Violent Adolescence: State Development and the Propensity for Militarized Interstate Conflict*

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Word Count: 10,002 including header suggestion, word count, blurbs, etc.

* Equal authorship implied. We thank Han Dorussen and the anonymous referees for their valuable comments on the earlier versions of this paper. The authors can be reached at crboehmer@utep.edu and dsobek@binghamton.edu. Data employed in this article can be obtained at http://utminers.utep.edu/crboehmer/. The statistical analysis is conducted using Stata7.
Abstract

This paper examines how economic development influences interstate conflict. Rather than theorizing a linear relationship between economic development and state behavior in militarized conflicts, this paper hypothesizes a non-linear relationship where both extreme poverty and prosperity reduce this risk. This occurs because states at an intermediate level of development have both the opportunity and willingness to pursue territorial claims, which makes them most prone to militarized interstate conflicts. The changing orientation of economies from agricultural and extractive activities eventually to service based economies alters the cost-benefit calculations concerning territorial acquisition. Developed states, more reliant on services for their economic growth are less likely to push territorial claims, decreasing their involvement in interstate conflict. Meanwhile, the poorest states, although they have more to gain through territorial expansion, have a decreased ability to pursue their objectives through military force. We examine all states between 1870 and 1992 at the monadic level of analysis. In general, the statistical analysis confirms the hypotheses. States of an intermediate level of development are most prone to initiate and participate in militarized conflicts, including those over the issue of territory and those that result in battlefield deaths. High levels of economic development also mitigate the effects of military power and population growth that increase the risk of interstate violence. This project helps explain why past studies have linked development to both war and peace, as well as to suggest possible flashpoints in the future. Finally, the results also suggest that other models in the literature theorizing linear functions for economic development and conflict are misspecified.
Introduction

How does a state’s level of economic development affect its conflict propensity? This question is particularly interesting since a number of views offer contrasting explanations about how it could either increase or decrease international conflict. Since economic development entails an increase in productive and consumptive capacity, it is reasonable to link development to the growth of militarism and expansionist foreign policies (Tilly, 1975, 1985; Choucri & North, 1975). On the other hand, much attention has been paid in recent years as to how economic interdependence and joint democracy appear to pacify states (Russett & Oneal, 2001). Research has found that these pacific states also appear to be primarily economically developed (Mousseau, 2000). States with such attributes tend to resemble Rosecrance’s (1986) “trading” states, which avoid war because they no longer rely on land-based growth strategies centered on territorial expansion. Like trading states, the most developed states do not depend on agricultural or extractive industries for their economic prosperity, or even heavy industry, which in the past often led to foreign conquest and imperialism. In fact, no two developed states have fought each other in a war since World War II (Mueller, 1989).¹

So how then could it be that economic development has been found to lead to such massive misery and destruction over the past two hundred years but is now identified as an important source of peace?

The answer is that both sets of arguments contain a kernel of truth. Such a state of affairs is possible because the relationship between economic development and conflict is non-linear. We argue that as states begin to develop, their propensity to engage in interstate conflict increases, but only to a point. Continued development beyond this apex reduces a state’s bellicose behavior. This implies that states at an intermediate level of development should be the most belligerent. Such “adolescent” countries have begun to enjoy some of the fruits of industrialization but remain heavily

¹ Peace may be, as Hegre (2000a) and Mousseau (2000) contend, contingent upon both states in a dyad being developed. In addition, this contention does not necessarily apply to disputes short of war.
reliant upon land-based resources such as agricultural commodities and extractive industries. This theory provides an explanation of the paradoxical effect of development, where the economic development of European states in the 19th century led to wars and conflict, but its continued growth after World War II has created a relatively peaceful environment.

Presuming that the most developed states remain unlikely to fight a war with each other, and that the increasing development of states such as China and Russia could further reduce the risk of interstate conflict, the industrial development of many poor states may spell the increase of war in regions less associated with violent interstate conflicts. If this presumption is wrong, particularly if there is still some possibility of great power conflicts as Mearsheimer (2001) suggests, then the world remains a dangerous place. Even if economic development has begun to render the major powers pacific, other perils still lurk. Though Rosecrance’s “trading” states have progressed through the stage of economic development most reliant on land-based growth, the legacy of imperialism and catastrophic global conflagrations suggest that extensive periods of war marked the rise of the now peaceful “trading” states. It is hence possible that many less developed states could pose a danger to the international system as they develop. So before accepting the idea that the world will become more peaceful with the expansion of growth and prosperity, one should step back and further explore the effects of economic development on interstate peace.

We contend that different levels of development affect state behavior, and this variation could be understood by taking into account the opportunity and willingness of states to fight (Most & Starr, 1989). We argue that many poor states lack the military wherewithal to risk an extended military clash and thus the opportunity to escalate to war, whereas highly developed states, though capable, are less willing to engage in foreign policies that could upset economic relations and their prosperity. The moderately developed, or mid-ranged, states have the right mix of opportunity and willingness to stimulate, or support, more belligerent behavior.

This research question is particularly important for three reasons. First, our theory provides not only an understanding of how certain levels of economic development influenced states to set
forth on expansionist foreign policies and why others abandoned such endeavors, but also potentially facilitates the prediction of which types of states may pose a danger in the future. Second, our theory helps explain why for many years the literature on development, imperialism, and conflict linked development to state-making and war-making, but recently revisionist studies have argued that development has a pacifying effect. Third, as noted earlier, studies have begun to examine how differential economic development affects the likelihood of conflict in dyads of states. Research designs by Mousseau (2000) and Hegre (2000a) assume a linear functional form for development on the state level, but the findings we present here indicate that their variable constructions are misspecified.

**Scholarship on Development and Interstate Conflict**

Many of the studies discussed below linking economic development and interstate conflict are by no means new. In fact, the modern nation-state arose from the war-torn European system (Poggi, 1978; Bates, 2001). Earlier studies linked growth of military power, the pursuit of natural resources, and interstate conflict to technological advances and industrialization. Improved productivity in manufacturing increased state military capabilities and power. Yet, only later did authors begin to claim that increasing levels of wealth reduce interstate conflict (Rosecrance, 1986). Recently, however, some contend that the costs of contemporary wars, in terms of both human and natural resources, have led developed states to reject militarized conflict as an acceptable means to settle disputes, at least amongst themselves (Mueller, 1989). They no longer view war as ‘politics by other means’, as once stated by Carl Von Clausewitz (1832).

