An Assessment of the Validity of Empirical Measures of State Satisfaction with the Status Quo*

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Abstract: There exists no consensus as to what indicates state satisfaction with the systemic status quo even though it has been a widely used concept in the empirical literature on war. This is surprising because satisfaction is not a new concept in international relations and has been accorded a central role in many theories of war. In this paper, I present a measure of satisfaction based on the cost of money for sovereign borrowers and compare that measure to several leading indicators of satisfaction. I find little correlation among the existing indicators and similar variation in their ability to predict conflict. Overall, my results point to the cost of money as the most valid indicator of satisfaction as it: 1) best predicts behaviors consistent with satisfied/dissatisfied states, 2) is least susceptible to strategic behaviors related to conflict, 3) is least likely to obscure the impact of independent variables common to conflict studies, and 4) can also be included with measures of dyadic preferences in most models of conflict.

There exists no consensus as to what indicates state satisfaction with the status quo even though it has been a widely used concept in the empirical literature on war.[1] Status quo evaluations have been measured most prominently as deviations in alliance portfolio similarity from the most powerful state, as military buildups, as the existence of status inconsistency, and as changes in the cost of money, and all of these have produced interesting, statistically significant results, regarding the processes that lead states to war (for examples of each indicator see respectively, Lemke and Reed, 1996; Werner and Kugler, 1996; Volgy and Mayhall, 1995; and Bueno de Mesquita, 1990). Still, there has not been a systematic examination of the validity of these measures.

This is surprising because satisfaction with the systemic status quo is not a new concept in international relations and has been accorded a central role in many theories of war. For example, power transition theorists believe that transitions are only dangerous if the challenging state is dissatisfied (Organski, 1958; Organski and Kugler, 1980; Lemke and Kugler, 1996; DiCicco and Levy, 1999) and may explain why democracies do not fight each other (Lemke and Reed, 1996). But even if satisfaction does not fully explain the democratic peace, many have still wanted to control for its effects on the linkages between regime type and war (Gelpi, 1997; Rousseau, Gelpi, Reiter, and Huth, 1996; Ray, 1995).

Given the prominence of the satisfaction concept and the lack of any systematic investigation into the empirical validity of the various indicators, I use this paper to evaluate the validity of the satisfaction indicators and assess the relationship between satisfaction and conflict generally. I do this through comparisons of inter-correlation as

[1] An informal count by the author found that satisfaction is an independent variable in over 65 quantitative studies of conflict since 1970.

well as through correlations of the measures with behaviors thought to be consistent with either satisfied or dissatisfied states. My results show that the measure of satisfaction chosen matters greatly in each test and that, overall, changes in the cost of money, as measured by differences in long-term government bond rates, tend to be the most valid indicator of state satisfaction with the status quo. The next section begins the paper by describing how previous studies have conceptualized state satisfaction. I then move to a discussion and tests of the validity of each measure. I conclude with a re-examination of Oneal and Russett's (1997) findings to demonstrate how use of the proper indicator can improve current research.

CONCEPTUALIZING SYSTEM LEVEL SATISFACTION

James Payne (1970) provided a definition of the status quo in the context of the Cold War rivalry between the United States and the Soviet Union. According to Payne (1970: 68), the "status quo is a mutually perceptible distribution of rights." The rights are derived through usage and renunciation. Usage, in this sense, refers to the territorial rights both states in a dyad perceive to be valid. Renunciation applies when one state foregoes the rights associated with a particular territory. Mutual perception is important as a defining criterion, but its application may be a bit ambiguous. For example, both the United States and the Soviet Union perceived that Hawaii belonged to the United States. This gave the United States power to either use or renounce Hawaii at any time. If the United States were to renounce Hawaii to the Soviet Union, the United States would no longer be able to stake a claim. This hypothetical case seems clear. However, a more difficult case would be the status of Taiwan. Usage would dictate that the Republic of

Taiwan had a controlling interest, but the lack of renunciation by China proper would belie Taiwan's independence. Payne (1970: 68-83) resolves these tensions by arguing that changes in the status quo must be responded to immediately, or *de facto* possession brings *de jure* rights.[2]

If the status quo can be defined as the mutually perceptible distribution of rights, then dissatisfaction with the status quo would imply a willingness to alter that distribution of rights. This does not mean that all dissatisfied states would seek to alter the status quo because many if not most of these states would not have the power to challenge the satisfied states. It also does not mean that all minor states are waiting their turn to alter the distribution of rights; these states might just as well be content with their current share of the system.

These issues are hard to separate in practice, and the conflation of power and satisfaction has been a significant problem in the satisfaction literature (see the exchange between de Soysa, Oneal, and Park (1997) and Lemke and Reed (1998), for a good discussion of this issue). Early on, Organski (1958) described the distribution of power and satisfaction within the system as resembling a pyramid. The dominant nation, always satisfied, sits atop the pyramid and represents the hegemon, the inheritor and caretaker of the status quo. The "Great Powers" are the next most powerful states; comprising this group are the central system members who are capable, if allied with one another, of upsetting the status quo. The international order is dependent upon their satisfaction. From this group of nations downward in the pyramid, dissatisfaction increases as power to change the status quo decreases. The middle powers, small powers, and colonies,

[2] This example applies to a specific piece of territory, but Payne's analysis could apply to any tangible good. The status quo defines how rights to these goods are developed and maintained.

represent differing degrees of satisfaction: perhaps half the middle powers are satisfied, one-third of the small powers, and even fewer of the many colonies (1958: 322-338).

This conflation of power and satisfaction in the early description of power transition obscured an interesting and powerful theory of war. According to Organski, war occurs when the capabilities of a "Great Power" challenger begin to overtake the capabilities of the dominant state. The cause of war does not turn solely on differences in capability, however; instead, it depends upon the challenger's level of satisfaction with the rules of the system established by the leading state. For Organski, like Payne who followed him, the distribution of rights was the important determinant of the status quo. Satisfaction is based upon how states evaluate the differences between the shares of rights they receive from the system as compared to the rights that they believe they should receive.[3]

This is an interesting point that seems to have been lost in early reformulations of the power transition literature. To avoid the conflation of power and satisfaction, the revision of the power transition thesis by Organski and Kugler (1980) emphasized capability measures rather than satisfaction. Organski and Kugler operationalized satisfaction using Bueno de Mesquita's (1975) measure of system "tightness". They argued that "the willingness of elites to fight" could be measured by changes in alliance behavior. Loosening behavior would indicate that elite judgment of security issues had softened.[4]

[3] See Lemke and Reed (1998) for an excellent discussion of this point.
[4] "If alliances tighten, and interaction among alliance groups decreases, such behavior may be taken as an indication that those who have responsibility for guiding their countries in their international dealings perceive the environment as presenting a threat to the security and/or the power positions of their countries, and are preparing to fight" (Organski and Kugler, 1980: 39).

A major problem with the Organski and Kugler (1980) operationalization of satisfaction, however, is the confusion in the unit of analysis. Trying to explain satisfaction levels of individual states, Organski and Kugler substituted a systemic level interpretation of overall satisfaction with the status quo. They argue that, by measuring the willingness of competing elites to fight the dominant nation, the overall potential for a dangerous power transition could be approximated. The emphasis in their analysis shifted away from Organski's earlier discussion (1958) of the satisfaction level of the challenger. Instead, the level of analysis had turned to a focus upon the willingness of a coalition to fight with the challenging nation, regardless of whether the challenging nation was dissatisfied. The shift to measuring coalitions of states made it impossible for Organski and Kugler to determine the satisfaction level of the challenger because they were unable to predict the satisfaction level of individual states.

The inability to independently measure the satisfaction of the challenger forced Organski and Kugler to assume that a power transition occurring before or during a major war (in 5 out of 10 of their cases) involved a dissatisfied challenger. The remaining five cases did not result in war, presumably because the challenger was satisfied (1980: 44-53). As Werner and Kugler (1996: 192) point out, this analysis devolves into tautology; it "is impossible to falsify unless extreme conditions of preference polarity exist." Nothing is explained by the theory because one of the most important variables is just assumed away.

