

## ABSTRACT

Title of Thesis: STRATEGIC VS. OPPORTUNISTIC  
LOOTING: THE RELATIONSHIP  
BETWEEN ANTIQUITIES LOOTING AND  
ARMED CONFLICT IN EGYPT

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Antiquities are looted from archaeological sites across the world, seemingly more often in areas of armed conflict. Previously, the relationship between antiquities looting and armed conflict has been assessed with qualitative case studies and journalistic evidence due to a lack of data. This study considers the relationship between antiquities looting and armed conflict in Egypt from 1997 – 2014 with a newly collected time series dataset. A combination of Lag-augmented Vector Autoregression (LA-VAR) and Autoregressive Distributed Lag Models (ARDL) is used to look at both the overall relationship between these two phenomena and their temporal ordering. Ultimately, this thesis finds that: (1) antiquities looting and armed conflict have a positive statistically significant relationship, (2) there is stronger support for antiquities looting preceding armed conflict than for the reverse temporal ordering, and (3) this relationship varies by type of conflict.

STRATEGIC VS. OPPORTUNISTIC LOOTING:  
THE RELATIONSHIP BETWEEN ANTIQUITIES LOOTING AND ARMED  
CONFLICT IN EGYPT

by

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## Dedication

This work is dedicated to Daniel D'Ippolito and Nicholas Fabiani. Without their love and support, this thesis would not have been the same.

## Acknowledgements

I would like to thank my committee for their continued support and encouragement through the learning process of this master's thesis: Dr. Jean McGloin, my committee chair; Dr. Laura Dugan; and Dr. Sally Simpson.

## Table of Contents

Dedication .....	ii
Acknowledgements .....	iii
Table of Contents .....	iv
List of Tables, Equations & Figures .....	v
Chapter 1: Introduction .....	1
Chapter 2: Strategic and Opportunistic Looting in Armed Conflict .....	6
Routine Activity Theory .....	6
CRAVED Principles .....	9
Antiquities Looting and Armed Conflict: Two Relationships .....	12
Strategic Antiquities Looting in Armed Conflict .....	14
Opportunistic Antiquities Looting in Armed Conflict .....	16
Hypotheses .....	17
Chapter 3: Egypt as a Case Study .....	18
Egypt’s Cultural Heritage .....	18
A Brief History of Armed Conflict in Egypt .....	20
Reports of Antiquities Looting in Egypt .....	22
Chapter 4: Data & Methods .....	24
The Utility of Open Source Data & Quantitative Methods .....	24
Antiquities Looting .....	27
Armed Conflict .....	36
Control Variables .....	41
Analytic Plan .....	42
Lag-Augmented VAR & Autoregressive Distributed Lag Model .....	45
Procedure .....	48
Chapter 5: Results .....	50
Descriptive Statistics .....	50
Hypothesis 1: Antiquities Looting and Armed Conflict are Positively Related .....	53
Hypothesis 2: Strategic Antiquities Looting in Armed Conflict .....	55
Hypothesis 3: Opportunistic Antiquities Looting in Armed Conflict .....	58
Time Periods .....	61
The Influence of Control Variables .....	62
Limitations .....	63
Summary of Results .....	65
Chapter 6: Discussion .....	67
The Relationship between Antiquities Looting and Armed Conflict .....	67
Temporal Ordering: Strategic vs. Opportunistic Looting .....	68
Alternative Explanations: Crime vs. Antiquities Looting .....	71
Summary and Directions for Future Research .....	74
Appendix .....	76
Codebook .....	76
Bibliography .....	84

## List of Tables, Equations & Figures

Table 1. The application of the CRAVED principles and Routine Activity Theory to strategic and opportunistic looting.....	13
Table 2. Key Terms for Reuters and Lexis Nexis Data .....	30
Table 3. Summary statistics for the monthly and quarterly data .....	51
Table 4. Cities/Towns that Experienced Both Armed Conflict Incidents and Antiquities Looting Incidents .....	53
Table 5. Cointegration Results.....	54
Table 6. The Effects of Antiquities Looting on Armed Conflict.....	57
Table 7. The Effects of Armed Conflict on Antiquities Looting.....	60
Table 8. Summary of Results by Hypothesis.....	66
Equation 1 .....	48
Figure 1. Reports of Antiquities Looting 1997-2014.....	26
Figure 2 (above). Distribution of antiquities looting and cultural property crime 1997-2014.....	51
Figure 3 (below). Distribution of armed conflict by type (terrorism, riots and protests, other) 1997-2014.....	51
Figure 4 (above). Distribution of antiquities looting and cultural property crime 2010-2014.....	52
Figure 5 (below). Distribution of armed conflict by type (terrorism, riots and protests, other) 2010-2014.....	52
Figure 6. The cumulative sum of squares .....	65

## Chapter 1: Introduction

Antiquities looting has become increasingly prominent in news headlines. Newspapers around the world show headlines reporting antiquities looting from Israel, Cambodia, China, Greece, Italy, Egypt, Peru, Syria, and the United States.<sup>1</sup> Though reports of antiquities looting are found in all regions, many seem to be especially concentrated in areas of armed conflict. Indeed, many headlines suggest that there is a relationship between antiquities looting and armed conflict. Headlines such as “Syria’s Historical Artifacts aren’t just being Destroyed by ISIS, They’re Being Looted” imply that parties involved in armed conflict are using antiquities as a source of funding” (Robins-Early, 2015). Although there is evidence that over 50% of archaeological sites globally have reported at least some degree of looting (Proulx, 2013), evidence on the extent to which antiquities looting is related to armed conflict is largely journalistic (see Antiquities Coalition, 2014).

Such evidence is important; however, if antiquities looting is indeed concentrated in areas of armed conflict, then it is also important to quantitatively assess what, if any, relationship exists between them. There are two (non-mutually) exclusive relationships that are especially important to consider: strategic antiquities looting in armed conflict and opportunistic antiquities looting in armed conflict. These relationships reflect two temporal orderings: antiquities looting preceding armed conflict (strategic) and armed conflict preceding antiquities looting

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<sup>1</sup> Examples include “Peru Investigating Instances of Looting and Other Activities Threatening Nazca Lines,” “25 Greco-Roman artifacts seized in illicit digging attempt in Alexandria,” (Fox News Latino, 2014; The Cairo Post, 2015). Sources for all headlines are listed in the references section.

(opportunistic). Because of the intrinsic value of antiquities, defined broadly in this research as any object over 100 years old located in the ground or embedded in a fixture of an archaeological site, they could be used to fund violent campaigns or to send messages that attack cultural identity.<sup>2</sup> Both cases represent strategic antiquities looting. By contrast, during armed conflict there can be a breakdown in social order, which can lead to increases in crime in general including antiquities looting. Antiquities looting in this case is opportunistic and akin to other types of crime resulting from a vacuum in social order.

Antiquities looting is a crime in many countries, yet criminology rarely adopts it as a crime of focus. Several scholars have called on criminologists to study art and antiquities related crimes, citing the need to apply concepts from deterrence to reduce the trafficking of looted antiquities (Casey, 2006; Dobovšek & Slak 2011; Hill, 2008; Mackenzie & Green, 2009; Ojedokun, 2012; Passas & Proulx, 2011; Polk, 2009). Other criminological theories, particularly those looking at the interaction between offenders and the settings of crimes (e.g., Routine Activity Theory and the CRAVED principles), are also applicable to this problem but have yet to be applied. Cohen and Felson's (1979) Routine Activity Theory focuses on the elements necessary for a crime to occur (motivated offender, capable guardian, and suitable target). Clarke's (1999) CRAVED principles focus on why certain resources or objects are used to fund armed conflict or terrorism.

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<sup>2</sup> There is no consensus on the definition of an antiquity of antiquities looting. A broader discussion of this issue can be found in the Data & Methods section.

Despite the relevance of antiquities looting to criminology, most research on this topic has been conducted by archaeologists, art historians, and political scientists who emphasize the importance of maintaining the history and the cultural heritage of a given area. Yet, because antiquities looting is a crime in many countries and the trafficking of antiquities is a crime internationally, criminology has much to offer. There are also several scholars whose work focuses on how antiquities looting (and art theft) funds terrorism using qualitative and journalistic evidence (Di Giovanni et al., 2014; Hanson, 2015; Howard et al., 2015; Losson, 2016). For example, a news article by Di Giovanni et al. (2014) discusses antiquities looting as a source of funding for ISIS based on journalistic evidence that “by some estimates, these sales now represent ISIS’s second largest source of funding,” and that “hundreds of millions of dollars’ worth of irreplaceable pieces are being sold to fund terrorists.” Articles like Di Giovanni et al.’s are important for understanding the rich context around and underlying mechanisms of a specific incident. Quantitative analysis can complement journalistic and qualitative research by looking at patterns across incidents and time.

This thesis uses criminological theory to illuminate the possibly complex relationship between antiquities looting and armed conflict quantitatively. For example, antiquities can be looted to support armed conflict and conflict can in turn promote looting by: (a) increasing the opportunities for crime due to decreased capable guardianship or (b) fostering antiquities looting to prolong or extend conflict (e.g., through targeted destruction of the opposing side’s “social identity,” providing money, weapons, etc.). It may also be that antiquities looting does not initially

support armed conflict and instead looting may begin as an opportunity-based crime. Then, during armed conflict antiquities looting can become a source of funding to prolong or extend the conflict, depending on the degree of organization among the involved parties.

Understanding the nature of the relationship between looting and conflict might provide insight to design policy to prevent both armed conflict and antiquities looting more effectively. For example, if antiquities are looted to support armed conflict, then interventions could address the intentionality behind the crime. They could take into account the international nature of organized crime and how natural resources are targeted in conflicts (their monetary value, proximity, ease of concealment, and ease of transport). Further, an increase in antiquities looting might be one indicator that an armed conflict is brewing, giving the authorities time to intervene before the situation escalates. Conversely, if antiquities are looted as a result of increased opportunity in an armed conflict, then interventions could assess the nature of looting opportunities, including the effects of changes in capable guardianship and motivations of offenders (e.g., lack of ability to protect archaeological sites and incentivized looting through the issuance of licenses).

This thesis assesses the relationship between antiquities looting and armed conflict in Egypt to better address this void. Egypt has several characteristics that make it a good case study for this research endeavor. Egypt has many antiquities and archaeological sites and it is invested in protecting its cultural heritage, increasing the likelihood that looting events are reported. Further, because Egypt has experienced

many types of armed conflict, the analysis may be able to address whether different types of armed conflicts have different relationships with antiquities looting.

The next chapter provides the theoretical background for the relationship between antiquities looting and armed conflict, focusing on strategic antiquities looting in armed conflict and opportunistic antiquities looting in armed conflict. The third chapter provides more context for Egypt as a case study. The fourth chapter outlines the data sources and method. The fifth chapter reviews the findings; the thesis ends with a discussion on the implications of the findings, limitations, and next steps.

## Chapter 2: Strategic and Opportunistic Looting in Armed Conflict

Both the CRAVED principles and Routine Activity Theory can help explain the relationship between antiquities looting and armed conflict. Both theoretical perspectives draw on the rationality of the actor in weighing the risks and benefits prior to committing crime, which in the context of armed conflict may speak to the threshold at which looting becomes more favorable than the perceived (or actual) punishment. Researchers have argued that those looking to fund conflict will use objects that are easily accessible, transportable, and have a consistent market value, such as natural resources. Additionally, there needs to be a temporal and spatial confluence of three elements in order for a crime (e.g., antiquities looting) to occur: a suitable target, a motivated offender, and a lack of capable guardianship. Combined, these theories focus on why certain objects or places are subject to crime more often than others.

### Routine Activity Theory

Cohen and Felson's (1979) routine activity's theory directly addresses the ecological requirement for crime, which encompasses both crimes committing during conflicts and archaeological sites. Cohen and Felson (1979) argue that there are three elements required for a crime to occur: a motivated offender, lack of capable guardianship, and suitable targets. When there is a confluence of these in time and space, crime is more likely to occur. They use the term target instead of victim as both persons and property can be considered "targets," while a victim is usually a person. Cohen and Felson (1979) further state that there are two central propositions

to how routine activities shape the potential for crime. First, potential offenders weigh the value of an intended target and the extent to which it has guardianship. Second, routine activities can create opportunities for crime through interactions between the offender and the intended target.

Target suitability is central to both propositions. Cohen and Felson (1979) define target suitability as reflecting such things as value, inertia, visibility, and access (VIVA). Value refers to the material or symbolic desirability of a personal or property target. Inertia is how difficult it is to remove the target, including the “weight, size, and attached or locked features of property preventing or inhibiting its illegal removal and the physical capacity of personal victims to resist attackers” (Cohen & Felson, p. 591). Visibility is how exposed targets are to offenders (Felson & Clarke, 1998). Access refers to other features of everyday life that make it easy for offenders to get to targets (Felson & Clarke, 1998).

Felson and Clarke (1998) further developed all four dimensions of target suitability, which they called the “VIVA model” as part of a broader discussion on the merits of viewing crime as a product of the interaction between the individual and the setting (p. 33). They argue that focusing on the setting frees criminologists from being confined to explaining crime based on abstractions or debates on class, race, or intelligence quotients (Felson & Clarke, 1998: 33). Instead, criminologists can focus on how tangible features of the world govern people’s movements, provide routines for people, and structure their choices. The VIVA model is one of ten principles of opportunity and crime used to support this argument, namely that “some products offer more tempting crime opportunities” (Felson & Clarke, 1998: vi). They argue

that the VIVA model offers a way to identify which products are likely to be targeted (“hot products”) using findings from studies by the Home Office Police Research Group (see for example, Brown, 1995). It is important to note that there have been no explicit tests of the VIVA model as a stand alone explanation of crime; it is always embedded in tests of opportunity theories (usually routine activities).

Routine Activity Theory has been the focus of numerous tests, most of which focus on the notion of guardianship (Pratt & Cullen, 2005). Even without considering a motivated offender and the suitability of the target, studies generally support the conclusion that routine activities influence crime rates across ecological units. There is also a growing body of literature looking at how routine activities affect the likelihood of victimization (Fisher et al., 2010). While there tends to be support for the routine activities angle, inconsistent results and incomplete research designs limit the findings in this area (Meier & Miethe, 1993).

Routine activities can help to explain how archaeological sites are targeted. These sites often cover large geographic areas, when there are typically few resources available for monitoring. Given their size, archaeological sites are both difficult to police and are typically areas of low priority. Thus, it is difficult to establish guardianship over archaeological sites. There is also a plethora of potentially valuable objects in an archaeological site, particularly in a country like Egypt, where antiquities are everywhere. According to Mohamed Ibrahim Ali, Egypt’s minister of state for antiquities, “when you dig, you find something” (Boyle, 2014). This makes archaeological sites eminently suitable targets for theft and looting. Finally, a motivated offender is anyone that is able, willing, or trying to commit a crime (Cohen

& Felson, 1979). Looting of archaeological sites provides a living for many people; sometimes the trade is passed down through generations. This creates a pool of offenders who are especially able and willing to loot. Beyond the subsistence looters, the combination of a large number of archaeological sites and objects available with little to no guardianship could create a motivated offender from any person in need of some quick cash.

