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*Original*

The Arc of Modernization: Economic Structure, Materialism, and the Onset of Civil Conflict / Chatagnier, J. Tyson; Castelli, Emanuele. - In: POLITICAL SCIENCE RESEARCH AND METHODS. - ISSN 2049-8470. - 7:2(2019), pp. 233-252. [10.1017/psrm.2016.24]

*Availability:*

This version is available at: 11381/2820661 since: 2021-11-16T19:51:55Z

*Publisher:*

Cambridge University Press

*Published*

DOI:10.1017/psrm.2016.24

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note finali coverpage

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# POLITICAL SCIENCE RESEARCH AND METHODS



**CAMBRIDGE**  
UNIVERSITY PRESS

## **The Arc of Modernization: Economic Structure, Materialism, and the Onset of Civil Conflict**

Journal:	<i>Political Science Research and Methods</i>
Manuscript ID	PSRM-OA-2015-0133.R1
Manuscript Type:	Original Article
Date Submitted by the Author:	22-Feb-2016
Complete List of Authors:	Chatagnier, John; Vanderbilt University, Political Science Castelli, Emanuele; Bruno Kessler Foundation, Research Center on International Politics and Conflict Resolution
Keywords:	Civil/Domestic Conflict, International Relations

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Manuscripts

Accepted for publication in

Political Science Research and Methods , Volume 7 , Issue 2 , April 2019 , pp. 233 - 252

DOI: <https://doi.org/10.1017/psrm.2016.24>

Published online by Cambridge University Press: 09 June 2016

## The Arc of Modernization: Economic Structure, Materialism, and the Onset of Civil Conflict\*

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### Abstract

The onset of intrastate conflict has two requisite conditions: that prospective insurgents have an incentive to rebel, and that the state lacks the capacity to deter such a rebellion. We outline a simple rationalist argument grounded in gains from economic growth (to both individual income and state revenues) to argue that modernization has the potential to affect the likelihood of civil conflict through both of these conditions. The shift away from a rent-seeking economy affects opportunity costs for rebellion by increasing the cost of recruitment, broadening the time horizon for gain, and decreasing looting possibilities. On the state side, modernization increases state military, economic, and institutional capacity, allowing governments to deter rebellion. We construct an index of modernization from World Bank data and apply a strategic model to explore the effect of modernization on both states and rebels simultaneously. We find that the modernization process describes an arc that may increase the likelihood of unrest in the early stages, but has long-term stabilizing effects.

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\*Authors' names are listed in reverse alphabetical order, and do not indicate unequal contributions. Previous versions of this paper were presented at the 2014 Meeting of the European Political Science Association and the 2014 Meeting of the American Political Science Association. We thank Filippo Andreatta, Rob Carroll, Kerim Can Kavakli, and Francesco Moro for helpful comments.

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## Introduction

More than fifty years ago, the term “modernization” emerged in the social sciences to describe the transition from traditional structures to more advanced systems. According to the original literature, modernization originates in the economic realm (Rostow 1960), bringing about fundamental changes in politics (Lipset 1959; Almond and Coleman 1960; Huntington 1968) and society (Deutsch 1961; Eisenstadt 1964; Smelser 1968), subsequently affecting culture as well (Hoselitz 1960; Gellner 1983). However, despite its effect on multiple dimensions of human life, its role as a relevant driver of change has often been dismissed in political science: theoretically, it was considered a Western phenomenon, with limited applicability to non-Western societies (Bendix 1967); empirically, it was simply not shown to lead to democracy (Przeworski and Limongi 1997). Of course, modernization can follow several paths, depending on the time (Gerschenkron 1962) and place (Wallerstein 1979) in which it occurs; additionally, it often encompasses multiple features, which a single theory cannot capture. However, it is possible to identify certain trends—or “coherent trajectories” (Inglehart 1997, 7)—that represent the broad commonalities shared by every modernizing country.

In this paper, we examine the link between modernization and the onset of civil conflict. The influence of economic development on conflict has been studied broadly within the international relations literature (Boix 2008; Buhaug et al. 2011; de Soysa 2012; Mousseau 2012). Surprisingly, however, few studies have focused specifically on societal changes brought about by economic modernization as important dynamics affecting the occurrence of intrastate disputes.<sup>1</sup> The aim of this essay is to provide further specification of this relationship, arguing that it is not economic growth itself that matters for the onset of civil conflict, but specifically development driven by industry-based economic modernization.

To understand how the transition to modernity affects conflict, we construct an index of modernization using principal component analysis (PCA), and extract two dimensions (economic structure and level of materialism) that describe an “arc of modernization.” We demonstrate

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<sup>1</sup>This is largely because the past twenty years have seen the concept of modernization superseded by globalization as a potential factor influencing the likelihood of unrest and civil war. We discuss globalization below.

that modernization can affect states differently, depending on the level of economic development and the degree of materialism. In particular, the first stages of modernization are associated with a greater probability of rebellion, because of rising levels of materialism and lower levels of state capacity. This is consistent with the literature stressing relative deprivation as a cause of instability (Gurr 1970) and with the breakdown of modernization hypothesis (Deutsch 1961; Eisenstadt 1964; Huntington 1968). In the long run, however, the shift to a modern, industry-based social structure has a stabilizing effect both on politics (by increasing state capacity) and society (by enhancing satisfaction and discouraging rebellion). For rebels, the shift toward industrialization increases the cost of recruiting, by broadening the time horizon for realizing gains and reducing the potential for looting (contrary to rentier states, resources in industry-led economies are not easily lootable, giving rebels limited incentive to challenge the state). For governments, a heightened ability to extract resources through taxation enhances at least three dimensions of state capacity: military (state ability to penetrate society), economic (state ability to provide welfare services), and institutional (state ability to address political mobilization through rule of law), though the latter is conditional on elites' decisions to allow greater access to the political system (North, Wallis and Weingast 2009, 149).

The paper proceeds as follows. We begin by reviewing the literature on civil war onset, highlighting its division into two main categories: material (greed and inequality, and administrative and military capacity) and immaterial (grievance and institutional capacity). Next, we outline our model, showing how modernization can affect the causes of intrastate disputes. In doing so, we argue that structural shifts can have impacts on both rebels' and rulers' considerations. The next two sections are devoted to empirical analysis, and the conclusion draws implications from our findings and suggests paths for future research.

## The Causes of Rebellion

Recent studies of intrastate conflict have generally explained disputes by looking only at rebels or rulers, emphasizing either why rebels decide to fight or, conversely, how the state can deter rebellion.<sup>2</sup> From the rebel perspective comes a group of explanations that relies on grievance-based or “justice-seeking” arguments (de Soysa 2002, 397). They claim that insurgencies emerge because of ethnic or political hatred (Horowitz 1985; Sambanis 2001), political exclusion of ethnic minorities (Cederman, Gleditsch and Hug 2013; Denny and Walter 2014), or lack of participation in the political system (Krain and Myers 1997; Reynal-Querol 2005). While these arguments do not wholly neglect the opportunity cost of rebellion, they hold that material benefits from fighting are a secondary concern, relative to ideology and other immaterial factors.

A second group of (primarily economic) arguments asserts that civil wars are motivated by inequality and relative deprivation, or by rebel greed. On one side are the classic inequality arguments, in which economic development—especially when rapid and followed by a period of stagnation (Davies 1962)—produces a gap between aspirations and expectations. This is relative deprivation (the difference between what one perceives one is entitled to have and what one actually has), which can prompt turmoil among citizens (Gurr 1970), even in the absence of ethnic and cultural cleavages (Bartusevičius 2014). However, some of the literature on this topic still considers group (i.e., horizontal) inequality to be an important predictor of civil unrest (Stewart 2002; Stewart, Brown and Mancini 2005; Østby 2008; Cederman and Gleditsch 2009).