**Development, State-Building, and War**

Gianfranco Poggi (1978), William McNeill (1982), Charles Tilly (1975, 1985), and Bates (2001) claim that modern nation-states developed out of the rising need for higher levels of defensive and extractive capabilities coinciding with the bureaucratization of governments and armed forces. Advances in technology (especially gun powder) required further improvements in strategy and tactics and the constitution of modern militaries. No longer could a lord and his subjects retreat to a
castle with a small band of knights and poorly armed peasants. Modern warfare increasingly required well equipped professional armies. Whereas a few thousand political entities lacking substantial economic and military power composed Medieval and Renaissance Europe, advances in military technology and organization spurred on consolidation towards economies of scale. Larger, more powerful, states absorbed smaller political entities that could not survive on their own. A symbiotic relationship arose where modern military warfare required the transformation of state structure, based on centralized and increasingly professional bureaucracies, to extract greater tax revenues to fund the development of infrastructure (Weber, 1946; Bates, 2001). This was accompanied by the rise of mercantilism and then later capitalism. Feudalism gave way to political absolutism and mercantilism, and later mass participation and capitalism (or communism). Nation-states became the dominant entities of world politics and their chief purpose was protection, although these transformations also led to offensive and aggressive behavior first in Europe and then later throughout the world. Tilly (1985) analogizes states in this period to mafias: their purpose was to defend their citizens in a hostile world but not without extracting the necessary resources to buttress their own power. Of course history shows that frequent wars broke out among the “mafias” over territory and regional influence. Survival required the maintenance of territorial integrity and the pursuit of additional natural resources. Development and state making thus became identified with military might and war making.

This story best explains the historical rise of such states as France, Germany, and possibly Great Britain. States have often sought to expand territorial holdings in a quest for development. This premise is clear in the writings of Hobson (1917, 1938), although this behavior was an unnecessary perversion of capitalism from his point of view. Lenin (1916), with a similar supposition, theorized that capitalism will sow the seeds of its own destruction by precipitating a major war between the leading industrial countries (each state pursuing command over a diminishing supply of new territorial holdings and markets for its native capitalists) that will expedite their downfall, eventually paving the way for proletarian revolution. Choucri and North (1975) explain
that states with growing economies and populations seek expansion in order to maintain their
growth. Such states may exert what they term “lateral pressure” in the pursuit of new territory and
markets, where such behavior can lead to international disputes and war as national interests collide.

Nevertheless, many of the earliest quantitative studies could not present evidence of a
general relationship between economic development and interstate conflict (Richardson, 1960; East
& Gregg, 1967; and Rummel, 1967, 1968), nor could a relationship be identified between population
growth, population density, and war (Singer, 1972; Bremer, Singer & Luterbacher, 1973). Tir &
Diehl (1998), however, found that population growth is associated with higher levels of interstate
conflict, where this is particularly the case for less developed states. This apparently occurs because
higher levels of technological development mitigate the pressures of population growth. Tir and
Miriam Laboratories (1998) also find positive relationships between interstate conflict and the
interactions of economic growth with both level of development and military expenditures.

**Development, Interdependence, and the Obsolescence of War**

Almost a century has passed since the writings of Hobson and Lenin, and capitalism has spread
globally in the interim. While Lenin could ultimately be correct, few scholars expect that a global
proletarian revolution will come to pass. Instead, three themes are found in the literature explaining
how development reduces the likelihood of interstate conflict. First, war has become too costly and
destructive as a means to settle conflicts. Second, militarized conflicts threaten prosperity and
economic growth either directly or indirectly through its impact on the global economy (increased
perceived uncertainty and risk, higher commodity prices, reduced supply of goods and capital, higher
inflation). Third, war has become increasingly perceived as barbaric and uncivilized by the citizens of
developed states and thus inappropriate as a means to settle conflicts.

According to Rosecrance (1986), states exist in one of two worlds: the *military-political* or
*trading* worlds. All states seek growth and prosperity, but usually the strategy they adopt falls closer to
one of these heuristics. States that take up the former strategy often rely on territorial expansion to
uncover new resources to fuel economic growth and military power. This depiction is partly
consistent with Lateral Pressure Theory (Choucri & North, 1975). The foreign policy of these states will likely conflict with the interests of other states, increasing the risk of war. Liberman (1996) and Mearsheimer (2001) contend that conquest still pays. However, this strategy appears to have become less feasible for most states, especially major powers, with the advent of nuclear weapons, higher costs for military technology, and the mass mobilization of people.2 The costs of war have increased while potential benefits for many states have decreased. As evidence of this thesis, witness the inability of the United States and the Soviet Union to subdue the populations of Vietnam and Afghanistan respectively, two states that by most any indicator lacked significant power. Instead, the most developed states have seemingly joined the trading world. Economic growth has become contingent upon increasing levels of transnational trade and capital flows and the growth of service industries in place of heavy industry. While it may still be possible to engage in strategies of territorial expansion and conquest (Liberman, 1996), most developed states have shifted their focus to fostering the internal economic economy and prosperity of their citizens (Polayni, 1944; Ruggie, 1982, 1994; Bates, 2001). In contrast to Lenin’s thesis, states that enjoy high levels of economic development have abandoned direct imperialism and appear unlikely to become involved in wars with each other. Instead, their economies have become intertwined and their economic interdependence quite costly to sever.