To resolve this difficulty, Werner and Kugler (1996: 192) produced a new measure that was independent of system-level measurements. They postulate that dissatisfaction can be operationalized by the presence of an arms race. More specifically,

in periods immediately prior to a transition in power between the dominant nation and a challenger, the presence of an arms race would indicate that the challenger is dissatisfied with the status quo maintained by the dominant nation. The lack of an arms race suggests a satisfied challenger and, hence, a peaceful transition. "The military buildup thus reflects either the decision maker's choice to challenge the system or to defend the status quo" (Werner and Kugler, 1996: 192).

The theoretical trade-off in Werner and Kugler's analysis is their conflation of the satisfaction measure with indicators of an arms race.[5] It would be difficult to determine whether dissatisfaction or some other variable caused the military build-up. A state could quite plausibly prepare for war, as any good realist prescription would assert, without necessarily being dissatisfied with the status quo. Indeed, given the meaning Werner and Kugler attach to the build-up, a dominant nation would be the unlikeliest to arm - even during parity or transition - because it is, by definition, satisfied with the status quo. However, Wallace (1982) shows that status quo nations do undertake arms races, and wars occur even when the dominant nation has a higher rate of military expenditures. Even if Wallace's findings are not convincing, the two dominant nations over the past two centuries have obviously each pursued military buildups – the United States during the Cold War and Great Britain prior to World War I. This anecdotal evidence and Wallace's findings introduce some problems for the Werner and Kugler measure of satisfaction.

The early work of Bueno de Mesquita (1981) does not suffer from these theoretical difficulties. The Correlates of War Formal Alliance Data Set classifies

[5] Satisfaction with the status quo has been so difficult to measure that many studies will often conflate satisfaction with observable behaviors or other indicators – power distributions, alliances, and arms increases.

alliances as either: 3=entente; 2=neutrality or non-aggression pact; 1=defense pact. These categories were used by Bueno de Mesquita to compare the types of commitments made between two states. A 4 x 4 matrix (0 for no alliance or 1,2,3 for each of the commitment types) assesses the level of commitment each state has with other states in the system (each state is also assumed to have a defense pact with itself). The level of shared commitment to other states is reflected in the Tau B measure of association for the entire matrix that ranges from -1 to 1. A score of –1 indicates that the two states share no commonalities in their alliance portfolio; perfect agreement is indicated by a score of 1.

The Tau B measure was initially a dyadic measure of affinity. However, if one assumes that the most dominant nation is, by definition, satisfied with the systemic status quo, satisfaction levels can be coded as measures of difference between a state's policy and the policy of the dominant power (Kim, 1991; Lemke and Reed, 1996). "The dissatisfied challenger is the nation that has not much common interest with the dominant nation. The more dissatisfied a challenger is, the less common interest it shares with the dominant nation" (Kim, 1991: 842). The importance of the alliance portfolio measure lies in its ability to approximate a nation's satisfaction with a measure that is independent of system-level measures. The level of analysis has returned once again to Organski's focus on individual state perceptions.

Despite these conceptual advances, Signorino and Ritter have recently argued that the Tau B measure is technically inappropriate for measuring the similarity of state alliance portfolios because it measures a rank-order correlation of alliance commitments, not the level of overall similarity of these commitments (1999). For example, a Tau B of –1 is traditionally interpreted as complete dissimilarity of alliance commitments, but

Signorino and Ritter are able to show that several different types of similar commitments can be found that would yield a –1 Tau B association (see Table 3, 1999: 122).

Signorino and Ritter argue that a spatial measure of foreign policy similarity (the S score) is superior to the early affinity scores established with Tau B. In addition to alleviating the validity problems, the S score has the advantage of allowing various weighting methods to be employed in assessing overall policy similarity. It is also amenable to the use of other indicators of state similarity like individual state voting in the United Nations. Conceptually, however, the S measure is, for lack of a better term, quite similar to the Tau B in its approach to measuring the similarity of state preferences – it compares state behavior on a range of indicators to arrive at an affinity score.

What is interesting for all of these measures – Tau B, S, or military buildups – is that each has to assume that the most powerful state in the system is satisfied with the status quo. Since the measure has been developed within the power transition literature, which believes that the dominant nation is the guarantor of the status quo, this assumption is made in order to have a base comparison with which to develop the various levels of satisfaction in less powerful states. Obviously though, there have been cases where the most powerful state is dissatisfied with the status quo (perhaps the United States in the late 1960's and 1970's) or where the status quo was created by a powerful state that had since declined (Britain following World War I for example). Though this assumption does not invalidate the measure, it is always troubling to make assumptions that contradict known facts.[6]

[6] Status inconsistency has also been used to approximate the satisfaction of a state. Experimented with in the early 1970's (see Ray, 1974; Wallace, 1972; Midlarsky, 1975), status inconsistency received little further attention because it revealed only a mixed correlation with the initiation of war. A concept borrowed from sociology, proponents of status inconsistency theory assume that at least two hierarchies

Bueno de Mesquita (1990: 41-42) provides the most innovative measure of satisfaction with the status quo. He argues that differences in the cost of money can serve as an important indicator of international expectations regarding the future of individual states. If future events are likely to impact a state poorly, that state will find it difficult to attract money; a decreasing cost of money indicates the international expectation that the future holds advantages.

The comparison to other states is key. Money will flow, all else being equal, to the place where perceived risk is least. Leaders of troubled states have to increase the amount that they are willing to pay for capital to compensate for the higher perceived risk associated with investment in their country. In this sense, the market indicates contemporary expectations of what the future holds for each state. It is not a large leap to assume that states will be dissatisfied with their current situation, and hence the status quo, if the amount they have to pay for money greater than the rate for other states.

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exist in the system of states, a hierarchy of ascribed status – state capabilities – and a hierarchy of achieved status – reputation or something similar. Conflict occurs when large differences exist between a state's achieved status and its ascribed status. A state is hypothesized to be "dissatisfied" with its ascribed status if it was much lower than its achieved status – a fact that has plagued Russia and the Soviet Union for much of their histories, for example.

What makes sense in theory is not always demonstrated in the empirical world, and efforts to correlate status inconsistency with the initiation of war produced only modest results. However, some recent work has begun to reconsider this variable, arguing that slight reformulations of the measure could better capture its effects upon the war behavior of states. Cashman (1993) argues that status inconsistency could still be an indicator of dissatisfaction and eventual conflict if extremely large differences persist between the two hierarchies. Cashman believes this is especially true for states on the periphery, where ascribed status often trails achieved status substantially. For example, Japan, China, and the Soviet Union have not been included as core members of the group of states that developed the systemic status quo (1993: 232). The key factor according to Cashman (1993) is whether the status discrepant states are included as creators of the contemporary rules in the system.

Volgy and Mayhall (1995) have come closest to empirically demonstrating an association between status inconsistency and conflict in the system. Using a temporal domain of 1950 to 1987, they find that status inconsistency is related to war only under certain conditions. The first part of the period experienced deep ideological cleavages that were correlated with conflict in the system; the second period saw the relationship reverse as the cleavages dissipated. While these results give important evidence regarding the system as a whole, the results offer little insight into the actual linkage between an individual state and its evaluation of the status quo and the likelihood of conflict. Status inconsistency seems to always suffer from this ecological leap (see especially Bueno de Mesquita's critique, 2000: 497-499).

Satisfied states are the ones who find money more cheaply on the open market. Bueno de Mesquita (1990: 42-45) argued that the discount rate data for Austria and Prussia from 1863 to 1865 demonstrated that Prussia's victory in the Seven Weeks' War was not expected, nor was its position in the international system expected to be fundamentally changed because the cost of money was equal to or more expensive than regional averages at the time.[7]

Alliances and UN voting, or even the sending of diplomatic missions, can be costly signals that states are unwilling to make. Moreover, they are unlikely to respond as quickly or as accurately as the international market for money in assessing the rise and fall of expectations regarding the future of states, and assumptions regarding the most powerful state are unnecessary.[8] As I argue in the next section, unlike other indicators of satisfaction, the cost of money is also unlikely to be greatly influenced by the causes of conflict – an important point for those using satisfaction as a measure predicting disputes and wars.

