A Test of Resolve:

Asymmetry and Brinkmanship in Nuclear Crises

Sean Ashley and C. Peter Kim

Abstract: We examine the effect of nuclear arsenal asymmetry on crisis outcomes and duration within nuclear dispute dyads. We identify and improve upon certain shortcomings in existing scholarship, to provide more rigorous confirmation of the positive relationship between nuclear asymmetry and favorable crisis outcomes in nuclear crisis dyads. We confirm said relationship but find inconclusive support for a mechanism of resolve, suggesting that the mechanism of nuclear crisis bargaining may be less parsimonious than previously suggested. We extend the crisis bargaining logic to nuclear crisis duration, finding that asymmetry in nuclear arsenal size and second strike capacity within nuclear states dispute dyads decreases the length of crises. This is consistent with the view that nuclear weapons confer bargaining advantages on states, and further suggest that crisis bargaining behavior is closely calibrated to the potential costs of nuclear escalation, with decision makers apparently able to recognize fine-grained differences in the costs of nuclear escalation within nuclear dyads.

Introduction

What effects do nuclear weapons have on crisis duration and outcomes? The transformative effects of nuclear weapons possession on crisis and security outcomes have been issues of continual salience to policymakers since the Cold War (Betts 1987) and have acquired renewed importance in light of aspiring regional powers with nuclear arsenals such as Iran and North Korea (Kroenig 2012). However, while considerable support exists as to the benefits of proliferation (Mearsheimer 1984; Sagan 1993; Waltz 1981), there remains substantial debate as to the extent of, and mechanism by which, nuclear weapons benefit their

possessors. Indeed, skepticism exists as to whether nuclear weapons can function as credible threats due to the high costs to the user of nuclear use (Muller 1998; Tannenwald 1999, 2005). Scholarship regarding the advantages of nuclear weapons is heterogeneous and inconclusive. Further, the bulk of scholarship is dominated by qualitative analyses and informed by Cold War era debates about the utility of nuclear weapons vis--vis direct and extended deterrence between second-strike capable superpowers, and thus offers but a parochial examination of nuclear crisis bargaining (Jervis 1984; Powell 1990; Schelling 1960).

We address the question of whether nuclear weapons confer bargaining advantages upon their possessors within crises more generally. We first review the existing scholarship regarding the benefits of nuclear weapons in crisis bargaining. We then make methodological adjustments to analyze a directed-dyad nuclear crisis data set provided by Kroenig (2013). We correct two shortcomings in this work to more thoroughly investigate whether and how nuclear weapons confer benefits in crisis bargaining: (i) the use of a dichotomous, rather than ordinal, scale to code crisis outcomes, which obfuscates variation in crisis outcomes and (ii) the use of a capabilities index that inflates the capabilities of populous, urbanized countries. Having done so, we find that while the results hold, a number of control variables become significant, suggesting that a parsimonious causal logic cannot be drawn so easily between nuclear asymmetry and crisis outcomes. Accordingly, we use similar crisis bargaining logic to investigate whether nuclear asymmetry is a predictor of nuclear crisis duration, finding that asymmetry in both nuclear arsenal size and second strike capacity are significant predictors of reduced crisis duration. This suggests that nuclear weapons in fact do raise the expected costs of crisis escalation, and further, that policymakers are sensitive to not merely nuclear weapons possession versus non-possession (Beardsley and Asal 2009) but also the state of the nuclear balance. We conclude with a brief discussion of possible alternative mechanisms affecting crisis outcomes and the implications of our findings for policymakers.