On the other side, building on the seminal work of Collier and Hoeffler (1998), scholars have grounded their arguments on the opportunity cost of rebellion, wherein the decision to take part in an insurgency depends on the expectation of reward from violent political action (de Soysa and Fjelde 2010). Within this framework, rebellion is essentially considered a job like any other (Fearon 2008); for this reason, these arguments can be labeled “profit-seeking” approaches: potential rebels join insurgencies only when the expected payoff from rebellion outweighs that of the status quo

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<sup>2</sup>An important exception comes from Jakobsen, de Soysa and Jakobsen (2013), who examine both sets of explanations, pitting them against one another. They find that opportunity cost mechanisms have greater explanatory power.

(Olson 1965; Taydas, Peksen and James 2010). Accordingly, these studies take into consideration factors such as the country's level of economic development (Fearon and Laitin 2003; Jakobsen, de Soysa and Jakobsen 2013) and growth, and the presence of (lootable) natural resources (Collier and Hoeffler 2004; Boix 2008).

From the perspective of the government, the literature on state capacity similarly stresses both political and economic factors that influence the ability to resist or deter internal uprisings. States with strong institutions or economies should be especially well suited to resisting rebellion (Buhaug 2006). According to the institutional capacity argument, civil disputes can be prevented through the strengthening of good governance, democracy, and the rule of law. Indeed, in such systems, minorities have greater representation and demands can be channeled peacefully into the polity. But regime type may be related to civil war through an inverted U-shaped curve (Klopp and Zuern 2007): democratizing regimes that score in the middle range on the democracy-autocracy index (anocracies) are more likely to experience civil conflicts than are either full-fledged democracies or harsh autocracies (Fearon and Laitin 2003; Gleditsch, Hegre and Strand 2009). Similarly, Cederman, Gleditsch and Hug (2013) show that, while elections are not dangerous, per se, the problem of post-electoral violence may arise in the first two competitive elections after a period of no polling. Thus, democracy can reduce the risk of conflict, but only where the conditions for stable democracy are present.

For this reason, some authors have found that the peace-inducing effect of democracy may be contingent on development (Hegre, Gissinger and Gleditsch 2003), and that the democratic civil peace is stronger for developed countries (Hegre et al. 2001; Gleditsch, Hegre and Strand 2009) than for developing states.<sup>3</sup> States that are economically and militarily powerful can either deter (or repress) possible insurgencies or provide material welfare and wellbeing to the population, making rebellion a less attractive option. By contrast, weak states are poor at counterinsurgency and can provide neither security nor welfare to their own citizens. A weak state may even provide

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<sup>3</sup>Mousseau (2012, 473) addresses this phenomenon from an opportunity cost perspective by proposing a distinction between clientelistic (contract-poor) and market-capitalist (contract-rich) societies: the former are more likely to experience intrastate disputes because groups are "in a constant state of conflict over distributive gains," while in the latter, citizens are interdependent, and the harming of one group makes everyone worse off.

opportunities to generate “rebellion-specific capital,” further increasing the payoff from insurgency (de Soysa and Fjelde 2010, 295).

Moreover, state weakness can be produced by the spread of globalization, which can reshape sub-national group identities (Rosenau 2003), affecting state capacity (Ferguson and Mansbach 2004) and fueling new forms of violence (Devetak and Hughes 2007). Recent works in this field have found that, although the economic and social aspects of globalization may reduce the likelihood of civil war (Barbieri and Reuveny 2005; Flaten and de Soysa 2012), economic openness may also produce redistributive struggle (Bussmann and Schneider 2007), especially if it generates sudden change (Nieman 2011).<sup>4</sup> From this point of view, globalization may be seen as a sort of re-packaged version of the classic modernization paradigm (Mason 2003) insofar it affects a country’s economic structure, bringing about social and cultural change. In our view, however, modernization goes beyond globalization for two reasons. First, it necessarily implies a shift to an industry-based mode of production, while globalization relates primarily to international trade levels and flows.<sup>5</sup> Second, and more importantly, globalization generally implies the adoption of free-market orientations (Amoroso 1998), while we do not differentiate between liberal and state-driven origins of modernization.

Ultimately, the causes of civil unrest are more complex and multifaceted than any single theory can capture. Fjelde and de Soysa (2009), for example, find at least three different routes through which a strong government may discourage rebellion: coercion, cooptation, and cooperation. They argue further that civil peace may actually be *co-produced* by these factors. Additionally, there may be overlap between these causes. Economic and political development, for example, may be mutually-constitutive processes (Thies and Sobek 2010). Similarly, the greed, opportunity cost, and state capacity arguments can all be linked (e.g., a strong state raises the opportunity cost for rebellion). Furthermore, globalization may simultaneously render the use of violence both more and less attractive for potential rebels, by weakening state capacity while generating economic

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<sup>4</sup>See Schneider (2014) for a review of the literature on the globalization-civil war nexus.

<sup>5</sup>The KOF Index’s economic globalization component (Dreher, Gaston and Martens 2008), for example, does not take into account industrialization as a measure of global integration. Although it is conceptually similar in many ways to our measure of modernization, it lacks an important theoretical component.

benefits for society. In this regard, the presence of natural resources can make a significant difference: indeed, the broad literature focusing on the so-called “oil curse” (that dependence on primary commodity exports makes civil war more likely) relies on both the greed and opportunity cost mechanisms to account for civil conflict (Ross 2012), though the relationship between oil wealth and political violence remains controversial (Thies 2010). We argue that, although this is a step in the right direction, the focus on primary commodity exports is too narrow; dispute onset can be understood more readily by looking at the overall structure of society and the economy.

## Modernization and Civil Conflicts

A review of the quantitative literature on the causes of civil conflict suggests that, while there is widespread agreement among scholars that low levels of per capita income or economic growth are especially likely to be associated with civil unrest (Dixon 2009; Blattman and Miguel 2010), and that lootable resources are connected to the onset of civil conflict, the more general relationship between economics and conflict is unclear (Ross 2004). Notably, a thorough specification of how modernization might affect intrastate disputes remains absent from the literature. In particular, one of the main contributions of recent works in the study of political violence is that the economic *structure* may matter for explaining the occurrence of civil conflict (de Soysa and Fjelde 2010; Mousseau 2012). Since the onset of the Industrial Revolution, nearly every state on earth has initiated the process of modernization (Inglehart 1997, 18). With industrialization, peace has become more profitable (Gat 2013). Furthermore, as noted by modernization scholars (e.g., Lerner 1958; Lipset 1959), modern societies share common features, such as high degrees of industrialization, urbanization, and education. It is difficult—if not impossible—to explain exactly how the components of modernization interact, since the transition to modernity is neither linear nor deterministic (Moore 1966). However, it is possible to consider how the socio-economic change brought about by the process affects both the state (by increasing fiscal revenues) and the society (through job creation and enhanced material opportunities). Importantly, modernization tends

to be an irreversible process: once industrialized, a country will not return to its agriculture beginnings, but will eventually shift to a focus on services in a later stage (Bell 1973). Similarly, once urbanized, people tend to remain in cities, and education levels tend to increase and then level off. The cultural changes from the process come about much later, making their role more difficult to assess, since values do not adjust immediately to the new socio-economic environment, potentially generating deviant behavior (Inglehart 1977). However, some modernization scholars (Schumpeter 1955 [1919]; Weber 1958 [1795]; and later Gellner 1983) have stressed that, with the shift to industrialization, individuals tend to attribute more value to *material* goods, and to physical security, wellbeing, and prosperity. This is consistent with Maslow's (1943) hierarchy of needs: following the shift to an industrial mode of production, people tend to satisfy material needs that emerged during the pre-industrial phase (the Scarcity Hypothesis put forward by Inglehart (1997)). It is this value system, which gives priority to the satisfaction of material needs, that Inglehart calls materialism.