### *CRAVED Principles*

Clarke's (1999) CRAVED principles focus on the idea that certain objects (or natural resources) can be considered "hot products," (a term he first uses in his paper with Felson in 1998 in discussing the VIVA model). He argues that just as focusing research on "hot spots" (places with high rates of reported crimes or police calls for assistance) has been effective for directing police and interventions to reduce crime, research should also focus on "hot products" to reduce crime (Clarke, 1999: v). He defines "hot products" as any kind of stolen good that is easily concealable, removable, available, valuable, enjoyable, and disposable (i.e. the CRAVED principles) (Clarke, 1999: vii). Such products include "not just manufactured goods, but also food, animals and works of art" (Clarke, 1999: v).

The CRAVED principles are an extension of Cohen and Felson's (1979) and Felson and Clarke's (1998) discussion of target suitability and the VIVA model. Clarke (1999) agrees with both of these works that understanding the interaction of the setting and the target is essential for crime prevention, with an emphasis on understanding target suitability. The CRAVED principles also reflect the argument that looking at tangible attributes of targets instead of abstract concepts focuses

discussions of target suitability on features that structure offender choices. Both the VIVA model and the CRAVED principles identify features of objects (and for the VIVA model, persons) that make them more likely to be targeted by offenders for theft.

Clarke's principles move beyond VIVA by both refining its dimensions and extending them to address the limitation that the VIVA model cannot account for why certain objects are "hot" (Felson & Clarke, 1998: 33). Clarke breaks up *value* into valuable and enjoyable to account for both the monetary value and the fact that value can be subjective in the eye of the offender. An object might be "valuable" for aesthetic reasons even if there is no plan to sell it. *Inertia* and *visibility* are combined into the single concept of removable, and *access* is comparable with available. These concepts (valuable, enjoyable, removable, and available) get at what objects are likely to be taken. However, Clarke also includes why certain objects would be taken over others through the concepts of concealability and ease of disposal of goods. Both are judgements that must be made by the offender and speak to offender motivation because of Clarke's emphasis on objects destined for illegal markets. Offenders will be more motivated to target objects that are judged to be easily concealable and easily disposed of because they will be easier to move and to sell for profit.

These principles have been applied to the illegal wildlife market to better understand why some species are more likely to be trafficked than others (Moreto & Lemieux, 2014; Petrossian & Clarke, 2013; Pires & Clarke, 2012). These few studies have found support for the principles in that they were able to explain the focus on certain species over others with the characteristics of hot products (concealable,

removable, available, valuable, enjoyable, and disposable). Further, they conclude that these principles are relevant for designing policies to combat illegal wildlife markets as well as other illegal markets. Both wildlife and antiquities that are trafficked to be sold in large part for their aesthetics. There is reason to suspect that these principles would also apply to antiquities.

Antiquities are easily *concealable* by passing them off as fake, falsifying documents, creating pastiches out of multiple objects, or simply putting them in a pocket, depending on the size and type of object. They also have very little protection in archaeological sites and are thus easily *removable*, especially if the site is undocumented. In Egypt antiquities are readily *available* at numerous known and unknown archaeological sites. Antiquities have an inherent cultural and aesthetic *value* in addition to their high potential market value, which makes them ideal as a form of currency in exchange for supplies. Their aesthetic value also makes antiquities in high demand by collectors and museums. An antiquity that is used as a form of currency may be sold again or held onto for the *enjoyment* of its aesthetic value. Antiquities looted from archaeological sites, especially those that are undocumented, are easy to sell on the licit and illicit markets. Even with Red Lists<sup>3</sup> on certain types of antiquities, the market value of an antiquity remains high for a long period of time, so if it is not *disposable* immediately, it will be in the future.

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<sup>3</sup> The United Nations Educational, Scientific, and Cultural Organization (UNESCO) produces “Red Lists” or lists of classes of artifacts from specific countries that have been illegally looted and trafficked. These lists are intended as a guide for border patrol, law enforcement, dealers, collectors, museums, and auction houses to try to help reduce the viability of these items on the open market.

### *Antiquities Looting and Armed Conflict: Two Relationships*

Both the CRAVED principles and routine activities can explain how antiquities looting can support armed conflict and be a consequence of armed conflict.

Antiquities are objects that can be looted, transported, and disposed of into other illicit networks or sold at a high market value with little concern for getting caught.

The lack of effective regulation over antiquities looting and trafficking makes them easily disposable (a key element for Clarke in the creation of “hot products”) and also makes them effective sources of revenue for funding conflict before and during the fighting. What distinguishes strategic antiquities looting in armed conflict and opportunistic antiquities looting in armed conflict are the characteristics that are more highly valued in each relationship. The elements of Routine Activity Theory apply to both relationships and though all CRAVED principles apply to each relationship, they are not all equally important for each relationship. Table 1 provides an overview of how routine activities and the CRAVED principles support each relationship. The CRAVED principles that are more important for each relationship are italicized. Theoretical support for each relationship is then discussed in detail.

**Table 1.** The application of the CRAVED principles and Routine Activity Theory to strategic and opportunistic looting.

<b>Opportunistic Antiquities Looting in Armed Conflict (i.e. Armed Conflict Preceding Antiquities Looting)</b>		
<i>CRAVED Principles</i>	Concealable	Antiquities are easily concealed; however, during a breakdown in social order this may not be necessary.
	<i>Removable</i>	<i>Antiquities easily removed from archaeological sites due to lack of guardianship and general turmoil of conflict.</i>
	<i>Available</i>	<i>Antiquities are readily available in all territory controlled by a group or easily accessible to an individual.</i>
	<i>Valuable</i>	<i>Antiquities have a good return on investment and are able to be sold either in bulk for a quick return or individually to drive up the price.</i>
	Enjoyable	The readily available supply of sellable antiquities and their ease of acquisition may provide enjoyment.
	<i>Disposable</i>	<i>There is always a market for antiquities. Even with agreements between countries if cultural heritage is in danger, there will be some seeking to buy what they can to "preserve" it.</i>
<i>Routine Activity Theory</i>	Suitable Targets	There is a plethora of antiquities and archaeological sites available in countries like Egypt.
	Lack of Capable Guardianship	Nationally, the breakdown in authority associated with many conflicts that further decreases capable guardianship. Internationally, existing regulations are ineffective and easy to bypass.
	Motivated Offender	At the individual level, the choice of antiquities may be opportunistic as options to earn a living may be decreased. At the group level, the convenience makes it a natural resource of to exploit.
<b>Strategic Antiquities Looting in Armed Conflict (i.e. Antiquities Looting Preceding Armed Conflict)</b>		
<i>CRAVED Principles</i>	<i>Concealable</i>	<i>Antiquities are easily concealed and thus easier to get to the market before looting is noticed.</i>
	<i>Removable</i>	<i>Antiquities are easily removed from archaeological sites due to stretched resources.</i>
	Available	Antiquities are readily available in territory controlled by a group but objects may also be targeted if they are not in territory controlled by group and thus not readily available.
	<i>Valuable</i>	<i>Antiquities have a good return on investment and can be sold either to the market or used as currency/collateral in trade for weapons and other materials.</i>
	Enjoyable	Looting a culture's heritage that does not align ideologically with the group's may provide enjoyment.
	<i>Disposable</i>	<i>There is always a market for antiquities, especially if there are no agreements between governments highlighting existing bans on sale.</i>
<i>Routine Activity Theory</i>	Suitable Targets	There is a plethora of antiquities and archaeological sites available in countries like Egypt.
	Lack of Capable Guardianship	Nationally, local resources are not sufficient to protect all archaeological sites. Internationally, existing regulations are ineffective and easy to bypass.
	Motivated Offender	The choice of archaeological sites and antiquities is strategic and intended to fund future activities.

### *Strategic Antiquities Looting in Armed Conflict*

An increase in looting prior to a conflict or during a conflict might reflect that one or more parties (ethnic group, terrorist organization, etc.) may be selling or trafficking antiquities to acquire funds to support or sustain a conflict or violent action.<sup>4</sup> As mentioned above, it is difficult to maintain guardianship over archaeological sites during times of peace and archaeological sites are eminently suitable targets for crime by motivated offenders. In armed conflict, capable guardianship is difficult to maintain as the priorities of government shift to address the greatest need. Nationally, archaeological sites are more likely to be overlooked during conflict as local law enforcement are deployed elsewhere. Internationally, existing regulations are both easy to bypass and ineffective at stopping trafficking in looted objects during conflict.

With regard to motivated offenders, actors in armed conflicts and trafficking networks intentionally and rationally choose how to finance their actions, using whatever resources are accessible “unless these clash with honestly held religious or ideological positions” (Passas & Jones, 2006: 1). They prefer easily acquired objects because these do not require any special skills and are a reliable source of revenue (Freeman, 2011). The choice of archaeological sites and antiquities is strategic and intended to fund current and future activities.

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<sup>4</sup> While it is more likely that an increase in antiquities looting would signal a rise in local conflict, it is possible that an international organization could loot antiquities in one country to fund a conflict or violent action in another. Documents from ISIL’s “department of artifacts” confirm antiquities looting as a source of income for the organization. Given that they control territory in Syria and Iraq, they could be looting in one to fund activity in the other (Keller, 2015).

The strategic value of antiquities for conflict financing relates to their suitability as a target for looting in armed conflict. Antiquities can be seen as a natural resource that is exploited, or a “hot product” (Clarke, 1999). Although Clarke (1999) does not specifically consider “hot products” in the context of conflicts, objects that meet the CRAVED principles would be good resources to exploit for financial needs as conflict is just a specific need.<sup>5</sup> Specifically, objects that are concealable, removable, valuable, and disposable should be the most relevant of the CRAVED principles for financing an armed conflict.<sup>6</sup> Antiquities are easily concealed, making it easier to get them on the market before the looting is noticed. Looting archaeological sites (i.e. digging holes) does not require any special skills, which makes antiquities easily accessible (Freeman, 2011). The high concentration of valuable objects within archaeological sites makes them a reliable means of acquiring funds. Most important though, are their value as a commodity and their disposability. From an organizational perspective, access to large quantities of easily accessible natural resources is a good source of funding. Plentiful resources with little market value or a small return on investment are not a good source of funding for conflict because they must be sold quickly. In times of conflict, quick trades or sales are not always possible, so commodities that retain their market value are better sources of funding. Commodities, like diamonds and antiquities that maintain their market value and have a high return on investment are favored because they can be sold or held as needed. There are thousands of categories of both diamonds and antiquities, the most

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<sup>5</sup> The role of natural resources in armed conflicts has been examined in more depth in political economics. See for example, the work of Michael Ross (2004) and Philippe LeBillon (2001).

<sup>6</sup> Enjoyment and availability may also be relevant, but they are of secondary importance.

valuable of which will have a narrow market. Once they enter the market, they will be noticed; however, their sale will have a high return. Lower-end diamonds and antiquities can also be sold in bulk at consistent prices. Both can also be used as currency for illegal goods and services (Wilford, 2003) and they are excellent “storage assets” because they retain their market value over time (Hardouin & Weichhardt, 2006: 306).

### *Opportunistic Antiquities Looting in Armed Conflict*

Armed conflict may also increase the extent of antiquities looting by changing the opportunity and choice structuring properties around this type of crime. Conflict makes looting easier by exacerbating the difficulty in monitoring and protecting archaeological sites, which in turn makes it easier for objects to reach the legal markets. During times of armed conflict, there is often a breakdown in authority that further decreases capable guardianship, both affecting the motivation of the offenders and the suitability of the target. Where prior to conflict the perceived (or actual) cost of committing a crime like looting may have been too high, the decrease in capable guardianship may lower the perceived risk. Given the potential existing lack of guardianship, it may also be the case that at an individual level, previously available more profitable options (legal or illegal) become unavailable or too difficult to pursue during armed conflict. In such a case, looting would be considered an opportunistic crime with easier access, high rewards, and little to no consequences.

Archaeological sites become suitable (and possibly ideal) targets during armed conflict not only for the ease of access and low perceived cost, but also for the objects themselves. As mentioned above, it takes little skill to loot objects from an

archaeological site, making them easily removable. The prevalence of antiquities makes them readily available to loot while the action of looting is difficult to detect. It is easy to fake an object's provenance (history of ownership), which allows them to move through a gray market (a market that conducts both legal and illegal transactions) to the buyers in legal markets (Kersel, 2006; Mackenzie, 2011; Proulx, 2013).

Given the inter-related nature of armed conflict and antiquities looting, I expect that both of the above relationships exist. This research examines the extent to which antiquities looting leads to armed conflict and armed conflict leads to antiquities looting. It is important to note that the argument antiquities looting to support armed conflict is most applicable to domestic conflicts, particularly in the case of Egypt where there is a long history of religious and ethnic conflict. Because Egypt has antiquities from many cultural groups, it is possible to target a specific culture's heritage. Any strategic decision to use antiquities as a funding source could also involve targeting a particular culture or history that does not reflect the group's ideology. As such, part of this research also involves looking at conflict events by the type of conflict. The methods and data that I used to test my hypotheses about these relationships are discussed in the following sections.

### Hypotheses

1. Antiquities looting and armed conflict have a positive statistically significant relationship
2. An increase in antiquities looting incidents will precede an increase in armed conflict incidents
3. An increase in armed conflict incidents will precede an increase in antiquities looting incidents

## Chapter 3: Egypt as a Case Study

There are a number of countries in the Middle East with a rich cultural heritage that could serve as the case study for this research; however, there are three primary reasons for why Egypt is a good case study. First, Egypt has a long, rich, cultural heritage and is invested in attempting to protect and preserve it. Second, because Egypt is invested in its cultural heritage, it is more likely to report when antiquities are looted, which is essential for data collection. Third, Egypt's armed conflict events from 1997 – 2014 have relatively well-defined start dates, which are helpful when trying to disentangle the two possible relationships between antiquities looting and armed conflict. This date range covers the end of one armed conflict in Egypt that spanned 1993 – 1998 and the beginning of a second conflict in Egypt spanning 2011 – present day.<sup>7</sup> Each reason is discussed in more detail below.

### *Egypt's Cultural Heritage*

Cultural heritage is everywhere in Egypt and integral to its economic wellbeing. Egypt has a history of preserving its cultural heritage and because almost all the cities are built in the presence of heritage sites, they use the preservation of these sites to their advantage by marketing their history to tourists (Coben, 2011; UNDP, 2016). As tourism makes up a large part of Egypt's economy, it is in the country's interest to both preserve the quality and quantity of its cultural heritage. To maintain the quality of the sites, the country periodically shuts down the pyramids to

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<sup>7</sup> Egypt was part of conflicts dating back to the 1980s; however, they do not have cleanly defined start and end dates and there is less information on the motivations behind the conflicts. As such, this thesis focuses on only two conflicts. Additionally, the date range ends in 2014 as data from 2015 will not have been released yet by the time the analysis for this thesis is completed.

mitigate environmental changes resulting from the press of tourists. For example, the humidity caused by people breathing in a burial chamber can lead to changes in the pH balance of the imagery (Golia, 2014). Egypt has also invested in their cultural heritage by getting them on the UNESCO World Heritage list. Egypt is home to seven UNESCO World Heritage Sites and has another 33 proposed heritage sites under consideration (UNESCO, 2016).

Despite Egypt's best efforts, the sheer quantity of cultural heritage in the country makes preservation a difficult task. Cultural heritage includes all objects in museums and storage facilities, the great monuments, antiquities in archaeological sites (both known and unknown). There are numerous archaeological sites in Egypt, many of which are tourist destinations. However, there is no complete list of archaeological sites that have been or are in the process of being excavated in Egypt and there are also numerous sites that have not yet been identified or discovered. As such, there are many unknown archaeological sites in Egypt. This quantity of antiquities means there are a lot of antiquities to steal from known or unknown archaeological sites.

