Observing the Capitalist Peace: Examining Market-Mediated Signaling and Other Mechanisms[1]

Allan Dafoe[1,2] and Nina Kelsey[3]

1: Department of Political Science, Yale University

2: Department of Peace and Conflict Research, Uppsala University

3: Travers Department of Political Science, UC Berkeley

Abstract:

Countries with open capital markets tend to have fewer militarized disputes and wars. Gartzke, Li, and Boehmer propose that this association arises from the enhanced ability of states with open capital markets to credibly signal resolve through the bearing of economic costs ex ante to militarized escalation. We test this causal mechanism by qualitatively examining six crucial cases in which the mechanism is most likely to be operative and observable. We employ a formal case selection strategy designed to yield cases with high inferential leverage for our confirmatory test and to select cases for an exploratory analysis of scope conditions. Through analysis of media reports, government documents, and other sources, we evaluate the extent to which relevant individuals drew the appropriate inferences about market–mediated costs and resolve. We conclude that while market-mediated signaling may operate in major conflicts, it is unlikely to account for much of the association between capital openness and peace. Exploratory analysis of our cases identifies potential scope conditions, clarifies the role of different signaling mechanisms, and suggests other explanations for the peaceful behavior of countries with open capital markets.

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[1] More detailed discussion of the cases can be found in the Online Appendix, available at allandafoe.com Replication files are available there or at: data.allandafoe.com. For helpful input we thank Olivia Briffault, Paul Clarke, Patrick Cottrell, Christian Ford, Erik Gartzke, John Gerring, Ron Hassner, Sophia Hatz, Ben Oppenheim, Ivo Plsek, Steve Weber, Jessica Weeks, John Zysman, and especially Giacomo Chiozza.

Countries with liberal political and economic systems rarely use military force against each other. This anomalous peace has been most prominently attributed to the "democratic peace"—the apparent tendency for democratic countries to avoid militarized conflict with each other (Maoz & Russett, 1993; Ray, 1995; Dafoe et al., 2013). More recently, however, scholars have proposed that the liberal peace could be partly (Russett & Oneal, 2001) or primarily (Gartzke, 2007; but see Dafoe, 2011) attributed to liberal economic factors, such as commercial and financial interdependence. In particular, Erik Gartzke, Quan Li, and Charles Boehmer (2001), henceforth referred to as GLB, have demonstrated that measures of capital openness have a substantial and statistically significant association with peaceful dyadic relations. Gartzke (2007) confirms that this association is robust to a large variety of model specifications.

To explain this correlation, GLB propose that countries with open capital markets are more able to credibly signal their resolve through the bearing of greater economic costs prior to the outbreak of militarized conflict. This explanation is novel, plausible, and resonates with the rationalist view of asymmetric information as a cause of conflict (Fearon, 1995). Moreover, it implies clear testable predictions on evidential domains different from the ones examined by GLB.

In this paper we exploit this opportunity by constructing a *confirmatory* test of GLB's theory of market-mediated signaling. We first develop an innovative quantitative case-selection technique to identify crucial cases where the mechanism of market-mediated signaling should be most easily observed. Specifically, we employ quantitative data and the statistical models used to support the theory we are probing to create an impartial and transparent means of selecting cases in which the theory—as specified by the theory's creators—makes its most confident predictions. We implement three different case selection rules to select cases that

optimize on two criteria: (1) maximizing the inferential leverage of our cases, and (2) minimizing selection bias.

We examine these cases for a necessary implication of market-mediated signaling: that key participants drew a connection between conflictual events and adverse market movements. Such an inference is a necessary step in the process by which market-mediated costs can signal resolve. For evidence of this we examine news media, government documents, memoirs, historical works, and other sources. We additionally examined other sources, such as market data, for evidence that economic costs were caused by escalatory events. Based on this analysis, we assess the evidence for GLB's theory of market mediated costly signaling.

Our paper then considers a more complex *heterogeneous effects* version of market-mediated signaling in which unspecified scope conditions are required for the mechanism to operate. Our design has the feature of selecting cases in which scope conditions are most likely to be absent. This allows us to perform an *exploratory* analysis of these cases, looking for possible scope conditions. We also consider alternative potential mechanisms. Our cases are reviewed in more detail in the Online Appendix.[2]

To summarize our results, our confirmatory test finds that while market-mediated signaling may be operative in the most serious disputes, it was largely absent in the less serious disputes that characterize most of the sample of Militarized Interstate Disputes (MIDs). This suggests either that other mechanisms account for the correlation between capital openness and peace, or that the scope conditions for market-mediated signaling are restrictive. Of the signals that we observed, *strategic* market-mediated signals were relatively more important than *automatic* market-mediated signals in the most serious conflicts. We identify a number of potential scope conditions, such as that (1) the conflict must be driven by bargaining failure

[2] Online Appendix is available at: allandafoe.com

arising from uncertainty and (2) that the economic costs need to escalate gradually and need to be substantial, but less than the expected military costs of conflict.

Finally, there were a number of other explanations that seemed present in the cases we examined and could account for the capitalist peace: capital openness is associated with greater *anticipated economic costs* of conflict; capital openness leads *third parties* to have a greater stake in the conflict and therefore be more willing to intervene; a dyadic *acceptance of the status-quo* could promote both peace and capital openness; and countries seeking to institutionalize a regional peace might *instrumentally* harness the pacifying effects of liberal markets.

The correlation: Open capital markets and peace

The empirical puzzle at the core of this paper is the significant and robust correlation noted by GLB between high levels of capital openness in both members of a dyad and the infrequent incidence of militarized interstate disputes (MIDs) and wars between the members of this dyad (Gartzke, Li & Boehmer, 2001). The index of capital openness (*CAPOPEN*) is intended to capture the "difficulty states face in seeking to impose restrictions on capital flows (the degree of lost policy autonomy due to globalization)" (Gartzke & Li, 2003: 575). *CAPOPEN* is constructed from data drawn from the widely used IMF's Annual Reports on Exchange Arrangements and Exchange Controls; it is a combination of eight binary variables that measure different types of government restrictions on capital and currency flow (Gartzke, Li & Boehmer, 2001: 407). The measure of *CAPOPEN* starts in 1966, and is defined for many countries (increasingly more over time). Most of the countries that do not have a measure of *CAPOPEN* are communist.[3]

[3] The main non-communist countries that have missing values for CAPOPEN are Bhutan, Brunei, Luxembourg,

GLB implement this variable in a dyadic framework by creating a new variable, *CAPOPENL*, which is the smaller of the two dyadic values of *CAPOPEN*. This operationalization is sometimes referred to as the "weak-link" specification since the functional form is consonant with a model of war in which the "weakest link" in a dyad determines the probability of war. *CAPOPENL* has a negative monotonic association with the incidence of MIDs, fatal MIDs, and wars (see Figure 1).[4] The strength of the estimated empirical association between peace and *CAPOPENL*, using a modified version of the dataset and model from Gartzke (2007), is comparable to that between peace and, respectively, joint-democracy, log-distance, or the GDP of a contiguous dyad (Gartzke, 2007: 179; Gartzke, Li & Boehmer, 2001: 412). In summary, *CAPOPENL* seems to be an important and robust correlate of peace. The question of why specifically this correlation exists, however, remains to be answered.