Theory and Hypotheses

As mentioned, the state of the field regarding the effects of nuclear weapons on coercive diplomacy is highly heterogeneous. Many scholars seem to agree that nuclear weapons have a dampening effect on conflict as the potential costs of nuclear use are so high as to deter both nuclear aggressors (Schelling, 1960, 1966; Powell, 1987) and aggression at all levels (Rauchaus 2009). With the substitutions of crises for wars (Hoffmann 1965, 236), international crisis outcomes in the nuclear age have been commonly conceptualized as the result of exercises in risk taking. In this view of this nuclear brinkmanship literature, while states do not outright threaten nuclear attacks, states raise the risk of nuclear escalation to reveal information about the resolve of opponents. The lesser-resolved opponent will be unwilling to suffer the risks of a nuclear crisis potentially escalating to nuclear war. Nonetheless, while this is a commonly accepted view in scholarship (Gaddis 1986; Jervis 1989; Powell 1987, 1988, 1990; Waltz 1990, 2003), there is also a notable body of skepticism. Mueller (1998) argues that nuclear use is so remote as to be irrelevant as a credible threat, and Geller (1990) argues that nuclear weapons are ineffective deterrents against nonnuclear aggressors. Among nuclear brinkmanship theorists, there is substantial disagreement as to the efficacy of nuclear weapons as instruments of deterrent (Schelling 1960) and compellent threats (Sechser and Fuhrmann 2013), or even if nuclear weapons provide benefits regardless of issuing threats (Kissinger 1956).

As noted by Beardsley and Asal (2009) this heterogeneity in the field is, in large part, due to the countervailing effects of nuclear weapons on the expected costs and probability of nuclear escalation. The massive destructive potential of nuclear war makes the costs of nuclear escalation, prima facie obvious. Further, as noted by Kroenig (2013), nuclear superiority reduces the expected costs that a country would incur in the event of nuclear war. This revision in costs and benefits for nuclear states versus their opponents constitutes

a powerful bargaining advantage. However, one cannot automatically expect that nuclear weapons will affect the risk calculations of policymakers (Beardsley and Asal, 2009) due to the strong normative prohibitions and possible material costs of using nuclear weapons (Paul 2009, Tannenwald 2005). Accordingly, nuclear use may be both high costly and highly improbable, and so scholars are ambivalent about the effect of nuclear weapons on crisis bargaining and risk calculations (Zagare and Kilgour 2000).

We attempt to verify that the cost of nuclear escalation affects risk calculations by looking at nuclear crisis dyad outcomes. While Beardsley and Asal (2009) look at nuclear versus non-nuclear states, we attempt to discover less obvious findings by looking at nuclear dyads. While there is a clear differential between the costs of crisis escalation for nuclear versus non-nuclear powers, some scholars claim a distinction may not be so clear for nuclear versus nuclear powers. According to several brinkmanship theorists, crisis bargaining power is "unaffected by most changes in the arsenals on both sides" (Bundy 1984). This is the logic that underwrites such concepts as minimal deterrence: that a certain threshold exists beyond which costs of a possible nuclear attack become prohibitive to the opponent, and therefore increases in arsenal size are redundant (Mearsheimer 2001; Waltz and Sagan 2002). Bernard Brodie (1959, 275) argues that a nation with even a single nuclear weapon "to give the Soviet government pause". We however, believe that decision makers are capable of recognizing that "not all nuclear wars would be equally devastating" (Kroenig 2013). As noted by Kroenig (2013) a nuclear exchange producing 10 million deaths versus one producing 80 million deaths are "tragic but distinguishable" outcomes. Accordingly,we differentiate our paper from Beardsley and Asal (2009) in demonstrating that changes in nuclear arsenal size, rather than merely the fact of nuclear acquisition affects crisis outcomes and duration. Following Kroenig (2013), we integrate the logic of nuclear brinkmanship with the effects of nuclear superiority and offer our first hypothesis.

Hypothesis 1: States with larger nuclear arsenals are more likely to prevail in nuclear crises.

Following this, one would expect a crisis involving a large nuclear imbalance to be resolved more expediently. As a crisis continues, the risk of nuclear escalation rises, and so one would expect that the less resolved state will be less willing to prolong a crisis.

Hypothesis 2: Conflicts with high nuclear asymmetry are likely to be resolved more quickly than those between symmetrical nuclear powers.