Egypt is invested in protecting its cultural heritage and has a long history of attempting to protect and preserve its cultural heritage from the destruction of conflict and from looters. Their strategy for reducing the looting of antiquities, especially from archaeological sites, is to pass stricter laws with harsher penalties, increase security measures, and place checkpoints at every Egyptian port (El-Aref, 2005). Unfortunately, there has been no systematic evaluation of these measures, so it is unclear how effective they are.

### *A Brief History of Armed Conflict in Egypt*

This section provides a brief history of armed conflict in Egypt to provide context for the analysis discussed in the next section. Egypt has long history of multiculturalism and armed conflict tied to tensions between religious groups and non-state actors, particularly between Coptic Christians and Muslim groups (UCDP, 2015). This section focuses only on those events taking place between 1993 and 2014 to provide the context for both conflicts that are partially covered in the time period of the study (1997 – 2014). From 1993 to 2014, Egypt experienced two major armed conflicts along with scattered incidents of terrorism and unrest, all of which related to changes in the Egyptian Government. Neither conflict is completely contained in the period of study, which may affect the results of the analysis (see below for more information on this).

Starting in the 1990s, the Egyptian Government underwent a massive neoliberal reform, from a primarily state-operated economy to a globalized capitalist very quickly (Schwartz, 2011: 33). While the government was creating a capitalist foundation in the country, it was not advancing Western ideals of equal rights for citizens (Schwartz, 2011). Thus, while Egypt as a country was doing well economically, dissatisfaction with the government was growing from both the Islamist groups and the disenfranchised lower classes of society. Islamist groups' took issue with the secular influence of the West on the government and instead wanting to create an Islamic state (Schwartz, 2011: 33-34). The lower classes and disenfranchised (e.g., women and Coptic Christians) took issue with the lack of rights and fair living wages (Masoud, 2011; Schwartz 2011: 33-36).

From 1993 – 1998, the Egyptian Government was engaged in an intrastate conflict with the al-Gama'a al-Islamiyya (the Islamic Group) over governmental power. Originally a part of the Muslim Brotherhood, a political party and religious organization, the Islamic Group's radical views led them to split off in the 1970s (Fletcher, 2008).<sup>8</sup> The Islamic Group sought to overthrow the secular government and replace it with an Islamic regime by using violence to garner support for their position. Their insurgency targeted more than the government by attacking other religious groups like the Coptic Christians, secularists, and any others who opposed them. In the most notable incident, the Luxor Massacre (1997), six al-Gama militants attacked tourists visiting a temple, killing 63 of them. Several of the leaders were imprisoned and signed a unilateral truce; however, the conflict did not end until 1998, when Egyptian authorities arrested the remainder of the group (including those that rejected the truce) (Fletcher, 2008; UCDP, 2015). While this conflict ended in 1998, the actions of the al-Gama movement resonated with other Islamist groups like the Tahwid wal Jihad (United and Holy War) that conducted terrorist attacks in 2004-2005 (Fletcher, 2008; UCDP, 2015).

From 2011 – present day, Egypt has been involved in an intrastate armed conflict stemming from the Arab Spring uprising in Egypt of 2011. The Arab Spring began in other countries in 2010, but did not impact Egypt until 2011, when President Hosni Mubarak was ousted as a result of large scale uprisings (involving both the Islamic Group and Coptic Christians) that demanded his resignation (Masoud, 2011).

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<sup>8</sup> The Muslim Brotherhood was founded in the 1920s by Hassan al-Banna, who believed that secularization and modernization were taking Muslim countries away from the glory of the ancient Muslim civilizations (UCDP, 2015).

The initial impetus of the uprising involved many, sometimes contradictory, goals. While both Coptic Christians and Islamist groups called for Mubarak's resignation, Coptic Christians wanted more equality and higher wages (especially for women). Meanwhile, the Islamist Group disdained the secular government and wanted a return to an Islamic rule (Bowker, 2013; Gerbaudo, 2011; Masoud, 2011; Schwartz; 2011; UC DP, 2015). Additionally, the role of the military has been central to this intrastate conflict as it has consistently had the most power and influence beyond that of the government (Gerbaudo, 2013). They have at times supported the uprisings and at other times suppressed them. The Supreme Council of Armed Forces (SCAF) assumed leadership of the government after Mubarak resigned until Mohammed Morsi was elected President in 2012. Morsi was then ousted in a military coup in 2013 due to his inability to find a credible alternative to an Islamic state and perceived ineptitude (Gerbaudo, 2013: 104-105). The former military chief Abdel Fattah el-Sisi has now held the position of President since 2014 (Basil, 2014).

#### *Reports of Antiquities Looting in Egypt*

Egypt's investment in its cultural heritage makes it more likely to report instances of looting, theft, or destruction. It has a long history of reporting to market countries like the United States and international bodies like the International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM) when its cultural heritage is in danger. Such reports lead to the development of memorandums of understanding prohibiting the import, export and sale of antiquities from Egypt and the issuance of Red Lists of prohibited or stolen antiquities, respectively. Egypt also reports to news outlet on cultural heritage crimes. From 1997

– 2014, there were 150 news reports in English language outlets that mentioned looting, theft, destruction, return or repatriation of antiquities in Egypt. This is likely an underestimate of the number of reports that went to news agencies since it only includes English news sources. There are also several Egyptian archaeologists who have tried to report individual instances of archaeological looting as they find them.<sup>9</sup> Although this may seem like a small number of reports for a 17-year period, it is still more news reports than other countries apart from Iraq and Syria. These reports also reflect the degree to which the country is invested in its cultural heritage. The number of news reports in the Arab Spring were more than four times that of all the other years combined, which suggests that media reports will only continue to become more prevalent as time passes. This investment and commitment to reporting events makes it more likely that there is data in news reports that can be quantified. Combined with Egypt's plethora of antiquities and its clearly defined armed conflicts, this tendency to report events makes Egypt a good choice for a case study looking at the relationship between armed conflict and antiquities looting.

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<sup>9</sup> See for example Monica Hanna's twitter feed  
<https://twitter.com/monznomad/status/597860115555942400>

## Chapter 4: Data & Methods

I created both a month-level and a quarter-level dataset with variables for reports of antiquities looting incidents at archaeological sites and reports of all armed conflict incidents in Egypt from 1997 – 2014. A month was the smallest unit of time that still had sufficient variation in the number of antiquities looting events reported and the number of armed conflict incidents reported. Because antiquities looting is such a rare event in the media, I also conducted an analysis at the quarter level to see whether the unit of analysis affected the outcome. The next three sections discuss the utility of open source data, definitions for antiquities looting and armed conflict, and data sources.

### *The Utility of Open Source Data & Quantitative Methods*

Open source data broadly include any publicly available information that can be coded and quantified into a data base. These data have several benefits for studying crime, especially those types that are not traditionally considered “street crime.” First, by virtue of being publicly available, open source data are useful for studying new areas within criminology. There is generally less data available on crimes not considered “street crimes” because they are not areas of focus (and thus funding) within the discipline of criminology. Official sources of data, such as the Uniform Crime Reports (UCR) in the United States, have developed to include information on crimes relevant to law enforcement. Crimes that are not a priority for law enforcement will not be included in these data sources. Self-report data have developed in response to the limitations of official data and provide researchers with

access to responses from offenders themselves. For those crimes that are considered outside of the traditional scope of criminology, official and self-report data either do not exist or are not available to the public. Open source data allow researchers to look at new types of crime that would otherwise not be considered.

Second, open source data are a cost-effective way to collect data on a wide variety of subjects. Online digitization, publishing, and archiving of newspapers, journals, and blogs provides easy access to decades of news articles from media outlets around the globe. Repositories can be specific to a single institution (e.g., Reuter's<sup>10</sup> archives) or be large databases covering many large and small publications (e.g., Lexis Nexis<sup>11</sup>). Access to these databases through universities or private subscriptions allows researchers to access large quantities of information spanning any subject. These databases also allow for easier data collection on international crimes. Within criminology, open source data has been used to create one of the most robust terrorism databases currently in use – the Global Terrorism Database (GTD) (LaFree & Dugan, 2007).

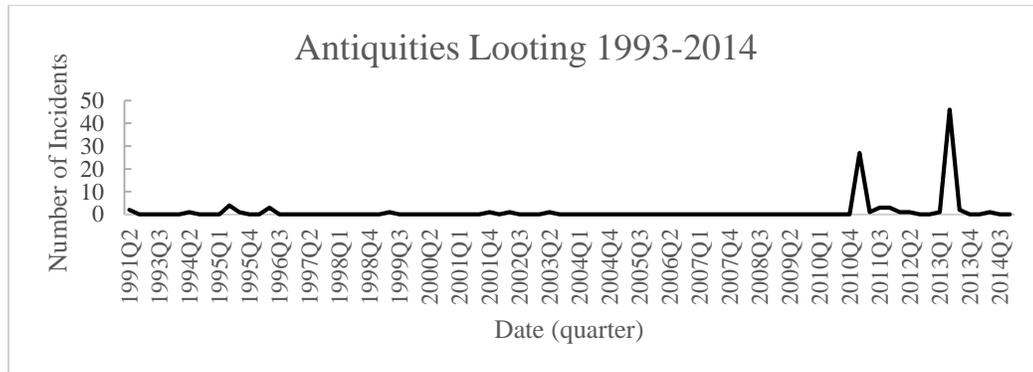
With respect to antiquities looting, open source news stories provide an initial look at the scope of both antiquities looting incidents and interest in these events. Egypt, despite its long history of attempting to stop the looting and trafficking of antiquities, has been unable to evaluate the effectiveness of their actions as they do not have any baseline numbers to work from. As the data show, the number of news

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<sup>10</sup> Reuters is the news and media division within Thomson Reuters, one of the world's largest international news providers across multiple forms of media. See <http://thomsonreuters.com/en/products-services/reuters-news-agency.html>.

<sup>11</sup> Lexis Nexis is a news article database with archives from 1987 – 2014 accessible through the University of Maryland library system. See <http://www.lexisnexis.com/hottopics/lnacademic/>.

stories reporting antiquities looting in Egypt has increased since 2011 (see Figure 2). Though an imperfect measure, such data can start to provide a baseline on the frequency of looting events. Open source data also allows for empirical analysis and a more nuanced understanding of the relationship between antiquities looting and armed conflict.



**Figure 1.** Reports of Antiquities Looting 1997-2014

Quantitative methods are also important for understanding this issue and, as this analysis shows, have much to offer. Prior evidence of any relationship between antiquities looting and armed conflict has been journalistic or based on case studies of isolated incidents. Quantitative methods like multiple time series complement these qualitative methods in two ways. First, they make it possible to look at whether there is any empirical evidence for a relationship between the two. Second, they make it possible to see if the relationship is true over time and for different types of conflicts. The analysis above found empirical evidence of the relationship within the context of one conflict and across a broader time-period including periods of conflict and peace. While the results should be viewed cautiously given the exploratory nature of this study, their consistency across time periods and units of analysis indicate the value of quantitative methods in the area.

### Antiquities Looting

There is no consensus among international legislation or academics on the definition of an antiquity (e.g., compare the definitions in the 1954 Hague Convention and the 1970 or 1972 UNESCO Conventions). The debate focuses on what specifically distinguishes the terms for an antiquity, cultural property, and cultural heritage. All three terms are generally defined to include any object, building, work of art, scientific collection, archive, manuscript, or structure with cultural, archaeological, historical, prehistorical, literary, linguistic, artistic or scientific value that is over 100 years old. Broadly, definitions for these terms include: moveable objects (objects removed from archaeological sites, museums, archives), immovable objects (monuments, historic buildings), and intangible culture (songs, traditions, and folklore). As the focus of this research is on archaeological sites, I define an antiquity as any object over 100 years old located in the ground or structural complex within an archaeological site. Antiquities looting is defined as illegally excavating antiquities.

According to journalistic evidence (existing media portrayals, qualitative case studies) and satellite imagery, antiquities looting is not a rare event (Manacorda & Chappell, 2011; Parcak, 2009); however, it is less likely to be reported in official reports or the news than other types of events (e.g., terrorist attacks). What accounts for this “dark figure of looting”? One explanation could be that there is a lack of access to sites where looting occurs during conflict or lack of resources on the part of law enforcement. Changes in trends in reporting and the social media revolution also impact the underrepresentation of antiquities looting in the news. News and media outlets have increased the frequency of publication over the last decade. The use of

social media platforms and the ease with which information can be shared have contributed to a general increase in news reports and social media reports (Facebook, Twitter, etc.) as well as an increase during times of armed conflict.

This surge in media coverage of armed conflicts occurred prior to the social media revolution as well; however, it was not as large a scale and news was not always as widely disseminated. The result of these changes is that during armed conflict it there are more likely to be reports of antiquities looting (and other crimes in the area) but post-social media revolution there are more likely to be reports on antiquities looting period. What is unknown is whether the increase seen in the number of reports of antiquities looting reflects an actual increase or just an increase in coverage of such incidents. All of these contribute to the “dark figure of looting,” and as a result, any incidents that are reported in the news are likely to be an underestimate of the true extent of looting.

To capture as many incidents of antiquities looting as possible, data were compiled from multiple sources. Reuters was a good source to start with because its editorial control over the content is better than any other source (Dugan & Chenoweth, 2013: 472; Schrodtt & Gerner, 1994). However, given that reports of antiquities looting are relatively rare in the news, I also used Lexis Nexis, which pulls from many different news sources. The goal initially was to code each story based on the lead sentence<sup>12</sup> alone; however, there was not sufficient detail in the lead sentences to do so. As such, the lead sentences served as a means of filtering out non-

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<sup>12</sup> A lead sentence is the first 1-2 sentences of a news article that summarize the contents of the story.

relevant cases. Each remaining news story was then coded in its entirety for information on antiquities looting incidents.

Data were compiled both from news stories previously downloaded (in batches of 100) from Reuters using Factiva<sup>13</sup> and those downloaded for this research from Lexis Nexis. The data from both sources were available starting in the 1980s. To ensure that no stories were left out, data were pulled from Reuters and Lexis Nexis for as many years as were available (1980 – 2012 and 1987 – 2014, respectively). Only data from 1997 – 2014 were ultimately kept for the analysis (see below). The Reuters data included 180,349 stories downloaded using only the key term “Egypt” and the Lexis Nexis data included 1,138 stories downloaded using a complex search string. The data from Reuters had already been downloaded in batches of 100 and each batch had to be searched individually for key terms relating to antiquities looting. By contrast, the Lexis Nexis data were downloaded for this analysis and so a complex search string of key terms could be used, which accounts for the difference in the initial number of results returned.

Table 2 shows the key words searched for both Reuters and Lexis Nexis and the number of results returned for each.<sup>14</sup> While the time period of interest is 1997 – 2014, all articles from 1987 – 2014 were initially kept and coded (see analytic plan below). All coding of the news stories was done by hand. All lead sentences were

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<sup>13</sup> Factiva is an online tool that provides access to thousands of news articles and other information services. The service allows searches based on specific criteria and formats the results as downloadable datasets. See <http://new.dowjones.com/products/factiva/>.

<sup>14</sup> After the initial search of key terms was conducted, I thought to add “illicit dig” and illegal” dig to both searches. In both cases, these terms returned no unique, additional results.

reviewed to remove stories not relating to antiquities looting in Egypt or that were published prior to 1987.