Maldives, Switzerland, Taiwan, and Zimbabwe.

[4] See replication files for details for this and other statistical analyses performed in this paper.

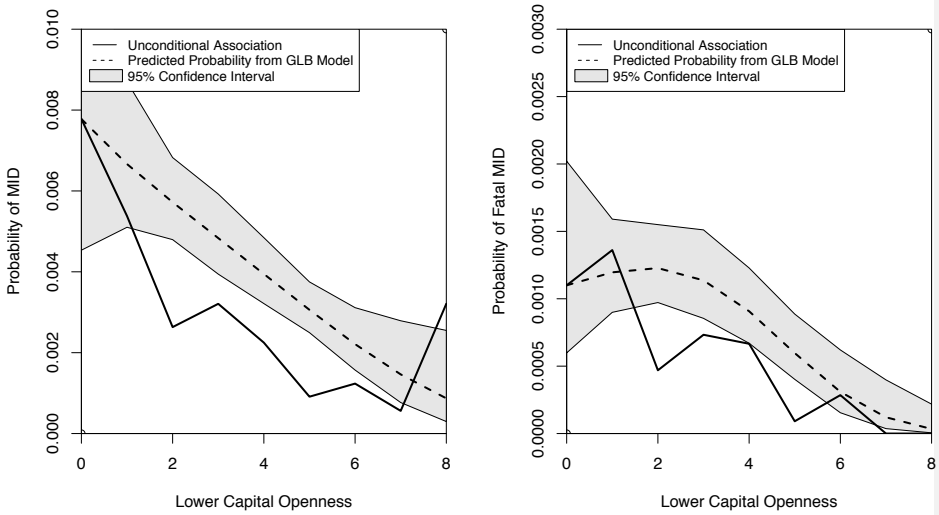

Figure 1: association between Capital Openness and peace.
The left figure illustrates the negative association between Lower Capital Openness and militarized disputes, the right between Lower Capital Openness and fatal militarized disputes. Higher values of Lower Capital Openness refers to more open economies. The solid line plots the unconditional association. The dotted line (with CI) plots the predicted probability from a statistical model. The predicted probability is set equal to the actual proportion for *CAPOPENL=0*, and then calculated based on the estimated marginal effect of *CAPOPENL* from the specification of models 5 and 9 from Gartzke (2007), but with a cubic polynomial for *CAPOPENL* to allow for flexibility in functional form. Note that the unconditional association and predicted probabilities need not agree, since the predicted probability is conditional on the values of other covariates.

The mechanism: Market-mediated signaling?

Gartzke, Li, and Boehmer (2001) argue that the classic liberal account for the pacific effect of economic interdependence – that interdependence increases the expected costs of war – is not consistent with the bargaining theory of war (see also Morrow 1999). GLB argue that "conventional descriptions of interdependence see war as less likely because states face additional opportunity costs for fighting. The problem with such an account is that it ignores

incentives to capitalize on an opponent's reticence to fight." (Gartzke et al., 2001: 400.)[5] Instead, GLB (see also Gartzke, 2003; Gartzke & Li, 2003) argue that financial interdependence could promote peace by facilitating the sending of costly signals. As the probability of militarized conflict increases, states incur a variety of *automatic* and *strategically imposed* economic costs as a consequence of escalation toward conflict. Those states that persist in a dispute despite these costs will reveal their willingness to tolerate them, and hence signal resolve. The greater the degree of economic interdependence, the more a resolved country could demonstrate its willingness to suffer costs *ex ante* to militarized conflict..

Gartzke, Li, and Boehmer's mechanism implies a commonly perceived costly signal *before* militarized conflict breaks out or escalates: if market-mediated signaling is to account for the correlation between *CAPOPENL* and the absence of MIDs, then visible market-mediated costs should occur prior to or during periods of real or potential conflict. Thus, the proposed mechanism should leave many visible footprints in the historical record. This theory predicts that these visible signals must arise in any escalating conflict, involving countries with high capital openness, in which this mechanism is operative

Clarifying the signaling mechanism

Gartzke, Li, and Boehmer's signaling mechanism is mostly conceptualized on an abstract, game theoretic level. In order to elucidate the types of observations that could inform this theory's validity, we discuss with greater specificity the possible ways in which such signaling might occur.

A conceptual classification of costly signals

The term signaling connotes an intentional communicative act by one party directed

[5] Though in most models, it tends to be the case that increasing anticipated costs does reduce the probability of war. See Banks (1990), Reed (2003), and Polachek&Xiang, 2010.

towards another. Because the term signaling thus suggests a willful act, and a signal of resolve is only credible if it is costly, scholars have sometimes concluded that states involved in bargaining under incomplete information could advance their interests by imposing costs on themselves and thereby signaling their resolve (e.g. Lektzian &Sprecher, 2007).

However, the game-theoretic concept of signaling refers more generally to any situation in which an actor's behavior reveals information about her private information. In fact, states frequently adopt sanctions with low costs to themselves and high costs to their rivals because doing so is often a rational bargaining tactic on other grounds: they are trying to coerce their rival to concede the issue. Bargaining encounters of this type can be conceptualized as a type of war-of-attrition game in which each actor attempts to coerce the other through the imposition of escalating costs. Such encounters also provide the *opportunity* for signaling: when states resist the costs imposed by their rivals, they "signal" their resolve. If at some point one party perceives the conflict to have become too costly and steps back, that party "signals" a lack of resolve. Thus, this kind of signaling arises as a byproduct of another's coercive attempts. In other words, costly signals come in two forms: *self-inflicted* (information about a leader arising from a leader's intentional or incidental infliction of costs on himself) or *imposed* (information about a leader that arises from a leader's response to a rival's imposition of costs).

Additionally, costs may arise as an automatic byproduct of escalation towards military conflict *or* may be a tool of statecraft that is strategically employed during a conflict. The *automatic* mechanism stipulates that as the probability of conflict increases, various economic assets will lose value due to the risk of conflict and investor flight. However, the occurrence of these costs may also be intentional outcomes of specific escalatory decisions of the states, as in the case of deliberate sanctions; in this case they are *strategic*.