Extending this line of thinking, we would expect an imbalanced second strike capacity to also decrease crisis duration.

Hypothesis 3: Conflicts wherein only one nuclear power possesses second-strike capability are likely to be resolved more quickly than those between nuclear powers with both or neither possessing second strike capability.

Data

For our data, we utilized Kroenig's original study which draws on the International Crisis Behavior Project's (ICB) data on international crises. It contains 52 nuclear crises directed dyads from 1945 to 2001 where nuclear powers were involved in 20 unique nuclear crises. Each nuclear crisis has a duplicate set of observations that reverses the direction of the dyadic relationship. So for instance, the Cuban Missile Crisis involved two actors: the U.S. and the Soviet Union. This crisis had two observations: one in which the U.S. was state A and the Soviet Union state B and a second with the Soviet Union as state A and the U.S. as state B. And so in our data set, we have 20 unique nuclear crises that produce 52 total

observations of directed dyads.

As defined by the ICB, a crisis is an interstate dispute that threatens at least one state's values, has a heightened probability of military escalation, and has a finite time frame for resolution (Brecher and Wilkenfeld 2000). Furthermore, a nuclear crisis is defined as a crisis in which all states involved possess nuclear weapons. This is not to say, however, that the crisis had to involve the use or the threatened use of nuclear weapons. Instead, in including and defining nuclear crises as explained above, we assume that when nuclear states engage in a crisis with one another, they do not need to be explicitly threatened or attacked with nuclear weapons in order for the adversarial state's nuclear arsenal to calculate into a focal state's decision making process.

Outcome of Nuclear Crises

In Kroenig's study, victory was coded as a dichotomous variable where a 1 indicated a complete victory and a 0 indicated a loss. A loss, however, also included directed dyad observations where the outcome was a compromise or stalemate. In his results, many controls that would intuitively be important in predicting the outcome of nuclear crises are as insignificant. For instance, one could argue, and reasonably so, that conventional capabilities and second strike abilities would configure into the resolve of nations involved in nuclear crises, yet they neither achieves significance in his models.

To better test these controls, in our measurements, we disaggregate outcomes by creating an ordinal variable for victory (victory_ordinal). This new measure separates outcomes into loss, stalemate, compromise, and victory which are indicated as 1, 2, 3, and 4 respectively. According to this measure, the utility of an outcome for a focal state increases with higher values of victory_ordinal. For instance, a state prefers victory to compromise, compromise to stalemate, and stalemate to loss. Using this ordinal variable, our measures

and model specifications help us to distinguish the finer effects that nuclear superiority has on the outcomes of nuclear crises.

In Table 1, we first compare Kroenig's results with our own when we simply replace the original dichotomous victory variable with a more finely measured ordinal variable. We ran an ordered probit regression of victory_ordinal on the original controls Kroenig had in his models. We find that in our model, several of the controls are now much more statistically significant. For instance, average number of crises (cris_ave) goes from no significance to significant at the 1% level and 5% level respectively. Additionally, regime type (polity21) goes from no significance to 10% level significance while violence (viol) and second strike capability (strikea) go from 5% and 10% level significance respectively to 1% level significance.

Recognizing the importance and predictive power of control variables after we re-measure victory, we then alter the model specifications to improve the controls in our models and ultimately better understand the influence of these variables on nuclear crises outcomes. First, we replace the capability ratio (capshare) with military expenditure ratio (milex_rat) because capshare inflates the capabilities of populous, urbanized countries. We think it reasonable to separate population from military expenditure when discussing capabilities vis-a-vis nuclear crisis bargaining as a large population may both enhance a state's military powers but present a vulnerable target to nuclear attack. Then, we add an election year variable (electionyear), a dichotomous variable where 1 indicates a democratic nation with an election one year out and 0 if the focal state is either a non-democracy or a democracy without an election one year out. This variable was added since democratic nations might send more credible signals when there is an upcoming election in accordance with audience cost logic (Fearon 1994; Tomz 2007). We then run ordered probit regressions of the ordinal victory variable on each of our independent variables of interest nuclear ratio and superiority with our revised controls. These models are shown in Table 2.