**Table 2.** Key Terms for Reuters and Lexis Nexis Data

<b>Reuters</b>		<b>Lexis Nexis</b>	
<i>Key Words</i>	<i># of Results</i>	<i>Complex Search String</i>	<i># of Results</i>
archaeological	28	Egypt AND archaeological OR archeological OR archaeological site OR archeological site OR historic site OR relic OR antiquities OR art OR antique OR cultural heritage OR cultural property OR artifact OR artefact AND theft OR looting OR danger OR smuggling OR smuggled OR smuggler OR dealer OR antiquities looting	1138
archeological	3		
archaeological site	9		
archeological site	2		
looting	27		
theft	25		
relic	19		
antiquities	128		
antique	11		
antiquities looting	0		
cultural heritage	9		
cultural property	0		
danger	305		
historic site	2		
smuggling	198		
smuggler	71		
smuggled	66		
art	80		
fake	24		
forgery	30		
dealer	1482		
artifact	20	<i>Note: "fake" and "forgery" were omitted from the Lexis Nexis search string as an independent search of the terms returned no relevant results. The terms "archeol*" and "archaeol*" were omitted because an independent search did not return accurate results.</i>	
artefact	28		
archaeol*	0		
archeol*	0		
<b>Total</b>	<b>2567</b>	<b>Total</b>	<b>1138</b>

Note: The totals in this table include redundancies. For example, if a sentence included both “art” and “dealer,” that sentence would be captured twice - once for each search term.

Those lead sentences that were unclear, were marked as “unsure” and kept for further investigation, which left 156 stories in Reuters and 576 in Lexis Nexis. These

732 stories were coded based on the entire news story according to the following variables (see Appendix I for a complete codebook):

- Id
- Publication date
- File source
- Year
- Quarter
- Month
- Day
- Summary of the incident (brief 1-2 sentence description of the incident)
- Location (a description of the incident location)
- Location type (archaeological site, museum, other, or no information provided)
- Location type text (only if location type was “other”)
- Incident type (destruction, looting, or theft)
- Was the object recovered
- Date of recovery
- Object(s) recovered
- Related stories
- Was the object repatriated
- Object(s) repatriated
- Date of repatriation

For any case that was marked unsure, or when there was a question on the information provided in the news story, additional research would be conducted to corroborate and supplement the information in the story. This research involved tracing sources referenced in the story or by searching for additional news stories not captured by Reuters or Lexis Nexus that had more detailed information on the case in question.<sup>15</sup> Supplemental sources were recorded in the “related stories” variable below.

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<sup>15</sup> To confirm that any supplemental news stories were truly not captured by the initial search, I did a search within the dataset for the lead sentence, data source, and author.

Coding was done based on the content of the story rather than the presence of the story itself. Because of the inherently subjective nature of defining and quantifying “antiquities looting,” it is important to discuss the assumptions I made about what constitutes an incident of looting. For this research, I assumed that only one incident of looting occurred in a given day at a given location, unless the news article specifically identified multiple looters, times of day, or locations of antiquities looting.

Often, looting in news articles is reported in generalized statements, such as “The looting is pandemic, every night and even in the morning,” (Hiel, 2013) or “Illegal digs near ancient temples and in isolated desert sites have swelled a staggering 100-fold over the past 16 months...” (Hendawi, 2012). Such instances were both too specific and too vague. Across all stories, there was not enough consistent detail to determine whether the looting being described was a sustained activity, multiple separate attempts, multiple coordinated attempts, or an isolated brief incident. As such, the most consistent and granular amount of information I could code was one looting incident per day at a given archaeological site. The exception to this coding rule was if the article specifically identified multiple incidents of looting (multiple looters, locations, days, etc.).

If a story referred to multiple incidents, each incident was coded separately. For example, one article referred to four separate instances of looting to code: two separate instances at the Bent pyramid of Giza, one incident at a pyramid complex south of Cairo, and incident at the site of Tell El Fara’in (Raven, 2011). Further, in cases where the date was referred to in indirect language (e.g., several, few, couple,

many, mid-), the common meaning of the term was used. For example, if an incident took place “several weeks” ago, it would be coded as 3 weeks prior to the date of publication. After coding the data, there were 190 incidents, including instances of theft and destruction at locations other than archaeological sites.

For an incident to be considered looting, the object(s) had to have been removed from the ground or structural complex of an archaeological site.<sup>16</sup> Since the act of looting often destroys some, if not all, of a site, an incident was only coded as destruction if the main purpose was indicated as destruction and no objects were taken. Similarly, the terms “looting” and “theft” are often synonymous in the media. In this research, an incident could only be coded as theft if the object(s) have been recorded and removed from the archaeological site. For example, an object taken from an archaeological site storage facility is theft because the objects have already been discovered and recorded. Though seemingly a semantic distinction, strategic and opportunistic targeting of catalogued collections may differ from strategic and opportunistic targeting of unknown objects.

Antiquities in museums have been catalogued, researched, and often been the subject of publication. This makes such objects more difficult to sell on the black market without a buyer already lined up. Thus, the strategy involved in targeting a museum may be for a single object that has been requested by a buyer elsewhere in the world. Museums also do not exclusively hold antiquities or objects from a single culture. They are repositories of many cultures and time periods from ancient times to

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<sup>16</sup> My definition of antiquities requires that the object be at least 100 years old. By restricting this research to archaeological sites, I inferred the age of the object from the location of the incident. This is a reasonable assumption to make since archaeological sites in Egypt contain objects and features of cultures over 1,000 years old.

present day and though some news articles report specific objects that have been stolen, many more simply report that an object has been taken. It is not possible to determine whether such objects are antiquities or contemporary works. From an opportunistic perspective, museums are more likely to be targeted in riots/protests or civil unrest that occurs in the dense cities where such buildings are located. In such cases they are more likely to be the target of general crime and mayhem that happens to result in the loss of an antiquity.

By contrast, looting of archaeological sites requires more intention for both opportunistic and strategic forms of looting. Strategically, archaeological sites are targeted because any antiquities discovered are the equivalent of unmarked bills. They have no record of existence and so are easier to sell on the market without predetermined buyers. Further, because armed conflicts are not bounded by city limits and archaeological sites are often in more rural locations (or at least outside the city limits), people do not necessarily have to go out of their way to target archaeological sites. Indeed, several news articles reported people digging in the basements of their homes for objects because they happened to find something one day. Opportunistic looting in the wake of armed conflict may result because of the general lack of order surrounding remote locations where skirmishes took place. Given these distinctions, destruction, theft, and looting are coded as separate actions in the data.

There were also several cases that could not be classified as destruction, theft, or looting, and so were coded as “other.” For example, because a storage facility is not within the archaeological complex, it is not considered part of the archaeological site. The exceptions to this are objects physically attached to a structure within the

archaeological site. For example, if a part of a statue is removed or part of a mural cut from a wall or tomb, this action would be considered looting even if the object(s) had been identified previously by archaeologists. Below are examples of incidents coded as “looted,” “theft,” and “destruction.” For more detailed discussion of the coding decisions made, see the codebook in Appendix I.

**Looting:** “Grave-robbers cut away part of a false door bearing painted stone reliefs depicting ceremonial figures and a bronze statue of Horus was also taken” (Boseley, 1997).

**Destruction:** “a bomb blast destroyed a museum/mosque with Islamic art in it” (Gauch, 2014).

**Theft:** “Ka-Nefer-Nefer mask from 19th dynasty Egyptian noblewoman stolen in early 1990s from the storage facility near it's excavation site” (MO Lawyers Media Staff, 2006).

When a site was described as being looted consistently for a long period of time, it was assumed that at least one looting would happen per day and so the incident was counted 1 per day unless details were provided identifying separate lootings. For example, one story specified that looting had occurred at the site of Abydos in Luxor each night since the beginning of the month. As the story was published on March 19, 2011, I coded 18 instances of looting in that location. There were 20 cases where information was available for the year but not the month. These cases were coded as taking place in June, since it was the middle of the year.<sup>17</sup> Cases where: (1) there was not enough information to code specific incidents, (2) only information on the year was available, (3) incidents were of theft or destruction, and (4) incidents located outside of archaeological sites were excluded from the final dataset. As the time

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<sup>17</sup> Comparing coding these cases at different months throughout the year (i.e. coding them as January vs. June) had no significant impact on the findings. As such, they were coded as if they occurred in June to be consistent with prior coding decisions regarding dates. I also found that there was no difference in the results, regardless of whether these cases were included or excluded from the dataset. As such, I included them.

period of interest is 1997-2014, cases prior to 1997 were ultimately dropped from the final dataset. There were 91 cases of antiquities looting at archaeological sites from 1997 – 2014. The antiquities looting data were aggregated to both the month and quarter such that a given row contains the total number of looting incidents at archaeological sites for a given month or quarter, respectively.

The main limitation with these data is the implicit bias in the data that is unavoidable. I am restricted by what the media chooses to cover on antiquities looting, which changes over time. This includes what the media considers to be newsworthy, what is of interest to the public, and the means of reporting information. For example, the advent of the Internet made it significantly easier for journalists and amateur reporters to disseminate information. This in turn broadened the range of newsworthy topics making it more likely to antiquities looting to be reported later in the timeline. Additionally, news stories may lack granularity to get at the actual behavior of interest – antiquities looting. More dramatic or serious cases of looting are more likely to be reported by news agencies while every day looting may go unnoticed or unreported. As such, the events in the data may disproportionately represent targeted or strategic lootings compared to opportunistic lootings. We also must assume that objects have been removed from the sites being reported as “looted.” With this data, the closest we can get is reports of antiquities looting.

### *Armed Conflict*

Similar to antiquities looting, armed conflict is an ambiguous term; it can fall within the legal purview of international humanitarian law or it can fall outside of those laws. International humanitarian laws try to limit the effects of armed conflict

and include general international conventions such as the Geneva Conventions of 1949 and more specific agreements like the 1954 Hague Convention (ICRC, 2004). International humanitarian laws only apply to those conflicts with definite start and end dates or by whether the involved parties are organized groups and if the incident meets a certain threshold for the number of fatalities. Battles in a civil war or bombings in an inter-state conflict would meet this definition. These laws do not cover “internal tensions or disturbances such as isolated acts of violence” (ICRC, 2004). As such, riots, political violence, and terrorist attacks are all types of armed conflict that typically fall outside of humanitarian laws.

In order to capture a wide range of political violence, I compiled data on armed conflicts from two sources of event data: the Armed Conflict Location and Event Data Project (ACLED) and the Global Terrorism Database (GTD). For this research, I looked at three categories of armed conflict: terrorism, riots/protests, and other types of armed conflict in order to discern whether the relationship between antiquities looting and armed conflict differs by type of conflict. Terrorism accounts for approximately 78% of incidents in the GTD and riots/protests account for approximately 63% of the ACLED incidents. So, while this is somewhat of a simplification of the range of armed conflict in Egypt, this breakdown allows for an initial look at whether the type of conflict is relevant.

Data from the ACLED compile information on a variety of political violence incidents in Egypt from 1997 – 2014. These data are currently coded by date, location, agent, and event type. Event type includes three types of battles, violence against citizens, remote violence, rioting (violent demonstrations), protesting (non-

violent demonstrations), and three types of non-violent events (ACLED, 2015). There is also no fatality minimum, so the data capture all political violence episodes in a given state (ACLED, 2015).

To ensure there are armed conflict events throughout the whole time period of interest capture terrorist attacks, which are not included in the ACLED, I used data from the GTD. The GTD is an open-source event level database that includes terrorist events from around the world from 1970 – 2014. It was designed to be a comprehensive, robust event database of domestic and international terrorist attacks (LaFree et al., 2015). Data include variables on: incident date, region, country, state/province, city, latitude and longitude, perpetrator group name (when known), tactic used in attack, nature of the target, identity/corporation/and nationality of the target, type of weapons used, whether incident was considered a success, if and how a claim of responsibility was made, amount of damage, total number of fatalities, total number of injured, and if incident was international or domestic (LaFree et al., 2015; START, 2015). To be included, an incident must be “an intentional act of violence or threat of violence by a non-state actor” (LaFree et al., 2015: 19). Additionally, incidents are only included if they meet at least two of the following three criteria: (1) the violent act was aimed at attaining a political, economic, religious, or social goal; (2) the violent act included evidence of an intention to coerce, intimidate, or convey some other message to a larger audience(s) other than the immediate victims; and (3) the violent act was outside the precepts of international Humanitarian Law (LaFree et al., 2015: 19-20).

The data from both databases were filtered to include variables on the incident date, country, and location of the incident (at the governorate, city, and site level). Additionally, the data were coded to include the following variables: whether the incident was part of a series, the conflict type (terrorism, riot/protest, other), the attack type (accounts for the type of incident in the GTD and the event type in the ACLED), whether the incident took place during the period of the first or second conflict (two dummy variables), and whether incident was international or domestic. Looking at multiple incidents served as a to distinguish if the incident was part of an enduring attack or whether it was an isolated event. Combined with the dummy variables identifying incidents within each conflict's time period (1997 – 1998 & 2011-2014, respectively), these three variables were a proxy for looking at enduring conflict compared to isolated incidents.

To code for international or domestic, I identified incidents that mentioned foreign nations Egypt was actively involved with or protesting. Five countries (Palestine, Lebanon, the U.S., Israel, and France) were consistently discussed. Since most of these events took place at embassies of the nation being targeted, I also identified incidents mentioning “embassy.” Incidents were coded as international if they were flagged in any of these 6 terms. All other incidents are assumed to be domestic.

The data were cleaned to remove any duplicate events both within and between data sources. Because the ACLED data were designed to capture both violent and nonviolent incidents, there were several duplicate incidents that had to be removed. For example, an event could be coded as both “Battle-No change of

territory” and “violence against civilians” in an exchange between militants, police, and civilians. There were also 347 cases that existed in both the ACLED and the GTD data, 274 of which were coded as terrorism in the GTD. Twelve of these cases were coded as both “riots/protests” in the ACLED and “terrorism” in the GTD. As conflict is defined here based on terrorism, riots/protests, and other, if an event was coded as terrorism in the GTD and *not* riots/protests in the ACLED, the code of terrorism was retained.

For those events where it was coded as both riots/protests and terrorism, the following decision rule was used: if the incident focused on the action of the protest itself, then it was coded as a riot/protest. If the protest/riot/protesters are the victims or tangential to the action, then it was coded as terrorism variables (see Appendix I for a complete codebook). There is a limitation to these armed conflict data. Both the ACLED and GTD have detailed codes for actions within armed conflicts (e.g., violence against civilians, bombing/explosion). However, it was not possible to systematically reconcile the two sets of actions. As such, it was not possible to look at more detailed types of armed conflict than terrorism, riot/protest, and other types of armed conflict.

In total, there were 5,762 incidents of armed conflict in Egypt from 1997 – 2014. As I used multiple time series analysis, the ACLED and GTD data were merged together and aggregated to the month and to the quarter to create two time series datasets. These were then merged with the antiquities data at each unit of analysis.

### Control Variables

It is possible that other factors could influence the relationship between armed conflict and antiquities looting. As such, I included several control variables on economic and political factors. Economic variables came from the World Bank's Development Indicators (World Bank, 2016) for Egypt from 1997 to 2014. I focused on two variables: Egypt's GDP per capita (in current US\$), goods exports balance of payment (BoP - in current US\$).<sup>18</sup> Both variables speak to Egypt's overall economic standing and the potential barrier customs may pose to would-be smugglers. A country in economic decline (a lower GDP) may have a higher goods export as they rely more on transactions with foreign people and nations. Further, during such a time, the restrictions on imports and exports may slacked to decrease the barriers to trade. Weak restrictions and increased need for trade may provide increased opportunity or incentive for those interested in antiquities looting.