Thus, the transition to industrialization has effects on the state and society simultaneously: the state increases its capacity through the expansion of tax revenues, while individuals become more interested in maximizing material gains (Inglehart 1997; Blokland 2008). We argue that this has important implications for dispute onset. Earlier studies have generally explained civil conflicts by looking only at rebels or rulers, emphasizing either state capacity *or* opportunity costs for rebellion, but not both. However, many recent contributions have stressed that the two dimensions may be interrelated. What is needed is a theory (and empirical model) that can account for societal structure, while considering its effects on rebels and rulers simultaneously. This can be done by including the deterrent effect of state capacity into rebels' calculations, and assuming opportunity cost for rebellion to be a function of both state capacity and potential rebel considerations. In other words, the interaction should be strategic, as depicted in Figure 1. An insurgency emerges when a rebel group challenges the government. The government can respond by resisting the rebellion or giving in. If a government is strong enough, it can reduce the rebels' expected payoff for insurgency, effectively deterring the rebellion. If the rebel group is sufficiently

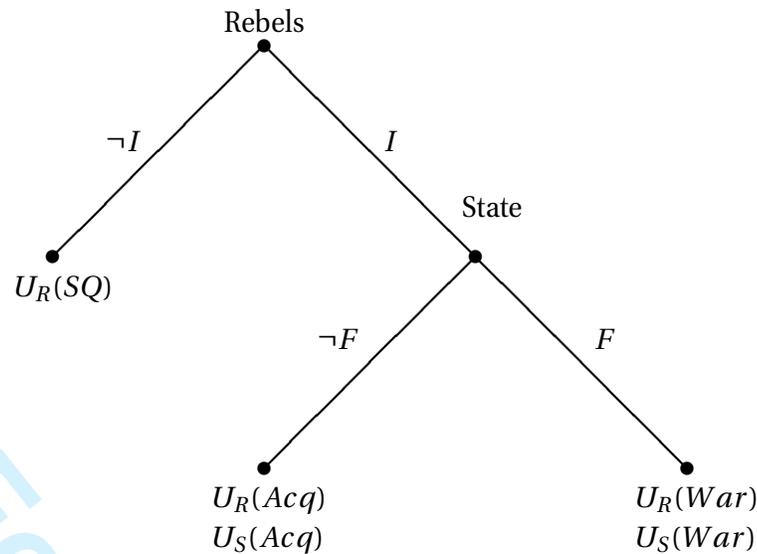


Figure 1: A Simple Rebellion Game

powerful relative to the state, and able to mount a significant military challenge, the government will be unable to deter the rebellion. In this case, an insurgency will occur, and the final result will depend on each side's relative military power. The ultimate decisions made by the government and the rebel group depend on their expected payoffs from each action.

At the individual level, potential rebels are interested in expected gains from rebellion. This is affected by the valuation of the status quo, relative to the future under a successful rebellion, and by the probability that a rebellion would be successful. Modernization affects these calculations in three ways. First, by bringing new jobs, industrialization increases the payoff from the status quo, making rebellion less attractive and hindering recruiting. An individual with a secure occupation should leave his or her job and salary to join a rebellion (unless that individual expects to gain more from fighting). This may explain the general reluctance of the middle class to revolt: middle-class citizens are virtually impossible to recruit because they tend to be satisfied with the status quo in terms of job, salary, and status, and will only join a rebellion when value-rational considerations emerge (often during social revolutions). By contrast, it was relatively easy for the Afghan mujahideen in 1979 and for Hutu rebels in 1994 to recruit fighters in refugee camps (where people had neither jobs nor property) in Afghanistan and Rwanda, respectively. However, given

that materialism becomes more prevalent during modernization, potential rebels are expected to pay a great deal of attention to the material costs and benefits of rebellion.<sup>6</sup> The second effect of modernization concerns time horizons. Modern, profit-seeking economies are driven by continuous investment, which has the potential to lead to sustained growth. This can be contrasted with pre-modern, agrarian societies, which are characterized by subsistence economies and lower prospects for growth. In modern countries, then, individuals expect to see gains in the future, under the status quo, and they will be concerned about the lasting consequences that domestic unrest can have on human and physical capital (Blattman and Miguel 2010). This should decrease incentives for rebellion to an even greater degree, as those citizens living in modern states will see prospects for enhanced living standards around the corner. Third, potential rebels have greater incentive to capture a rent-seeking economy than a profit-seeking economy. Resource-rich states can use non-tax revenues to buy consensus from the population, making rebellion less likely (Morrison 2009); however, if resources are concentrated in a limited portion of the state territory and easily lootable, rebels will have an incentive to challenge the government, in order to take power in those regions. In industrial economies, resources are not easily lootable, and extraction is made more difficult because it requires taking over and doing, rather than simply selling commodities. After conquest, rebel groups must find a way to run the industrial sector efficiently, reducing the immediate benefits from victory. For these three reasons, we expect a shift to modernization to be associated with a direct reduction in rebel utility for war.

**Hypothesis 1.** *As a state modernizes, the utility from the status quo for potential rebel groups will increase.*

Individual calculus is not the only factor that affects the opportunity cost for rebellion. A modern (i.e., militarily-, economically-, and institutionally-capable) government can deter even highly-motivated and well-organized rebels. In this case, the distinction between profit- and rent-seeking economies (Brawley 1993) is crucial, as a key component of state capacity is the

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<sup>6</sup>Of course, if grievances are present, this calculus may also be shaped by value-rationality (i.e., how much an individual gains in terms of immaterial benefits, such as living in a country ruled by elites that shares his or her values, language, and culture).

government's ability to extract resources from society via taxation: in the latter set of states, rulers exploit the country's existing resources to enrich themselves without increasing general productivity (increasing only their own slice of the pie); in profit-seeking economies, by contrast, resource exploitation is associated with an increase in productive efficiency (meaning that rulers increase their share by enlarging the entire pie). At the military level, increased fiscal revenues have an immediate effect on state military strength, as providing internal and external security is usually the first concern when a government acquires additional resources. Militarily-powerful states are able to provide domestic order and to make credible threats to fight back, if necessary. Advanced economies, by definition, have more assets to protect than developing economies. Thus, they tend to give greater priority to securing those assets. Additionally, modern economies need infrastructure (roads, telecommunications, transport) to sustain the exchange of goods and services, and to manage increasing rates of urbanization (a phenomenon generally associated with industrialization). This can generate a positive externality for the state: rebels exploit rough terrain and sanctuaries in the countryside (that the state is unable to control) to organize their movements; if a government invests in public infrastructure or city planning, this can have a positive impact on the state's ability to penetrate society (Fearon and Laitin 2003; Fearon 2008).<sup>7</sup> Finally, industrial infrastructure often has a dual-use: it can be refitted for military purposes, benefiting the state in a conflict. During World War II, for example, the major automobile manufacturers were responsible for 33% of U.S. machine guns, 80% of U.S. tanks and tank parts, and half of all aircraft engines (Gropman 1996). At the economic level, taxes and other fiscal revenues increase the ability of the state to provide welfare services (e.g., health care, housing, unemployment benefits). This should render potential rebels happier with the status quo, increasing the opportunity cost for rebellion. Finally, as political development theorists (e.g., Deutsch 1961; Eisenstadt 1964; Huntington 1968) have stressed, modernizing states are usually faced with the problem of setting new institutions to manage the new socio-economic environment. This means channeling rising demands in the

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<sup>7</sup>This occurred in France under Napoleon III, who appointed Baron Hausmann to modernize the then-still-medieval center of Paris, by building large boulevards, public parks, and open-space squares. According to Mumford (1961), the renewal of Paris was designed not only to improve sanitation and quality of urban life, but also to allow the army to counter social unrest and discontent, which it did during the repression of the Paris commune in 1871.

political system, dealing with social mobilization, and coping with pressure on existing resources. If they are successful, a consolidated democracy or open-access system (North, Wallis and Weingast 2009) is likely to emerge. On the other hand, failures to meet public demands may lead to revolutions and political decay (as occurred with the Shah's regime in Iran).<sup>8</sup> The reason for these breakdowns can be found in the difference between profit- (open-access) and rent-seeking (natural) states (North, Wallis and Weingast 2009): the former are more likely to base their activity on impersonal relationships, provide transparent institutions, and allow political participation and competition, grounding their power on legitimate authority (*Herrschaft*, in Weberian terms); the latter tend to be characterized by personal and clientelistic relationships, and to have small selectorates and oligarchic political systems. Natural states have only one means to manage rebellion: brute force (the Weberian *Macht*). Sometimes this tactic succeeds (as in the case of contemporary China). Other times (as in the case of Assad regime in Syria), it paves the way for civil war and revolution. However, even in the absence of institutional capacity (i.e., if a modernizing state chooses repression instead of rule of law), economic modernization should at least increase state military and economic capacity. This should be associated with an increase in the state's utility for war, which will have a deterrent effect on rebel groups.