Finally, at a practical level, we identify three different potential kinds of economic costs of militarized conflict that may be mediated by open capital markets: capital costs from political risk, monetary coercion, and business sanctions. The most prominent mechanism proposed by Gartzke, Li, and Boehmer to account for the correlation between capital openness and peace is that of *capital costs*. They note that "since conflict threatens investments among disputing states, it makes such investments less desirable and capital becomes relatively scarce" (Gartzke, Li & Boehmer, 2001: 407) and hence more costly. Increased capital openness may increase the capital costs of escalation by increasing both the ease of capital flight (Abadie & Gardeazabal, 2003; 2007) and the expected harm of escalatory events to the national economy.[6] This mechanism will be more effective in countries with more open capital markets; countries where the value of investments are more publicly observable (such as arises with a public stock exchange); and countries where leaders are more sensitive to the costs of capital.[7]

Two other types of mechanisms may be potent sources of credible signals in pre-war bargaining amongst dyads with open capital markets: *monetary coercion* and the *disruption of business*. Monetary coercion is aptly exemplified by the U.S. attack on the British pound during the Suez crisis. By intentionally selling pounds and obstructing access to IMF reserves, the U.S. was able to create a sufficient threat to the value of the pound to force Britain to abandon its military intervention in Egypt.[8] States with open capital and currency markets may be more capable of or susceptible to monetary coercion. Similarly, states with open capital markets may be more vulnerable to disruption of business because they are more likely to have businesses

[6] If, for example, economies with open capital markets are more reliant on flows of goods, services, or capital that can be readily disrupted by militarized disputes.
[7] The tenure of democratic leaders seems to be particularly sensitive to economic conditions, see Lewis-Beck 2000. There is also evidence that low economic growth contributes to the removal from office of non-democratic leaders, see Alesina 1996.
[8] For a general discussion of the role of monetary forms of statecraft, see Kirshner 1995.

that are dependent on peaceful interstate relations. States may impose strategic costs on these dependent businesses (as occurred extensively prior to the US invasion of Panama) or the businesses may suffer automatically from the escalation dynamic. In such cases, capital openness may proxy for a broader set of processes related to the globalization and increasing sensitivity to disruption of the domestic economy, as capital openness tends to correlate with vulnerability to these other forms of costs.

The observable implications of market-mediated signaling

A market-mediated costly signaling mechanism involves the following concrete steps: first, at least two states *enter or show the potential to enter a dispute*. Second, *the dispute generates some costs* to at least one member of the dispute. As discussed above, these costs may be born by businesses, or expressed in capital and currency markets; they may be strategic or automatic; they may be self-inflicted or imposed. The leadership must be sensitive to these costs: either directly, or indirectly because they are borne by individuals or organizations capable of influencing the state's behavior. The *costly process should be observable* to informed external actors, such as through a publicly visible event like market movements or through a shared understanding of the economic consequences of an escalatory act. Third, states facing these new costs choose either to continue to *persist in their claim or to soften their demands* (or concede altogether). Finally, observing the response of their rival, the states then *update their beliefs* about the resolve of their rival and may then *modify their bargaining position*. In expectation, this process reduces uncertainty.

There are thus several observable implications. We focus on a set of implications that is most easily observed and crucial to the theory: do informed observers perceive a link between economic costs and the escalation of the dispute? Specifically, (1) signaling through automatic

capital or monetary costs implies devaluation of assets due to local risk and pressure on the exchange rate during and after escalatory events. (2) (Strategic) monetary coercion generally implies publicly observable pressure on a currency. (3) (Automatic) business sanctions involve the imposition of large costs on some economic agents, and thus should be noticed by informed contemporary observers. In addition, strategic business sanctions involve an overt sanction.

To test the different variants of market-mediated signaling mechanisms we qualitatively examine cases with high levels of capital openness and where an escalating dispute did or was likely to have taken place. We examine the historical record, news reports, memoirs, and government documents for evidence that observers perceived states suffering substantial economic costs prior to the outbreak of militarized conflict; and we examine financial data (Global Financial Data) for evidence of significant shifts in equity or currency value. Using these same sources, we also specifically look for evidence that informed observers drew the appropriate inferences about resolve. To the extent that we are unable to find such evidence for market-mediated signaling, we can conclude that market-mediated signaling is not operative as a mechanism or only applies under restrictive scope conditions.

A complementary strategy for testing GLB's theory would be to use *event studies methods* (see MacKinlay, 1997) to estimate whether escalatory actions are associated with significant and sizeable movements in asset prices. This strategy has the strength that it would be more objective, would not be dependent on the availability of news sources and other historical documents, and would provide an estimate of effect sizes. However, it also has several disadvantages: it requires that the analyst can accurately specify the relevant assets (businesses sensitive to political risk), it requires that escalatory events be unanticipated by the markets, and it requires an event series that can be analyzed, such as a daily stock market or free-floating

exchange rate record. Most importantly, it is not in fact necessary or sufficient for GLB's mechanism. That is, signaling occurs if and only if relevant observers *believe* that markets moved in response to political risk; it is neither necessary nor sufficient that the markets actually respond.

Case selection and methodology

Case selection is often carried out in an ad-hoc, subjective, and opaque manner, using implicit weighting over various criteria, case-specific expertise, or other idiosyncratic elements. While it may be the best method available for particular studies, such a case selection procedure renders it difficult for a reader to estimate the severity of different forms of bias, and replication or extension of the study may lead to the selection of radically different types of cases.

We use a new case selection technique that overcomes many of these problems. Specifically, we suggest that when a theory is well characterized by a particular statistical model, scholars can use the relevant dataset and statistical model as an objective means of selecting cases to test the theory.[9] Employing the dataset and model used by the proponents of the theory in question reduces the risk of an unintended bias towards selecting cases that don't fit the theory. Furthermore, the explicitness of the selection rule allows scholars to objectively assess, correct for bias in, replicate, and expand the selection.

Our primary case selection criterion is to maximize the inferential leverage of our design. We maximize the inferential leverage of our cases by identifying *disconfirmatory* (*most likely) crucial cases*: cases for which, if the theory is true, there is a high probability of observing the necessary implications of the theory (see Gerring 2007 for a brief discussion of this case selection strategy). We develop a statistical procedure for statistical selection of disconfirmatory

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[9] For more on the statistical selection of case studies, see Seawright and Gerring (2008), and a forthcoming special issue of Sociological Research & Methods on case selection, edited by John Gerring, Colin Elman, and Jim Mahoney.

(most likely) crucial cases, as well as offer a formal justification of this method. As far as we are aware, these developments are new to our paper.

We can maximize the probability of observing the theory's necessary implications (denoted μ) by selecting cases with high capital openness (denote capital openness as *C*) *and* a serious militarized dispute (denote the severity of the dispute as *Y*). We need high capital openness (*C*) so that the mechanism is present, and we need a serious dispute (high *Y*) so that there is an escalatory process during which signaling should occur.

For the purposes of testing a *constant effects* version of GLB's theory, selecting on *C* and *Y* is not a problem. To see this, let the following model represent the *constant effects* data generating process:

$$Y = C\beta_C + X\beta + \epsilon$$

Y denotes a *n x* 1 vector representing the severity of the conflict for all *n* observations, *C* a *n x* 1 vector of the level of capital openness, *X* a n x p matrix of the p other causes of *Y*, ϵ a *n x* 1 random vector, where ϵ_i are independent and identically distributed, β a *p x 1* vector of coefficients, and $\beta_C < 0$ the coefficient on *C*. We can think of wars as observations with a high severity ($Y \geq k_{war}$) and similarly for fatal MIDs and MIDs. GLB's theory implies that μ is weakly increasing in *C* and *Y*, though it may be entirely absent for low values of either.