Politically, the change of regime or power in Egypt could influence both armed conflict and the presence of looting. As such, I included variables on regime duration, whether there was a regime change, and the date of the regime change. These data came from the Polity IV project, a part of the Integrated Nations Center for Societal Conflict Research's (INCSR's) database. The polity data continually track and update on regime changes around the world (Center for Systemic Peace, 2015). Both the economic and political variables are only available at year intervals.

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<sup>18</sup> Goods exports Balance of Payment refer to all movable goods (including nonmonetary gold and net exports of goods under merchanting) involved in a change of ownership from residents to nonresidents (World Bank, 2016).

As such, when merging these variables into the antiquities-armed conflict dataset, each month of a given year had to have the same value for each control variable.

There are several limitations with the control variables. The economic control variables are only available at the year level, while the analysis is at the month and the quarter. Each variable was held constant throughout a year instead of interpolating the values, which assumes that all the change in value occurred between December and January. Given that the Arab Spring started in January 2011, it seemed reasonable to have the change in values occur at the end of the calendar year; however, it is not clear what kind of an effect this assumption had on the analysis. Finally, though there are a relatively large number of regime changes in the dataset (given that regime changes are typically a rare event), there are still many more zeros in the data, which may affect the findings.

Once all data were cleaned and coded, they were aggregated and merged into a month-level dataset and a quarter-level dataset. These were the most granular units of analysis for which there was sufficient variation in the antiquities looting and cultural property crime variables.

### *Analytic Plan*

I used open source data to create a time series dataset of incidents of armed conflict, antiquities looting, and several control variables from 1997-2014. My analysis sought to better understand the relationship between antiquities looting and armed conflict in Egypt over this time period using quantitative methods through three hypotheses: (1) antiquities looting and armed conflict have a positive statistically significant relationship, (2) an increase in antiquities looting will precede

an increase in armed conflict, and (3) an increase in armed conflict will precede an increase in antiquities looting.

I first looked descriptively at antiquities looting and armed conflict to get a sense of whether there was reason to believe they might be related. Then, I used multiple time series to look at each temporal ordering more closely. Specifically, I used a combination of two extensions of vector autoregression (VAR) (lag-augmented vector autoregression (LA-VAR) and autoregressive distributed lag model (ARDL)) to examine strategic looting and opportunistic looting separately. Using open source data has a number of benefits, as described above; however, there are also limitations. Most notably, the trends in reporting news have evolved over time and so it is not necessarily clear whether the patterns seen in the data reflect the underlying patterns in antiquities looting or the changes in reporting trends over time. For example, the Arab Spring was a series of armed conflicts across multiple countries in the Middle East connected and propelled through the use of social media. The number of news articles looking at armed conflict, antiquities looting, and Egypt more generally increased dramatically starting at the end of 2010.

It is not possible to disentangle the changes in reporting trends from the underlying changes in patterns of looting activity. One way to address this limitation is to look only at the Arab Spring in addition to looking at the broader time period. I used monthly data to look at the Arab Spring (2010 – 2014) as a form of sensitivity analysis to try to determine the extent to which reporting trends were affecting the data. Because this is a shorter time period, I used a more granular unit of analysis (the

month as opposed to the quarter) to look in more detail at the conflict and to minimize the effect of any decrease in statistical power the analyses would otherwise have.

I ran 5 sets of models (each model was run at the month and the quarter, making 10 models in total) to investigate the relationship between antiquities looting and armed conflict. The control variables stayed the same in each model, only the main variables of interest changed. The first model looked at antiquities looting and all armed conflict events. This provided the foundation for my analysis as it most directly looks at the relationship of interest. Yet, as mentioned in the literature review, there is reason to believe that antiquities looting to support armed conflict (Hypothesis 2) might vary by the type of conflict. As such, the next three models looked at the relationship between antiquities looting and terrorism, riots and protests, and other armed conflict incidents, respectively.<sup>19</sup> Finally, due to the small number of incidents for antiquities looting, I also considered the relationship between cultural property crime in general and armed conflict to see whether this influenced the results of the first model.<sup>20</sup>

Each model was run at the month and the quarter. The month analyses provide a test of the hypotheses in the context of a specific armed conflict – the Arab Spring. While the Arab Spring started in Egypt in 2011, the conflict and movements started in 2010 in other parts of the world. To account for the possibility of a build-up in antiquities looting prior to the start of the conflict in 2011, the month analyses covered 2010-2014. Indeed, there was a small increase in antiquities looting at the

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<sup>19</sup> The other category for type of armed conflict is a broad “catch-all” category for armed conflict and includes all types of conflict except for riots/protests and terrorism.

<sup>20</sup> Cultural property crime includes all crimes involving cultural property found in the dataset – theft, destruction, and looting at any location including but not limited to archaeological sites.

end of 2010 just before the January 2011 revolutions in Egypt (see Figure 2 – Figure 5 below). The quarter analyses provide a test of the hypotheses across the whole time period. Analyses at the year were considered and ultimately rejected. due to the small sample size.

### *Lag-Augmented VAR & Autoregressive Distributed Lag Model*

Both antiquities looting and armed conflict incidents are random processes, as they are both phenomena that evolve over space and time and whose value at any given point in time depends on a set of possible random events (Lindsey, 2004). Multiple time series models are appropriate for assessing the mutual associations between random processes as they allow for the consideration of all the possible ways that armed conflict and antiquities looting can evolve independently and together. The LA-VAR and ARDL models are extensions of the basic vector autoregression (VAR) model, which looks at the short-term and long-term relationship between two or more variables over time. Typically, VAR models are employed in economics to assess the effect of changes in policy on phenomena like unemployment, inflation, and interest rates (Sola & Driffill, 1994; Stock & Watson, 2001). Yet, in criminology and political science, VAR models have been used to assess the effectiveness of antiterrorism policies, the dynamics of setting foreign policy agendas, and to understand the political process (Enders & Sandler, 1993). VAR models multiple time series data so that each series is used as explanatory variables in the other (Lütkepohl, 2011: 2). These models are generally inductive, initially treating all variables as endogenous.

VAR models and their extensions have several strengths over other time series methods. First, the inductive nature of the models makes them better at characterizing

the uncertainty and underlying dynamics of the data. Second, there are multiple methods that can help to better understand the relationship between the variables of interest (e.g., forecasting, Granger-causality, and structural modeling) (Lütkepohl, 2011: 2). However, basic VAR models require that all dependent variables have to be the same order of integration (i.e. if one variable is differenced all of the variables have to be differenced). Another weakness of the VAR model is that they tend to have a large number of regression parameters, reducing their parsimony and risking overparameterization (Brandt & Williams, 2007: 56). As the analysis proposed here does not have a large number of parameters, this should not be a significant limitation.

When conducting a multiple time series analysis, there are a number of decisions that have to be made that affect which model(s) are used (Pesaran & Smith, 1998):

1. The number of endogenous variables to be included
2. The number of exogenous variables to be included
3. The nature of the deterministic variables and whether there need to be any restrictions on intercepts or trend coefficients<sup>21</sup>
4. The order of the model
5. The order of integration of the variables
6. The number of cointegrating vectors<sup>22</sup>
7. The lag structure of the model or variables

Hiro Toda and Taku Yamamoto (1995) proposed a more reliable method for testing for cointegration and granger causality in vector autoregression models with

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<sup>21</sup> There are five different trends (or cases) often encountered in analyses: 1) no intercept of trend, 2)  $r$  restricted intercepts which enter the cointegrating relations and no trend, 3)  $m$  unrestricted intercepts and no trends, 4)  $m$  unrestricted intercepts and  $r$  restricted trends, and 5)  $m$  unrestricted intercepts and  $m$  unrestricted trends (Pesaran & Smith, 1998). In these cases,  $r$  is the rank of the model and  $m$  refers to the order of integration of the variable(s).

<sup>22</sup> Cointegration refers to when at least two variables covary together over time such that together they are stationary, even if separately one or more of the variables are not. Engle and Granger (1987) introduced the concept of “cointegration” to allow for stochastic trends to be captured in VAR models.

possibly integrated processes. Their lag-augmented vector autoregression model incorporates additional lags as exogenous variables in the model. After applying a normal lag selection procedure to a potentially cointegrated VAR and determining a lag length  $k$ , a  $(k + d_{max})$ th-order VAR is estimated, where  $d_{max}$  represents the maximum order of integration of the variables (Toda & Yamamoto, 1995). This process has proved more robust for determining granger causality in small samples than alternative methods (Lütkepohl, 2006). If granger causality exists, there must be at least one cointegrating relationship in the model (Giles, 2011). As such, this method can also be useful for determining whether cointegration might exist. For any purpose other than testing for granger causality, the lag-augmented VAR has the same restrictions as the basic VAR model in that the variables must be the same order of integration (Ashley & Verbrugge, 2009; Giles, 2011).

The autoregressive distributed lag model (ARDL) was developed to address the limitations of other vector autoregression models. Specifically, ARDL was developed to be robust in spite of mixed orders of integration (i.e. some variables that are I(0) and others that are I(1)), possibly cointegrated relationships, separate lag structures for each variable, and small sample sizes (usually less than 100) (Pesaran & Shin, 1995, 1997; Pesaran & Smith, 1998; Pesaran et al., 2001). The basic ARDL model is in equation (1), where  $\sum \beta_i \Delta y_{t-i} + \sum \beta_j \Delta x_{1t-j} + \sum \beta_k \Delta x_{2t-k}$  estimate each set of parameters in levels and  $\theta_0 y_{t-1} + \theta_1 x_{1t-1} + \theta_2 x_{2t-1} + \theta_3 x_{3t-1}$  estimate the lagged (and/or differenced) parameters that combined create an unrestricted error correction term (Giles, 2013). This combination of estimating the parameters in levels and lags allows

for cointegrated relationships and mixed orders of integration between the parameters.

$$\Delta y_t = \beta_0 + \sum \beta_i \Delta y_{t-i} + \sum \beta_j \Delta x_{1t-j} + \sum \beta_k \Delta x_{2t-k} + \theta_0 y_{t-1} + \theta_1 x_{1t-1} + \theta_2 x_{2t-1} + \theta_3. \quad (1)$$

### Procedure

Initial tests of the data revealed that antiquities looting, cultural property crime, and the balance of payment for goods exported were all stationary but that armed conflict and its derivatives (terrorism, riots and protests, and other) were not.<sup>23</sup> It was also not clear whether or not there were cointegrating relationships among the variables. As such, to analyze the relationship between antiquities looting and armed conflict, I had to use a method that could a) determine whether any cointegrating relationships existed, b) accommodate mixed orders of integration between the variables of interest, and c) allow for cointegration in addition to mixed orders of integration, if necessary. At both the month and quarter levels of analysis, the data have small samples ( $n = 60$  and  $n = 84$ , respectively), which affected the ability of traditional tests to detect cointegration and granger causality.

Given the complexity of the data, I used a combination of the LA-VAR and ARDL models to analyze the three hypotheses at both the month and quarter levels. It is important to note that using the ARDL model in Stata requires that either armed conflict or antiquities looting be specified as the dependent variable. As such, the

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<sup>23</sup> GDP was not tested for stationarity as it was treated as an exogenous variable in the model, meaning it was a forced independent variable in the time series models. Also, the goods export variable was found to be not significant in any model and so was removed from the final models.

ARDL model was run with each as the dependent variable. The procedure used for each model is as follows:

1. Check the stationarity of the variables and determine their order of integration ( $m$ )
2. Use the Todo-Yamamoto procedure to test for granger causality using the Lag-Augmented VAR:
  - a. Set up a VAR model in the levels of the data, regardless of each variable's order of integration as determined in step 1.
  - b. Determine the appropriate maximum lag length for the VAR based on information criteria such as AIC and SIC
  - c. Ensure the model is well-specified (no serial correlation, model is stable)
  - d. Test for cointegration using the Johansen methodology (a standard method for testing for cointegration) (SOURCE)
  - e. Using the well-specified model, add  $m$  additional lags of each of the variables into each of the equations as an exogenous variable
  - f. Test for Granger causality using a Wald test on the first lag of the equation (regardless of how many lags there are).
3. Use the ARDL model to analyze the relationship based on the results of the T-Y Granger causality tests with armed conflict (or subtype or armed conflict) as the dependent variable
  - a. Formulate the unrestricted error correction version of the ARDL model in equation (1) with armed conflict as the dependent variable
  - b. Determine the lag structure of the unrestricted error correction model. This lag structure selects a lag for each of the endogenous variables in the model.
  - c. Make sure the model is well-specified (no serial correlation and the model is stable)
  - d. Perform a bounds test for cointegrating relationships
4. Repeat Step 3 and all component steps with antiquities looting (or cultural property crime) as the dependent variable.

## Chapter 5: Results

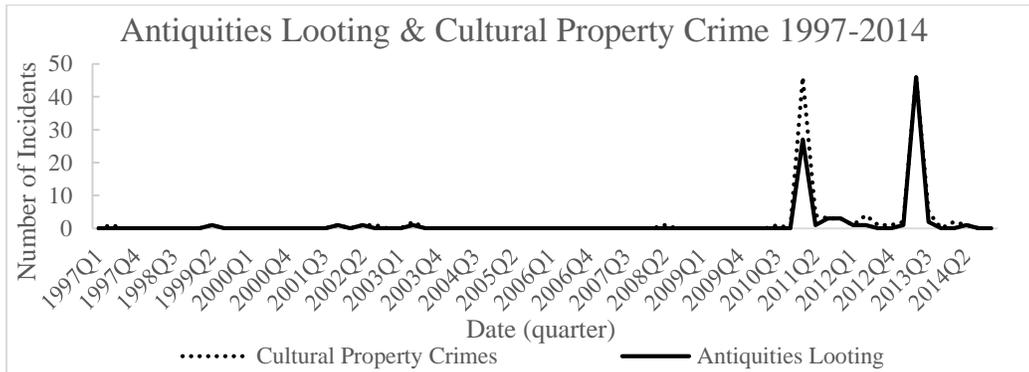
To review, this study used a combination of LA-VAR and ARDL to examine the relationship between antiquities looting and armed conflict. Specifically, this study evaluated three hypotheses: (1) antiquities looting and armed conflict have a positive statistically significant relationship, (2) an increase in antiquities looting will precede an increase in armed conflict, and (3) an increase in armed conflict will precede an increase in antiquities looting. Each hypothesis was looked at with regard to antiquities looting and armed conflict in general. They were then tested to see if the relationship varied by type of armed conflict (riots/protests, terrorism, and other types of armed conflict). Finally, each hypothesis was looked at with the broader variable of cultural property crime and armed conflict to see whether using antiquities looting or cultural property crime made a difference. All analyses were conducted at both the month and quarter level. The month was the most granular unit of analysis, but due to lack of variation in the antiquities looting data, the analyses could only be run from 2010-2014. The quarter was aggregate enough that the analyses could be run over the entire time period (1997-2014).

### *Descriptive Statistics*

Table 3 provides the summary statistics for the main variables of interest. There are significantly fewer antiquities looting (and cultural property crime) incidents than any of the armed conflict types. However, overall they have similarly skewed distributions (see Figure 2 and Figure 3). Most of the incidents across these variables occur immediately before or during the Arab Spring (2011-2014). Figure 4 and Figure 5 show the distribution of events from 2010-2014.