**Hypothesis 2.** *As a state modernizes, the utility from war for the state will increase.*

Ultimately, these two hypotheses suggest that modernity should be associated with a lower overall risk of conflict: it makes fighting less attractive to rebels and more attractive to the state, which helps it to deter rebellion. However, modernization is not a smooth process, and it does not occur instantly (North, Wallis and Weingast 2009, 27). Most importantly, as in any radical transition, the socio-economic change brought about by modernization is often accompanied by a cultural change that usually comes much later. This is why—when especially rapid or rocky—the process of modernization may experience breakdowns (Olson 1963), such as revolutions or civil wars. We argue that the problems affecting the earliest stages of modernization may be due to

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<sup>8</sup>According to Abrahamian (1982), for example, the Shah's uneven modernization of Iran during the 1960s was the most important factor in bringing about the 1979 Islamic Revolution.

rising levels of materialism. That is, it follows from the growing tendency toward the pursuit of material interests (acquisition and possession of goods).<sup>9</sup>

Growing materialism is clearly linked with the problems affecting the transition to modernity: first, early stages of modernization may lead to rising material inequality (Lipset 1994), as the benefits from growth—in the form of savings—tend to be concentrated among upper-income, urban groups (Kuznets 1955). This may lead to the recognition of relative deprivation among lower-income groups (Gurr 1970). Second, once basic material needs are satisfied, individuals will seek more, proceeding through Maslow's (1943) hierarchy. In turn, rising demands may lead to social mobilization. If the government is unable to address them (Deutsch 1961; Huntington 1968), they can lead to widespread violence, insurgencies, or revolutions.

Though rooted in different assumptions, this argument is also consistent with both the classical Marxist observation of unrest in the early stages of development, and the neo-Marxist literature on political violence, which has stressed the role of peasants (and not industrial workers) in the Russian and Chinese Revolutions (Moore 1966; Skocpol 1979), as well as third world insurgencies (Wolf 1969; Migdal 1974; Paige 1975; Scott 1977). Thus, as the socio-economic structure shifts from a traditional, agrarian-based to an industrial mode of production, there is an initial increase in materialist orientations. This is followed, along with a rise in education levels, by a return to more immaterial (or post-material), value-based system of beliefs. This is what we refer to as the "arc of modernization." We argue that the materialist dimension belonging to this arc is positively associated with the probability of civil conflict, with an initial increase in the likelihood of conflicts during the early stages, soon followed by a decrease in the level of violence as modernity takes root and materialism declines.

**Hypothesis 3.** *Early stages of modernization will be related to a higher probability of civil conflict, while later stages will be associated with a lower probability of conflict.*

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<sup>9</sup>Although the concept of materialism is often described as a philosophical orientation (in contrast to idealism), we employ it to refer to attitudes toward the pursuit of material interests (i.e., goods, needs, and desires). This originates from the transition from traditional structures, and affects the cultural system of a state (see Richins and Dawson 1992 for a brief literature review).

## Data and Methods

We examine our hypotheses using data from the UCDP/PRIO Armed Conflict Dataset ([Gleditsch et al. 2002](#)), which contains information on conflicts between 1946 and 2001. For the purposes of this paper, we limit ourselves to civil conflicts only. Our dependent variable is a binary measure of conflict onset. For a given country-year, it takes a value of one if a new civil conflict begins in that year, and a value of zero otherwise.<sup>10</sup> Because we are concerned specifically with dispute *onset*, multi-year conflicts are coded as zero in all subsequent years.

Our primary concept of interest is the degree to which a state has modernized. Unfortunately, there is no single measure of “modernization,” as it is a process, rather than an attribute of a state. As such, it is difficult to measure. However, there are at least three (measurable) components: industrialization (or economic structure, more generally), urbanization, and education.<sup>11</sup> As measures of each of these values exist, it is possible to construct an index that measures the level of modernization across the various countries in our dataset.

We begin by collecting data on each of the measures above. Economic structure—the percentage of GDP accounted for by the industrial, agricultural, and service sectors—comes from the [World Bank \(2013\)](#) data on economic composition. Urbanization data, which measure the percentage of the population living in urban areas, also come from the World Bank. Finally, to operationalize education, we look specifically at female schooling, as this concept not only taps into education, but also into gender equality (see, e.g., [Inglehart and Norris 2003](#)),<sup>12</sup> making it an excellent indicator of a modern society. We draw our data from [Barro and Lee’s \(2013\)](#) dataset on

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<sup>10</sup>A civil conflict is defined in the data as a conflict between two parties, of which exactly one is the government of a state, and there are at least 25 battle deaths.

<sup>11</sup>Income levels, generally measured through per capita income, have been traditionally used as a proxy for the level of modernization ([Lipset 1959](#)). More recently, [Jakobsen, de Soysa and Jakobsen \(2013\)](#) have found that per capita income can be a sort of “formative indicator” of one or more mechanisms that lead to civil conflict. While acknowledging that modernization is often associated with a higher income per capita, we argue that our composite index can measure modernization more appropriately for two reasons: first, it pays attention to the distributional effect of modernization (average income tells us nothing about the *distribution* of wealth), and second, some countries (OPEC members, for example) tend to display a high level of income per capita, despite the absence of a real industrial base.

<sup>12</sup>[Thyne \(2006\)](#) and [Sanborn and Thyne \(2014\)](#) report that educational *equality* is particularly important in reducing the likelihood of civil war onset.

educational attainment, using the percentage of females, aged 25 and older, who have attained at least some secondary education. While the education data are relatively complete in terms of geographic coverage over the 1950–2010 time period, they are only available at five-year intervals. Because our other variables are measured annually, we interpolate the values between data points.<sup>13</sup>

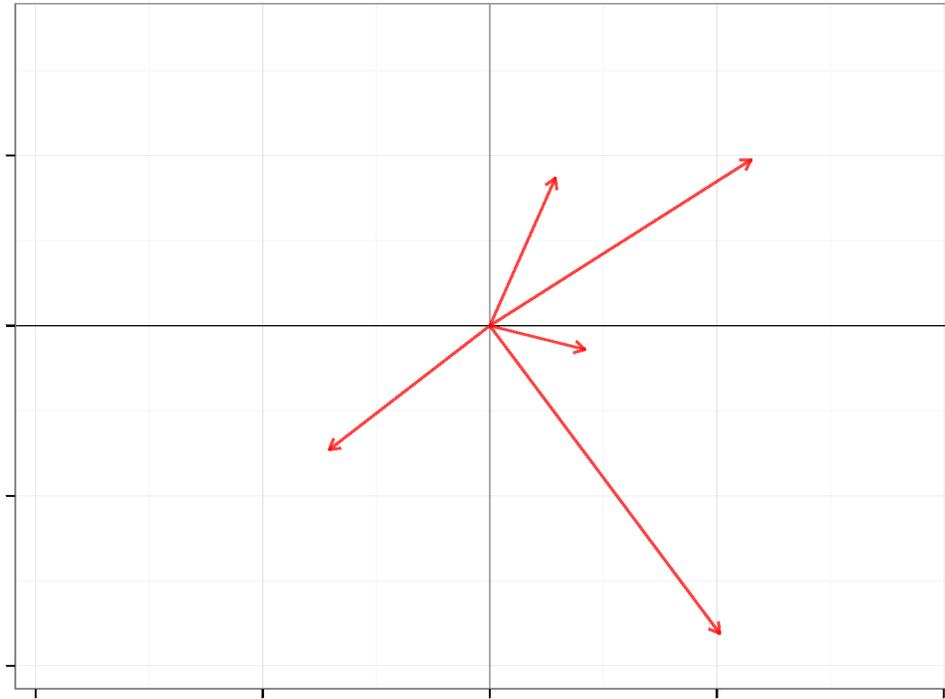


Figure 2: Biplot of principal components

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<sup>13</sup>As it is the simplest method, we employ linear interpolation. Given two coordinates,  $(x_0, y_0)$  and  $(x_1, y_1)$ , we can compute any  $(x, y)$  between them using  $y = y_0 + (y_1 - y_0) \frac{x - x_0}{x_1 - x_0}$ . Interpolation using natural cubic splines yields nearly identical results.