Selecting on high *Y* will yield observations with unusually high values of $X\beta + \epsilon$; and selecting on high $C|Y$---high *C* conditional on *Y*---will further amplify this selection effect. These are cases where other causes and random chance made a dispute especially severe. This is not a problem for testing the *constant effects* model, however, since the theorized effect of *C* is not influenced by the values of $X\beta + \epsilon$. A failure to observe market mediated signaling in our cases provides strong evidence against the constant effects model.

However, there will be problematic selection bias if we consider a *heterogeneous effects* model of market-mediated signaling. Denote *S* as those scope conditions that influence the effectiveness of market mediated signaling. *S* could have many values or be continuous, but for simplicity of exposition we let it be dichotomous. The heterogeneous effects model can be represented using a similar model, except with an interaction between *S* and *C* (*S* can be thought of as any factor that interacts with *C*; ∘ denotes element-wise multiplication):

$$Y = S \circ C\beta_C + X\beta + \epsilon$$

Now, selecting on high *Y* and high *C|Y* will yield cases with a higher probability of having *S=0* (or more generally cases with low values of *S*), as well as high values of $X\beta + \epsilon$. These are cases in which market-mediated signaling is inoperative (or less operative) due to the absence of the unspecified scope conditions (*S*).

Under the *constant effects* model, if we fail to observe market mediated signaling in cases selected for high *Y* and high *C|Y* we can interpret this as evidence against the market-mediated signaling mechanism. Under the *heterogeneous effects* model, however, our inference is more complicated. A failure to observe market-mediated signaling means either that signaling is not operative (β_C is close to 0) or that we have selected cases outside the scope conditions (*S=0*). The more prevalent are low values of *S*, the more severe will be our selection bias, and thus the more our inference will be driven by scope conditions. From the failure to observe market-mediated signaling we can thus conclude either that market-mediated signaling is not prevalent or that market-mediated signaling has important scope conditions.

Either way, a finding of no market-mediated signaling contributes to our knowledge by providing evidence against the constant effects model. If we believe that low values of *S* are rare, then selection effects will be minor, and the absence of evidence of signaling speaks

against the plausibility of market-mediated signaling. If we believe low values of *S* are prevalent, then the constant effects model is a poor model and our case selection strategy will select cases with anomalously low values of *S*; this allows us to use our cases for exploratory analysis of the scope conditions, which have otherwise not yet been specified by the literature.

In light of the selection effects arising from the heterogeneous effects model, our second case selection criterion is to minimize selection for low values of *S* (henceforth referred to as *bias*). For our case selection we thus employ multiple rules that trade-off on these two criteria: *maximizing inferential leverage* and *minimizing selection bias.* Our first rule (R1) prioritizes inferential leverage by selecting high-fatality MIDs from dyads with high levels of capital openness. We chose the two cases that best met this selection criteria, which were the war between the U.K. and Argentina in 1982 (the Falklands War or Guerra de las Malvinas) and the fatal conflict between the U.S. and Panama in 1989 (the U.S. Invasion of Panama).

Our second rule (R2) aimed for a middle-ground between leverage and potential bias. To reduce potential bias we weaken the importance of *Y* (severity of the dispute) in our selection. We selected dyad-years with the highest levels of capital openness and a non-fatal MID. We chose the two cases that best met this selection rule: Bahrain and Qatar, 1986, and Malaysia and Singapore, 1992.

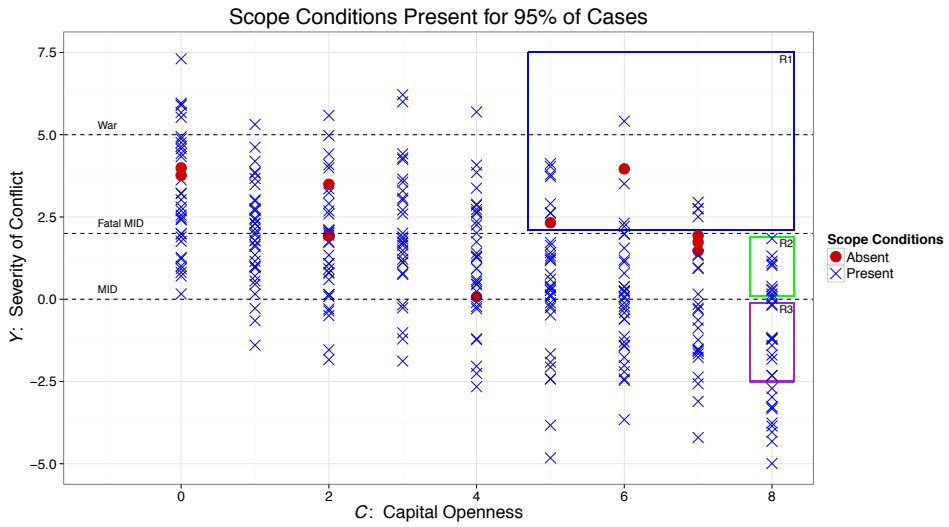
Our third rule (R3) weakens even further the weight of *Y* in our case selection strategy, aspiring for less bias at the cost of lower leverage. We select cases in which the militarization of a dispute was probable and capital openness was high. We selected those dyad-years in which the probability of a MID, fatal MID, or war, as predicted by a recent statistical model by Erik Gartzke (2007), were highest for the strata of dyad-years with the highest values of capital openness. The two cases that best fit these criteria were Kuwait and U.A.E., 1972-1979 and

Honduras and Nicaragua, 1966-1976.

Figures 2a, 2b, and 2c illustrates how these case selection rules balance leverage and selection bias using a hypothetical dataset generated from the heterogeneous effects model with three different prevalence levels (95%, 70%, 50%) for the random independently assigned scope conditions.[10] The x-axis is Capital Openness, the y-axis is the Severity of Conflict, each point is a conflict. The blue crosses are observations in which the scope conditions for market-mediated signaling are present; the red circles are observations in which the scope conditions are absent so that capital openness *C* has no effect on the severity of conflicts *Y*. Our three case selection rules are represented by the blue, green, and purple boxes (labeled, respectively, R1, R2, and R3). Inferential leverage is maximized in the upper right corner of the figures.

[Figure 1 HERE]

[10] The model generating this data was: $Y_i = 3 + \ 0.5\, S_i\, C_i + \epsilon_i$, where $\epsilon_i \sim \ N(0, 4)$, $S_i \sim Bernoulli(p)$ where p varies by the model, and C_i was drawn from the discrete uniform distribution from 0 to 8; all variables drawn independently. See data.allandafoe.com for complete code used to generate these data and figures.