[7] Technically, the discount rate does not measure the cost of money for a government. Instead, the discount rate is the interest rate charged by the government institutions for short-term loans to banks within a country (Mishkin, 1992: 324). As the lender of last resort, the central banks are able to use discount loans to ensure liquidity within the banking system, but most governments use these loans as attempts to control monetary policy. Increases in discount loans often coincide with an increase in the general money supply; decreases imply a contraction. The discount rate is set by the central bank, but since the government is literally subsidizing liquidity, the discounting process cannot be extended for too long against surging interest rates without suffering serious financial costs. The costs of these loans constrain discount rates such that they will often vary with interest rates. For the data I have – over 4,000 state-year observations during the past two centuries – the discount rate and interest rates on long-term government debt correlate at 0.77 ($p<0.001$). However, for the analyses presented in the remainder of the article, I properly measure the cost of money using long-term government bond rates.

[8] The United States, for example, has a greater than average cost of money for over 10 years during its reign as hegemon; this would make the United States dissatisfied with the international order even though it is the most powerful state in the system. Tau B and S would consider the United States the most satisfied state in the system. This point is discussed in more detail toward the end of this paper.

Satisfaction and Conflict – Which Way Does the Causal Arrow Point?

In theory, the causal arrow always flows from dissatisfaction to war; this is true in every study that includes status quo satisfaction as a control variable and for every theory that considers dissatisfaction an important cause of conflict. Nevertheless, many of the satisfaction indicators could be the result of either the strategic processes that lead states to war or the termination of important wars. For example, ten percent of the pre-1945 alliances in the Correlates of War formal alliance data set end in either 1918 or 1945, twenty percent of the pre-1945 alliances were formed between 1936 and 1945, and another five percent were formed during the period immediately prior to and during World War I, from 1912-1918. Whether using Tau B or S, this level of endogeneity obscures confident conclusions on the impact of satisfaction on war.

If independence from measures of armed conflict is tantamount, United Nations voting is a better alternative than alliance data for measuring satisfaction with the systemic status quo, but this does not mean that UN voting is completely isolated from conflict processes. Rather, the impact of the Cold War and the presence of Soviet bloc voting so dominate voting patterns that satisfaction measures often proxy Cold War divisions (Kim and Russett, 1996; Voeten, 2000). After the break-up of the Soviet Union, UN voting patterns mimic the North-South division between advanced and developing states, and while post-1991 data may accurately reflect some economic dimensions of the satisfaction/dissatisfaction continuum, the willingness of both hemispheres to vote in large blocs renders inference on within bloc variation in satisfaction nearly impossible.

The cost of money, though not unaffected by war, is far more removed from the causes of conflict. In general, wars impact the economies of belligerent countries by shifting preferences toward current rather than future consumption. As belligerents save less and spend more, the shift in consumption affects interest rates by raising the overall demand for money. Even neutral countries are affected because the cost of money increases with demand. Nevertheless, not all states are impacted equally by wartime interest rate changes, and the interest rate changes need not always affect the cost of money for belligerent states (see Gholz and Press, 2001: 12-13, for this argument).

Consider first the vast majority of states during a conflict – the non-active belligerents and war neutrals. The real interest rates (adjusted for inflation) of these states will not rise dramatically since active belligerents are constrained by borrowing limits and since the global supply of money is quite large. In other words, only the largest wars, pulling in multiple, large-economy belligerents, could greatly impact global monetary demand, and even these large hikes in demand would be moderated by the vast availability of money on the global market. According to Gholz and Press (2001: 13), "even the biggest wars in history – wars that have substantially raised interest rates in the belligerent economies – have not triggered huge increases in average world-wide interest rates." As Gholz and Press (2001: footnote 32) continue, the leading comprehensive source on historical interest rates "does not read like a series of war-related episodes" (see Homer and Sylla, 1991).

While the majority of states rest comfortably unaffected by rising interest rates, active belligerents could still suffer from the rising costs of war. The shift in belligerent consumption would drive up local interest rates, and these costs would be further

increased by the risk premium associated with a higher likelihood of default since belligerent states shift spending to non-productive assets and risk the destruction of those assets in war. But these cases are actually quite rare, and not all belligerents are equally affected by wartime costs.

For example, Bueno de Mesquita (1990: 44-45) argues that, even though the fear of war was reflected in the overall cost of money before the 1864 Second Schleswig-Holstein War, "the crisis did not have a substantial differential impact on the expectations concerning Prussia." During the war, "while the cost of money rose markedly in London, Berlin, and Amsterdam, it rose *more* in Prussia… immediately after the battle of Koniggratz the market responded with a rapid fall in the price of money, in which Prussia *led* the baseline of London and Amsterdam [emphases in original]." In other words, the market for money initially rated Prussia to be a higher risk than other states in the region, but after its initial successes, the market responded to the new information and updated its relative risk ratings.[9] These arguments suggest the cost of money is the satisfaction measure least susceptible to problems of endogeniety in conflict studies.

Measurement Trade-offs and Biases with Independent Variables of Interest

The choice of satisfaction indicator may also bias conclusions regarding the impact of several commonly used independent variables. For example, a growing literature has established the link between democracy and alliances, finding that jointly democratic dyads are likely to be allied (Siverson and Emmons, 1991; Lai and Reiter,

[9] Consider too the long-term government bond rates for France before, during, and after the Franco-Prussian War (1870-1871). Until 1862, France trailed the average cost of money for major states, but from 1863 until the start of the war, the cost of money in France ranged from two-tenths to one full percent cheaper than other major states. Poor performance in the war reversed this trend as France began to trail other majors by one-half of a percentage point; by 1873, France had recovered to pre-war trends. I compare the measures for this case in greater detail later in this paper.

2000; Leeds et al, 2002) even though democracies do not necessarily form alliances with other democracies (Simon and Gartzke, 1996). Indeed, over 90% of jointly democratic and allied dyads in the Correlates of War dataset are found in three large, regional defense pacts formed during the beginning years of the Cold War – the North Atlantic Treaty (1949), the Organization of American States (1947), and a Western European defense pact (1948). While democracies do form alliances with non-democratic states, the effects of these three alliances would tend to inflate the satisfaction levels of democratic regimes as alliance ties capture the likelihood of joint democracy in alliance rather than systemic satisfaction.

United Nations voting data does not escape these effects. As Voeten (2000: 207) demonstrates, "the wealth and level of democracy of a country thus relate strongly to the extent that country's voting behavior corresponds to that of the West." Democracies vote together, and with Western states more generally, and this would again inflate the level of satisfaction found for these states, especially as issues of colonialism, human rights, disarmament, and superpower politics reach the Assembly's agenda (2000: 209). In fact, Oneal and Russett (1999) find that democracy may cause voting preferences in the UN, and their results have been confirmed by Gartzke (2000). Although Gartzke demonstrates well that dyadic voting preferences still impact conflict, even after controlling for the endogenous effect of democracy, the level of conflation between voting preferences and regime type unduly muddies the empirical relationship between satisfaction and conflict, especially at the systemic level. After all, the S measures the dyadic voting preferences for the United States and other states in the system, and obviously each state's level of trade with the United States, its level of democracy, its

geo-strategic position, and an entire host of strategic factors particular to the system leader will affect voting preferences.

