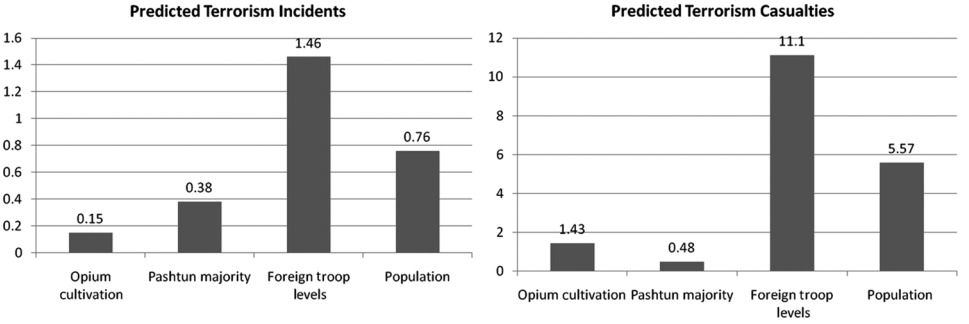

Figure 1. Substantive effects simulations. *Monte Carlo simulations of the substantive effects of one quartile or one unit increases of the independent variable on dependent variables.

increases in three of the most robust covariates in the model: whether or not the province is Pashtun majority, foreign troop presence, and province population. In the simulations, I hold all other covariates in the model constant to their appropriate measures of central tendency—mean for interval indicators and median for ordinal indicators—or at zero if the indicator is a dummy variable.

The results of the substantive effects simulations indicate that while opium production is a significant contributor to terrorist activity at the provincial level, and is highly robust when controlling for other province factors, the local opium economy produces modest amounts of terrorism relative to other significant contributors, thereby supporting hypothesis two. While increasing the number of hectares of opium production in one year by 25 percent yields 0.15 more attacks and 1.43 more casualties due to terrorism annually on average, merely being Pashtun majority ensures that the province experiences 3.8 more terrorist attacks per year and suffers more than .48 more casualties per year. The most substantive contributor to terrorism in the Afghan provinces is the presence of foreign troops. For each quartile increase in NATO-ISAF troops in a province, terrorist attacks increase by 1.46 events while casualties increase by 11.1. This even outstrips province population size as a substantive predictor. Increasing the population of a province by 25% yields .76 more attacks and produces 5.57 more casualties due to terrorism.

I make a couple of comments about the findings in the substantive effects simulations. First, given the potentially strong effects that foreign troop presence may have on terrorism in Afghanistan, I am more confident in my core result that opium production increases terrorism than I would have been if troop presence were omitted from the models. The inclusion of foreign troops to the estimations makes the findings all the more robust. Second, the direction of causation between foreign troop presence and terrorism in Afghanistan is unclear. Theoretically, presence of foreign troops might stimulate terrorist activity, particularly in highly independent and xenophobic Pashtun areas or where such presence is accompanied by human rights abuses or offenses against local customs. However, it also stands to reason that foreign troops are more likely to be deployed to areas where terrorist activity is high and security is poor. Further statistical tests fail to clarify the endogenous nature of troop presence and terrorism in the provinces. For example, lagging by one period troop presence produces the same results as in the core model, suggesting that troops in one year (t_1) predict terrorism in the subsequent year (t_2). However, leads of foreign troop presence are also significant. Furthermore, when the models

Table 4. Direction of causation, regression models with lagged IV opium cultivation and terrorism in the provinces of Afghanistan, 1996 to 2008

Characteristic	(7) Terrorist attacks		(8) Terrorist casualties		(9) Terrorist attacks		(10) Terrorist casualties	
One-year lag, opium cultivation (log hectares)	.120	(.025)***	.177	(.039)***	.112	(.023)***	.178	(.040)***
Province population (log)	.608	(.174)***	1.147	(.242)***	.518	(.151)**	1.159	(.241)***
Province area (log)	.354	(.149)*	.282	(.199)	.288	(.131)*	.285	(.197)
Percent mountainous	.001	(.007)	.015	(.011)	.000	(.006)	.015	(.011)
Literacy rate	.015	(.013)	.003	(.016)	.013	(.021)	.003	(.016)
Access to safe drinking water	.021	(.008)	.040	(.015)**	.015	(.010)	.041	(.015)**
Percent below min. calories	−.000	(.008)	.021	(.015)	.000	(.007)	.021	(.015)
Percent all-season roads	.006	(.008)	.025	(.009)**	.005	(.007)	.025	(.009)**
Under 5 mortality rate	.005	(.003)	.007	(.004)	.004	(.003)	.007	(.004)
Pashtun majority	.997	(.297)**	.322	(.294)	.919	(.264)**	.324	(.296)
Foreign troops	.000	(.000)***	.000	(.000)***	.000	(.000)***	.000	(.000)***
Previous terrorism					.039	(.019)*	−.000	(.002)
Constant	−16.081	(2.855)***	−24.088	(4.406)***	−13.569	(2.582)***	−24.388	(4.322)***
Wald χ^2	364.27***		367.16***		351.33***		460.98***	
n	458		458		458		458	