Scope Conditions Present for 95% of Cases
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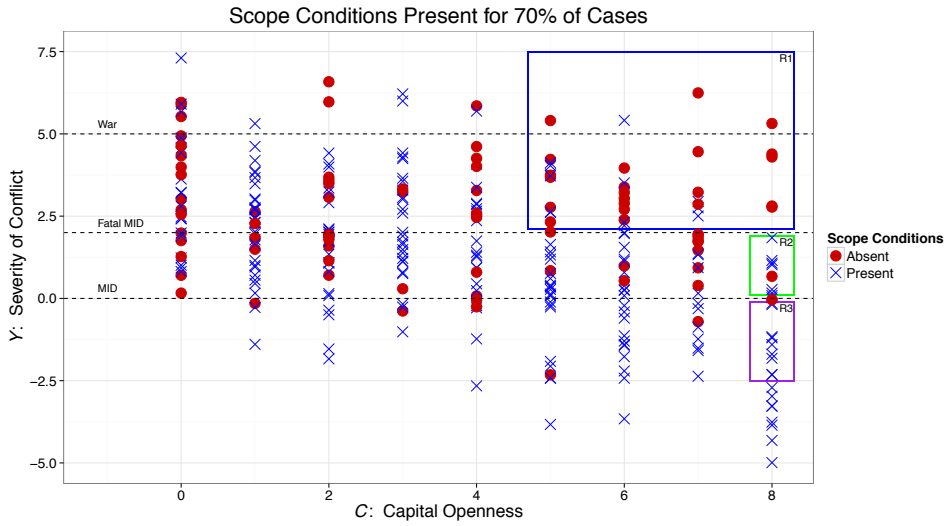
C: Capital Openness
War
Fatal MID
MID
R1
R2
R3
Scope Conditions
Absent
Present


Scope Conditions Present for 70% of Cases
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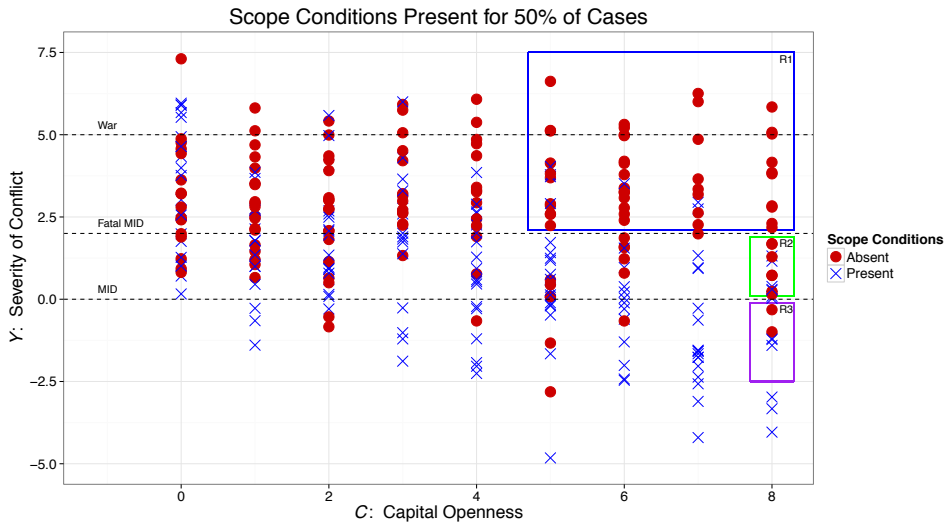
C: Capital Openness
War
Fatal MID
MID
R1
R2
R3
Scope Conditions
Absent
Present



Figures 2a, 2b, 2c: Simulations of selection for cases in which the scope conditions are absent.
An illustration of our three case selection rules (R1, R2, R3) for varying prevalence of scope conditions. R1 selects cases with the most empirical leverage (highest on *Y* and *C*) but also most likely to be lacking the relevant scope conditions.

This figure demonstrates how R1 selects cases with the most inferential leverage, but also the most severe selection of cases in which the scope conditions are absent, whereas R3 selects cases with less leverage and also less selection bias. R2 is a compromise between these two. Further, this figure makes clear that this kind of selection bias is most severe when there are many cases lacking the appropriate scope conditions for market mediated signaling. When *S=0* is rare, selection bias is not a concern and our design provides a direct test of market-mediated signaling. When *S=0* is prevalent, the theory needs to be substantially revised to account for the as yet unidentified scope conditions. Our design, by selecting cases with *S=0*, provides an ideal case selection strategy for an exploratory analysis of these scope conditions.

The following section will now summarize our cases, the evidence we find for market-

mediated signaling, and some conjectures about possible scope conditions.[11]

Case study findings

United Kingdom and Argentina, 1982 (high-fatality conflict)

The 1982 dispute between the UK and Argentina over the Malvinas/Falkland Islands involved close to a thousand fatalities. Argentina invaded the islands to attempt to wrest control of them from the UK. Following Argentina's surprise invasion, Britain immediately launched a task force to retake the Falkland Islands. In the month that followed there were extensive incidents of costly economic escalation and attempts at negotiation facilitated by the United States, but neither side proved willing to compromise on sovereignty of the islands. Fighting resumed in late April, and Argentina surrendered the islands on 14 June.

There were at least two periods with potential for signaling, during which both parties failed to reach a bargain: first, prior to the conflict Argentina failed to persuade the British parliament (and the Islanders) to seriously negotiate over the islands, while Britain, likewise, failed to make it clear to the *junta* that they would forcefully contest an invasion of the islands. Secondly, following the Argentinian invasion, Britain was unable to compel the *junta* to surrender the islands short of an invasion.

We find little evidence of movement in the currency or stock markets during negotiations prior to invasion, but significant evidence of currency and British stock market reaction to ongoing escalatory developments after the Argentinian invasion of the Falklands (Kirshner,

[11] See the Online Appendix A for more discussion of the selection criteria, a short-list of the next most promising cases for these selection rules. See Online Appendix B for more detailed discussion of the cases. See the replication files for the code and data used to select these cases.

2007: 195).[12] There were also some costs borne by both sides in terms of lost investment, sanctions, and frozen assets (Freedman, 2005: 124). Given that both sides bore these costs, these observations provide plausible grounds for costly signaling of resolve by both parties subsequent to invasion.

Nonetheless, these signals failed to prevent further escalation. Our analysis of the case suggests three reasons: first, in this case war may have been seen (at least prior to invasion) as relatively costless for both sides – possibly cheaper than economic escalation. A resulting lack of gradual pre-war economic escalation designed to avoid militarization would short-circuit many potential pre-war opportunities for signaling. Second, perhaps as a result, prior to the Argentina's invasion signaling was nonexistent or too weak to work; only after initiation of war did signaling become strong enough to make a difference. Third, escalation itself may have reduced the potential impact of signaling by raising domestic audience costs for backing down (thus making it difficult for leaders to reach a bargain even if their assumptions about resolve have been altered). Fourth, this may have been a case of issue indivisibility: neither party was willing to concede the core issue of sovereignty over the islands.