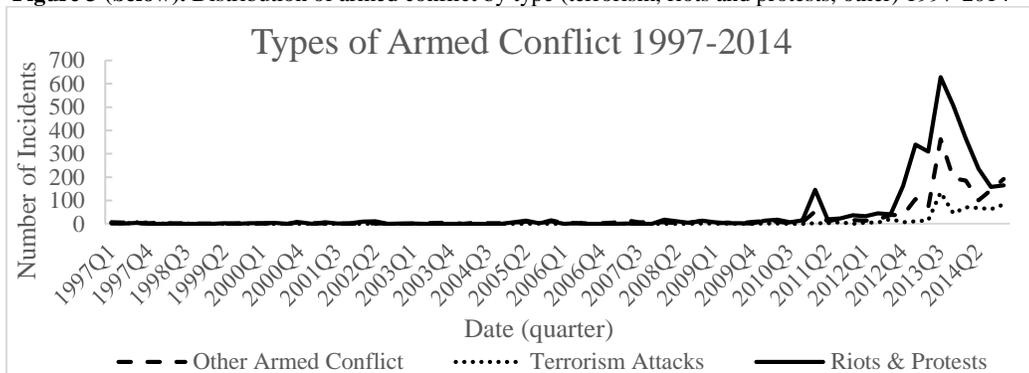
**Table 3.** Summary statistics for the monthly and quarterly data

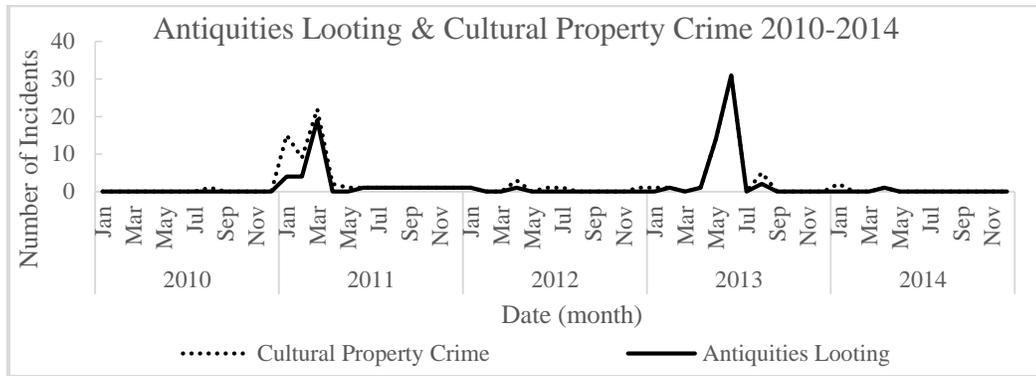
Monthly Analyses (2010 - 2014)					
	Obs	Mean	Std. Dev.	Min	Max
<i>Antiquities Looting</i>	61	1.40984	4.90706	0	31
<i>Cultural Property Crime</i>	61	1.96721	5.43129	0	31
<i>Armed Conflict</i>	61	88.4098	103.659	1	468
<i>Terrorism</i>	61	8.81967	13.2105	0	66
<i>Riots and Protests</i>	61	53.459	64.2901	0	256
<i>Other</i>	61	26.1312	32.0694	0	146
Quarterly Analyses (1997 - 2014)					
	Obs	Mean	Std. Dev.	Min	Max
<i>Antiquities Looting</i>	72	1.25	6.238793	0	46
<i>Cultural Property Crime</i>	72	1.777778	7.601375	0	46
<i>Armed Conflict</i>	72	80.02778	195.427	0	1126
<i>Terrorism</i>	72	7.875	22.91684	0	135
<i>Riots and Protests</i>	72	47.34722	118.4717	0	628
<i>Other</i>	72	24.80556	59.56288	0	363



**Figure 2 (above).** Distribution of antiquities looting and cultural property crime 1997-2014

**Figure 3 (below).** Distribution of armed conflict by type (terrorism, riots and protests, other) 1997-2014





**Figure 4 (above).** Distribution of antiquities looting and cultural property crime 2010-2014

**Figure 5 (below).** Distribution of armed conflict by type (terrorism, riots and protests, other) 2010-2014



Based on a visual comparison of the graphs, it appears that there may be spikes in antiquities looting around December 2010/January 2011 and March/April 2013. There were regime changes in Egypt in February 2011 and July of 2013. This suggests that there could be a relationship between antiquities looting and armed conflict, at least during the Arab Spring. Additionally, 30% of armed conflict incidents occurred cities and towns with archaeological sites that also had reports of looting incidents.<sup>24</sup> Table 4 shows the cities that experienced both armed conflict incidents and antiquities looting and the number of armed conflict incidents each reported in the data. the breakdown of these armed conflict incidents. The proximity and frequency of conflict incidents to archaeological sites that were looted may

<sup>24</sup> Note, I cannot say for certain that the conflict incidents occurred within the archaeological sites due to the nature of the data. However, the immediate vicinity of an archaeological site may make it more likely to be a target for looters, especially those who are organized or actors in the conflict.

suggest a conflict financing relationship. The results of the statistical analyses partially support these conclusions.

**Table 4.** Cities/Towns that Experienced Both Armed Conflict Incidents and Antiquities Looting Incidents

<b>City/Town</b>	<b># of Armed Conflict Incidents</b>
Alexandria	4
Aswan	58
Beni Suef	66
Cairo	633
Dahshour	2
Giza	268
Ismailia	129
Luxor	40
Manfalut	2
Minya	148
Port Said	109
Rafah	403
Taba	4
<b>Total</b>	<b>1866</b>

*Hypothesis 1: Antiquities Looting and Armed Conflict are Positively Related*

If cointegration was present between antiquities looting (or cultural property crime) and armed conflict (or its types) in an analysis, then that model provided support for this hypothesis. Cointegration refers to when there exists a long-term relationship between two variables such that they are jointly stationary. As such, if cointegration exists between two variables, then they are related. As Table 5 shows, all models at both the month and quarter level, except for one, showed that there was a positive relationship between antiquities looting and armed conflict. Note that there are no values reported in the table. This is because in cointegration analyses, the numbers reported are test statistics and so do not have substantive meaning.

**Table 5.** Cointegration Results

<b>Month</b>						
		<i>Antiquities Looting</i>	<i>Armed Conflict</i>	<i>Terrorism</i>	<i>Riots/ Protests</i>	<i>Other Types of Armed Conflict</i>
<b>Dependent Variable</b>	<i>Antiquities Looting</i>		***	***	***	***
	<i>Armed Conflict</i>	***				
	<i>Terrorism</i>	***				
	<i>Riots/ Protests</i>	*				
	<i>Other Types of Armed Conflict</i>	***				
<b>Quarter</b>						
		<i>Antiquities Looting</i>	<i>Armed Conflict</i>	<i>Terrorism</i>	<i>Riots/ Protests</i>	<i>Other Types of Armed Conflict</i>
<b>Dependent Variable</b>	<i>Antiquities Looting</i>		***	***	***	***
	<i>Armed Conflict</i>	***				
	<i>Terrorism</i>	***				
	<i>Riots/ Protests</i>	***				
	<i>Other Types of Armed Conflict</i>					

\*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.10$

The model looking at antiquities looting and the other types of armed conflict category provided only partial support for this hypothesis. For the quarterly analyses, when the other types of armed conflict category was used as the dependent variable, there was no evidence of a cointegrating relationship, yet when antiquities looting was used as the dependent variable, there was evidence of cointegration. To add to

the confusion, at the month level both dependent variables showed evidence of a cointegrating relationship. It is possible that since the other types of armed conflict category is a “catch-all” category for types of armed conflict, there may be cointegrating relationships with antiquities looting that are not being captured in the current coding. However, this seems unlikely as the cointegrating relationship was the only statistically significant finding in the quarter-level model with antiquities looting as the dependent variable.<sup>25</sup>

A more likely explanation for this difference in findings is that there is support for a relationship between antiquities looting and all types of armed conflict during the Arab Spring (covered in the month analyses) but not for armed conflict over the whole period of interest (1997-2014).

### *Hypothesis 2: Strategic Antiquities Looting in Armed Conflict*

In general, there seems to be consistent support for the hypothesis that an increase in antiquities looting precedes an increase in armed conflict. The relationship appears to be more complex than the hypothesis suggests and varies slightly by type of conflict. Vector autoregression (VAR) models return results for both short run and long run relationships between the variables for as many lags as are included in the model. ARDL models, as an extension of VAR, provide a similar set of results.

The short run relationship looks at the effects of prior changes in antiquities looting on changes in armed conflict. The long run relationship looks at the effects of

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<sup>25</sup> It is important to note that there is very little variation in the antiquities looting variable (i.e. looting at archaeological sites) prior to 2010, which may also be affected the results (see Figure 2). The results of the quarterly analysis between other conflict events and antiquities looting should be interpreted with extreme caution.

current antiquities looting on changes in armed conflict. In other words, the short run relationship looks at how changes in antiquities looting in the past (i.e. a sudden spike or drop) affect the current changes in armed conflict. The long run relationship then looks at how current antiquities looting is affecting changes in armed conflict over time. For there to be support for this hypothesis, at least one of the short or long run relationships needs to be positive and statistically significant in the model where armed conflict (or one of its types) is the dependent variable.

Table 6 provides an overview of the results for this set of analyses. As a reminder, no coefficient values are reported in the table. In ARDL models, the magnitude of the coefficients is not traditionally interpreted. Instead, only the direction and significance of the coefficients are reported. The results showed that at both the month and quarter, the short run relationship is negative and the long run relationship is positive (both are statistically significant). While it does not make sense to interpret the actual values of the coefficients, the pattern shown in the results is that a change in prior antiquities looting is associated with a small decrease in the change in armed conflict in the short run. In the long run, though, current looting is associated with a large increase (relative to the short run relationship) in the change in armed conflict. This overall pattern is found across the three types of conflict in the short run. A change in prior antiquities looting is associated with a small decrease in the change in riots and protests, terrorism, and other types of armed conflict.<sup>26</sup>

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<sup>26</sup> One exception to this was that at the quarter level, a change in prior antiquities looting was associated with a small increase in the change in other armed conflict. Because this is a broadly defined category of armed conflict, it is not clear if the difference in finding indicates an alternate pattern or if it suggests that further differentiation of types of armed conflict is needed.

**Table 6.** The Effects of Antiquities Looting on Armed Conflict

<b>Month</b>				
	<i>Short Run</i>		<i>Long Run</i>	
	+/-	Sig.	+/-	Sig.
Armed Conflict	-	***	+	**
Terrorism	-	***	+	**
Riots/Protests	-	***	+	*†
Other Types of Armed Conflict	-	***	+	**
<b>Quarter</b>				
	<i>Short Run</i>		<i>Long Run</i>	
	+/-	Sig.	+/-	Sig.
Armed Conflict			+	***
D	-	***		
Terrorism			+	
D	-	***		
Riots/Protests			+	***
D	-	***		
Other Types of Armed Conflict			+	
D	+			
LD	+	***		
L2D	+	***		
L3D	+	***		

\*\*\* $p \leq 0.01$ , \*\* $p \leq 0.05$ , \* $p \leq 0.10$

† $p = 0.055$ , so it was marginally insignificant at the 0.05 level, but significant at the 0.10 level.

Note: D indicates that the variable has been first differenced. L indicates that the variable has been lagged. Any number refers to the number of lags (e.g., L2D refers to a differenced variable with two lags).

In the long run, an increase in antiquities looting preceded an increase in all three types of armed conflict; however, this is not consistent across the unit of analysis. At the month level, this increase is found with both terrorism and other types of armed conflict. Riots and protests only saw this increase at the quarter level. This suggests that during the Arab Spring, antiquities looting is associated with an increase in terrorism and other types of armed conflict but not with an increase riots and

protests. Yet more generally, antiquities looting is associated with increases in riots and protests but not terrorism or other types of armed conflict. It is not clear why antiquities looting would be associated with increases in riots and protests generally, but not during the Arab Spring specifically. Given the lack of variation in the antiquities looting variables and almost certain underrepresentation of the true extent of looting, these results must be interpreted cautiously. However, overall there is moderate support for the hypothesis that increases in antiquities looting is associated with an increase in armed conflict.<sup>27</sup>

*Hypothesis 3: Opportunistic Antiquities Looting in Armed Conflict*

Across the models, there is only partial support for this hypothesis. For there to be support for this hypothesis, at least one of the short or long run relationships needs to be positive and statistically significant in the model where antiquities looting or cultural property crime is the dependent variable. Table 7 provides an overview of the results from all models with antiquities looting as the dependent variable. As a reminder, no coefficient values are reported in the table. The results for antiquities looting and cultural property crime as dependent variables were the same. As such, only the results of the antiquities looting models are presented and discussed.

There is no support for this hypothesis at the month-level. The armed conflict variables were either dropped from the final lag structure or were not significant. At the quarter-level, the lagged and second lagged values were significant for all types of armed conflict except for terrorism. Lagged values usually absorb variation in the

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<sup>27</sup> Using the more general variable of cultural property crime had no effect on the findings for this hypothesis.

model and so are not considered. Given that these are significant, I tested the model without the lags for those variables and found that they dropped from their respective models. This suggests that the relationship may be nonlinear and combined with the small non-normally distributed sample of antiquities looting suggests that opportunistic looting is more complex than could be adequately captured in these analyses. For example, at both the month (in the short run) and quarter (in the long run), terrorism had significant negative relationship on antiquities looting and riots/protests had a significant negative relationship at the third lagged value.

Based on these results, I cannot say that opportunistic looting does not happen, only that I find no evidence of it in this data. It may be that opportunistic looting is less likely to be reported by news agencies except in rare high profile cases like the Egyptian museum or Iraq museum. If that is the case, then other data sources would need to be used or supplemented to detect the relationship. Relatedly, given the lack of variation in the antiquities looting and cultural property crime variables, it may also be that this lack of support is an artifact of the small sample size. Either way, more research needs to be done to determine whether there is empirical evidence for opportunistic antiquities looting.

**Table 7.** The Effects of Armed Conflict on Antiquities Looting

<b>Month</b>				
	<i>Short Run</i>		<i>Long Run</i>	
	+/-	Sig.	+/-	Sig.
Armed Conflict	N/A		-	
Terrorism	N/A		-	
Riots/Protests	N/A		+	
Other Types of Armed Conflict			-	
D	-			
<b>Quarter</b>				
	<i>Short Run</i>		<i>Long Run</i>	
	+/-	Sig.	+/-	Sig.
Armed Conflict			+	
D	-			
LD	+	***		
L2D	+	***		
Terrorism			-	
D	-			
LD	-			
Riots/Protests			+	
D	-			
LD	+	***		
L2D	+	***		
L3D	-	***		
Other Types of Armed Conflict			+	
D	-			
LD	+	***		
L2D	+	***		

\*\*\* $p \leq 0.01$ , \*\* $p \leq 0.05$ , \* $p \leq 0.10$

Note: D indicates that the variable has been first differenced. L indicates that the variable has been lagged. Any number refers to the number of lags (e.g., L2D refers to a differenced variable with two lags).