We find that after respecifying our models with improved measures of our control

Table 1

	Dependent variable:	
	Victory	Victory (Ordinal)
	(Model 1)	(Model 2)
Nuclear Ratio	4.252^{***}	2.431^{***}
	(1.306)	(0.723)
Proximity	2.323^{***}	1.530^{***}
	(0.551)	(0.284)
Gravity	-0.951	-0.319
	(0.875)	(0.371)
Regime	0.036	0.029^{*}
	(0.033)	(0.017)
Capability Share	-1.602	-0.763
	(1.713)	(0.896)
Second Strike Capability	2.328^{*}	2.003^{***}
	(1.315)	(0.373)
Population	0.00000	0.00000
	(0.00000)	(0.00000)
Violence	0.332^{**}	0.362^{***}
	(0.119)	(0.055)
Average Crises	-7.611	-7.624^{**}
	(6.719)	(3.192)
Constant	-3.883^{***}	
	(1.030)	
1|2		1.055
		(0.810)
2|3		2.199
		(0.879)
3|4		2.766
		(0.954)
Observations	52	52
Log Likelihood	-22.571	-56.165
R^2	0.327	0.189
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 2

	Dependent variable:	
	Victory (Ordinal)	
	(Model 1)	(Model 2)
Nuclear Ratio	2.230***	
	(0.347)	
Superiority		1.523***
		(0.231)
Proximity	1.500***	1.302***
	(0.305)	(0.315)
Gravity	−0.278	−0.224
	(0.344)	(0.343)
Regime	0.024	0.015
	(0.015)	(0.017)
Military Expenditure Ratio	−0.011***	−0.008***
	(0.003)	(0.003)
Second Strike Capability	1.999***	2.114***
	(0.359)	(0.341)
Population (in 1,000's)	−0.000	−0.001
	(0.001)	(0.001)
Violence	0.369***	0.361***
	(0.054)	(0.057)
Average Crises	−7.601**	−7.503**
	(3.060)	(3.253)
Election Year	0.232	0.592
	(0.360)	(0.437)
1|2	1.228	0.867
	(0.698)	(0.643)
2|3	2.380	1.979
	(0.768)	(0.708)
3|4	2.949	2.562
	(0.826)	(0.773)
Observations	52	52
Log Likelihood	-55.564	-55.288
R^2	0.198	0.202
Note:	*p<0.1; **p<0.05; ***p<0.01	

variables and victory dependent variable, many more of the controls are now highly statistically significant and to a greater extent. For example, in both models, proximity, military expenditures ratio, second strike capability, and violence are all significant at the 1% level and average crises at the 5% level. These results indicate that Kroenig's results were not fully capturing the importance of these controls, thus inflating the influence of nuclear ratio and superiority relative to other predictors. While nuclear superiority as expressed in superiority or nuclear ratio is still an important predictor of the outcome of nuclear crises as both Kroenig's and our results suggest, our models recognize the importance of other variables such as conventional military capability and second strike capacity. This helps provide a more holistic understanding of how nuclear crises will unfold for states rather than overemphasizing a particular factor by underemphasizing others.

Duration of Nuclear Crises

Many scholars have argued that crises are balances of resolve (Powell 1990; Schelling 1960). States would prefer to avoid war since it is costly, and so when states are involved in a crisis in which the last resort entails a destructive conflict, they are testing each others' resolves more so than intentionally precipitating a war. An explanation for why a particular state wins in a crisis, then, is that a particular state has more resolve than the other. In other words, the more resolved state was more willing to risk escalating a crisis further than the less resolved state, and so the less resolved state withdrew from the crisis earlier than the strongly resolved state.