2 Liberman (1996) notes in his preface that his analysis does not figure in many of these costs of war and points out that some wars of conquest are lost due to balancing behavior. He instead focuses on whether the industrial resources of states are “cumulative,” meaning they are transferable or efficiently operated by conquerors. Moreover, Liberman selects his cases primarily from World War I and World War II when the countries in question were arguably still in the political-military world (Rosecrance, 1986), and nor do these cases contradict Mueller’s claim about developed states no longer fighting since WWII. Considering that it would presumably take a developed country to conquer a developed country, the type of conquest Liberman discusses may remain possible but rather unlikely when other costs are calculated.
While Rosecrance mentions that the mass mobilization of people in many societies may act as a deterrent to foreign military occupation, it could also serve as a constraint on bellicose foreign policies. Mueller (1989) primarily carries this theme forward. He agrees that economic interdependence has become an important constraint on interstate conflict, at least among developed states; however, he theorizes that the primary reason why war has become less common is due to a shift in norms and belief-systems. War has historically been accepted as a fact of human existence and a valid means to settle conflicts between political entities. But in the same manner that slavery and dueling eventually became viewed as immoral and/or irrational, and thus obsolescent, Mueller (1989) and Ray (1989) expect that the same thing is happening in regard to war. Not that war will disappear in the very near future, but more frequently wars originate from conflicts involving less developed states.

It is no surprise then that the role of development has recently become an important potential explanatory factor in democratic peace research. Mousseau (2000) argues that a monadic factor powers the Democratic Peace: peace is more likely in dyads that share political cultures based on liberal economic tenets and institutional mechanisms for conflict resolution. Indeed, he finds that the democratic peace is strongest in developed dyads. Additionally, Hegre (2000a, 2000b) shows that development singularly, and when interacted with trade interdependence, reduces interstate conflict. In other words, the conflict reducing effects associated with trade interdependence are strongest in dyads composed of developed states (Hegre, 2000a). In the end, understanding why developed states avoid military conflict requires a closer examination of the monadic effects of development, especially since these latter dyadic studies make this monadic assumption.

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3 Hegre also found that increasing trade with many poor states may lead to more disputes that result in fatalities. He extends this research (Hegre, 2000b) at the state level and finds that the interaction of development and democracy reduces the risk of fatal disputes, although industrialization is the key economic source of peace and not necessarily trade relations.
A Nonlinear Theory of Development and Conflict Propensity

States enter into conflict with the expectation of gains. While the costs and risks associated with international conflict decrease the expected gains, states generally have a positive expected utility when they initiate a war (Bueno de Mesquita, 1981; Bueno de Mesquita & Lalman, 1992). Simply having the capacity to win a war is not sufficient for a state to have a positive expected utility. For states to fight they need to possess both opportunity and willingness (Most & Starr, 1989). This interplay of opportunity and willingness can explain the variation in the propensity of states to initiate militarized conflicts as they develop.

Previous studies examining the relationship between development and conflict typically hypothesized a linear relationship. This process holds only if opportunity and willingness positively co-vary as states develop. In other words, linear relationships occur only if development increases (or decreases) both the opportunity and willingness of states to engage in war. We argue that development does not necessarily affect opportunity and willingness in the same way; rather, we believe that development increases a state’s opportunity to fight as it decreases its willingness.

Figure I depicts a stylized representation of how a non-linear effect derives from the proposed interaction of opportunity and willingness. Assume that a state’s conflict opportunity and willingness each vary from 0 (least) to 10 (most). States with high willingness and no opportunity and ones with high opportunity and no willingness will both have equally low conflict propensities. To use a far-fetched example to make this point clear, presume Bolivia wishes to attack Uzbekistan (high willingness), but because of the lack of military resources to bridge the distance between these two states (no opportunity), this event is nearly impossible in a bilateral war. Even in its own neighborhood, Bolivia’s continued lack of development and state/military capacity has likewise meant that it has not been able to sustain efforts to regain its coastal territory lost to Chile during the Pacific War (1879-1883). In contrast, the United States may be quite capable of attacking (high opportunity), for example, the Bahamas, but the USA’s presumed lack of motivation (low
willingness) makes this improbable. A state’s initiation of international conflict is conditioned by both opportunity and willingness.

Economic development ultimately affects both the opportunity and willingness of a state to engage in conflict. This relationship between opportunity, willingness, and development creates the non-linear conflict propensity seen in figure I. At lower levels of development the lack of opportunity limits a state’s ability to initiate militarized conflict (Bolivia versus Uzbekistan or Chile). In contrast, at the higher levels of development the lack of willingness limits a state’s conflict propensity even though it is more than capable (USA versus Bahamas). It is the middle range of development, where states have the volatile mix of opportunity and willingness to engage in bellicose behavior. This does not imply that conflict is impossible at low and high levels of development; rather, it is less likely. So the question is why, development affects opportunity and willingness in the ways delineated above?

**Opportunity**

The expansion of state resources remains one the most notable consequences of economic development. For example, growth provides for an expanded tax base that can be utilized to build and upgrade the military. Regardless of where a state uses its additional resources, development tends to boost its power, thereby increasing its ability to wage war (Boulding, 1963). Additionally, economic development improves the potency of the state by enhancing the effectiveness of domestic political institutions (Weber, 1946; Almond & Powell, 1966; Jackman, 1993; Bates, 2001). This strength gives these states a greater ability to organize and aggregate their innate power, which reinforces the consequences of economic growth. Jackman (1993) similarly argues that legitimate institutions are the source of state political capacity. Thus, without strong institutions, a state may simply not have the capacity to manage its internal affairs or fight other states (Kugler & Arbetman, 1997).
In general then, economic development increases a state’s ability to engage in international conflict by providing greater means to engage in interstate warfare for extended periods of time. While any state could occasionally participate in militarized conflicts (especially when targeted by other states), frequent or sustained conflict requires substantial economic resources (Blainey, 1988: 87-97). With more wealth and stronger political institutions, a developed state has a relatively greater capacity (opportunity) to wage war as compared to less developed states, and is hence less disinclined to shy away from initiating, or participating in, militarized conflicts. Yet, this increased opportunity does not necessarily imply a concurrent increase in a state’s willingness to participate in costly conflicts.

**Willingness**

In order to understand how development affects willingness, it is important to discern how it alters the perceived benefits of conflict. In general, developed states garner fewer direct and tangible benefits from international conflict. This is especially true when looking at militarized disputes over territory, the issue at the heart of many disputes. At the lower levels of development, where economies characteristically rely on agriculture and natural resources, international conflict, especially territorial gain, provides a tangible benefit. As economies become more industrial and then service oriented though, the gain accrued through territorial expansion decreases. The decreased utility of international expansion and conflict will generally decrease the willingness of developed states to seek conflict.