U.S.-Panama, 1989 (high-fatality conflict)

The US–Panama case represents a deadly altercation between two countries with open economies, particularly intertwined due to the American involvement with the Panama Canal. The United States wanted to depose the leader of Panama, General Noriega, based on a claimed

[12] During the first days after the Argentinean invasion, the pound dropped by 1 to 2%, a slightly anomalous and noteworthy amount. As a measure of the perceived effect on the currency of the Falklands crisis, over the ensuing few months more than 40 articles were published per month relating the pound and the Falklands. The effect on the Peso was much more serious. Though the exchange rate was controlled, data on the black market exchange rate reveals that the invasion marks the beginning of a major inflation, with the black market rate 50% more than the already inflated official rate. See for example: *Financial Times*, April 8. "Falklands: The Price to Be Paid."

lack of support in fighting the drug trade. Noriega, on the other hand, was unwilling to step down without, at a minimum, guaranteed protection against U.S. drug-related indictments (Goshko, 1988a,b; White, 1988)Inability to find a bargain ultimately resulted in the U.S.'s 1989 invasion of Panama.

We found multiple dates on which specific escalatory events (such as imposition of sanctions and several small-scale MIDs) occurred that could plausibly have generated market-mediated costs between July 1987, when the U.S. suspended military and economic aid to Panama, and December 1989, when Panama declared itself in a state of war with the U.S. and the U.S. invaded.

Evidence of possible signaling via open capital markets is mixed. Panama did not have a stock market in 1989, and thus cannot have signaled via stock market movement; in addition, its currency was pegged to the U.S. dollar, making signaling via exchange rates impossible. In the U.S. market, examination of major indices and currency prices[13] show no obvious effects throughout most of the period. Near the end of the escalatory process, U.S. stock markets did drop significantly following the Panamanian declaration of a state of war on Dec. 15, 1989 (Cole, 1989; Kaletsky, 1989). However, this likely came too late in the escalatory process to be useful in terms of bargaining.

However, both sides experienced other market-mediated business costs. Panama experienced a variety of automatic market-mediated costs from escalation with the U.S., such as damage to foreign businesses and investment, difficulty obtaining financing (Latin American

[13] In fact, in some cases Panamanian instability was cited as one of multiple causes for a strong or rising dollar, based on the general observation that international instability tends to cause flight to the safe haven of the dollar. The fact that the U.S. dollar and certain markets (such as gold) may respond positively to conflictual events suggests that the mechanism underlying market-mediated signaling does not operate uniformly across different states and markets. Does being the owner of the global reserve currency limit the U.S.'s ability to signal resolve prior to militarized conflict?

Markets, 1989; Barber, 1988), and personal costs to Noriega and his associates *Washington Post* (1989). These measures were ruinous to the Panamanian economy, producing bank closures, widespread unemployment, default on international loans, and other serious problems (U.S. Government Printing Office,1988; Hufbauer, Schott & Elliott, 1990: 261-265; Kirshner, 1995: 160; Scranton, 1991: 136-138). Noriega's bearing of these costs can reasonably be described as a credible show of resolve; indeed, some commentators at the time referred to Noriega as "emboldened," "stubborn," and "tenacious," suggesting that observers were updating their beliefs about Noriega's resolve (Hufbauer, Schott & Elliott, 1990).

On the U.S. side, the costs of escalation were proportionally much smaller, but present. The escalation process risked destroying the large U.S. business community in Panama. Interestingly, in this case the result may have been a signal of *lack* of resolve by the U.S. The U.S. government responded to domestic complaints by creating exceptions for U.S. companies, reducing the potency of U.S. signals of resolve – a point not lost on observers. As Congressman Sam Gejdenson noted in hearings on the Panama situation, "There were two contradictory and therefore unattainable goals for the economic sanctions. We wanted to get Noriega out, but we did not want to hurt U.S. businesses, the people of Panama, or the Panamanian economy… since the Administration *was not fully committed to either goal*, we failed to accomplish either" [emphasis ours] (Haufbauer, Schott & Elliott, 1990: 63-64).

In sum, we find *some* evidence of costly market-mediated signaling on both sides. However, as with the U.K.-Argentina case, the evidence suggests that credible demonstrations of resolve came too late in the bargaining process (in the case of the U.S.) and were subject to the problems of increasing audience costs following escalation. Noriega's "stubbornness" may in fact have contributed to a late attempt by the U.S. to offer him a more favorable bargain,

dropping indictments against him. Unfortunately, by the time the offer was made, in the late spring of 1988, it was likely no longer credible to Noriega. After the indictments decision, a strong sanctions push, and multiple minor clashes, U.S. public opinion had turned strongly against Noriega, and it was unclear that Congress, the presiding judge for the indictments, or Vice President and likely next President Bush would be willing to honor the deal. (Pear, 1988).

Singapore-Malaysia, 1992 (non-fatal MID)

In 1992, a series of small incidents (non-fatal MIDs) occurred over Pedra Branca, a disputed island controlled by Singapore but claimed by Malaysia (Straits Times, 1992a,b,c,d; Hassan, 1992a,b). Following these incidents, the two states de-escalated, reiterated their commitment to peaceful negotiations, and completed a previously agreed-upon exchange of materials documenting each country's claim on the island. Did market-mediated signaling play a role in this resolution?

Both Singapore and Malaysia had stock markets and floating currencies in 1992. However, we see little clear market response to the escalatory incidents. Movements in the stock markets and currency around these dates were not anomalously large and we found no concerns in the press about market or currency movements specifically related to such movements. Malaysia in particular did face other costs, such as damage to the Singaporean tourist trade, to which it responded by making visible attempts to step back from these economic consequences: Malaysian leaders complained about the disruptions to tourism and reiterated their desire to actively resolve the problem through peaceful negotiation Osman (1992a,b,c) This de-escalation was explicitly described by some radical groups as a sign of Malaysia's lack of resolve over Pedra Branca (Osman, 1992a), suggesting that the governments

of Singapore and Malaysia were probably also aware of this implication of Malaysia's de-escalation. We are unable to identify comparable immediate costs to the Singaporean economy. However, Singaporean officials did express concern about the *potential* impact of further conflict on the regional economy and investments. Following the escalatory incidents, Singaporean officials, like their Malaysian counterparts, expressed their desire for a peaceful resolution through negotiation or arbitration (Joo, 1992).

Both governments behaved in the manner we would expect if both lacked (and signaled a lack of) willingness to use military means: each nominally continued to press its claim, but both avoided risky escalatory behavior. Thus, their behavior is consistent with the operation of market-mediated signaling, but is consonant with other explanations as well.

Bahrain-Qatar, 1986 (non-fatal MID)

On April 26, 1986, Qatari helicopters strafed and seized workers engaged in building a coast guard station for Bahrain on Fasht al-Dibal, a reef controlled by Bahrain but claimed by Qatar (Mideast Markets, 1986). Ultimately the two countries began negotiations leading to compromise, assisted by neighboring Saudi Arabia. As well as having the highest IMF measures of capital openness, Bahrain and Qatar were both involved in several recently formed economic consortiums of Middle Eastern nations, such as the Gulf Cooperation Council, and pooled investment ventures, suggesting high interdependence. We found no evidence of any costly signaling via market-mediated or other investment-related costs arising from conflictual events.