A large determinant of resolve is, as Kroenig and we point out, nuclear superiority. It reduces anticipated costs to oneself in the event of a nuclear war (Glaser 1990) and raises a state's expected probability of victory, therefore increasing a state's anticipated payoff vis-a-vis a compromise. We would then expect that nuclear superiority should also influence the

duration of nuclear crises. Specifically, if the nuclear balance is heavily skewed in favor of one state over the other, then we should expect a large difference in resolve between two states. And the larger the difference in resolve, the larger the difference in states' willingness to risk escalating a crisis to a war, ultimately resulting in a shorter crisis duration. We expect that the durations of two nuclear crises with varying levels of nuclear asymmetry should differ largely due to the influence nuclear superiority has on resolve. If a state in one crisis has significant nuclear inferiority compared to its adversary, that state should be likely to pull out earlier than a state in another crisis whose nuclear arsenal is only slightly inferior to its respective adversary.

To test for this, we fitted nuclear crises durations using the Weibull duration model, and we constructed variables that measure differing levels of nuclear arsenal balance between two states in nuclear crises. Our first measure is the level of asymmetry in the nuclear arsenals between involved states. Asymmetry is a binary variable indicating whether the nuclear arsenals between the two states was balanced or imbalanced. Since a nuclear ratio of 0 or 1 would mean complete imbalance in the nuclear arsenals of two states, asymmetry was coded as 0 if the nuclear ratio was between .35 and .65 (indicating fairly balanced nuclear arsenals) and coded as 1 if the nuclear ratio was less than .35 or greater than .65 (indicating fairly imbalanced nuclear arsenals).

We also tested nuclear crises durations with second strike capability. Second strike capability is measured as an ordinal variable that was coded as 0 if neither state had a second strike capability, 1 if both states had a second strike capability, and 2 if only one state had a second strike capability. A higher value of the second strike variable indicates a greater imbalance of capability and therefore resolve. So for example, if neither state has second strike capability, then states do not anticipate a nuclear retaliation. Therefore, the strength of one's nuclear arsenal (or perhaps the absence of it) is irrelevant in a crisis and does not contribute to any sort of nuclear, and consequently resolve, imbalance. If both states

have second strike capability, the nuclear ratio between the states becomes relevant and, consequently, potentially exacerbates an imbalance of resolve. And only one state having second strike capability is a clear indication of nuclear imbalance since only one state fears the nuclear retaliation of another in a crisis.

We simulated nuclear crises durations using varying levels of our independent variables of interest - nuclear asymmetry and second strike capability imbalance - while holding control variables at their medians. Details on the model specifications and estimates are provided in the appendix.