Undeveloped economies typically focus on agriculture and natural resources, which can be gained through territorial expansion, to generate economic growth (Matsuyama, 1991; Page, 1996). As they develop, however, economies become industrial and then later service oriented (Rostow, 1971). This alters the returns that economies garner from physical and human capital (Durlauf & Johnson, 1995). Once states move into a service economy, territorial acquisition gives little additional benefits. In fact, as states industrialize, economic growth is driven increasingly by investment in indigenous industry (DeLong & Summers, 1991; and Justman, 1995). Consequently, as
economies develop, territorial acquisition becomes less and less a motive for conflict, which implies a decrease in expected benefits of such behavior.

The history of the United States history provides an example of this argument. In 1853 the United States purchased almost 30,000 square miles of property from Mexico that now constitutes the southern areas of Arizona and New Mexico. Besides clarifying a few issues related to the Treaty of Guadalupe Hildalgo, ending the Mexican War during which the United States seized roughly half of Mexico, the land was also valuable for deposits of silver and copper as well as a railroad thoroughfare. Would the United States accept a similar offer to purchase the Mexican state of Chihuahua today? Chihuahua, which borders the area next to the territory of the Gadsden Purchase, includes mineral deposits and industrial infrastructure associated with the Maquiladora industries. Yet, the administration of such an area would likely cost just as much, if not more, resources as could be extracted, and would not be worth the time and investment relative to other economic endeavors in the modern US economy. The border region of Mexico is probably more valuable to the United States under the terms of NAFTA than it would be under direct occupation. It appears that the United States would not be willing to purchase much less fight over such territory, despite the fact that Mexico is one of the least militarized countries in the world and an exceedingly easy target (for the United States). The point is not that such territory would not yield some economic benefit (including the cumulative transfer of industry), but the likely perception would be that such a transaction would not be economically lucrative relative to other activities and investments within the United States or in global markets.

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4 We understand that scholars often use examples including the USA that are thought to be generalizable that are not so since the USA, as a superpower, is often anomalous in its behavior. While the USA is unique in that it is highly conflict prone but economically developed, this example should still hold validity considering we highlight the economic logic underlying conflict and not other factors associated with the USA’s role in the world as a superpower.
Does a lower utility for territorial acquisition necessarily decrease a developed state’s willingness to engage in or initiate all kinds of conflict? While the decreased willingness will certainly be most obvious in disputes over territory, the changing nature of a developed state’s economy should lead to a generally less willing state. These states simply have less to gain and more to lose in international conflict. Conflicts are costly, and states need to derive some tangible benefit to engage in such behavior. What can a service economy derive from a conflict that makes it worthwhile? Simply in terms of economic utility the answer is not much, and this should decrease a highly developed state’s willingness to initiate militarized conflict.

In sum, development has two main effects. First, it increases the capability of a state to engage in conflict, while decreasing a state’s willingness. For this reasons we do not completely disagree with Mearsheimer (2001) and Liberman (1996) that conquest may still remain profitable, but mostly for those states at an intermediate level of development that posses a particularly volatile mix of capacity and willingness.

Expectations

Given that economic development affects willingness and opportunity in different ways, the overall effect of development on militarized conflict participation and initiation will be non-linear. In particular, we hypothesize an inverted-U shape relationship between level of development and interstate conflict. Given that opportunity and willingness are both needed for a state to initiate international conflict, these opposing changes should lead to a situation where the most conflict prone states are those in the middle level of development.

**Hypothesis 1**: As its level of development increases, a state becomes more and then less likely to initiate a militarized interstate conflict (an inverted-U shaped relationship).

States at an intermediate level of development should also be more likely to push territorial claims. Since semi-developed states often rely on land-based economic accumulation, we should expect that they would most often press territorial claims against other states. This occurs not only
because additional territory provides potential economic benefits, but also because these states have
the necessary capability to engage in militarized conflict. Contrast that to developed states with
service based economies, where additional territory would have a marginal economic effect (no
willingness), even though they have a greater capacity to pursue revisionist territorial claims.
Hypothesis two formalizes our expectations regarding the effect of development on conflict
involvement over territory.

**Hypothesis 2**: As its level of economic development increases, a state becomes more and
then less likely to seek to become involved in militarized disputes over territory (an inverted-U
shaped relationship).

International conflicts can also costs lives. While all lives are valuable, the service driven
economies of the most developed states generate economic growth from increases in human, as
opposed to physical, capital (Goodfriend & McDermott, 1995). The value that highly advanced
states place on human capital will decrease their willingness to engage in conflicts that could lead to
deaths. This does not mean that all conflicts that involve death will be avoided; rather, the
willingness of a state to risk their human capital decreases as a state develops since the potential
benefits are unlikely to offset the economic and human costs. This leads to hypothesis 3.

**Hypothesis 3**: As its level of development increases, a state becomes more and then less
likely to participate in a militarized interstate conflict that results in fatalities (an inverted-U
shaped relationship).

**Research Design**

To test our propositions, we employ a national-level study where the unit of analysis is the nation-
year covering all states from 1870-1992. We argue that the development of a state alters the

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5 The system membership data were generated from Eugene 1.95 (Bennett & Stam, 2000). The availability of
GDP data limits the temporal domain to 1870.
probability that it will become involved in, but particularly initiate, international militarized conflict. This does not mean, however, that conflict decisions are based solely on level of development or any other variables in our model; rather, a state at the mid-level of development, holding everything else constant, should have a higher likelihood to start and become involved in conflict abroad.