All models are negative binomial regressions, robust standard errors clustered by province in parentheses.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .000$.

Table 5. Direction of causation: Results of Granger causality tests

1, 2 and 3-year lags	Combined model χ^2
Opium cultivation granger causes terrorist incidents	13.61**
Opium cultivation granger causes terrorist casualties	6.15*
Terrorist incidents granger cause opium cultivation	4.79
Terrorist casualties granger cause opium cultivation	2.39

All coefficients are combined tests of one, two and three-year lags.
**$p \leq .01$; *$p \leq .05$.

are respecified to predict foreign troop levels rather than terrorism, both terrorist incidents and terrorist casualties in provinces significantly predict foreign troop presence. These results suggest a complex, endogenous relationship whereby foreign troops are allocated to terrorism-plagued provinces in order to foster security, but in doing so exacerbate terrorist activity.

Direction of Causation Between Opium and Terrorism

Finally, in line with the previous discussion, the study employs two means to further increase confidence in the direction of causation of the relationship between opium production and terrorism at the provincial level and to test for the influence of endogeneity. First, the core negative binomial regression models are refitted using a one-year lagged version of the main independent variable. This allows a test of the effects of opium production in t_1 on terrorist attacks and terrorism casualties in t_2. The results of these models are presented in Table 4.

Across all specifications, lagged opium production is a significant predictor of terrorism. This includes models 9 and 10 where the lagged dependent variable—which is highly significant and adversely affects the level of significance of other covariates in the model—is included. These results provide partial support for hypothesis three, demonstrating that opium production is causally linked to terrorism in the Afghan provinces, and is not a mere correlate.

The results of the second test to determine causation also supports hypothesis three. Table 5 shows the results of a set of Granger causality tests using one, two, and three-year lags of both the independent and dependent variables.

Table 5 demonstrates that opium cultivation Granger-causes terrorist incidents and terrorist casualties in the Afghan provinces, but that incidents and casualties do not Granger-cause opium production. Both Tables 4 and 5 suggest that while opium production produces conditions favorable to the vitality of terrorist groups and their activities, the experience of terrorism does not precipitate opium production; for example, by eroding security to a point that opium producers move in to take advantage of poor policing, or by destroying alternative employment opportunities for locals.

Conclusion

The empirical results of this study are preliminary, but they provide evidence that opium production is an important driver of terrorism in Afghanistan's provinces, that provinces that feature opium cultivation are at a significantly higher risk of

experiencing terrorist attacks and of seeing their citizens harmed in terrorist incidents, that opium production is likely a cause of rather than an effect of terrorism, but that poppy cultivation is by no means the only substantive root cause of terrorism at the provincial level. At the very least, the results justify the consideration of the illicit drug market as a crucial contributor to the terrorism threat in Afghanistan and to the larger security picture in that country.

The study also paves the way for several future research directions on the relationship between illicit drugs and terrorism in Afghanistan. First, the study is limited to the 34 provinces of Afghanistan while the Taliban engagement in the opiate trade is known to transcend the border with Pakistan. Furthermore, the type of analysis featured in this piece could be extended to other countries in which illicit drugs are commonly believed to be a driver of terrorist activity—such as Colombia and the Philippines—or regions of the world, like North and West Africa, that have become important transit points for the international drug trade. Second, the study provides a framework within which empirical examination of the effectiveness of U.S. and Afghan government counternarcotics strategies might be assessed. Though analysts and policymakers nearly universally regard the drug trade as a sustaining force for terrorism in the country, and though drug crop eradication and drug interdiction strategies have become staple components of U.S. counterterrorism policy, these strategies are still controversial, with some experts charging that they are counterproductive and may even drive Afghan peasants into support for the Taliban.[74] The effectiveness of counternarcotics efforts in Afghanistan could be similarly evaluated in a province-year framework similar to the one employed in this study.