Figure 1

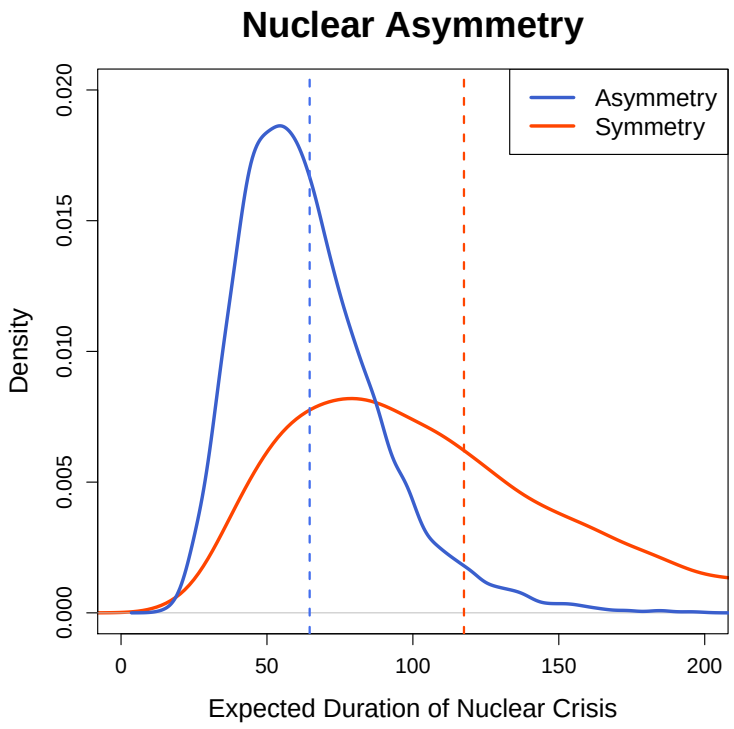
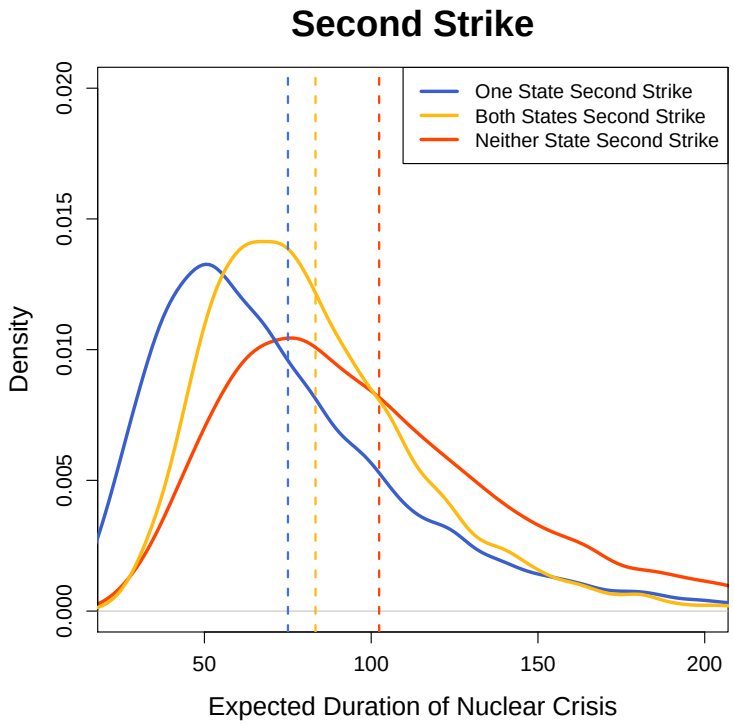


Figure 1 portrays the distributions of expected nuclear crises durations when there is high nuclear asymmetry between the two states and when there is fairly balanced nuclear arsenals. We observe that an imbalance in nuclear arsenals between states in a dyadic nuclear crisis strongly reduces the expected duration of nuclear crises as expected. For instance, we

find that the average expected duration of nuclear crises between states with high asymmetry in nuclear weaponry is approximately 53 days shorter than that of crises between states with fairly symmetrical strength of nuclear weaponry.

Figure 2



We find a similar relationship between nuclear balance and crisis duration when we measure nuclear imbalance with second strike capability. Figure 2 shows the distributions of expected nuclear crises duration when only one state has second strike capability, when both have it, and when neither have it. As expected, we find that the expected duration of nuclear crises decreases as levels of nuclear imbalance increases. The average expected duration for crises between two states where only one has second strike capability is shorter than that for crises between two states who both have it, which in turn is shorter than that for crises between two states who both do not have it. And in comparing the extreme cases of nuclear imbalance and balance, the average duration of crises with only one state with

second strike capability is approximately 27 days shorter than those where neither state has capability.

Alternative Explanations

The significance of multiple predictor variables merits a discussion of alternative casual logic underwriting nuclear crisis outcomes. While our analysis has verified Kroenigs (2013) assertion that all nuclear crises are not created equal and that arsenal size affects cost calculations, we have made the assumption that all nuclear weapons are created equal. However, as Vipin Narang (2012) notes, variation in force posture may also affect crisis outcomes as states may use nuclear weapons to attract the attention of superpower patrons who can bail them out of crises. Extending such a line of argument would be relevant for assessing how changes in nuclear doctrine, strategy, force posture, command and control architecture, and delivery systems affect crisis outcomes as well as allow for a greater resolution of debates as to the effectiveness of varying Cold War era strategies, such as flexible response and massive retaliation. Furthermore, the effects of nuclear arsenal size must be qualified by the efficacy of nuclear defense systems. If such systems can absorb or deflect a nuclear attack, this will surely affect decision makers crisis calculations.