Bias caused by regime type is less apparent in the cost of money indicator. While a certain level of national wealth is necessary to attract lenders, there is no reason to conclude that a relationship between democracy and the cost of money should exist. While democracies may be more open, wealthier, and perform better economically (Bueno de Mesquita, 2000), democracies are as likely as non-democracies to be punished for poor foreign and domestic policies and rewarded for stability and profit potential.[10]

EMPIRICAL TESTS OF THREE MEASURES OF SATISFACTION

Thus far, I have argued that the cost of money is less likely to be caused by conflict, insulating it from possible endogeneity problems in studies of disputes and wars, and the cost of money has a greater tendency to vary more naturally with fluctuations in satisfaction rather than by fluctuations in regime type or other independent variables. Given these arguments, the cost of money would seem to be a superior measure of state status quo evaluations. To determine if this empirically true, I use the remainder of the paper to develop and then implement a research design, assessing the validity of several

[10]The types of bias present in most of these indicators will only affect the certainty with which hypotheses can be rejected in most quantitative studies of conflict as multicollinearity affects standard errors. This should not be problematic in most large-N studies of conflict that employ tens of thousands of cases. However, a more important consequence of collinearity between the satisfaction variables and democracy concerns the cases used for estimation. If two variables co-vary substantially, coefficients will be estimated using the cases that do not vary (Voss, 2004). For satisfaction measured with alliances, the effects of democracy will be estimated without European dyads and with only few Western Hemisphere dyads as both dominate the jointly democratic dyads in alliance and, hence, greatly influence S. Similarly, the UN voting preferences of European states change little, are heavily satisfied, and are likely to be less influential in statistical models that jointly assess the impact of democracy and satisfaction on conflict. While space precludes a full discussion of other commonly used independent variables, substantial bias should also be present in models that employ capabilities, status, culture, and/or language while also considering the effects of satisfaction using alliance portfolios and UN voting. These biases should be considered when specifying any model of conflict that employs such proxy variables.

different indicators of satisfaction with the systemic status quo. I begin by outlining the traditional operationalizations of the various satisfaction indicators, and I then subject these indicators to two important tests of validity. First, I measure the inter-correlation properties of the indicators to determine convergent validity. Second, I measure the ability of each satisfaction indicator to predict overall citizen satisfaction scores in over 40 countries. Finally, I conduct systematic study of the relationship between joint satisfaction, joint democracy, and conflict, thus replicating Oneal and Russett's (1997) seminal study. I conclude with a summary discussion of the findings for each indicator.

Operationalizing Satisfaction

I calculate six satisfaction measures for every state-year in the system for which data are available during the years 1816 to 2000:

Alliance Portfolios – S and Tau B measures. The Tau B and S scores are state-level correlation statistics computed on a dataset of alliances. The dataset for these statistics include either the entire population of cases or a subset of cases based upon the Correlates of War region of each state. For each variable the most powerful state in the system is assumed to represent the systemic status quo, and correlation statistics that indicate marked deviation from the most powerful state are assumed to indicate dissatisfaction with the status quo. Since both the S and Tau B measures vary from –1 to 1, dissatisfaction is generally indicated by negative scores, while positive scores denote a satisfied state. I use the correlates of War data set on formal alliances to compute both statistics. The mean of Tau B with system leader is near 0 (0.08, sd=.33), and the mean for Tau B with regional leader is at 0 (sd=.41). However, the mean of the S with system

leader and S with regional leader are quite high [0.53 (sd=.25) and 0.39 (sd=.44), respectively], as less than 2% of the state-years have negative S scores.

United Nations Voting – S measure. I use Gartzke's (2000) data on United Nations voting; this is measured using the S statistic and computed including abstentions.[11] The UN voting measure is only available for years 1946 and after, and I include S scores until the year 1997. The mean of this S measure is 0.01 (sd=.40). I also computed the first differences of the measure in order to assess Gartzke's (1998) claim that UN voting is less ossified and potentially contains more information than alliance patterns. A comparison of first differences proves this point well – UN voting is 2.5 times more likely than any of the alliance measures to change from the previous year [a mean first difference of 0.005 (sd.=.18) versus 0.002 (sd.=.09) for Tau B with leader], though the bulk of that variation occurs in regions other than Europe. However, the mean first difference of the cost of money indicator is 0.02 (sd.=3.14), suggesting this measure includes even more variation, and possibly information, than UN voting.[12]

Cost of Money. The cost of money is the rate that sovereign borrowers must pay on the international market to raise capital. To operationalize this in a form that is comparable across all states, I use yearly averages of the long-term government bond rate for each state and compare this rate to the average yearly rates across each of the five regions used by the Correlates of War System Membership Data. The difference between the yearly

[11] The data without abstentions correlates at 0.98 with the measures for abstentions included.

[12] It is not clear that variation is necessarily an advantage for measures of systemic status quo. When measuring dyadic preferences, variation not based on strategic behavior can be a useful indicator of changes in state-to-state preferences. However, systemic rules are unlikely to vary much from year to year, and states that are satisfied (or dissatisfied) are likely to remain so absent large structural changes. In this sense, the *ability* of a measure to vary with structural changes would be important but that variation would not necessarily be observable. Still, the lack of variation in satisfaction measures across entire continents makes it almost impossible to differentiate between satisfied and dissatisfied states. Africa, for example, is often dominated by one or two large regional alliances, giving twenty or more states the same regional and leader satisfaction scores (see Lemke, 2002, for this point).

long-term government bond rate for each state and the regional average for that year corresponds to that state's cost of money. When the regional average is higher than the long-term government bond rate, I consider that state satisfied since its cost of money is generally cheaper than the rates paid by other states. When the average cost of money is lower, I consider the state dissatisfied with the status quo as the system is rating the state a riskier bet than its neighbors. To facilitate comparisons to the other satisfaction measures, I standardize this measure so that it also varies from –1 to 1. The mean of the standardized measure is 0.59 (sd.=.11), and it is used in all the analyses that follow.[13]

INTER-CORRELATION LEVELS AMONG INDICATORS

Correlations. It could be the case that each of the three conceptualizations of satisfaction is correlated with the other two measures. This inter-correlation would be ample evidence that all the measures are essentially tapping the same concept of satisfaction with the system-level status quo. However, as Table 1 clearly shows, no strong correlational relationship exists across the various measures.

***** TABLE 1 ABOUT HERE *****

Three points should be noted about the table of correlations. First, the choice among portfolio measures matters empirically. More than this, the choice of data for the same measure may alter results as the choice between UN voting data and alliance portfolios affects the correlation, even when using the same similarity statistic. It also matters whether the similarity measure is calculated at the regional or system level. In

[13] These relatively high averages for the S and cost of money measures should caution scholars to think carefully before dichotomizing these measures according to sign. Even with a mean of zero, creating dummy variables for the Tau B and UN voting scores loses too much information. Instead, I suggest employing continuous measures when the state is the unit of analysis and employing a "weak link" specification for all dyadic studies by using the lowest level of satisfaction in the dyad.

all, correlations among these measures range from 0.151 to 0.897 – a wide variation to say the least, and a variation that continues even when the same data are used to assess portfolio similarity.

Second, large differences persist among the same measures when United Nations voting is used instead of alliance ties. The largest correlation between the voting and alliance data is 0.381 (for the regional Tau B measure), and the correlation with the other S measures is less than 0.18. This latter point should discourage those interested in combining the alliance and voting data into a variable that spans the entire 1816 to 2000 time period, as these may not be comparable datasets.

Third, the cost of money measure is not strongly correlated with the portfolio similarity measures. Again, though significant at the $p<0.01$ level, the highest absolute value of correlation is 0.07, and the correlation between the cost of money and United Nations voting is not statistically significant at any conventional level. In sum, it matters greatly how satisfaction with the system is measured, and these correlation statistics demonstrate clearly that some of these indicators either are tapping different facets of the satisfaction concept or are not related to status quo satisfaction at all.

TESTS WITH AN EXPECTED RESULT

ICOW Territorial Claims. Since the correlations among the various measures of satisfaction yield no clear relationships, one method of determining the validity of a measure is by a comparison to a known or theoretically expected result. Adcock and Collier (2001: 542-543) refer to this as "nomological/construct validation", and the

rationale is quite simple – namely, an indicator "should fit well-established expectations derived from causal hypotheses that involve this concept."