We conduct our research at the monadic level for the following reasons. First, our theory is first and foremost monadic, as is the bulk of the research on this topic, including the theories of Choucri & North (1975), Rosecrance (1986), Mueller (1989), and Bates (2001). Second, though focusing research on conflict at the dyadic level has made definite progress, much of this research continues to posit monadic assumptions, including prominent works studying the effects of development and democracy between pairs of states on the likelihood of conflict. To find that

6 Monadic studies can capture general relationships, though they may occasionally be obfuscated by strategic interaction. Though Most & Starr (1989) provide strong justification for their avocation of the dyadic level in the study of war, their discussion of the faults of monadic research do not preclude the usefulness of all such studies but instead offer an explanation for the failings of past studies. Indeed, wars arise from the decisions of at least two actors involved in a series of strategic interactions, although certain actions such as conflict initiation only require one actor. Thus, studies focusing exclusively on the occurrence of interstate war are more prone to such errors of research design. It may take two states to fight a war, but the conflict propensity of single states could contribute to a heightened or decreased risk of conflict, which is an assumption made with the weak-link assumption. Past monadic studies on conflict have typically failed in this manner, and may explain why they have not yielded the results predicted, especially regarding the democratic peace (Gleditsch & Hegre, 1997). We of course recognize the importance of development between pairs of states and plan on exploring such relationships in future work.
development does not generally affect conflict, or that the relationship is curvilinear, would suggest that the dyadic models of Mousseau (2000) and Hegre (2000a) are misspecified.7

**Dependent Variables**

We examine three dependent variables in order to discern the relationship between economic development and interstate conflict. All three dependent variables are constructed from the Militarized Interstate Dispute (MID 2.10) data set produced by the Correlates of War project. A MID occurs when a state threatens, displays, or uses military force against another state (Gochman & Maoz, 1984; Jones, Bremer, & Singer, 1996). These data exclusively examine disputes that have become militarized by at least one participant.

All three dependent variables are dichotomous and measure the onset of a MID. The first dependent variable used in this analysis examines the initiation of a MID. *Initiation* is coded a one if a state initiated a new MID (original participant on side A of the dispute) in a given year, and zero otherwise. Next, *Revise Territory* equals one when a state becomes involved in a MID over territory, and zero otherwise. The last dependent variable examines those disputes that have become fatal, where *Fatal MID* equals one when a state is an original participant of a dispute where fatalities occur in a given year, and zero otherwise.

**Independent Variables**

We explore the potential nonlinear effect of economic development on interstate conflict using two variables. First, *Development* equals a state’s energy consumption per capita, and these data originate from the National Capabilities data set produced by the Correlates of War Project (Singer, Bremer, &

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7 To some, inconsistent findings between levels of analysis need not be of much concern, since they are not necessarily commensurate by theory or empirics. Yet, along similar lines of Russett & Oneal (2001:50) on their point regarding this very issue in the democratic peace literature, we would seem to require a more developed and logical explanation for this disconnect. If dyadic studies did not posit monadic assumptions, this problem would not be of issue.
Stuckey, 1972; Singer, 1987). Since we also want to test for a nonlinear relationship, we create $Development^2$ by squaring Development. Both measures are logged ($Development^2$ is squared after it is logged) to take into account the declining marginal effects of wealth. The squared term indicates whether the relationship is non-monotonic. If the coefficient on $Development^2$ is zero then the relationship is linear; a non-zero coefficient indicates a non-linear relationship. Conceptually, a positive coefficient on $development^2$ signifies a U-shaped relationship and a negative coefficient indicates an inverted-U.

We include several additional control variables that may have an important impact on the conflict behavior of states. These variables should capture the effect of demographic pressures that could precipitate state involvement in interstate conflicts. First, Population Growth averages the rate of population growth of a state over the previous ten years, where these data come from the National Capabilities data set. Population Density equals total population divided by total land area and is from Banks (1999).

Some have argued that regime type also plays a role in the conflict behavior of states even at the level of the monad (Bremer, 1992; Benoit, 1996; Russett & Oneal, 2001). Of course many democratic states are also highly developed. To capture these potentially confounding effects we include Democracy based on the Polity III data (Jaggers & Gurr, 1995). Democracy equals a state’s democracy score minus its autocracy score.

Of course, not all states have a similar ability to engage in interstate conflict. The strongest states are afforded the most opportunity. For this reason, we include Capability to measure a state’s power, which equals a state’s share of global power in a given year. These data are based on the Composite Indicator of National Capability (CINC) data produced by Correlates of War project (Singer, Bremer, & Stuckey, 1972; Singer, 1987). Finally, previous literature indicates that states reliant on trade for national growth and revenue should be less apt to risk disruption of economic
ties.\(^8\) *Openness* equals exports plus imports divided by GDP for each state in each year. The trade data come from Barbieri (1998) and the GDP data from Maddison (1995, 2001) and the Penn World Tables (Heston & Summers, 1996).\(^9\)

The dichotomous dependent variables require that we employ maximum likelihood estimation. We test our hypotheses using a logit estimator with robust standard errors and also include four control variables for temporal dependence based on Beck, Katz, & Tucker (1998). *Peace Years*, which equals the number of years since the last conflict event, is included along with three spline variables testing for non-montonic temporal effects. This technique allows us to control for temporal dependence in the data while permitting the use of robust standard errors, which allows us to relax the assumption that our panels are independent. We also employ Generalized Estimation Equations (GEE) that also control for temporal and spatial dependence, which is particularly useful for pooled time-series research designs. Some believe that this model better accounts for temporal dependence (Russett & Oneal, 2001).

**Results**

In general, the results correspond to our expectations. We confirm the non-linear relationship in the form of an inverted-U between development and our dependent variables. Our results also provide

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\(^8\) Note that Trade Openness is an appropriate proxy for a commercial-trading state since the purpose is to measure the basic economic orientation of states instead of dyadic interdependencies. Russett & Oneal (2001:137) also argue that trade openness 'provides a valuable test of the causal influence of economic interdependence on the likelihood of conflict because it is difficult for a state to manipulate the economic importance of its trade with all countries simultaneously [as opposed to bilateral trade].'

\(^9\) Note that the GDP data were converted from GDP per capita in the case of the Penn World Tables data. Maddison (1995, 2001) is used as the primary source of data and the PWT data used to fill in the rest through an update merge in Stata6. Though both sources are denoted in power purchasing parity (PPP), different but compatible methodologies were used to calculate their figures. See Maddison (1995) for further discussion.
modest support for the demographic dimension of lateral pressure theory. Below we discuss the results from our models.