Honduras-Nicaragua, 1966-1976 (high MID probability but none observed)

Honduras and Nicaragua had a high predicted probability of a MID[14] and high capital openness during the ten-year span between 1966 and 1976, especially before 1970. However, they did not experience any MIDs. This case tested for any evidence that market-mediated signaling prevented potential MIDs. We found no such evidence, even following a potentially inflammatory event (an accidental, non-sanctioned border crossing by off-duty Nicaraguan troops) in 1968.

UAE-Kuwait, 1972 – 1977 (high MID probability but none observed)

These dyad years have the highest probability of both a fatal MID and war in the entirety of the data set used by Gartzke between countries both with maximal capital openness.[15] Nonetheless, no MIDs occur between the two nations during this period. We find even less evidence of sub-MID inflammatory events than in the Honduras-Nicaragua case. Both Kuwait and the UAE had pegged currencies[16] and neither had a fully operational over-the-counter stock exchange during the period of interest. We find no equity or other investment data that suggest costly signaling.

Discussion: Analysis, scope conditions, and alternative explanations

Evaluation of evidence for costly signaling

Observations	U.K.-Argentina 1982	U.S.A – Panama 1989	Bahrain – Qatar 1986	Malaysia – Singapore 1992	Kuwait – U.A.E 1974-79	Honduras – Nicaragua 1966-76
CAPOPENL	4	6	8	8	8	7-8

[14] The factors leading to such a high probability of a MID were: their contiguity and proximity, relative equality in military capabilities, low levels of democracy, and low GDP per capita.
[15] The factors leading to such a high probability of a MID were: their high GDP per capita, proximity to each other, and relative equality in military capabilities.
[16] In the first few years of the period examined, different states in the UAE used different currencies: the Qatar-Dubai riyal and the Bahrain dinar, before consolidating on the UAE dirham.

Approximate Fatalities	1000	250	0	0	0	0
Exchange Rate	Floating; Floating	Floating; Pegged	Pegged; Pegged	Floating; Floating	Pegged; Pegged	Pegged; Pegged
Types of Costs						
Capital	Yes	Yes	No	No	No	No
Currency	Yes	Yes	No	No	No	No
Business	Yes	Yes	Maybe	Yes	No	No
Proportion of Strategic to Automatic	High	High	Low	Moderate	--	--
Scope Conditions?	A, B, E	B, C, D, E	A, B	B	--	--
Evidence of Alternative Explanations	W, X	W	W, X, Y	W, Y	W, Y, Z	W, Y, Z

Table 1: Summary of evidence

The above table lists our central findings from each case. We also note possible scope conditions and alternative explanations. Scope Conditions: (A) Sudden Escalation; (B) Issue Indivisibility; (C) Limited Military Aims and Large Economic Costs; (D) Commitment Problems; (E) Lock-In. Alternative Explanations: (W) Anticipated Costs; (X) 3rd Party Intervention; (Y) Reverse Causation; (Z) Instrumental Use of Market Integration to Secure Peace.

Our cases reveal mixed support for GLB's theory of market-mediated signaling. We found definite evidence for various forms of market-mediated cost-bearing in the most serious disputes: capital and currency markets *automatically* responded to the escalation of disputes, and business suffered from the hostilities. These costs were substantial. In the other four cases, however, there was no clear evidence of *automatic capital* or *monetary* costs. There was evidence of low to moderate levels of *automatic business costs* in the two non-fatal MIDs.

Additionally, we found many instances of market-mediated costs as consequences of strategic economic coercion: the U.K. (with dubious legality) froze $1.5 billion of Argentinean assets (Montagnon, 1982), the U.S. froze Panamanian-owned funds in U.S. banks (Barber, 1988), blocked the supply of U.S. currency to Panama (Kirshner, 1995), withheld canal

revenues (Gardner, 1988), and proposed banning ships flying Panamian flags from US ports (Journal of Commerce, 1989; Albright, 1989). This suggests that capital openness facilitates bargaining by providing actors non-military means of imposing costs on each other.

We also found that, in contrast to the conceptualization of costly-signaling as something one does (or ought to do) to oneself (Lektzian & Sprecher, 2007), most costs borne by a state arise from the imposed sanctions of its opponent. When there were self-inflicted costs they arose as a byproduct of escalation towards war. Thus, at least in these cases, the conceptualization of signaling as self-inflicted is mistaken: rather, states typically force their rival to "signal" by accepting or rejecting the economic costs of ascending the ladder of military escalation.

In sum, our research confirms that states may bear, and be perceived as bearing, substantial economic costs during militarized disputes. However, we found little evidence of economic cost-bearing (or perception of it) in the less serious (non-fatal MID or non-MID) cases (though in the Singapore-Malaysia case mutual signaling of *non*-resolve *might* have helped support a peaceful outcome). Thus, our research suggests that market-mediated signaling is unlikely to be the primary mechanism at work; other mechanisms are likely necessary to fully account for the correlation of open capital markets with peace (that is, the lack of MIDs). We now discuss the findings from our exploratory research on possible scope conditions.

Scope conditions for signaling

The analysis above reveals one significant scope condition for functioning of the costly signaling mechanism: conflict must escalate to a fairly serious degree – typically to the fatal MID status – before substantial signaling occurs. The two fatal-MID cases that we examined also give some insight into additional scope conditions of GLB's theory: in both these cases,

market-mediated signaling took place but it failed to resolve the dispute. Here, we discuss several specific reasons why and the scope conditions they suggest.

Surprise Attack: The dispute over the Falklands went from a low level diplomatic dispute to a major crisis when Argentina launched its surprise invasion. Had the conflict escalated gradually as British and American intelligence services anticipated, market-mediated costs may have been able to play a greater role in the communication of resolve; because it did not, Britain did not have an opportunity to adequately assess Argentina's resolve or demonstrate its own.

Limited Military Aims and Large Economic Costs: In the Falklands War, the potential costs of the military conflict were limited since the dispute was strictly over the islands and neither party was likely to engage in serious punitive military attacks. As particular evidence of this, Argentina chose to keep many of its best units out of the conflict all together (Arquilla & Rasmussen, 2001: 760). The costs of economic coercion, on the other hand, were sufficiently great that Britain refrained from employing all possible sanctions. A comparable dynamic appeared to be at work in the U.S.-Panama case. These cases suggest that military action is sometimes less costly to both parties than the full execution of economic sanctions.

Audience-Cost Lock-In: Fearon (1994: 578) argues that to the extent that domestic audience costs for backing down in a conflict increase with escalation, leaders may become "locked-in" to the conflict. We observed this in both our fatal-MID cases. The Argentinian invasion escalated the dispute to a point where it would have been very costly for either government to back down thereafter (Lebow, 1985: 121). Similarly, in the US invasion of Panama, after Noriega persisted through many months of economic sanctions, President Reagan made a final offer that included a promise from the administration to support a motion to drop indictments against Noriega. Unfortunately, by the time the offer was made, in the late spring

of 1988, it was likely no longer credible to Noriega. After the indictments decision, a strong sanctions push, and multiple minor clashes, U.S. public opinion had solidified strongly against Noriega, and it was doubtful that the incoming administration would be willing or able to honor the deal (Pear, 1988; Scranton, 1991: 150).