In the case of satisfaction, the literature points dramatically to dissatisfaction as a cause for conflict, since dissatisfied states are those least likely to appeal to systemic rules in resolving their interstate claims (Geller, 2000). Therefore, I take as given that, ceteris paribus, *dissatisfied states will be more likely than satisfied states to initiate conflict to defend their claims*. A valid satisfaction measure should be able to confirm this relationship.

To complete this test, I use the innovative new ICOW data set from Paul Hensel (2001). ICOW is currently mapping all interstate claims made between 1816 and 2001; the claims are grouped according to issue. Currently, ICOW lists all dyadic claims made on North American territory between 1815 and 1997 with other regions soon to follow. The North American data provides a list of 3,060 dyad-years in which territorial claims were made. Force – defined as the initiation of a militarized interstate dispute (MID) – was used to defend those territorial claims in 114 separate dyad-years. Given the assumption that dissatisfied states are more likely to use force to settle their claims, I expect a valid measure of dissatisfaction with the status quo to be more likely to identify those years in which a territorial claimant initiates a MID. To test this expectation, I use separate bivariate probit models to jointly estimate the presence of a claim and the initiation of conflict after a claim so as to control for possible selection effects in the MID initiation model. I also control for the effects of several commonly used independent variables.[14] Table 2 presents the results of this test for each measure.

[14] I expect territorial claims to occur more frequently between contiguous states (measured using direct Correlates of War contiguity) and states at parity (measured using the Composite Index of National

***** TABLE 2 ABOUT HERE *****

The censoring models yield results that are consistent with the overall conflict literature. Allied dyads and dyads with high minimum Polity scores are less likely to have territorial claims while contiguous dyads are much more likely to experience these claims. Variations in coefficient size across these models are due to missing data in the outcome models, but the missing data points do not affect the substance of the results.

The outcome models in Table 2 show once again that the choice of satisfaction measure matters greatly. The two Tau B measures produce results significant at the 0.05 level; however, neither is in the expected direction. Instead, those states that are Tau B similar to the system or regional leader (the United States in both cases post-1945, and Britain as system leader prior to that) are *more* likely to initiate conflict to defend their claims. None of the three S measures is significant at any conventional level, though all are in the expected direction. Only the cost of money significantly ($p<0.01$) and correctly predicts the states less likely to initiate MIDs.

As the measures are not strongly correlated, it should come as no surprise that only one indicator is capable of correctly predicting the states likely to press their claims through force. However, the strong, positive relationship between the Tau B measures and the use of force is troubling. While the analyses are limited to the Western Hemisphere, satisfaction with the status quo is not generally thought to cause conflict among this set of states. To see if these results are an aberration or indicative of a larger trend, I use the next section to assess the relationship between the satisfaction measures and popular opinion regarding political satisfaction.

Capabilities data). I expect allied dyads (defined as any Correlates of War alliance) and highly democratic dyads (identified using the minimum Polity IV score in the dyad) to be less likely to experience territorial claims. These controls are similar to Hensel's (2001) controls when testing settlement attempts.

World Values Survey Data. The satisfaction measures are intended to gauge how states view the current distribution of benefits in the international system. Another way of determining whether states are receiving their fair share of benefits is to ask the citizens. This is exactly what the "World Values Survey" project did in three waves of questioning (1981–1984, 1990–1993, and 1995–1997). Headed by Ronald Inglehart (2000), the survey conducted a cross-national comparison of responses to over 200 questions related to individual attitudes on values and norms in over 50 countries by the 1995-1997 wave. Included in the surveys were at least 3 questions related to the satisfaction of the survey respondent with the status quo:

> Survey question #64: "All things considered, how satisfied are you with your life as a whole these days? [Range = 1 to 10, highest]"
>
> Survey question #152: "Where on this scale would you put the political system as it is today? [Range = 1 to 10, highest]"
>
> Survey question #165: "How satisfied are you with the way the people now in national office are handling the country's affairs? Would you say you are very satisfied, fairly satisfied, fairly dissatisfied or very dissatisfied? [1=very satisfied; 4=very dissatisfied]"

Domestic political and economic concerns will obviously play a primary role in these responses, but a proper indicator of status quo satisfaction should also be correlated with overall trends in state-level responses. After all, individuals should view their environment more favorably when they believe that their political and economic systems are functioning well.

To determine if this assumption is true, I averaged the survey data for each state and for each wave producing a total of 110 unique cases. The mean number of surveys for each state-wave was 1,418, and the range varied from a low of 96 questionnaires to a

high of 6,025 (standard deviation equaled 740.13).[15] I correlated the average scores for each state-wave with the alliance, UN, and cost of money measures from the year immediately prior to each survey wave, and Table 3 presents the results of these correlations.

***** TABLE 3 ABOUT HERE *****

The analyses show that the portfolio similarity measures using alliance data are correlated with answers to the question regarding life satisfaction and are in the expected direction. However and perhaps more importantly, the portfolio similarity scores are not significantly correlated with the political satisfaction questions. Only the cost of money measure is correlated with each question in any meaningful way, and each statistic is in the expected direction.

Obviously, it is asking quite a bit of these systemic satisfaction measures to predict individual responses to these three questions. Individual satisfaction could be influenced by personal economic well-being or even by such vagaries as an individual's mood at the time of questioning. Nevertheless, the fact that the cost of money is correlated with each of these questions, especially the political satisfaction questions, constitutes strong additional evidence confirming the validity of the measure.

In the above tests – with state behavior following territorial claims and with individual attitudes on survey data – the cost of money measure was more likely to perform as theoretical expectations would predict. This suggests that government bond rates are a more valid indicator of systemic status quo evaluations than either the Tau B or S measure as they are calculated now. To demonstrate how use of this measure may

[15] Question #64 was asked in all three state-waves, while the other two questions were added in later waves. This variation across waves and missing data account for the somewhat low number of cases in Table 3.

alter current findings regarding satisfaction, I completed two additional analyses. The first, available in a web appendix to this paper, examines three dyadic time periods and shows how the choice of satisfaction measure significantly alters the interpretation of events.[16] The second analysis, and the remainder of this paper, revisits the often analyzed Oneal and Russett (1997) data linking democracy and trade to peace. I demonstrate that only two system satisfaction measures have a statistically significant effect on the likelihood of peace, and of these two measures, the cost of money indicator has the larger substantive impact.

SATISFACTION, CONFLICT, AND DEMOCRACY

Oneal and Russett (1997) find that "the classical liberals were right" – democracy, economic growth and trade all reduce the likelihood of dyadic disputes, and their comprehensive model of conflict has been used in numerous studies to test the impact of various methodological controls (Beck, Katz, and Tucker, 1998; Reed, 2000) and substantive arguments (Gartzke, 2000; Oneal and Russett 1999). More importantly, Oneal and Russett (1997: 289) suggest that economic interdependence may be one way of determining "the value two states place on the status quo," and in this way, trade and openness would be better indicators of state interests than United Nations voting, alliances, or alliance portfolio comparisons. While Gartzke (2000) and Oneal and Russett (1999) estimated the impact of dyadic preferences on conflict between democracies, I test the effects of systemic status quo evaluations. Here, I replicate the original Oneal and Russett (1997) study, using their publicly available data. In addition to serving as a test

[16] http://anon

of the central hypothesis – that dissatisfaction causes conflict – the use of this dataset affords easy comparisons to other studies.[17]

To evaluate the impact of systemic satisfaction in the Oneal and Russett model, I use yearly measures of Tau B and S with alliance portfolio data, S with United Nations voting data, and government bond data – all operationalized as above. I include each indicator separately in re-estimations of Oneal and Russett's (1997: 278, Table 2) equation 4. This equation includes a minimum level of democracy in the dyad, the lower rate of economic growth in the dyad, whether the dyad is allied and/or contiguous, the capability ratio between the states in the dyad, and the dyadic level of trade interdependence and changes in that interdependence over the previous three dyad-years.[18] I employ corrections for temporal dependence but for space considerations report only the variables of interest in Table 4.