**Historical Trends**

Before testing our theory, we examine the distribution of territorial MIDs across levels of development and time in order to demonstrate two contentions. First, territory remains an issue that states fight over across time. Second, less developed states have more territorial MID, in general, but the effects may still be non-linear. In particular, the data reinforces our theoretical contention that territorial acquisition provides fewer benefits for developed states in that the least developed states are involved in more disputes over territory, ignoring for now differences between the lowest and intermediate levels. Of the years in which states were in the bottom quarter of the development measure, roughly 6.8% of them contained a dispute over a territorial claim. This drops to 2.14% of the country-years in which states were in the highest development quartile. In essence, the least developed states were generating territorial conflicts at three times the rate of the most developed states.

The phenomenon does not seem confined to one particular era. Before World War II, 4.5% of the country-years had territorial disputes as compared to 4.6% after World War II. Many of the territorial conflicts after World War II cluster on the decolonization period. In particular, between 1945 and 1965, 7.2% of the country-years had a conflict over land, which drops to 3.6% after 1965. This slight decrease in the number of territorial claims, however, can be attributed to states having developed over time. Dividing the data set into three eras (pre World War II, 1945-1965, and 1965 to today), one sees the least developed states (lowest quartile) consistently having more territorial disputes than the most developed states (highest quartile). Before World War II, 7.5% of the least developed country-years had territorial disputes as opposed to 2.53% for the most developed. During decolonization the effect becomes even greater. In particular, 11.2% of the least developed country-years contained a dispute over territory, where only 0.7% of the most developed have one.
The difference moderates a little in the most recent period where the rates are 3.8% and 2.5%, respectively.

The data seem to confirm the theoretical argument that as states develop they garner fewer tangible (economic) benefits from territorial acquisitions, which reduces disputes over territory. This effect does not seem confined to any particular era, although the rates are slightly lower in the modern era. This does not mean that states no longer attempt to gain territory for economic benefit. One only needs to look at Iraq’s invasion of Kuwait in 1991 (oil), the dispute between China, the Philippines, and Vietnam over the Spratley Islands (oil), and the continuing conflict in the Democratic Republic of Congo (diamonds, among other resources) to see states competing for territory and its concomitant economic boon.

Economic development has not occurred uniformly across the world. The theory detailed above indicates that the most developed regions of the world should have the fewest disputes over territory. Before World War II, Europe had roughly 19% of its country-years in the highest quartile of development. During this period, 3% of them experienced a dispute over territory. Contrast this with the post-World War II Europe where 76% of the country-years are in the most developed quartile and only 1.5% contain a dispute over land. The situation reverses when one looks at Africa in the post-World War II periods, where only 4% of the country-years are highly developed, and 2.6% have territorial conflicts.

In general, the least developed states become involved in disputes over territory at a rate greater than the most developed countries. This effect is not isolated to one particular area, although certain regions of the world appear more or less prone to territorial conflicts depending upon its level of development. This analysis only supports the willingness part of the theory. The next section examines the three main hypotheses.

**Conflict Initiation Models**

We are interested in whether states of an intermediate level of development are more prone to initiate militarized disputes than other states. In general, both the logit and GEE models show a
non-linear relationship between development and MID Initiation. Models 1 and 2 confirm a non-linear relationship between economic development and MID initiation, as demonstrated in Table I.\textsuperscript{10} The development-squared variable is negative and statistically significant in support of hypothesis 1. According to the regression estimates, the most conflict prone level of development in regard to MID initiations is 0.27 energy per capita (-1.3 logged energy per capita), which is empirically equivalent to Austria-Hungary at the beginning of World War I, Spain in the 1950's, and Belgium around 1850. Figure II shows the effect of development on the probability of MID initiation. As a state moves from the least developed point to the inflection point, the probability of MID initiation increases by about 1700\% (from 0.0014 to 0.0275).\textsuperscript{11} As a state develops from the inflection point to the maximum value, the probability of MID initiation decreases by 65\% (from 0.0275 to 0.0088).

Aside from development, other variables in models 1 and 2 significantly affect MID initiation. In particular, long-term population growth and high military capabilities increase the likelihood that states will initiate a MID. A standard deviation increase in population growth increases the probability of MID initiation by 10\%, while the same increase in capabilities increases

\textsuperscript{10} The signs of the coefficients should be interpreted with care. Note that the development variables were logged so that the variable development has a large number of data points to the left of the origin. This means that a negative sign on the coefficient (indicating an inflexion point to the left of the origin) is not a non-sensible value.

\textsuperscript{11} The figure presents the predicted probability of MID initiation, varying development from its minimum to maximum values, holding all other variables of the model at their respective means.
the probability by 37%. The significance of the population growth variable again provides some support for the demographic component of Lateral Pressure Theory, but this is not the case in regard to population density. Democracy, at least in the spline models, also significantly affects the initiation of MIDs, where a standard deviation increase in democracy decreases the probability of MID initiation by 13%. In the spline model, both economic openness and population density have no significant effect, although population density becomes negative and significant in the GEE model.

**Territorial Dispute Models**

Hypothesis 2 argues that states undergo a period in which territorial acquisition grants them an economic benefit, which coincides with an increased capacity to engage in conflict. If this were the case then we would expect an inverted-U shaped relationship between development and disputes over territorial claims. Model 3, of Table II corroborates this intuition. Using a logit estimator, the results confirm our expectations showing that economic development first increases than decreases militarized disputes over territorial claims. In model 3, both development variables exhibit negative and significant coefficients implying an inverted-U shaped relationship with the inflexion point left of the origin.

[Table II about here]

In addition to the statistically significant effects, the substantive impact of development is quite clear. Figure III maps the changes in the predicted probability that a state will seek to militarily

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12 The baseline probability is the probability of the dependent variable equaling one when all variables are set at their means (using the spline models). The new probability is the probability of the dependent variable equaling one when the key variable is increased by a standard deviation.