Notes

1. India is the lead licit opium producer, with its crop used to produce medicinal opiates. See Victoria Greenfield, Victoria A. Letizia Paoli, and Peter Reuter, "Is Medicinal Opium Production Afghanistan's Answer?: Lessons from India and the World Market," *Journal of Drug Policy Analysis* 2, no. 1 (2009): 22–38.

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4. UNODC, United Nations Office on Drugs and Crime, *Afghanistan Opium Survey 2007: Executive Summary* (Vienna: UNODC, 2007).

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6. Gretchen Peters, *Seeds of Terror: How Heroin is Bankrolling the Taliban and Al Qaeda* (New York: Thomas Dunne Books, 2009); "Afghan Leader Warns of Terrorism," *Los Angeles Times*, October 13, 2006, A9; Henry J. Hyde and Mark Steven Kirk, "Letter to Secretary of Defense Donald Rumsfeld Regarding the Opium Crisis in Afghanistan," October 12, 2006, http://www.internationalrelations.house.gov/archives/press.htm; Svante E. Cornell, "The Interaction of Narcotics and Conflict," *Journal of Peace Research* 42, no. 6 (2005a): 751–760; Svante E. Cornell, "Narcotics, Radicalism and Armed Conflict in Central Asia: The Islamic Movement of Uzbekistan," *Terrorism and Political Violence* 17, no. 4 (2005b): 619–639; Rohan Gunaratna, *Inside al-Qaeda: Global Networks of Terror* (New York, NY: Hurst and Company, 2002); Asa Hutchinson, "Narco-Terrorism: The International Connection Between Drugs and Terror," Address of Drug Enforcement Agency Director before the Heritage Foundation, April 2, 2002, http://www.justice.gov/dea/speeches/s040202.html; Frank Cillufo, "The Threat Posed from the Convergence of Organized Crime, Drug Trafficking, and Terrorism," Director, Counterterrorism Task Force, Center for Strategic and International Studies. Address before

U.S. House Judiciary Subcommittee on Crime, 2000, http://csis.org/files/media/csis/congress/ts001213cilluffo.pdf; Raphael Perl, "Taliban and the Drug Trade," CRS Report for Congress, 2001,http://fpc.state.gov/documents/organization/6210.pdf; Ahmed Rashid, "The Taliban: Exporting Extremism," *Foreign Affairs* 78, no. 22 (1999): 22–35.

7. Perl and Goodhand claim that the Taliban levy a 10 percent tax on cultivation of poppy and a 10 to 20 percent tax/fee on stored product and for trafficking rights. Raphael Perl, "Taliban and the Drug Trade," Congressional Research Service Report for Congress, 2001, http://fpc.state.gov/documents/organization/6210.pdf; Jonathan Goodhand, "From Holy War to Opium War?: A Case Study of the Opium Economy in Northeastern Afghanistan," *Central Asian Survey* 19, no. 2 (2000): 265–280.

8. Hamida Ghafour, "Poverty and Terrorism Fuel Booming Drug Trade in Afghanistan," *Daily Telegraph*, August 24, 2004, http://www.telegraph.co.uk/news/worldnews/asia/afghanistan/1470090/poverty-and-terrorism-fuel-booming-drug-trade-in-Afghanistan.html; John K. Cooley, *Unholy Wars: Afghanistan, America and International Terrorism* (London: Pluto Press, 2002); Ikramul Haq,"Pak-Afghan Drug Trade in Historical Perspective," *Asian Survey* 36, no. 10 (1996): 945–963.

9. According to Cornell (see note 6 above, 2005b), p. 756.

10. Kathy Gannon, "Afghanistan Unbound," *Foreign Affairs* 83, no. 3 (2004): 35–46; Goodhand (see note 7 above).

11. Graham Farrell and John Thorne, "Where Have All the Flowers Gone?: Evaluation of the Taliban Crackdown Against Opium Poppy Cultivation in Afghanistan," *International Journal of Drug Policy* 16 (2005): 81–91.