***** TABLE 4 ABOUT HERE *****

Each model confirms the results in Oneal and Russett (1997): democracy, economic growth, alliances, preponderance and interdependence all exhibit pacific effects on the dyad-year while contiguity increases the likelihood of observing a dispute. The addition of the satisfaction measures does not alter either the direction or statistical significance of these relationships. In fact, only two of the satisfaction measures are statistically significant at any conventional level – the S measure using alliance portfolio

[17] Lemke and Reed (1996) provide an additional argument for combining measures of satisfaction and democracy in a single model; they argue that satisfaction with the system status quo may provide an explanation for the lack of conflict between democracies. In other words, and consistent with the traditional literature on satisfaction, democracies are peaceful not because of their political systems, but they instead are peaceful because they have no reason to try to change the status quo. The democratic peace is thus largely a subset of dyads that are explained by power transition theory (1996: 160), and their study provides support for this argument.

[18] These variables have been described numerous times and are described in detail in Oneal and Russett (1997: 273-277).

comparisons to the United States and the cost of money. None of the other indicators have any effect on the likelihood of dyadic conflict in this model.

I compared the relative impact of the S alliance measure and the cost of money indicator against the minimum level of democracy measure by computing predicted probabilities for changes in each independent variable, as Oneal and Russett report in their Table 3 (1997: 279). First, I estimated a model that contained both the cost of money indicator and the S score with the leader using alliance data. I then computed a baseline probability of conflict for the model by holding all variables, except for alliance and interdependence trends, at their mean; the two exceptions were held at zero. This yielded a base probability of conflict equal to 0.088. Finally, I assessed the impact of S with leader, the cost of money, and minimum level of democracy by increasing each factor 10% of its total scale from the mean of the measure; in other words, I varied S and the cost of money by 0.20 from their respective means, and I varied democracy by 2 on the Polity scale. An increase of S by 10% of its scale yields a predicted probability of conflict equal to 0.059; an increase in the cheapness of money by one-third of its scale yields a predicted probability equal to 0.051; and an increase in the Polity scale by 2 equates to a 0.076 likelihood of conflict. These probabilities equate to 33%, 42%, and 13% reductions in the likelihood of conflict for the S, cost of money, and minimum democracy levels, respectively. Measured in this way, increased satisfaction with the status quo is more pacifying than increasing levels of democracy.

These results are obviously confirmatory in the context of the Lemke and Reed (1996) argument that satisfaction and democracy are both related to peace. The results also confirm the speculation by Oneal and Russett (1997) that status quo evaluations

matter in their model. Comparing the satisfaction measures, it is once again obvious that the choice of indicator matters. Four of the six measures imply that status quo satisfaction is not related to peace for this sample of dyads. Of the two measures that are significantly related to peace, the cost of money indicator has a moderately stronger impact. And as the cost of money measure is not well correlated with dyadic measures of similarity – United Nations voting and alliance portfolio – the indicator is unique in that it can be combined with dyadic preference data in expanded models of conflict.

FINAL ASSESSMENT – MEASURING SATISFACTION PROPERLY

Three groups of satisfaction measures were examined in this paper – alliance portfolio scores using S and Tau B, an S score using United Nations voting, and an indicator of the cost of money using government bond rate data. Though all have been used to indicate state evaluations of the status quo, correlation analysis showed that the measures were not significantly inter-related. This could mean that the various indicators are tapping different aspects of satisfaction, but it could also mean that some of the measures are simply not related to state satisfaction with the status quo.

The Tau B measures of alliance portfolios suffer from a lack of empirical support in these analyses. The indicators were plagued by inconsistent relationships to conflict and relatively weak associations overall. The Tau B measures are inversely related to the likelihood of conflict following a territorial claim, a seemingly easy test for a measure of satisfaction, and none of the measures are associated with the political satisfaction scores of the World Values Survey. These inconsistent and relatively weak findings add further

empirical evidence to Signorino and Ritter's (1999) claim that S is a superior measure of alliance portfolio similarity.

Even though the S measure may be theoretically superior to Tau B, it also suffers from a lack of empirical support when it is used to assess systemic status quo valuations. Neither S measure predicts MID initiation following a territorial claim. Neither S measure is associated with political satisfaction as measured by the World Values Survey, and while the S with leader is statistically significant in the full conflict model, its substantive effects are smaller than the cost of money indicator. These results, combined with the susceptibility this S has to sudden changes in alliance patterns, a strategic behavior among states, demonstrate that the cost of money may be a preferred way of measuring state evaluations of the systemic status quo.

The cost of money measure performed well in each test. According to Bueno de Mesquita (1990: 41-42) differences in the cost of money serve as an important indicator of state expectations regarding the future. Declining rates, or a decreasing cost of money, indicate the expectation that the future holds advantages for the state in comparison to other states; increasing rates are the harbinger for rough times ahead. Empirically, the government bond rate indicator demonstrated statistically significant results, in the expected direction, for each analysis. The cost of money is related to the probability of a dispute following a territorial claim, political and overall satisfaction in states as measured by the World Values Survey, and the probability of dyadic conflict. This measure also has a theoretical advantage over the portfolio measures since no assumption has to be made regarding the satisfaction level of the dominant state.

The major drawback of using government bond rates is the relative dearth of data, especially for 19th century states. The number of cases was reduced by more than half in many of the analyses due to missing data. This problem can be greatly ameliorated by a large data collection effort, but for a significant minority of cases, the data probably do not exist. In spite of this drawback, the consistent and strong results suggest the cost of money constitutes the best indication we have of whether a state is satisfied with the systemic status quo. And as the replication of Oneal and Russett's (1997) work shows, its usage will provide a fruitful avenue for continued investigations into the relationship between satisfaction and conflict.

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Table 1: Pairwise correlation coefficients for 6 measures of Satisfaction with the Systemic Status Quo

	1.	2.	3.	4.	5.
1. Tau B using global alliance data	-----				
2. Tau B using regional alliance data	**0.897** N=12,830	-----			
3. S using global alliance data	**0.531** N=12,830	**0.492** N=12,830	-----		
4. S using regional alliance data	**0.456** N=12,830	**0.697** N=12,830	**0.585** N=12,830	-----	
5. S using United Nations voting data (Includes the use of abstentions.)	**0.338** N=6,005	**0.381** N=6,005	**0.175** N=6,005	**0.151** N=6,005	-----
6. Government Bond Rate data	**0.066** N=4,305	**0.071** N=4,305	**0.029** N=4,305	**0.045** N=4,305	0.046 N=1,365

Note: **Boldface** correlation coefficients are significant at $p<0.01$. The number of observations varies due to missing data.

Table 2: MID Initiation after Territorial Claims -- Assessing the Ability of Each Satisfaction Measure to Predict Conflict using Bivariate Selection Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent Variable:	MID initiation	MID initiation	MID initiation	MID initiation	MID initiation	MID initiation
Selection Variable:	Territorial Claim	Territorial Claim	Territorial Claim	Territorial Claim	Territorial Claim	Territorial Claim
Data Set:	North American Dyads	North American Dyads	North American Dyads	North American Dyads	North American Dyads	North American Dyads
Time Period:	1816-1992	1816-1992	1816-1992	1816-1992	1816-1992	1816-1992
Outcome Model (MID initiation in dyad):						
Challenger Satisfaction with System						
Tau B using global alliance data	.379 (0.123) ***					
Tau B using regional alliance data		.328(.123) ***				
S using global alliance data			-.228(.364)			
S using regional alliance data				-.186(.157)		
S using United Nations voting data					-.249(.176)	
Government Bond Rate data						-3.104(.947) ***
Constant	-1.655(.116) ***	-1.648(.114) ***	-1.498(.301) ***	-1.546(.156) ***	-1.214(.301) ***	-2.247(.177) ***
Censoring Model (ICoW Territorial Claim in dyad):						
Parity	-.182(.041) ***	-.182(.041) ***	-.182(.041) ***	-.182(.041) ***	-.246(.065) ***	-.200(.062) ***
Contiguity	1.792(.022) ***	1.792(.022) ***	1.792(.022) ***	1.792(.022) ***	1.378(.035) ***	1.843(.034) ***
Minimum Polity Score	.000(.001)	.000(.001)	.000(.001)	.000(.001)	.012(.003) ***	.004(.001) ***
Allied	-.470(.022) ***	-.470(.022) ***	-.470(.022) ***	-.470(.022) ***	.625(.042) ***	-.787(.037) ***
Constant	-2.018(.020) ***	-2.018(.020) ***	-2.018(.020) ***	-2.018(.020) ***	-3.001(.045) ***	-2.429(.031) ***
Rho	-.122(.072)	-.106(.071)	-.084(.071)	-.084(.071)	-.164(.132)	.222(.112)
N uncensored	3,060	3,060	3,060	3,060	754	1,229
N censored	58,800	58,800	58,800	58,800	58,800	58,800
Wald $c^2(1)$	9.40**	7.09**	0.39	1.40	2.01	10.75**