Conclusion and Future Research

Our study has focused on the role of nuclear superiority - as it contributes to asymmetrical capabilities - in shaping the outcome and duration of nuclear crises. We find that greater nuclear superiority increases the likelihood of a focal state to emerge victorious in a dyadic nuclear crisis. Additionally, raising the level of imbalance in nuclear arsenals and second strike capability shortens the duration of nuclear crises, shedding light on the imbalance

of resolve.

Our findings serve as a corrective to a body of nuclear brinkmanship literature that assumes a ceiling beyond which changes in nuclear arsenal size do not affect cost calculations. Contrary to Beardsley and Asal (2009, 297), we present evidence that rejects the argument that if both parties to a crisis have nuclear weapons, [crisis bargaining] advantage is effectively cancelled out. This has bearing for policymakers as it may justify a relaxation of concerns about fledgling nuclear powers such as Iran and North Korea. While nuclear weapons may indeed rearrange regional crisis bargaining positions, the relationships between these powers and great powers, or even US interests, may not be markedly be changed through mere nuclear acquisition. Conversely, reaffirming the importance of nuclear arsenal size suggests greater care should be taken to maintain the superior US nuclear arsenal considering the superior size and recent aggressive crisis behavior of Russia in both Syria and Ukraine. Nuclear weapons have largely been absent in debates of the current US-Russia relationship; our finding perhaps ought to inform US positions on nuclear reduction and bilateral disarmament agreements. The US, even if it maintains so called standards of minimal deterrence, may stand to lose if it disarms with greater rapidity than its strategic competitors.

We also complicate the findings of Kroenig (2013) vis--vis nuclear crisis outcomes. Our selection of crisis duration as a dependent variable provides further support to the proposition that nuclear weapons confer crisis bargaining advantages. However, it is fair to say that the significance of a number of control variables in our ordered probit models suggest that parsimonious explanations may be insufficient to explain nuclear crisis bargaining outcomes. Accordingly, further research ought to be done that incorporates the structure, posture and purpose of states nuclear arsenals, as well as the effectiveness of their nuclear defense systems, into the crisis bargaining dynamic. Until when, while conceiving of nuclear risk calculations as related to nuclear arsenal size is a useful heuristic, it may ignore other ways in which nuclear weapons may be used to manipulate crisis outcomes.

Appendix

Nuclear Crises Duration Models

	Coefficient	SE
Intercept	5.6187	0.9695
asymmetry2	-0.5104	0.5160
proximity	-0.1268	0.3383
stakes	1.0187	0.4053
polity21	-0.0748	0.0464
milex_rat	0.0070	0.0119
strikea	-1.0135	0.5384
viol	-0.0695	0.1402
cris_ave	2.9453	2.2293
nato	0.2980	0.4809
demvsnondem	-0.9304	0.7428
Alpha	0.0638	0.1157

	Coefficient	SE
Intercept	4.8929	0.7822
strikebalance	-0.1719	0.3199
proximity	0.0958	0.3344
stakes	0.6975	0.3917
polity21	-0.0918	0.0575
milex_rat	0.0044	0.0106
viol	0.0198	0.1440
cris_ave	0.4682	1.6346
nato	0.7149	0.5379
demvsnondem	-1.1138	0.8495
Alpha	0.0079	0.1133

Works Cited

Betts, Richard K. 1987. Nuclear blackmail and nuclear balance. Washington, DC: Brookings Institution.

Beardsley, Kyle, and Victor Asal. 2009. Winning with the Bomb. Journal of Conflict Resolution 53(2): 278301.