With these variables in hand, we construct an index of modernization using principal component analysis (PCA). Figure 2 plots countries along two dimensions, using each of the five indicators discussed above. The first two components uncovered through PCA explain 71.6% and 14.3% of the variance, respectively. Moreover, they are useful in that they seem to correspond to clear and relevant latent variables. The first dimension (along the  $x$ -axis) corresponds to the level of economic modernization. States with high scores on this dimension have stronger industrial and service sectors and higher levels of urbanization and education. The second component (along the  $y$ -axis) seems to represent the degree of materialism that develops alongside the economic structure. Agrarian societies tend to have immaterial cultures, relying on rituals and superstition; with the shift to an industry-based economy, the level of materialism increases, as individuals begin paying greater attention to their material needs; finally, “after people have attained material security, and because they have attained material security” (Inglehart 1997, 35) we observe decreasing levels of materialism, and a shift to post-materialist values. Thus, countries that score high on both dimensions are those that have modernized, but have not yet made the post-materialist value shift. These would be the most materialistic of countries. By contrast, those that are modernized, but score low on the second dimension tend to be highly-developed, post-materialist societies. Thus, both dimensions represent important aspects of a state’s development.<sup>14</sup>

Moreover, there seems to be an important relationship between these two dimensions. The points in Figure 2 describe an arc. We argue that this arc is related to the *process* of modernization. As states modernize, they initially become more materialistic. However, at a certain level, they reach Inglehart’s shift, and begin to fall along the materialism dimension while continuing to advance on the modernization dimension. Thus, pre- and post-modern states should generally be associated with lower levels of materialism, while modernizing countries will exhibit higher levels. An example of this relationship is illustrated in Figure 3, for several countries, at different stages of modernization. The figures in the top row depict plots for the Republic of Korea and

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<sup>14</sup>The remaining three components explain 8.5%, 5.7%, and < 0.1% of the variance, respectively. We omit these, as the underlying concepts that they tap are not clear in theoretical terms.

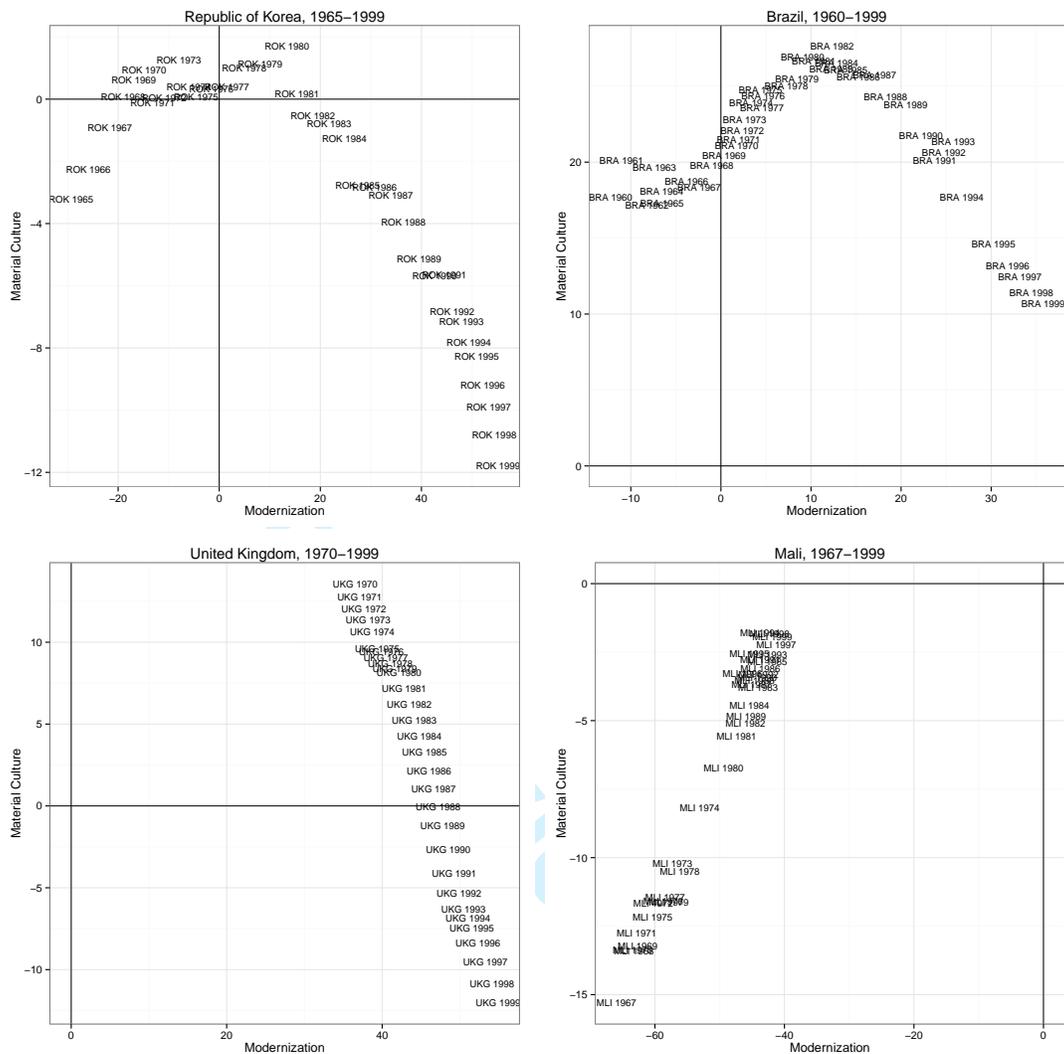


Figure 3: Principal component values for Selected Countries

Brazil, respectively. Both of these states experienced a significant portion of their modernization process within the years covered by our dataset. Korea modernized from the mid-1960s through the late-1970s, while its level of materialism also increased. With the onset of the 1980s, however, the country's level of materialism began a precipitous decline. Brazil, which employed import-substitution industrialization in the early- and mid-20th century, is typical of many Latin American countries. It eventually liberalized in the 1970s and 1980s. Similar arcs (with different peaks) can be found in Chile, Colombia, and Mexico. The Brazilian and Korean cases are emblematic of the process that we describe, as their arc can be traced through our data. The states on the bottom

row, by contrast, either had already entered the post-materialist shift (United Kingdom) prior to our data set beginning, or had yet to modernize fully (Mali) by its end. In our initial model, we account for the effects of both economic modernization and materialism, as well as their product. The latter of these should allow us to look for the concave relationship depicted in Figure 3.

As our dependent variable is dichotomous, a binomial model, such as a logit or probit, seems to be appropriate. Indeed, such models are incredibly common within the extant literature on intrastate disputes (e.g., [Fearon and Laitin 2003](#); [Fearon 2005](#); [Lujala, Gleditsch and Gilmore 2005](#); [Jakobsen, de Soysa and Jakobsen 2013](#); [Koubi and Böhmelt 2014](#)). However, our hypotheses—and many theories related to civil war—do not simply state that the likelihood of civil conflict should fall (or rise) as a particular factor rises. Rather, they posit specific mechanisms through which this change should occur. If the opportunity costs argument is correct (Hypothesis 1), then rebel groups should be less likely to attempt to initiate civil conflict as a state modernizes. If the state capacity argument is correct (Hypothesis 2), then states should be more likely to fight challengers as the economic and social structure becomes more modern. This serves to deter the rebels from initiating conflict in the first place. A simple setup for the theoretical interaction between the state and a rebel group was depicted above, in Figure 1.