12. Vanda Felbab-Brown, "Afghanistan: When Counternarcotics Undermines Counterterrorism," *The Washington Quarterly* 28, no. 4 (2005): 55–72; Glaze, *Opium and Afghanistan* (see note 3 above).

13. Perl, "Taliban and the Drug Trade" (see note 6 above).

14. Peters (see note 6 above); Cornell (see note 6 above, 2005b); Gunaratna (see note 6 above).

15. Hyde and Kirk (see note 6 above); Hutchinson (see note 6 above).

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19. Felbab-Brown (see note 12 above); Makarenko (see note 5 above); Rashid (see note 6 above).

20. This is an issue also observed by Cornell, p. 752 (see note 6 above, 2005a).

21. James A. Piazza, "The Illicit Drug Trade, Counternarcotics Strategies and Terrorism," *Public Choice* 149, nos. 3–4 (2011): 297–314.

22. Patrick Regan and Aysegul Aydin, "Weapons, Money and Diplomacy: Intervention Strategies and the Duration of Civil Wars." Paper prepared for the Mapping and Explaining Civil War: What To Do About Contested Datasets and Findings, Human Security Center at the Liu Institute for Global Issues, University of British Columbia, 18–19 August, 2003; Patrick Regan and Daniel Norton,"Protest, Rebellion and the Onset of Civil Wars," Paper prepared for the Mapping and Explaining Civil War: What To Do About Contested Datasets and Findings, Human Security Center at the Liu Institute for Global Issues, University of British Columbia, 18–19 August, 2003.

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24. Peters (see note 6 above); Mark A. R. Kleiman, "Illicit Drugs and the Terrorist Threat: Causal Links and Implications for Domestic Drug Control Policy," Congressional Research Service Report for Congress RL32334 (Washington, D.C.: The Library of Congress, 2004.)

25. See, for example, Ross (note 23 above, 2004a and 2004b).

26. UNODC, United Nations Office on Drugs and Crime, *2010 World Drug Report* (Vienna: UNODC, 2010).

27. Peter Reuter and Victoria Greenfield, "Measuring Global Drug Markets: How Good Are the Numbers and Why Should We Care About Them?," *World Economics* 2, no. 4 (2001): 159–173.

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30. Gunaratna (see note 6 above); David Tucker, "What's New About the New Terrorism and How Dangerous Is It?," *Terrorism and Political Violence* 13 (2001): 1–14.

31. Ross (see note 23 above, 2003).

32. Cornell (see note 6 above, 2005a); Karen Ballentine, "Beyond Greed and Grievance: Reconsidering the Economic Dynamics of Armed Conflict," in *The Political Economy of Armed Conflict*, ed. Karen Ballentine and Jack Sherman (Boulder, CO: Lynne Rienner, 2003).

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34. Goodhand (see note 7 above); Felbab-Brown (see note 12 above).

35. Peters (see note 6 above).

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40. James A. Piazza, "Incubators of Terror: Do Failed and Failing States Promote Transnational Terrorism?," *International Studies Quarterly* 52, no. 3 (2008): 469–488.

41. James A. Piazza, "The Illicit Drug Trade, Counternarcotics Strategies and Terrorism." Paper prepared for the Fourth Annual Terrorism and Policy Workshop, University of Texas at Dallas, May 2011.

42. Kleiman (see note 24 above).

43. Ibid.

44. Rashid (see note 6 above).

45. Felbab-Brown (see note 12 above).

46. As previously mentioned, however, Piazza's cross-national panel time series analysis of 170 countries for the period 1986 to 2006 produces results that are consistent with the core findings of this study: that illicit drug production is a positive predictor of terrorist activity. Piazza (see note 41 above).

47. However, national levels of opium production in Afghanistan—coded as annual totals for all provinces for the period 1980 to 2008—are highly correlated with national annual totals of terrorist attacks and numbers of terrorist casualties. Pearson's r values for opium production and terrorist incidents is 0.84 and for opium and casualties is 0.81.

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56. Seth G. Jones, *Counterinsurgency in Afghanistan* (Santa Monica, CA: RAND, 2008).

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65. Wade and Reiter (see note 52 above).

66. Von Hippel (see note 55 above); Cooley (see note 8 above); Rashid (see note 6 above).

67. Sinno (see note 57 above); Johnson and Mason (see note 57 above).

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