Brecher, Michael, and Jonathan Wilkenfeld. 2000. A Study of Crisis. Ann Arbor: University of Michigan Press.

Brodie, Bernard. 1959. Strategy in the Missile Age. Princeton, NJ: Princeton University Press.

Bundy, McGeorge. 1984. Existential Deterrence and its Consequences, in Douglas MacLean, ed., The Security Gamble: Deterrence Dilemmas in the Nuclear Age, Pp. 3- 14. New Jersey: Rowman and Allanheld.

Fearon, James D. 1994. Domestic Political Audiences and the Escalation of International Disputes American Political Science Review 88, no. 3 (Sept), pp. 577-592.

Gartkze, Erik, and Matthew Kroenig. 2009. A strategic approach to nuclear proliferation. Journal of Conflict Resolution, 53:151-160.

Glaser, Charles L. 1990. Analyzing Strategic Nuclear Policy. Princeton, N.J.: Princeton University Press.

Hoffmann, Stanley. 1965. The State of War: Essays on the Theory and Practice of International Politics. New York: Praeger.

Jervis, Robert. 1984. The Illogic of American Nuclear Strategy. Ithaca, N.Y.: Cornell University Press.

Kissinger, Henry A. 1956. Force and Diplomacy in the Nuclear Age. Foreign Affairs 34 (3):34966.

Kroenig, Matthew. 2012. Time to Attack Iran: Why a Strike Is the Least Bad Option. Foreign Affairs 91 (1): 76-86.

Kroenig, Matthew. 2013. Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes. International Organization 67(1): 141-171.

Mearsheimer, John J. 1984. Nuclear Weapons and Deterrence in Europe. International Security 9 (3): 19-46.

Mearsheimer, John J. 2001. The Tragedy of Great Power Politics. New York: W.W. Norton.

Mueller, John E. 1989. Retreat from doomsday: The obsolescence of major war. New York: Basic Books.

Mueller, John. 1988. The Essential Irrelevance of Nuclear Weapons: Stability in the Postwar World. International Security 13(2): 55-79.

Narang, Viping. 2012. "What Does It Take to Deter? Regional Power Nuclear Postures and International Conflict". Journal of Conflict Resolution 57(3):478508.

Paul, T.V. 2009. The Tradition of Non-Use of Nuclear Weapons. Palo Alto, Calif.: Stanford University Press.

Powell, Robert. 1990. Nuclear Deterrence Theory: The Search for Credibility. Cambridge, UK: Cambridge University Press.

Rauchhaus, Robert. 2009. Evaluating nuclear proliferation and the nuclear peace: A quantitative approach. Journal of Conflict Resolution, 53:258-277.

Sagan, Scott D. 1993. The Limits of Safety: Organizations, Accidents, and Nuclear Weapons. Princeton, N.J.: Princeton University Press.

Sechser, Todd, and Matthew Fuhrmann. Crisis Bargaining and Nuclear Blackmail. International Organization 67(1): 173-195.

Schelling, Thomas C. 1960. The Strategy of Conflict. Cambridge, Mass.: Harvard University Press.

Tannenwald, Nina. 1999. The United States and normative basis of nuclear nonuse. International Organization 53 (3): 433-68.

Tannenwald, Nina. 2005. Stigmatizing the bomb: Origins of the nuclear taboo. International Security 29 (4): 5-49.

Tomz, Michael. Domestic Audience Costs in International Relations: An Experimental Approach International Organization 61, no. 4 (Fall 2007): 82140.

Waltz, Kenneth N. 1981. The Spread of Nuclear Weapons: More May Be Better. Adel-

phi Papers No. 171, International Institute for Strategic Studies, London.

Waltz, Kenneth, and Scott D. Sagan. 2002. The Spread of Nuclear Weapons: A Debate Renewed. New York: W.W. Norton.

Zagare, Frank C., and D. Marc Kilgour. 2000. Perfect deterrence. Cambridge: Cambridge University Press.