13 Note that we ran additional models of initiated MIDs over territory and our expectations still hold. These results are available upon request.
alter the territorial status quo as it develops. Note that the probability of the occurrence of a MID over territory moves from a very low probability of 0.0004 to about 0.03 at the inflexion point (an increase of about 5600%). Moving from the inflection point to the highest level of development decreases the probability by about 80% (0.029 to 0.0056). This result indicates that states with development levels of 0.22 energy per capita (such as Russia on the eve of World War One, the United States during Manifest Destiny, and India in the 1960’s) are most likely to become involved in a MID over territorial claims.

[Figure III about here]

Democracy, Population Growth, and Economic Openness likewise have significant effects on a state’s decision to become involved in a dispute over territory. A standard deviation increase in democracy and economic openness decrease the probability of a state’s involvement in a MID over territory by 13% and 70% respectively, while the same change in population growth increases the probability by 9%. Population Density and Capabilities have no substantial effect even though Capabilities is positive and significant when using the GEE. Both models also provide partial support for the demographic component of Lateral Pressure Theory that states with growing populations are more likely to have revisionist territorial claims, although Population Density is not statistically significant.14

**Occurrence of Fatalities Models**

The models measuring the onset of militarized conflicts resulting in fatalities closely parallel the MID initiation results, as reported in Table III. We again find an inverted-U shaped relationship between Fatal MIDs and Development, where states with energy per capita of 0.04 (such as Austria-Hungary in the middle of the 19th century and Italy around 1875) are most likely to become involved in

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14 It is possible that the population density variable lacks the ability to inform us if of the relative abundance of resources worth fighting over. For example, Mali has much land but little resources or population. Ideally we would measure usable land relative to demographics.
disputes that contain casualties. As seen in model 5, trade openness has a pacifying effect on the onset of Fatal MIDs.

[Table III about here]

Figure IV shows the effect of development on state involvement in MIDs that result in fatalities. As seen before, moving from the least developed state to the inflection point has a large impact on the probability that a state will be involved in a fatal MID (from 0.0003 to 0.0036, a 623% increase). Further development from the inflection point decreases the probability by 93% (from 0.0036 to 0.0002). While the effect of development appears less pronounced, it still has a tremendous impact on a state’s choice to become involved in a militarized dispute with fatalities.

Model 5 also shows that Population Growth, Economic Openness, and Capabilities have a significant impact. A standard deviation increase in Population Growth and Capabilities will increase the probability of fatal MID involvement by 13% and 39% respectively. This same increase in Economic Openness, however, decreases the probability by 53%.

[Figure IV about here]

In general, the results provide support for hypothesis 3 and show that states experience an adolescence of some sort, where they become more likely to both initiate MIDs and become involved in disputes that result in fatalities. At the risk of carrying the analogy too far and invoking an ecological fallacy, these states are akin to teens that have matured physically to some degree but require further development and socialization. No state is immune from interstate conflict, though these intermediate level states are apparently most at risk. Additionally, we find some modest evidence that population growth, but not population density, increases the risk of militarized conflict, similar to the findings presented by Tir & Diehl (1998).

Conclusions

For the majority of the past two centuries, the behavior of the most developed countries was highly bellicose, particularly over the issue of territory, but by the second half of the 20th century these states became relatively peaceful. What then is the effect of development? The previous literature
attempted to answer this question through the examination of linear relationships, which resulted in mixed results. The theoretical and empirical disconnect in the literature appears linked to a common factor: economic development affects the behavior of states in a non-linear (inverted-U) manner. The literature's examination of linear relationships masks this effect.

Understanding this relationship is critical and calls into question the stylized view of development as a panacea for world peace. Economic development in the poorer regions of the world will not necessarily render them immediately peaceful. In fact, it may have the opposite effect. In the long run development should decrease conflict, but will likely come at a short term cost as growing states strive to control additional resources. Policy makers and scholars cannot unfortunately prescribe development without understanding the unintended consequence of increased violence.

Our analysis provides answers to a set of important questions. First, what countries are currently experiencing this violent adolescence and prone to militarized behavior? Second, what relatively undeveloped states of today will soon grow into this violent adolescence in the future? Last, are certain regions of the world more apt to experience militarized behavior today and in the future?

Our analysis points to a number of states at the middle level of development most at risk for militarized conflict. In particular, China, India, Iran, Pakistan, and Nigeria have reached the levels at which states have the requisite opportunity and willingness to initiate international conflict. Iraq had also obtained this level but has since been forced to take a step backwards. Nigeria particularly reflects our theoretical arguments as it has become more proactive in its claim on the oil rich region of the Bakassi peninsula in West Africa, twice coming close to the brink of war with Cameroon in 1996 and 1998.\(^{15}\) Our study unfortunately indicates that this type of conflict will remain common.

\(^{15}\) The Bakassi peninsula is about 400 square miles of swampland supposedly rich in oil and fish that extends into the Gulf of Guinea. The World Court has been invited to act as arbiter.
While the results point to conflict for many less developed countries, it also offers a glimmer of hope. Further economic development in the long run could reduce conflict over territory, and thus the motive of many disputes and wars. When this occurs, the propensity to initiate international conflict should decrease, although development will not necessarily lead uniformly to peace. But until such a turn of events, international conflict will be an unfortunate byproduct. A number of countries may still approach their ‘violent adolescence’ in the not too far distant future. Assuming continued economic development, states such as Liberia, Sudan, and the Democratic Republic of Congo may become more bellicose. While these states may not have the current capacity to be extremely active participants in international conflict, their further development would provide such a capability.