However, in a conventional logit or probit model, all of these effects would be aggregated together in a single estimation. Cross-cutting, complementary, and deterrent effects would be hopelessly entangled together, making more nuanced testing impossible. What is needed instead is a statistical analysis that corresponds more directly to this game, allowing us to recover parameters corresponding to the value that rebels place on the status quo versus state acquiescence or civil war, as well as the value that the state places on acquiescing versus going to war. Such an analysis could conceivably be accomplished with a strategic model ([Signorino 1999, 2002](#)), which could test all of our hypotheses simultaneously. Signorino suggests a method in which covariates enter into the model through players' utilities. The analysis recovers parameters for each regressor, in each of the contexts in which it appears. This allows us to differentiate, for example, between the effect of modernization on the government's decision to go to war, and on the rebel group's decision

to initiate conflict. In addition, the model assumes that the decisions at the two stages of the game are linked: the expected decision of the government will influence the rebels' choice. Thus, not only does it tell us the effect of modernization on the rebel's decision to initiate, but it does so given the group's expectation about the government's likely response. Thus, strategic models are especially useful when deterrence is involved, as they capture the dynamics of the strategic interaction well (Signorino and Tarar 2006).

Unfortunately, our data are not sufficient for the use of a conventional strategic model. Although we observe whether or not conflict occurs, we are unable to determine, in the latter case, whether the two sides remain at peace because the rebels opt not to challenge the government, or because the government acquiesces to rebel demands. Thus, our dependent variable is only partially observed. For this reason, we adopt Nieman's (2015) extension of Signorino's model (the strategic probit with partial observability (SPPO)), which allows for estimation in just such a situation. The SPPO relaxes the data constraints of the Signorino model, such that the analyst must provide only the variables that make up the utility for each outcome, and a single dependent variable (in this case, whether conflict occurs). The two non-events (acquiescence and non-initiation) are combined into the zeros. The model identifies the different types of non-events by making use of the observed portion of the utility. This is similar to the methodology behind the split-population model (see Xiang 2010). Unfortunately, because the SPPO begins with less information than the traditional strategic model, its variance will be greater. However, it allows us to obtain consistent coefficient estimates in situations that can be characterized by strategic interaction, even when we lack the data to implement Signorino's estimator.

As Nieman (2015) points out, civil war is a phenomenon that corresponds especially well to the strategic model. From a theoretical standpoint, the rebel group's decision to initiate conflict is driven, at least in part, by its assessment of the likelihood that the state gives in. Empirically, he compares the strategic model to Fearon and Laitin's (2003) logit model of civil war onset, demonstrating that the SPPO is a superior estimator when applied to civil conflict, and that such statistical analyses should incorporate the strategic process. Given these desirable properties, along

with the method's ability to test directly the hypotheses articulated above, we adopt the SPPO as our estimator of choice for this analysis.<sup>15</sup>

Estimation of the strategic model requires specification of utilities for each of the actors at each outcome node. We specify the utilities in the following way. For the rebels, we expect the value of the status quo to be enhanced by five factors: the level of modernization in the country; per capita GDP and its level of growth (Bolt and van Zanden 2013); the level of democracy in the country, as measured by its Polity score (Marshall and Jaggers 2002), and the square of that score, which is associated with the degree of anocracy (see Hegre et al. 2001).<sup>16</sup> Rebel utility for the status quo will be diminished by oil production, as oil-producing states tend to be heavily dependent upon lootable resources, which should decrease the rebels' preference for the status quo relative to either fighting or acquiescence, and by materialism, which leaves potential rebels hungry for additional gains. The rebel utility for war is based on factors that enhance rebel war-fighting capabilities—including (logged) population size or the (logged) degree of mountainousness within the state—and factors that increase the pool of potential recruits—including ethnic fractionalization and the level of minority group exclusion (operationalized as the ratio of excluded to included groups), which taps the degree to which resources are distributed equally within the state (a key factor in grievance-based civil conflict) (Koubi and Böhmelt 2014).<sup>17</sup> Finally, government utility for war is affected by three factors that are expected to strengthen capacity—modernization, per capita GDP, and institutional strength (operationalized as the square of the Polity score)—and two factors that reduce it—oil production, as oil exporters tend to be weaker states (see Fearon and Laitin 2003), and logged population. A summary of the variables included in each utility function, including hypothesized effects, is available in Table 1.<sup>18</sup> In order to minimize endogeneity concerns, we lag

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<sup>15</sup>Analyses with a standard probit model revealed substantively similar results, although, given the nature of the estimator, the nuances of the effects could not be disentangled.

<sup>16</sup>An alternative operationalization, using dummy variables for democracy and autocracy, rather than Polity and its square, provides weaker but substantively similar results.

<sup>17</sup>Koubi and Böhmelt also include an interaction between exclusiveness and GDP. However, as this interaction is correlated at  $r > 0.99$  with exclusiveness (and this difference does not noticeably decrease when the variable is demeaned), we believe that they are ultimately measuring the same concept. Moreover, the multicollinearity is so severe that the interaction term induces convergence issues. Thus, we omit it.

<sup>18</sup>We operationalize rebel payoff for acquiescence using only a constant, and normalize government utility for acquiescence to zero. We also omit the constant from the rebel payoff for war. These steps are taken to satisfy

all time-variant measures by one year.

Category	List of Variables	Expectation
Rebel Utility for SQ	Modernization	+
	Materialism	-
	Oil	-
	Per capita GDP	+
	GDP growth	+
	Polity score	+
	Polity <sup>2</sup>	+
	(Constant)	+
Rebel Utility for Acquiescence	(Constant)	+
Rebel Utility for War	Population	+
	Mountainousness	+
	Ethnic Fractionalization	+
	Exclusiveness	+
Government Utility for War	Modernization	+
	Oil	-
	Per capita GDP	+
	Squared Polity score	+
	Population	-
	(Constant)	+

Table 1: Specification of Utilities

## Analysis

Table 2 provides the results from estimation of the SPPO model.<sup>19</sup> Columns one through three are the effects of variables on the rebels' utilities (status quo, acquiescence, and war, respectively), while column four provides the effects of variables on the government's utility for war. A positive effect indicates that a variable increases the player's utility for that outcome, while a negative sign suggests that the variable decreases the player's utility. Given this configuration, variables that are positively associated with conflict onset will be those that are negatively associated with rebel

identification constraints, and do not affect the substantive results.

<sup>19</sup>Decade dummies enter into both rebel utility for the status quo and government utility for war, but are not presented here.

	Rebels		Government	
	Status Quo	Acquiescence	War	War
Modernization	0.41*			0.02**
	(0.24)			(0.01)
Materialist Culture	0.01			
	(0.01)			
GDP per capita (logged)	-10.65*			-0.61**
	(6.36)			(0.26)
Oil producer	-22.87*			-1.26***
	(13.70)			(0.47)
GDP growth	4.11**			
	(1.59)			
Polity	-0.04***			
	(0.01)			
Polity <sup>2</sup>	0.09			0.01*
	(0.06)			(0.00)
Population (logged)			-0.11	0.02
			(0.36)	(0.02)
Ethnic Fractionalization			1.08*	
			(0.60)	
Mountainousness			0.03	
			(0.12)	
Exclusiveness			0.05*	
			(0.03)	
Constant	65.98**	-66.35		5.40**
	(30.18)	(61.09)		(2.14)
<i>N</i>		2,377		
Log-likelihood		-269.60		

Standard errors in parentheses. Decade dummies not shown.

\*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ . All tests are two-tailed tests.

Table 2: Strategic probit analysis of modernization and dispute onset

utility for the status quo, positively associated with rebel utility for war, or negatively associated with government utility for war (although variables with a positive effect on government utility for war may also have a deterrent effect).

Looking at the results, we notice first that the Polity score has a negative coefficient in the rebel utility for the status quo. All else equal, rebels are less satisfied in democratic and wealthier states. This is unexpected, given that these factors would both be expected to enhance quality of life, making the status quo more attractive. With respect to former, one possibility is that rebels in

more democratic states may simply have higher expectations than those in non-democracies (see [Rose 1969](#); [Di Palma 1990](#)), leading to greater dissatisfaction with what is actually a better situation. Additionally, many democracies that experience civil conflict are actually young, unconsolidated democracies. This seems plausible, given that the coefficient on the square of the Polity score is positive; however, the estimate does not attain statistical significance at conventional levels. It is also initially surprising that high per capita GDP is related to lower satisfaction with the status quo, as this is an indicator of higher quality of life. However, it also means that there are greater gains to be reaped from conflict. In addition, we see a strong positive effect for GDP *growth*, which may be a better proxy for expected quality of life, and a strong negative effect for oil production. Thus, if there is more pie to be captured, rebels may be more likely to revolt, but if that pie is growing, they will think twice.