***p<0.01; **p<0.05; *p<0.01

Table 3.Pairwise Correlations between State Satisfaction Measures and Individual Satisfaction Responses to World Values Survey

Question #64: **"All things considered, how satisfied are you with your life as a whole these days? [Range = 1 to 10, highest]"**
Question #152: **"Where on this scale would you put the political system as it is today? [Range = 1 to 10, highest]"**
Question #165: **"How satisfied are you with the way the people now in national office are handling the country's affairs? Would you say you are very satisfied, fairly satisfied, fairly dissatisfied or very dissatisfied? [1=very satisfied; 4=very dissatisfied]"**

Sample comprised of average responses to 3 waves of questioning (1981-4; 1990-93; 1995-97) in over 60 countries.
N denotes number of state-years for which response and satisfaction measure data is available.

Question:	***#64***		***N***	***#152***		***N***	***#165***		***N***
Satisfaction Measures	***Corr.***			***Corr.***			***Corr.***		
Tau B using global alliance data	0.423	***	102	0.048		40	-0.048		42
Tau B using regional alliance data	0.445	***	102	0.170		40	-0.210		42
S using global alliance data	0.331	***	102	0.058		40	-0.061		42
S using regional alliance data	0.206	**	102	0.249		40	-0.378	*	42
S using United Nations voting data	0.000		92	-0.085		37	0.329	*	39
Government Bond Rate data	0.424	***	55	0.579	***	16	-0.583	**	16

*****p<0.001; **p<0.01; *p<0.05**

Table 4: Replication of Oneal and Russett (1997) -- Models of Involvement in Militarized Disputes: Assessing the Liberal Peace

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent Variable:	MID Onset	MID Onset	MID Onset	MID Onset	MID Onset	MID Onset
Data Set:	All dyads	All dyads	All dyads	All dyads	All dyads	All dyads
Time Period:	1950-1985	1950-1985	1950-1985	1950-1985	1950-1985	1950-1985
Minimum Democracy Score	-.041(.008) ***	-.045(.008) ***	-.038(.008) ***	-.045(.008) ***	-.042(.008) ***	-.056(.009) ***
Economic Growth Rate	-.021(.009) **	-.022(.009) **	-.024(.009) **	-.023(.009) **	-.025(.009) **	-.023(.014) *
Allies	-.736(.097) ***	-.800(.091) ***	-.651(.089) ***	-.799(.086) ***	-.751(.086) ***	-.920(.136) ***
Contiguity	1.383(.083) ***	1.389(.083) ***	1.379(.083) ***	1.404(.085) ***	1.398(.086) ***	1.674(.099) ***
Capability Ratio	-.003(.000) ***	-.003(.000) ***	-.003(.000) ***	-.003(.000) ***	-.003(.000) ***	-.001(.000) ***
Dyadic Trade-to-GDP	-80.942(15.200) ***	-81.286(15.246) ***	-79.312(15.260) ***	-81.844(15.311) ***	-76.027(15.006) ***	-140.397(25.198) ***
Trend, Trade-to-GDP	-8.892(2.920) ***	-8.892(2.920) ***	-8.827(2.931) ***	-8.904(2.924) ***	-9.341(2.950) ***	-7.569(3.399) **
Satisfaction Indicator						
Tau B with Leader	-.267(.173)					
Tau B with Regional data		.045(.110)				
S with Leader			-1.099(.219) ***			
S with Regional data				-.054(.071)		
United Nations Voting data					-.097(.118)	
Government Bond data						-1.956(.668) ***
Constant	-3.327(.082) ***	-3.325(.085) ***	-3.016(.100) ***	-3.333(.085) ***	-3.362(.085) ***	-2.224(.400) ***
N	19,772	19,772	19,772	19,772	19,038	13,127
LR Chi-square	730.98 ***	728.73 ***	753.46 ***	729.14 ***	683.17 ***	577.70 ***
Pseudo R^2	0.102	0.101	0.105	0.101	0.100	0.131

*p<0.10; **p<0.05; ***p<0.01

WEB APPENDIX—

Three Dyads and Empirical Measures of Satisfaction with the Systemic Status Quo

One way of demonstrating the differences between measures of satisfaction is by comparing their scores in specific cases. To accomplish this, I chose two time periods during which major states were at war – the Franco-Prussian War and the Spanish-Chilean War. The former case is one of the most important war cases according to power transition theory (see Siverson and Miller, 1996: 62; Organski and Kugler, 1980), while the latter case demonstrates the effects regional variation has on each of the measures. I also demonstrate how the measures behave in the UK-US dyad from 1916 to 1960 as the United States eclipsed Britain as system leader. Obviously, these cases were not chosen randomly, and no inferences beyond these cases should be drawn from the comparisons. This discussion is for heuristic purposes only, but these cases should provide good descriptive examples of how the cost of money can differ from the portfolio measures.

The Franco-Prussian War began on July 19, 1870, and ended on February 26, 1871. Prussia was able to isolate France in part through a treaty of benevolent neutrality with Russia and an assurance of Belgian neutrality with England. The Austro-Hungarian Empire was a threat to Prussia that never materialized thanks to early Prussian victories (Langer 1968: 736). The effects of the neutrality agreements on the S score ratings of Prussia are quite interesting. According to this satisfaction measure, Prussia had reached a low S of 0.35 in 1866, but the neutrality agreements brought its portfolio closer to the system leader, Britain. By the time the war began, Prussia had risen to an S of 0.66, and by the time the war ended, its S score neared France's S of 0.87. The effects of the alliances are even more dramatic for the Tau B measure, moving Prussia from negative to

strongly positive satisfaction levels. Apparent in all four measures is that neither state seems dissatisfied with the status quo prior to the war; also apparent is that the strategic behavior of these states highly affects their supposed preferences for the system.

***** SEE FIGURE 1 *****

The cost of money data tell a similar story of the satisfaction levels of these states, but the bond rates seem much more responsive to changes in the regional environment. In 1866, Prussia's bond rate was 4%, France's rate was 4.4%, and both benefited against a regional average of 4.6%, so prior to the outbreak of war, both states found money cheaper, but the market was rating Prussia a safer risk. Prussia's bond rate held relatively steady, fluctuating between 4 and 4.6% until unification (1871) and even during the ten years after. France's rate climbed only during the late 1860s, reaching a high of 5.6% in 1870, but even this high was much lower than the regional average of 10% during 1870 and 6.5% in 1880. Overall, the outbreak and aftermath of war caused France's rate to rise to 8% by 1872. France's cost of money remained higher than Prussia's throughout the war, matched Prussia's rate in the two years following the war, and once again fell below Prussia's in the third post-war year. Interpreting these scores as samplings of the satisfaction levels of both states, France was satisfied with the status quo prior to the war, became less satisfied as it suffered heavy losses at the hands of the Prussian army, and was once again returning to pre-war satisfaction levels as it recovered from the effects of war.