These expectations highlight an important consequence of this project and answer the third question: since economic development does not occur uniformly across the world, peace will not arise evenly across different regions. The rise of the great powers of the past two hundred years was marked by war. Yet today Western Europe is one of the most peaceful regions of the world. In contrast, the Middle East and the southern and eastern areas of Asia remain hot spots and Africa or the Central Asia, assuming continued development, have the potential to become the locus of conflict in the future. Many African and Central Asian states may one day approach the middle level of development and will then have the right mix of opportunity and willingness to initiate militarized conflict. As our analyses unfortunately suggest, this does not bode well for peace in these regions.
References


Figure 1. A Stylized Interaction of Opportunity and Willingness
Table I. The Effect of Development on MID Initiation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 (Spline)</th>
<th>Model 2 (GEE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>-0.13 (-2.52)**</td>
<td>-0.19 (-2.60)***</td>
</tr>
<tr>
<td>Development Squared</td>
<td>-0.05 (-3.06)***</td>
<td>-0.06 (-3.02)***</td>
</tr>
<tr>
<td>Democracy</td>
<td>-0.02 (-2.49)**</td>
<td>-0.02 (-1.38)</td>
</tr>
<tr>
<td>Population Growth</td>
<td>4.20 (2.46)**</td>
<td>4.80 (2.77)***</td>
</tr>
<tr>
<td>Population Density</td>
<td>-0.00001 (-1.36)</td>
<td>-0.00004 (-1.76)*</td>
</tr>
<tr>
<td>Economic Openness</td>
<td>-135.07 (-0.37)</td>
<td>510.18 (1.30)</td>
</tr>
<tr>
<td>Capabilities</td>
<td>7.57 (7.77)***</td>
<td>10.78 (5.09)***</td>
</tr>
<tr>
<td>Peace Years</td>
<td>-0.39 (-6.83)***</td>
<td>-</td>
</tr>
<tr>
<td>Spline 1</td>
<td>-0.01 (-3.39)***</td>
<td>-</td>
</tr>
<tr>
<td>Spline 2</td>
<td>0.003 (2.74)***</td>
<td>-</td>
</tr>
<tr>
<td>Spline 3</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.82 (-6.32)***</td>
<td>-2.00 (-9.18)***</td>
</tr>
</tbody>
</table>

Log Likelihood          | -1824            | -              |
Chi2                    | 480.92            | 43.15          |
P < Chi2                 | 0.00              | 0.00           |
Number of Observations   | 5417              | 5417           |

Note: Student's t-scores are in the parentheses
*p<0.10; **p<0.05; ***p<0.10 (two-tailed tests)
Figure 2. The Effect of Development on MID Initiation

Logged Development vs. Probability of MID Initiation
## Table II. The Effect of Development on a State's Involvement in a MID over Territory

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 3 (Spline)</th>
<th>Model 4 (GEE)</th>
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<tbody>
<tr>
<td>Development</td>
<td>-0.19 (-2.15)**</td>
<td>-0.24 (-1.49)</td>
</tr>
<tr>
<td>Development Squared</td>
<td>-0.07 (-3.00)***</td>
<td>-0.07 (-1.77)*</td>
</tr>
<tr>
<td>Democracy</td>
<td>-0.02 (-1.75)*</td>
<td>-0.02 (-0.92)</td>
</tr>
<tr>
<td>Population Growth</td>
<td>3.69 (1.72)*</td>
<td>4.65 (1.65)*</td>
</tr>
<tr>
<td>Population Density</td>
<td>-0.00003 (-1.02)</td>
<td>0.00 (0.10)</td>
</tr>
<tr>
<td>Economic Openness</td>
<td>-4291.7 (-3.44)***</td>
<td>-2865.3 (2.67)***</td>
</tr>
<tr>
<td>Capabilities</td>
<td>2.64 (1.47)</td>
<td>9.28 (4.72)***</td>
</tr>
<tr>
<td>Peace Years</td>
<td>-0.31 (-7.09)***</td>
<td>-</td>
</tr>
<tr>
<td>Spline 1</td>
<td>-0.001 (-2.53)**</td>
<td>-</td>
</tr>
<tr>
<td>Spline 2</td>
<td>0.0003 (1.21)</td>
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</tr>
<tr>
<td>Spline 3</td>
<td>0.0001 (2.02)**</td>
<td>-</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.78 (-3.41)***</td>
<td>-2.89 (-7.75)***</td>
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<tr>
<td>Log Likelihood</td>
<td>-827.5</td>
<td>-</td>
</tr>
<tr>
<td>Chi2</td>
<td>344.08</td>
<td>62.70</td>
</tr>
<tr>
<td>P &lt; Chi2</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>5417</td>
<td>5417</td>
</tr>
</tbody>
</table>

Note: Student’s t-scores are in the parentheses
*p<0.10; **p<0.05; ***p<0.01 (two-tailed tests)
Figure 3. The Effects of Development on a State's Involvement in a MID over Territory
Table III. The Effect of Development on a State's Involvement in a Fatal MID

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 5 (Spline)</th>
<th>Model 6 (GEE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>-0.39 (-3.30)***</td>
<td>-0.57 (3.58)***</td>
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<td>Development Squared</td>
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<td>Democracy</td>
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</tr>
<tr>
<td>Population Density</td>
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<td>-0.00003 (-0.61)</td>
</tr>
<tr>
<td>Economic Openness</td>
<td>-2762.4 (2.40)**</td>
<td>-2894.1 (-2.50)**</td>
</tr>
<tr>
<td>Capabilities</td>
<td>7.70 (3.88)***</td>
<td>10.63 (3.40)***</td>
</tr>
<tr>
<td>Peace Years</td>
<td>-0.16 (-2.89)***</td>
<td>-</td>
</tr>
<tr>
<td>Spline 1</td>
<td>-0.001 (-1.46)</td>
<td>-</td>
</tr>
<tr>
<td>Spline 2</td>
<td>0.0003 (1.15)</td>
<td>-</td>
</tr>
<tr>
<td>Spline 3</td>
<td>0.00 (-0.40)</td>
<td>-</td>
</tr>
<tr>
<td>Constant</td>
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<td>-4.09 (-12.57)***</td>
</tr>
<tr>
<td>Log Likelihood</td>
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<td>-</td>
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<tr>
<td>Chi2</td>
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<tr>
<td>P &lt; Chi2</td>
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<td>0.00 0.00</td>
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<tr>
<td>Number of Observations</td>
<td>5417 5417</td>
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</tbody>
</table>

Note: Student's t-scores are in the parentheses
*p<0.10; **p<0.05; ***p<0.10 (two-tailed tests)
Figure 4. The Effect of Development on a State’s Involvement in a Fatal MID
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