Turning to our variables of interest, the effect of modernization is apparent: it has both a pacifying and a deterrent effect. The benefits that come from economic modernization make rebels happier, increasing their satisfaction with the status quo. This reduces the probability that the rebels make demands of the state, ultimately decreasing the probability of conflict. At the same time, modernization strengthens the state, making it less likely to acquiesce to rebel demands. While this increases the probability of war, conditional on rebels making demands, it also has the effect of *detering* weak or unresolved rebels from attacking. As expected, modernization has cross-cutting effects, which would not be discernible if we were to use a less sophisticated model. Our findings with respect to modernization are consistent with Hypotheses 1 and 2. Materialism, meanwhile, also appears to increase rebel utility for the status quo, but the effect is small and non-significant ( $p \approx 0.415$ ), suggesting that materialism by itself does not affect incentives to rebel.

As mentioned above, the results in [Table 2](#) suggest a somewhat complex relationship between modernization and conflict onset. The government's increased utility from war may deter rebels from challenging, but if they do opt to rebel, the government is more likely to fight. Thus, it is important to examine the relationship in greater detail. Additionally, given the potential temporal relationship between modernization and materialism—depicted in [Figures 2](#) and [3](#)—

we believe that it is important to look at the effect of modernization across several different values of materialism. Therefore, we turn to a graphical analysis of the simultaneous effects of modernization and materialism on dispute onset.

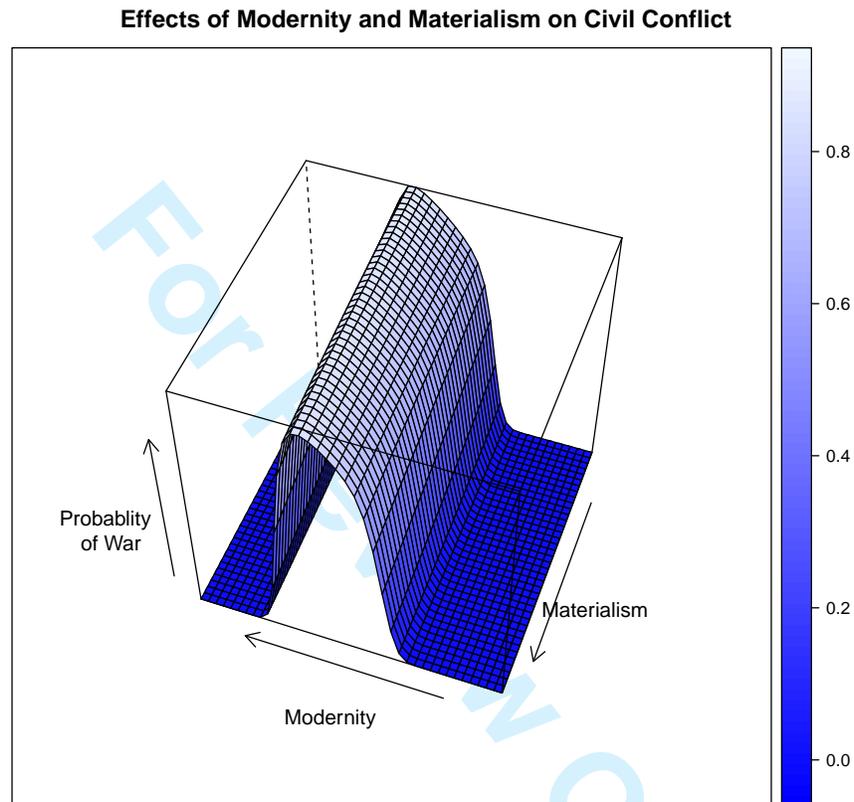


Figure 4: Modernity, materialism and the probability of civil conflict

Figure 4 depicts the predicted probability of conflict onset, as modernization and materialism vary from their respective minima to maxima.<sup>20</sup> The results suggest a non-monotonic relationship between modernization and the occurrence of a civil dispute. At very low levels of economic modernization, there is virtually no risk of civil conflict. As the state develops, the likelihood of onset rises, given the government's increased willingness to fight. This finding is consistent with Eisenstadt's (1964) "breakdowns of modernization" hypothesis. As modernization continues,

<sup>20</sup>All continuous controls are set to their mean values, dichotomous variables are set to zero, and polity and its square are set to -1 (the median value) and 1, respectively.

the effect dissipates, and the probability of fighting drops back to near-zero levels. This is a result of the shift in quality of life and rebel satisfaction with the status quo. At higher levels of modernization, potential rebels have no desire to fight, especially given the state's power. As expected from the results in Table 2, there is no obvious effect from materialism. These results are consonant with the theorized effects of the arc of modernization, and provide support for Hypothesis 3.

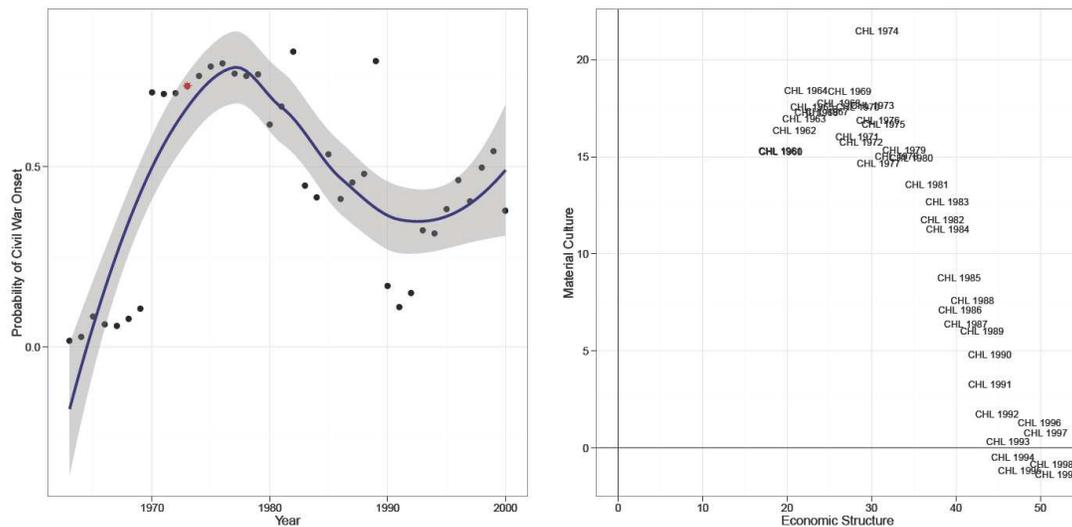


Figure 5: Estimated Probability of Conflict and Principal Component Analysis, Chile, 1960–1999

We also find it instructive to apply our results to real cases in the data. We start by looking at the case of Chile, which, like the two countries in the top half of Figure 3, traced its arc through our data. Figure 5 shows the results when applied to Chile between 1960 and 2000, as well as its levels of modernization and materialism. The points in the left panel display our estimated probabilities for civil conflict, in the actual data. We also plot the smoothed LOESS curve that best fits these data, with the associated 95% confidence interval to better illustrate the pattern of the estimates. The single civil conflict that Chile experienced during this time (Allende's 1974 coup d'état) is marked with a red starburst. The pattern of predictions for Chile roughly follows an inverted-U shape between 1960 and 1990, peaking in the mid-1970s. Notably, the coup takes place around the cluster of points during which we would expect conflict to be most likely. From

the late 1970s through the early 1990s, this probability declines, picking back up again in the mid-to-late 1990s. This occurs approximately concurrently with the sudden (and unexpected) rise in materialism in the late 1990s.