Issue Indivisibility: Sovereignty over the Falklands/Malvinas was an indivisible issue. In the years prior to the invasion, negotiators from Britain repeatedly tried to strike a deal between the Islanders and the Argentineans, but to no avail. British administrations considered conceding (or coercing) on other issues such as claims to Antarctica or payments (or withdrawn subsidies) to Islanders, or in any manner of complicated bargains, but at the core of all negotiations was the refusal of both Islanders and Argentineans to negotiate on the core principal of sovereignty of the islands.

The above suggests general scope conditions for the effective avoidance of militarized conflict through economic signaling. The conflict must (1) (continue to) depend largely on bargaining failure due to uncertainty, and should involve a (2) sufficiently gradual escalation so that (3) substantial economic costs can be born, but (4) these economic costs are smaller than the expected military costs of conflict. Surprise attacks fail the requirement for gradual escalation. Lock-in from audience costs renders uncertainty irrelevant. Issue indivisibility complicates or precludes the finding of a suitable bargain. Conflicts arising from other commitment problems, such as power transitions, will likely also be immune to the pacific effects of market-mediated signaling.

Alternative explanations

As noted above, our cases suggest that market-mediated costs typically become most

relevant only after a conflict has already escalated to high level. Therefore, while market-mediated signaling may be one mechanism supporting the capitalist peace, it does not seem likely to fully account for the correlation between *CAPOPENL* and the absence of MIDs. We now discuss some alternative mechanisms suggested by these cases.

Anticipated Costs: The classic liberal explanation for the pacifying effects of economic interdependence is that greater anticipated costs of war make war less desirable, and hence less likely. While this mechanism is hard to test, we did note suggestive evidence in our cases. In the Singapore-Malaysia dispute, the countries were deeply interdependent and Singapore in particular was highly vulnerable to Malaysia's control of its water supply. Both countries expressed concern during the dispute about the potential for on-going economic costs due to the dispute. In the Bahrain-Qatar dispute, members of the GCC perceived the Bahrain-Qatar conflict as threatening both economic and security gains such as a causeway construction project and the benefits of group membership in the Gulf Cooperation Council (Mideast Markets, 1986; Facts on File World's News Digest, 1986; Khalaf, 1987: 32). In the UAE-Kuwait dispute, both countries and OPEC more generally had much to benefit from continued cooperation. In Honduras-Nicaragua, the business community pressured Nicaraguan President Somoza to reduce belligerent behavior disruptive to the Central American Common Market (CACM) in part because of concern about foreign capital investment and credits (Latin America, 1969).

Third Party Intervention: Another possible mechanism is that capital openness may, because of regional interdependence and shared investments, lead other parties to have greater stakes in any given dyadic dispute. These parties may be more willing to act as intermediaries during disputes, and push harder to resolve disputes. In both UK-Argentina and Bahrain-Qatar

we noted an important role played by a third party who might not have been as involved were the disputants less economically integrated with third-party countries.

Reverse Causation: A final possibility is that, rather than *causing* peace, capital openness may be more likely to emerge when countries or regions accept the status-quo, and thus are no longer as focused on revising territorial or other arrangements. For instance, Malaysia and Singapore had reached a degree of mutual vulnerability and interdependence that suggests a shared acceptance of prior, perhaps implicit, terms of cooperation. Similarly, evidence from the Middle Eastern and Nicaragua-Honduras cases suggests a basic acceptance of the status quo as expressed through the formation of local economic consortia to aid joint development. This hypothesis also fits with later developments in the Nicaragua-Honduras case: capital openness declined and MIDs increased between Honduras and Nicaragua in the years after our period of analysis, as the new Sandinista government reoriented itself away from the local common market status-quo (1980).

Instrumental Use: The possibility of reverse causation, by providing a policy tool to promote peace, could also imply that capital openness is encouraged to promote peace. Dyads and regions that would like to foster peace may use economic interdependence instrumentally. This argument has been made about Europe: the European Coal and Steel Community has been regarded as "a political vehicle in economic disguise, a device for overcoming Franco-German hostility." (Judt, 2005: 158; see also Weber and Zysman 1997: 3). Evidence of this *instrumental strategic* use of economic integration is present in the Kuwait-UAE and Honduras-Nicaragua cases. During the formation of the Gulf Cooperation Council, Kuwait in particular pushed for a model of cooperation that stressed economic and cultural cooperation as well as military collaboration, and spearheaded the Inter-Arab Investment Guarantee Corporation, a multi-state

investment insurance consortium (http://www.iaigc.net/; Khalaf, 1987: 21). It appears that Kuwait sought to use economic openness as a means to secure regional stability. In Honduras-Nicaragua, the leader of Nicaragua was quoted as being in favor of the CACM for the political stability it brought *in spite* of fiscal difficulties it created for Nicaragua (Latin America, 1970).

Conclusion

The stakes are large for researchers to better understand the mechanisms supporting the liberal peace. This study sought to do so by investigating the family of market-mediated signaling mechanisms purported to generate the observed correlation between mutually open capital markets and peace. We examined six most-likely crucial cases to look for evidence of the mechanisms suggested by Gartzke, Li, and Boehmer (2001): that open capital markets facilitate costly signaling through economic costs ex ante to militarized conflict. We employed a novel formal case selection strategy that maximizes the leverage and minimizes the bias of our cases. Because our case selection strategy was objective, other scholars may examine potential problems with our design and may extend our analysis to the next most promising cases. Our research finds some support for market-mediated signaling mechanisms, clarifies the means by which they may operate, suggests reasons why they may fail to obviate a conflict, and finds suggestive evidence for alternative explanations for the relationship between capital openness and peace.

Our case studies yield a mixed judgment on the plausibility of market-mediated signaling mechanisms. The two wars that we examined provide strong support for the existence of market-mediated signaling following highly conflictual events, though in both these cases it clearly failed to avert the conflict. This seemingly paradoxical result may, however, arise from our selecting “high leverage” cases for which the relevant scope conditions were absent. We

find it plausible that market-mediated signaling could help to avert conflicts arising from asymmetric information in other circumstances where escalation is more gradual, issues are more divisible, and leaders have not become locked-in to the conflict.

However, in the other cases, which were selected in a manner less likely to retrieve cases outside the scope conditions of the mechanism (non-fatal MIDs and high risk dyad-years), we found little conclusive evidence of market-mediated signaling. These cases did suggest several supplemental or alternative accounts for the capitalist peace association. We found evidence for anticipation of costs as a factor in actors' thinking. We saw instances of third party intervention that may have been encouraged by the economic openness of parties involved. Several of our cases suggested that the causal relationship may be reversed: open capital markets may indicate a state's acceptance of the regional status quo and peace. Peace-oriented leaders may instrumentally use the pacifying effect of capital openness to reinforce their desired peace. These additional mechanisms suggest possibilities for future research.

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