### Time Periods

Overall, the month and quarterly analyses allowed me to compare findings specific to the Arab Spring and the broader time period (1997-2014). There are different findings by type of conflict and between the month and quarter units of analysis. This suggests that the relationship between armed conflict and antiquities looting may be more complex than I can ascertain with the current analysis. For example, The Arab Spring involved historically opposed groups (the Muslim Brotherhood and Coptic Christians) coming together to bring about a political upheaval. Despite the common immediate goal of removing President Morsi, the contradictory goals of an Islamic state and secular state with more equality, respectively produced a climate conducive to both extensive acts of terrorism and riots and protests. As such, the finding that antiquities looting is associated with an increase in the change in terrorism but not riots and protests in the context of the Arab Spring could be a significant distinction to investigate more closely.

Additionally, because this relationship is reversed at the quarter level, it may be useful to explore alternative explanations for the role of antiquities looting in riots and protests. For example, it may not be the case that antiquities are looted to finance riots and protests, but instead, the looting or targeting of archaeological sites could be the focus for the riots and protests. There is some literature to support that archaeological sites and cultural heritage can be strategic targets to send a political message (e.g., attempting to erase a culture's heritage, retaliation against a culture's perceived wrongdoing) (see Grove & Pease, 2014; LeBillon, 2001; Van der Auwera, 2012). Thirty percent of the armed conflict events took place in the immediate

vicinity of archaeological sites, which suggests their importance generally to armed conflict. Further, several incidents specifically mentioned targeting Christian churches and other cultural heritage sites.

### *The Influence of Control Variables*

Overall, the control variables included in the analysis showed only moderate influence on the relationship between antiquities looting and armed conflict. GDP was either not significant or a marginally significant impact that negligibly different from zero. Regime changes were significantly associated with some armed conflict and some antiquities looting. With respect to armed conflict, regime changes were only significant in the short term. At the quarter level in the short term, prior changes in regime changes were associated with a decrease in the change in riots and protests and armed conflict but an increase in terrorism and other types of armed conflict. At the month level, prior changes in regime changes were associated with increases in changes in armed conflict and terrorism. With respect to antiquities looting, regime changes were only significant at the quarter level. In the short term, prior changes in regime changes were associated with a decrease in the change in looting, while current regime changes were associated with an increase in the change in looting.

These findings may in part reflect how control variables are included in the models used. Because the LA-VAR and ARDL models are inherently endogenous, any variable included is analyzed without any restrictions imposed on it. In the base VAR model, the analysis involves creating systems of equations where each variable is a dependent variable one equation and an independent variable in the others. It is possible to force an exogenous variable into the model, which restricts it to being

included only as an independent variable in the analyses that only reports short run effects. The inclusion of exogenous variables in these models is a relatively recent development since endogeneity is considered one of their strengths. As such, most VAR models (and its extensions) are run with 2 or 3 variables maximum and including control variables can be challenging.

In the case of this analysis, GDP was included as a forced exogenous variable since it's effect was constant each year and it would have indirect effects on both armed conflict and antiquities looting. Regime changes, on the other hand, can have direct impacts on armed conflict and antiquities looting. As such, it was included as a third endogenous variable. In the output, GDP was only reported with short term effects, while regime change was reported with both short and long term effects. The identification of a variable as endogenous or exogenous in the model clearly influences the type of findings reported. It is worth noting that all available diagnostics on model fit were used to determine the final models to run, including Wald statistics to determine the significance of specific variables in the model. GDP was only significant to the model when it was included as an exogenous variable, while regime change was only significant to the model when it was an endogenous variable.

### Limitations

There are four significant limitations to the above analysis. First, the month and quarter analyses do not cover the same time periods. The monthly analysis could only look at 2010 – 2014 due to a lack of variation in the looting data prior to 2010. The quarterly analysis looked at 1997-2014 because aggregation improved the

distribution of the data. To account for the large number of zeros in the data, I tested for heteroscedasticity at both the month and quarter units of analysis. At the quarter level, several variables were heteroskedastic; however, the amount of error caused by the heteroscedasticity would have had to be excessively large to cause a problem. For example, the first difference of antiquities looting was heteroskedastic across all four models with the armed conflict and its types as dependent variables. However, in all but one of the models, the confidence intervals start at least 1.5 units away from 0 (in one case the confidence interval starts a 7).<sup>28</sup> At the month level, all variables of interest were homoscedastic.

Second, I attempted to run the models for three separate time periods: conflict 1 (1997-1998), between conflicts (1999-2009), and conflict 2 (2010-2014). However, there was not enough variation in the first two to run the models. To address this, I tried including three dummy variables for these time periods, but there were issues with multicollinearity at both the month and quarter level that the model could not handle.<sup>29</sup>

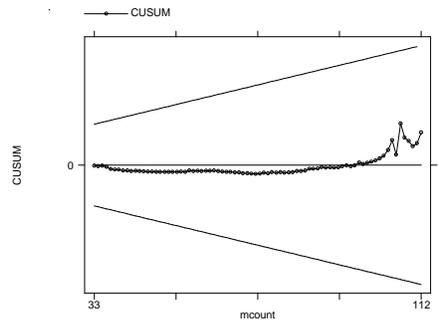
Finally, all models had showed signs of something in the data that has not been accounted for and omitted variable bias. Figure 6 shows the results of a cumulative sum of squares (CUSUM) analysis. The analysis returns two graphs (the CUSUM and CUSUM squared). The CUSUM graph is an indicator of your model's fit. The CUSUM squared graph is an indicator of whether you have captured all the patterns in your data through the model specification. These results are from the

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<sup>28</sup> Although the first difference of antiquities looting was heteroskedastic in the model with other types of conflict as the dependent variable, it was not significant and so is not relevant.

<sup>29</sup> I tried running these models with the time period dummy variables as both endogenous and exogenous variables. In all cases the issues with multicollinearity caused the models not to run.

quarterly analysis of the effect of antiquities looting on armed conflict, but are representative of the results of this analysis for all the quarterly models. The monthly models showed similar patterns, but they were less obvious because of the restricted time period.



**Figure 6.** The cumulative sum of squares

As can be seen in the first graph, the model is a relatively good fit overall; however, the second graph indicates that there is something not being accounted for in the model that is pulling it outside the lower boundary. This may reflect in part the omitted variable bias and may also reflect the disproportionate number of zeros in the antiquities looting data. This is not surprising given the problems with the antiquities looting data and the small number of parameters in the model. However, it does mean that these findings should be interpreted with caution and should be considered as preliminary.

### Summary of Results

Overall, the above results indicate strong support for the first hypothesis, moderate support for the second hypothesis, and weak support for the third hypothesis. Table 8 provides the summary of results by hypothesis. These findings are consistent regardless of looking specifically at antiquities looting or the broader

variable of cultural property crime. There was some variation by type of armed conflict, suggesting that this is an area that should be investigated further. These results suggest that the other types of armed conflict category may need to be further investigated.

**Table 8.** Summary of Results by Hypothesis

		<b>Positive Relationship</b>		<b>Strategic Looting</b>		<b>Opportunistic Looting</b>	
		<i>Month</i>	<i>Quarter</i>	<i>Month</i>	<i>Quarter</i>	<i>Month</i>	<i>Quarter</i>
<i>Dependent Variable</i>	Antiquities Looting	Strong	Strong	N/A	N/A	Weak	Weak
	Armed Conflict	Strong	Strong	Moderate	Strong	N/A	N/A
	Terrorism	Strong	Strong	Moderate		N/A	N/A
	Riots/Protests	Weak	Strong	Weak	Strong	N/A	N/A
	Other Types of Armed Conflict	Strong		Moderate		N/A	N/A
<b>Overall Level of Support</b>		<b>Strong</b>		<b>Moderate</b>		<b>Weak</b>	

*Note:* The overall level of support reflects the aggregation of all the month and quarter findings for a specific hypothesis.

## Chapter 6: Discussion

The above analyses are an important first step in understanding the relationship between antiquities looting and armed conflict. Although the method used cannot capture a causal relationship, the hypotheses address two of John Stuart Mill's (1882) three criteria for causation (a positive statistically significant relationship, temporal ordering, and alternative explanations). The first hypothesis directly tests whether there is a positive statistically significant relationship between antiquities looting. The remaining two hypotheses look at two different temporal orderings of events. The results indicate strong support for the first hypothesis, moderate support for one temporal ordering (antiquities looting preceding armed conflict), and weak support for the other temporal ordering. This is the first study to look at these questions directly using quantitative data and methods and makes two important contributions. This is the first study to demonstrate empirical support for the relationship between antiquities looting and armed conflict. This is also the first study to not only look at each temporal order separately but to find differing levels of support for them. Each contribution is discussed in more depth below.

### *The Relationship between Antiquities Looting and Armed Conflict*

The first of Mill's (1882) criteria for causality is that there must be a relationship between the phenomena of interest. This is usually seen in the form of a positive statistically significant relationship. This study hypothesizes that there is such a relationship between antiquities looting and armed conflict. The results indicate strong support across almost all the models for this relationship. As such,

there is empirical evidence for the relationship between antiquities looting and armed conflict. Further, the variation in the significance of the relationship by type of armed conflict (see Table 5) suggests that this relationship may depend on the specific conflict in question. For example, other types of armed conflict was only sometimes related to antiquities looting and riots/protests was not as strongly related to antiquities looting at the month as it was at the quarter. Because the monthly analyses focused on the Arab Spring, it may be that antiquities looting was more related to terrorism than riots/protests and other types of armed conflict during this conflict. This is an important finding as it is the first such empirical evidence in the literature and provides a baseline for future research. However, by itself, this finding does not tell us anything about the temporal ordering of the relationship between antiquities looting and armed conflict.

#### *Temporal Ordering: Strategic vs. Opportunistic Looting*

The second of Mill's (1882) criteria for causality is that for there to be a causal relationship between X and Y, then X must precede Y. The second and third hypotheses in this study test both temporal orderings (antiquities looting preceding armed conflict and vice versa). Evidence for antiquities looting preceding armed conflict would suggest that the looting was strategic and could be associated with an armed conflict financing argument. By contrast, evidence for armed conflict preceding antiquities looting would suggest that the looting was opportunistic and a result of the breakdown in social order. These temporal orderings are not necessarily mutually exclusive as both could potentially occur during an armed conflict by different perpetrators.

This study found some evidence for both temporal orderings; however, the results for the strategic angle were stronger than for the opportunistic angle. These are important findings for several reasons. First, this is the first study to be able to look at temporal ordering and while there are limitations with the data, the results suggest that it is important to distinguish between strategic and opportunistic looting. Second, when combined with the positive statistical relationship, this study can partially look at causality, which has not been attempted before. Third, these results provide important direction for future research.

The findings on opportunistic looting suggest that open source news articles may not be able to capture enough of the dark figure of looting to provide a comprehensive picture of the situation. As such, alternative sources of data should be considered and utilized in empirical analysis. Satellite images of archaeological sites may be a useful source of data. Research has shown that it is possible to calculate the number of looter tunnels within a single image and to estimate the probability that an object was taken based on the depth of the hole (see Parcak, 2009). If images were taken frequently enough, it would be possible to estimate the changes in antiquities looting over time with more precision than news stories allow. The geographic location of the looting would be known and the images may capture some of the individuals committing the looting (depending on when they are taken).

The findings on strategic looting suggest that there may be a difference between looting funding the initiation of armed conflict and sustaining an existing armed conflict. The results described antiquities looting as having a decreasing then increasing effect on armed conflict. Broadly, the short and long run relationships

suggest that antiquities looting supports armed conflict. However, a distinction should be made between supporting the start of an armed conflict and sustaining an ongoing conflict. Both forms of support are strategic and would treat antiquities looting as the extraction of a natural resource. While ARDL models are not able to clearly distinguish the start of an armed conflict from the duration of an armed conflict, the difference in the short run and long run relationships suggests that such distinction may be important to look at in the future.

Because the short run relationship considers the effects of past actions on changes in current events, it may be able to inform whether antiquities looting affects the start of an armed conflict in future research. Whether antiquities looting supports the start of an armed conflict depends on your interpretation of the lagged variables in the model and the length of the lag. In the current study, antiquities looting never had more than 2 lags in the ARDL models, meaning that a lag never represented more than a 2 month or quarter lag.

As such, a negative effect of prior change in antiquities looting on current change in armed conflict could indicate that increases in antiquities looting stopped as the conflict was about to begin. Such an interpretation makes sense if the actors in the conflict have extracted what they need to finance their initial attacks and have switched from financing to planning and execution of their attacks. However, a negative effect could also indicate that antiquities looting decreases prior to the start of armed conflict for the length of the lag. This interpretation requires explained by factors other than conflict financing and natural resources in armed conflict. The subjectivity of the short run relationship findings in this study make it difficult to

determine whether they are evidence for or are relevant to antiquities looting funding the start of a conflict.

The long run relationship, meanwhile, supports the argument for sustaining conflict by looking at the effect of current antiquities looting on changes in armed conflict in the long term. The strong statistically significant positive effect found in the models provides convincing evidence that strategic resource extraction, like antiquities looting, during a conflict could help to continue to finance operations. Combined, the short run and long run findings suggest that while there may or may not be evidence for antiquities looting supporting the start of armed conflict, there may be evidence for the argument that looting sustains armed conflict. This is an important finding not only because it provides some evidence for strategic antiquities looting in armed conflict, including as a source of conflict and terrorism financing. It is also important because it suggests that there may be a more nuanced relationship between antiquities looting and financing than previously thought. Despite the importance of the findings from this study thus far, there are alternative explanations that could not be accounted for that must be addressed.

#### *Alternative Explanations: Crime vs. Antiquities Looting*

The third of Mill's (1882) criteria for causality is that for causality to exist, one must be able to account for all alternative explanations. This is the most difficult criterion to meet because it is almost impossible to account for every possible alternative explanation. However, it is important to demonstrate that your analysis accounts for as many alternative explanations as possible. This study attempted to control for the effect of regime changes and economic conditions on the relationship

between armed conflict and antiquities looting. Unfortunately, there are two alternative explanations this analysis was not able to account for.

First, as mentioned before, one of the main limitations with open source data are that it is not possible to differentiate between changes in reporting trends and patterns in the underlying antiquities looting behaviors. To address this limitation, I conducted a sensitivity analysis by running all models for just the Arab Spring (2010 – 2014) using the month unit of analysis. I then compared these results with those from the quarterly analyses of the broader time period (1997-2014). The results of the sensitivity analyses were largely consistent with the results from the broader analyses. Despite the consistency in results, I cannot be sure that the findings of this analysis actually reflect the underlying patterns of antiquities looting and not trends in reporting.

I also cannot be certain that the findings of this analysis are unique to antiquities looting. It was not possible to account for the influence of crime in general on this relationship as no country-level crime rate statistics were available for Egypt from 1997 – 2014. This is a significant limitation. The findings could reflect a unique relationship between antiquities looting and armed conflict, but they could also reflect the broader relationship between crime in general and armed conflict.

Armed conflict creates opportunities for crime to occur and transforms existing criminal opportunities. For example, looting behaviors (of electronics, destruction of property, etc.) often occur in violent conflicts. Mac Ginty (2004) examined the relationship between violent conflicts and looting behaviors, which he identifies as a label encompassing all forms of theft in conflicts. He found that

broadly speaking, conflict created opportunities for looting behaviors (Mac Ginty, 2004). He argues this occurs through a combination of the lack of social order preventing crime and the range of motivations behind looting (affective, political, and economic-rational) (Mac Ginty, 2004).