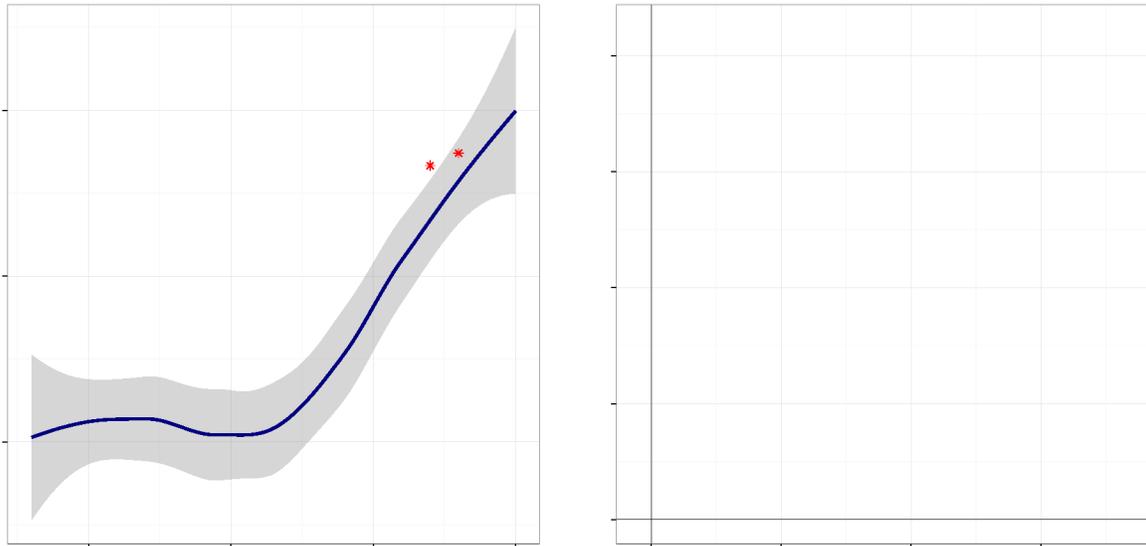


Figure 6: Estimated Probability of Conflict in Mexico, 1966–2000

Finally, it is useful to apply our results to Mexico, which saw multiple civil conflicts over the course of our data. The left panel of Figure 6 shows the predicted probabilities of conflict from 1966 through 2000. The two red starbursts correspond to the failed 1994 uprising by the *Ejército Zapatista de Liberación Nacional* (EZLN) and the 1996 clashes between the Mexican Army and the *Ejército Popular Revolucionario* (EPR), respectively. As before, the situation in Mexico is described by a non-monotonic relationship between modernization levels and the probability of conflict. The inverted-U-shaped curve does appear in the predicted probability for Mexico, taking place during the first decade depicted in the plot. The relationship is consistent with our expectations, though its peak remains relatively low (at a probability of just over 0.1). It is difficult to see, as its effect is swamped by what occurs in Mexico in the 1990s. From the mid-1980s onward, there is a sharp rise in the probability of conflict. It is in this era that we see the emergence of the EZLN and the EPR. This change is actually unrelated to modernization, and is due primarily to the changing political

landscape in Mexico in the late 1980s and early 1990s, as the country transitioned from semi-autocratic one-party rule to a more robust democratic system. Indeed, Mexico in the early-to-mid 1990s was relatively anocratic, with a Polity score of zero from 1989–1994. Its score rose to three in 1995 and then to six in 1998, but remained short of the standard threshold for democracy (a score of seven) until the turn of the century. Although modernization alone does not explain the recent conflicts in Mexico, it is encouraging to see that our model is fairly effective at predicting when conflict is likely to occur within the country.

Overall, our results provide robust support for our theory. The findings presented in Table 2 demonstrates the effect of modernization on the incentives of governments and rebel groups alike, and shed light on the theoretical mechanisms that underpin our results. We find that modernization increases both rebel utility for the status quo and state capacity. Finally, the non-monotonic relationship between modernity and civil conflict depicted across various figures—for both real and hypothetical configurations of variables—is consistent with the patterns that we note in Hypothesis 3 and Figure 2, as modernization—like democratization—tends to be accompanied by an initial, rocky period, before bringing about its benefits.

## Conclusion

This paper proposed an update to the decades-old theoretical framework of modernization, applying it to civil conflict, and accounting for decisions by both governments and rebel groups. Our argument posited that a shift away from a primitive, primarily-agricultural state to a more modern way of life could increase rebel satisfaction, while simultaneously enhancing state capacity. Importantly, we made no claims about the *source* of the economic shift. We expect no difference between liberal states that experience bottom-up modernization and autocracies like China, where these changes are wholly state-driven. Thus, our theory fits a wide range of cases. The theory highlights a novel aspect of the relationship between economics, society, and civil disorder, which—beginning from significantly different set of assumptions—explains the findings of the

neo-Marxists with respect to revolutions, and at the same time, is complementary to the literature on the resource curse (e.g., [Ross 2012](#)). Moreover, since modernization is virtually irreversible, it has the potential to be more effective or longer lasting than more mutable factors, such as regime type or simple economic growth

To examine our hypotheses, we employed a strategic probit with partial observation, which allowed us to tease out the direct effects of various factors on the two relevant actors. The analysis demonstrated that, although the health of the economy (in terms of per capita GDP growth) plays an important role in preventing intrastate disputes, modernization is also vital. In particular, agrarian states tend to be most prone to revolutionary conflict. Industrialization (and the subsequent growth of a service economy) makes war an unattractive option for rebels, even when accounting for economic growth. This is likely because the shifting economic structure provides greater opportunity to citizens, and increases the likelihood of sustained growth over time. For governments, modernization increases the attractiveness of war, as it raises the state's likelihood of victory.

Despite the fact that agriculture—an important component of pre-modernism—accounts for an extremely small portion of global GDP today (3.1% in 2011), a number of countries maintain pre-modern, agricultural economies. Indeed, among the states that the UN classifies as the least-developed countries, agriculture makes up, on average, around 30% of GDP. As of 2012, agriculture accounted for more than 40% of GDP in five of these states. Perhaps unsurprisingly, it is this group of states that has accounted for the majority of civil conflicts since 1995. Our theory suggests that the strife in these countries may be due as much to economic and social structure as it is to performance. A move away from an agriculture economy and the associated societal infrastructure may be helpful in these countries.

Our results have demonstrated both the importance and the usefulness of modernization. The development of a strong industrial or service sector, a commitment to education, and the process of urbanization have the potential to enhance living standards for would-be rebels and to strengthen the state. However, we suspect that the relationship may be more complex. We suggest

that an interesting path for future research would be to focus on the dynamics of modernization, and its relationship to globalization more broadly. Our initial findings point to the possibility that temporal factors may be at play with respect to the process of modernization. As the process of economic modernization progresses, we see an initial increase, followed by a gradual but marked decline in the incidence of intrastate disputes. This may reveal a cultural change brought about by the shift to a post-modern, highly-advanced, and (usually) more-democratic stage of development. However, we are unable to test whether there is a broader relationship between stability and the time since a state modernized directly. While we examine the degree to which a state has modernized, it is equally important to know how long ago the state reached modernity. This is especially true if, as [Schumpeter \(1955\)](#) posits, modernization brings with it a shift in attitudes about violence. Although a more in-depth analysis is beyond the scope of this paper, we would speculate that a relationship exists between time since modernization and the likelihood of peace. We believe this to be a fruitful avenue for subsequent research.

Another possibility, not considered here, is the existence of a “virtuous circle” between modernization and political liberalism. The opportunity costs that rise from economic advancement may make repression less necessary for the state, further increasing quality of life, and decreasing the incentive to rebel. We surmise that modernization may have effects not only in the immediate future, but indirect effects in later years as well. The state would benefit from such a situation, as it is able to extract more resources over time, and to focus its energies on growth, rather than the deterrence of rebellion; the population benefits both materially, from rising living standards, and immaterially, from the enhanced freedoms that it enjoys. Civil conflict becomes neither necessary nor desirable for either group, allowing both sides to gain as they travel through the arc of modernization.

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