Existing criminal opportunities and markets are also affected by armed conflict. Drug cultivation and distribution is both fostered and transformed by armed conflict (Cornell, 2007). The lack of social order allows such markets to continue to operate; however, their methods of sales and distribution have to adapt as the market shapes and adapts to the conditions of conflict (Cornell, 2007).

Crime also affects and shapes armed conflict through a crime-rebellion nexus (Galeotti, 1998). In particular, organized crime can affect rebellions by pitting sides of conflicts against each other, particularly in countries where there are criminal markets that are entrenched in its' social and political history (Galeotti, 1998; Makarenko, 2004). For example, Galeotti (1998) looks at how the prominence of the opiate trade and organized crime in Turkey has fostered and shaped the rebellion of the Kurds against the Turkish state. He found that the longstanding trade in opiates and social/political structures in Turkey helped to create connections between criminal groups and key political figures in both sides of the conflict. The protection afforded by these figures helped the organizations thrive and to influence the direction of the conflict to their benefit (Galeotti, 1998). Makarenko (2004) similarly looks at the role of transnational criminal organizations (TCOs) and terrorism and found similar connections between criminal groups, crime, and conflict.

Controlling for crime in general, including organized crime and street crime is important to understanding the relationship between armed conflict and antiquities looting. Without the ability to control for crime in general, this study cannot rule out the possibility that the relationship between armed conflict and antiquities looting is spurious.

### *Summary and Directions for Future Research*

This thesis sought to better understand this relationship using newly created quantitative data and empirical analysis. Using open source news stories, I created a time series dataset of reports of antiquities looting and armed conflict. Then using a combination of lag-augmented vector autoregression and autoregressive distributed lag models, I analyzed the data with respect to three hypotheses: (1) antiquities looting and armed conflict are positively related; (2) an increase in antiquities looting is associated with an increase in armed conflict, and (3) an increase in armed conflict is associated with an increase in antiquities looting. The first hypothesis received strong support, the second moderate support, and third weak support.

There are several findings worth highlighting. First, the analysis revealed a pattern where prior changes in antiquities looting were associated with a small decrease in armed conflict and current antiquities looting was associated with a sustained increase in armed conflict. This pattern holds in general across units of analysis, though there were differences by type of conflict in the long-run relationships. This supports the idea that looting can be strategic in armed conflict and provides evidence for the conflict financing angle. It also emphasizes the need to further investigate the effect of antiquities looting by type of armed conflict.

Second, while the analyses did not support the hypothesis that increases in armed conflict is associated with an increase in antiquities looting, I cannot say this means opportunistic looting does not occur. Rather, this suggests that these data are not able to capture this type of looting. Third, despite the limitations in the data these analyses show that there is value in using quantitative data. They allow for a more nuanced analysis of the relationship between antiquities looting and armed conflict than either individual case studies or journalistic evidence can. They also enable the use of quantitative methods such as multiple time series. Finally, this research emphasizes the importance of using quantitative methods to better understand this relationship. Though this research is an initial attempt to apply empirical analysis, the findings are significant and provide a baseline and direction for future research.

There are four directions for future research based on this study. First, future research should consider other sources of quantitative data to address the limitations of using open source news stories. Second, quantitative methods should continue to be used investigate further the relationship between antiquities looting and different types of armed conflict. Third, future research should expand this analysis to other countries to see if these initial findings are supported, particularly countries with overall crime data available to rule out alternative explanations. Finally, given the promising findings from this study, the relationship between antiquities looting and armed conflict should also be looked at using quantitative methods designed for causal inference.

## Appendix

### Codebook

## Antiquities Looting and Armed Conflict Codebook

### *General*

**Year (*year*):** year

**Month (*month*):** month

**Quarter (*quarter*):** quarter

### *Antiquities Looting Data Coding*

The data have already been loaded into an excel spreadsheet. The variables Old Reuter number, ID number, Date of story, lead sentence, and searchterm have been pre-loaded. The remaining variable need to be coded. Follow the coding directions here.

**Old Reuter Number (*oldreutnumb*):** An ID number from the Reuters data

**ID Number (*id*):** Each ID has a number indicating which dataset the incident comes from, the year, the month, and a count variable to ensure the ID is unique. IDs from Lexis Nexus dataset start with “8”, IDs from Reuters dataset start with “7.” Created using the code  
“=CONCAT("7",IF(ISBLANK(K2),"0000",K2),IF(ISBLANK(L2),"00","0"&L2),C2)”

**Count (*count*):** A count variable starting at 1 used to create the unique id variable.

**Date of story (*publish\_date*):** code in format mm/dd/yyyy

**Lead Sentence (*leadsentence*):** The lead sentence of the story to be coded

**Remove (*remove*):** code 1 if the row is to be removed, code 0 otherwise. If the row is marked with 1, mark the reason in *removenotes* and do NOT code the rest of that row. A sentence must meet the following three conditions to stay in the dataset, if one is not met, it should be removed. Duplicate sentences should also be removed.

Condition #1: The sentence must take place in Egypt

Condition #2: The sentence must be about looting of antiquities

Condition #3: The sentence must be describing an action or incident, not a general statement of fact.

**Unsure (*unsure*):** code 1 if unsure whether the row should be removed or not and mark the reason in *removenotes*. Continue to code the remainder of the row as best as possible. These sentences will be reviewed again.

**Remove Notes (*removenotes*):** Briefly describe why the row is being removed or why you are unsure if it should be removed.

**Searchterm (*searchterm*):** The searchterm used to isolate the sentence – Reuters only.

**Lexis Nexis Document Number (*lexisnexisdocument*):** The Lexis Nexis output automatically numbers each of the results, put the number here – Lexis Nexis only.

**Newspaper (*newspaper*):** The name of the newspaper the story was published in.

**Title (*title*):** The title of the news story.

**File source (*filesource*):** The name of the electronic file that contains each news story.

**Date of incident (*year, month, day*):** code in 3 columns, one for year, one for month, and one for day. If no information is provided in the lead sentence, leave blank. Unless the day of the incident is indicated, leave the day blank. Some stories use indirect language to refer to the date. Use the following system to account for these linguistic cues:

2 = couple

3 = several'

5 = many

Mid = the mid-point (e.g., “mid-1990s” would be coded as 1995)

**Description of the incident (*incidentsumm*):** Provide a 1-2 sentence description of the incident in the story.

**Location of the incident/looting (*incidentloc*):** write-in as much detail as possible about the location of the incident.

**Location (specific) (*locspec*):** code the location according to the following scheme. An archaeological site includes the grounds and structures within it. A museum is a building that must be publicly identified as a museum. Note that storage facilities for museums and archaeological sites should be coded as “other,” because these are buildings separate from the site or museum themselves. Similarly, if a location is not specific (e.g., public collection) it should be coded as “other.” Code “no information” if it is not possible to identify the location of the incident from the information provided or a brief supplement search online.

- 1 = archaeological site
- 2 = museum
- 3 = other
- 4 = no information

**Location (text) (*locspect\_text*):** The text if coded as “other.”

**Type of incident (*incidtype*):** code the type of incident described in the following scheme. Code for looting if the action was taking an object from the ground or structural complex of an archaeological site. In the case that a site is mentioned to be looted consistently for a long period of time, it is assumed that at least one looting would happen per day and so the incident is counted 1/day unless details are provided identifying separate lootings. Note that the act of looting necessarily destroys the site. Code for destruction if the purpose of the incident was to destroy not the take anything. Theft requires that the object(s) have been recorded and removed from the site. For example, an object taken from an archaeological site storage facility is theft because the objects have already been discovered and recorded. The exception to this are objects physically attached to a structure within the archaeological site. For example, if a part of a statue is removed or part of a mural cut from a wall or tomb, this action would be considered looting even if the object(s) had been identified previously by archaeologists.

- 1 = destruction
- 2 = looting
- 3 = theft

**Recovered (*recovered*):** indicates whether the object(s) were recovered.

- 1 = yes
- 0 = no

**Date recovered (*recoverydate*):** if the objects were recovered, this field indicates the date they were recovered. Code in mm/dd/yyyy. If a specific day is not mentioned, then assume the middle of the month. If the incident is referred to as “early” or “late” assume the first or last day of the month, respectively. If the objects were recovered over a period of time, only code the first day the objects were recovered.

**Related documents (*relateddocuments*):** The document number(s) from Lexis Nexis or Reuters of cases that are the same or related to the current one. Code this variable the first time the incident occurs. May code the other times as well, but make sure the first incident is complete with all related documents. If supplemental sources were used to triangulate information, include a link to them here.

**Repatriated objects (*repatriatedobjects*):** Write the object(s) that were repatriated.

**Repatriated (*repatriated*):** indicates whether the object(s) were recovered.

1 = yes

0 = no

**Repatriation date (*repatriationdate*):** if the objects were repatriated, this field indicates the date they were recovered. Code in mm/dd/yyyy. If a specific day is not mentioned, then assume the middle of the month. If the incident is referred to as “early” or “late” assume the first or last day of the month, respectively. If the objects were repatriated over a period of time, only code the first day the objects were repatriated.

## ***Armed Conflict Data Coding***

These are the variable which I am using, ones marked with \* are those I created and added to the data.

**Id (*id*):** A unique identifier for each incident of armed conflict. The IDs for the GTD and ACLED were kept and merged together.

**Date of incident (*year, month, day*):** code in 3 columns, one for year, one for month, and one for day.

**Event Type (*eventtype*):** From the ACLED, describes the granular type of event for each incident. Some incidents are coded twice if there are two event types present. These duplicates were removed from the data during cleaning.

**Admin1 (*admin1*):** From the ACLED. The governorate or region in which the incident took place.

**Admin2 (*admin2*):** From the ACLED. The city or area in which the incident took place.

**Provstate (*admin1*):** From the GTD. The governorate or region in which the incident took place. During cleaning was renamed *admin1* so that it could be merged with the ACLED variable.

**City (*admin2*):** From the GTD. The city or area in which the incident took place. During cleaning was renamed *admin2* so that it could be merged with the ACLED variable.

**Location (*location*):** From the ACLED. The specific location of the incident.

**Latitude (*latitude*):** From the GTD & ACLED. The latitude of the incident. Latitude and Longitude were used to compare incidents during cleaning to determine whether there were any overlapping events between the GTD and the ACLED.

**Longitude (*longitude*):** From the GTD & ACLED. The longitude of the incident. Latitude and Longitude were used to compare incidents during cleaning to determine whether there were any overlapping events between the GTD and the ACLED.

**Description of incident (*Notes*):** Provides a brief 1-2 sentence overview of the incident from the database as applicable. During cleaning the variables were made to both be named “Notes” and so could be merged into one variable.

From GTD = *incident summary* variable

From ACLED = *notes* variable

**\*Multiple incident (*multincident*):** Code according to the following scheme. This variable accounts for acts that occur as part of a series. For example, three buses set on fire in 3 cities would be 3 separate instances but if coordinated are part of the same series of incidents.

- 1 = yes
- 0 = no

**\*Related incident (*relatedincidents*):** the IDs of the other related rows in the coordinated/series of incidents.

**\*Conflict type (*conflictype*):** Code according to the following scheme. Coding for 1 (i.e. terrorism) means that there was a “0” for the variable *doubtterr*. In the GTD, all others from the variable *doubtterr* should be coded as a 3 (i.e. other). In the ACLED, all incidents of “Riots/Protests” from the variable *EVENT\_TYPE* should be coded as 2. All incidents coded as “Terrorism” from the variable *CONFLICT\_TEXT* should be coded as 1. Everything that is not coded as 1 or 2 should be coded as 3. Some incidents in the ACLED may have both terrorism and riots/protests coded already. If the incident focuses on the action of the protest itself, then code it as a riot/protest. If the protest/riot/protesters are the victims or tangential to the action, then code it as terrorism.

- 1 = Terrorism (0 in *doubtterr*)
- 2 = Riots/protests (from *eventtype*)
- 3 = Other

**\*Attack Type (*attacktype*):** This variable combines the event types from the ACLED with the Attack types from the GTD. Code according to the following scheme. Information for this variable comes from the GTD variable *attacktype1*. When combining with ACLED’s type of incident, refer to the descriptions of each type of attack on pages 21-23 of the GTD codebook. #1-9 come from the GTD, #10-18 come from the ACLED.

- 1 = assassination
- 2 = armed assault
- 3 = bombing/explosion
- 4 = hijacking
- 5 = hostage taking (barricade incident)
- 6 = hostage taking (kidnapping)
- 7 = facility/infrastructure attack
- 8 = unarmed assault
- 9 = unknown
- 10 = battle-no change of territory
- 11 = battle- non-state actor overtake territory
- 12 = battle – gov’t regains territory
- 13 = headquarters or base established
- 14 = strategic developments
- 15 = riots/protests
- 16 = violence against civilians

17 = non-violent transfer of territory  
18 = remote violence

**\*Conflict1 (*conflict1*):** A dummy variable indicating whether the incident took place during the first conflict in Egypt from 1993 – 1998.

1 = yes  
0 = no

**\*Conflict2 (*conflict2*):** A dummy variable indicating whether the incident took place during the second conflict in Egypt from 2011 – 2014.

1 = yes  
0 = no

**\*Domestic/International (*Domestic*):** Code according to the following scheme. A domestic incident is one that is domestic in focus and perpetrated by citizens of Egypt. An international incident is one that is international in focus and/or is perpetrated by people from other countries, regardless of whether it was within the borders of Egypt. This variable was coded by conducting a search of all summary information for key words of known countries to be active or have international relevance to Egypt, including Palestine, Lebanon, the US, Israel, and France. In addition, most internationally focused incidents appear to have occurred around or in embassies, so the key word search also included ‘embassy.’ It is important to note that this variable was in no way coded based on the 4 “international” variables in the GTD (*INT\_LOG*, *INT\_IDEO*, *INT\_MISC*, *INT\_ANY*).

1 = international  
2 = domestic  
3 = unknown

**\*Country variables (*Palestine, Lebanon, US, Israel, France, Embassy*):** To get at whether the incident is domestic or internationally focused, there are a series of dummy variables identifying which incidents relate to other countries. For example, a number of incidents relate to people dying as they try to cross the Egypt-Gaza border in support of Palestine. Currently there are dummy variables for: Palestine, Lebanon, US, Israel, France, and “embassy” (to catch other less common international players in the area).

**Source:** Code according to the following scheme. Not kept in the final dataset because the incidents are aggregated to the month.

1 = ACLED  
2 = GTD

### ***Economic Control Variables***

These variables are taken from the World Bank Development Indicators data, which are partially maintained by the International Monetary Fund. The only changes made to these variables was to add twelve months to each year. Each month of a year has the same value since these data are only available on a yearly basis. For example, the GDP per capita (in current US\$) would be the same for January – December 1997, but would change starting January 1998.

**GDP per capita in current US \$ (*GDP\_CD*):** The gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars (World Bank national accounts data and OECD National Accounts data files).

**Goods Export Balance of Payment (BoP) in current US \$ (*goodsexport\_CD*):** Goods exports refer to all movable goods (including nonmonetary gold and net exports of goods under merchanting) involved in a change of ownership from residents to nonresidents. Data are in current U.S. dollars (International Monetary Fund Balance of Payments Statistics Yearbook and data files).

### ***Political Control Variable***

These data are taken from the Polity IV project, which tracks regime changes in all major countries over time. The data were used to create a new variable called *regimechange* that indicates the presence of a regime change in a given month and year.

**Regime Change (*regimechange*):** Whether or not a regime change occurred in a given month.

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