The Spanish-Chilean War of 1865 and 1866 (also called the Chincha Islands War) was fought over the guano-rich islands off the Pacific Coast of South America. Spain attempted to seize the islands from the Peruvians, but failed miserably against Peruvian

and Chilean forces. Though Peru won the war, the price of guano fell sharply within five years and destroyed the Peruvian economy. Plummeting guano prices also coincided with the discovery of rich nitrate deposits in western Bolivia; the nitrate discovery increased tensions in the region as Chile proffered claims to the resource-rich territories. While Peru offered good offices in mediation, Chile responded with a demand for Peruvian neutrality and having failed to achieve this neutrality pledge, Chile attacked Bolivia and Peru. In the end, the Pacific War (1879-1883) cost Peru dearly as it ceded several coastal provinces to Chile.

***** FIGURE 2 ABOUT HERE *****

Figure 2 maps the changes in the satisfaction indicators for the three states involved in the 1865 war. The regional and leader Tau B for both South American states are negative throughout, suggesting two dissatisfied states even though both prospered until the Pacific War (and Chile prospered thereafter). The regional and leader S also drop for both states as a regional multilateral alliance ends. Peru's leader S then climbs to a high of 0.8 immediately after it lost several provinces (1884) because it had just completed an alliance with Bolivia to prosecute the war. Meanwhile, Spain's alliance measures are heavily controlled by the formation and dissolution of an alliance with France to recoup monies owed by Mexico; this alliance reverses the strongly negative Tau B scores and masks the overall distancing of Spain from the rest of the continent until the ententes formed during the late 1880s.

The cost of money was stable for Chile throughout the latter half of the 19th century, averaging roughly 6%. The regional average fluctuated greatly, however, and this was mostly due to Peru's climbing rate during the 1870s. Peru was paying a high of

52% on government bonds by 1877, against a regional average of 10%; though the economy began to recover by the end of the century, money was always more expensive in Peru than anywhere else in South America. Money was relatively cheap in Spain compare to the rest of Europe, at least until the war with Chile. Then the defeat of Spanish forces and declining money prices elsewhere on the continent, led to price adjustments that left Spain paying premium prices for money after 1872. This premium amounted to 10.5% versus an 8% regional average in 1872 and continued at a rate of 2-3% greater than the rest of Europe for the next 25 years.

The case of the Spanish-Chilean War demonstrates well the susceptibility of the S and Tau B measures to fluctuations in alliance patterns caused by conflict. Indeed, Peru's attempt to secure allies artificially increased its satisfaction with the status quo as measured by the portfolio scores, and the Spanish decision to compel Mexican repayments caused fluctuations in the portfolio scores, especially the Tau B, that masked the effects of Spanish territorial claims and battlefield failures. Only the cost of money indicator accurately responded to economic and territorial changes among the three states, as Peru and Spain became riskier havens following the loss of territories and sovereign wealth.

The final illustrative case is the period between 1915 and 1960 for the United States and Britain. As I mentioned earlier, most calculations of S score data consider Britain to be the system leader until 1945 when the US becomes guarantor of the status quo. This makes the trend lines in the scores less interesting, but it also brings into focus the effects of the assumption that the system leader is satisfied with the status quo. For example, the S score of the US had declined to its lowest point (0.15) during the last year

of World War II – a year that followed lend-lease for Britain and intense cooperation among the allies – and Britain's S score had reached a low of 0.14 immediately following World War II with the ending of the war-time alliances. This S score is replaced the following year by a score of 1.0, complete satisfaction with itself. The S for UN voting offers no leverage since it assumes complete satisfaction, even though United States policy was often at odds with the outcomes of many General Assembly resolutions.

The effects of the alliance data on British scores are most apparent in the years immediately after World War II. For example, in 1946, the Soviet Union actually had a higher S leader score than the British with a score of 0.68 versus 0.14 for Britain, even though Cold War tensions were already surfacing. Of course, this S score is higher than the extremely negative regional S and Tau B measures; both are below –0.80 because the regional measures are dependent upon British similarity to the Soviet Union, the regional leader for Europe. The United Nations voting data offers a more consistent and realistic assessment of British sentiment, but an examination of the voting agenda suggests that most Anglo-American disagreement, and hence most of the variation in the measure, originated from votes on the fate of colonial territories in Southern and Saharan Africa, an issue not at all central to the Anglo-American relationship.

***** FIGURE 3 ABOUT HERE *****

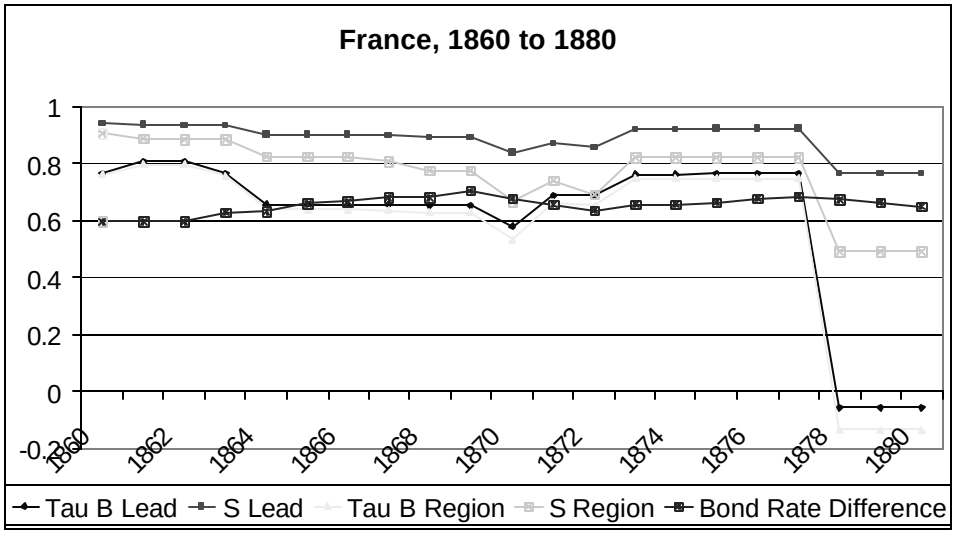
The government bond rates for both the United States and Britain remain stable during the early part of the twentieth century. The United States found money relatively cheap throughout the period, especially compared to other Western Hemisphere states but also compared to the major European states. The rate for money in the United States averaged 4% during the first part of the interwar period and 3% from 1934 until the

middle 1950s. Each of these averages was 2-3 points lower than regional and European averages at the time. The British rate was similarly stable. The cost of money in Britain was near 5% during the early part of the interwar period and fell to 2.7% against a continental average of 5.4% in 1934. This rate rose slowly during World War II (3.7% versus an average of 6%) but dropped after the defeat of Germany (2.5% versus 3.6% averages). By 1956, however, British domestic troubles – severe labor and debt problems – pushed their cost of money moderately higher than rates obtained on the continent (4.9% in Britain versus an average of 4.75% on the continent), and this margin continued until the middle 1960s. In sum, the cost of money indicator demonstrates two states that are generally satisfied with the status quo, and as British economic performance declined relative to the continental states of Europe, so did its level of satisfaction. The assumption of a satisfied leader is not needed for this indicator as satisfaction is confirmed empirically.

These three cases have been used to demonstrate some of the pitfalls associated with using S score data to indicate the satisfaction of states. The two war cases suggest S can become conflated with alliance patterns immediately prior to war. The case of peace between the US and Britain exhibits both the effects of the assumption regarding a satisfied system leader as well as the effects of formal isolation. In all three cases, the choice of indicator can greatly affect interpretations of state satisfaction with the status quo, but again, the cases above are used for illustrative purposes only.

Langer, William L. (1968). An encyclopedia of world history. 4th ed. Boston, MA: Houghton Mifflin.

Figure 1: Satisfaction Measures and the Franco-Prussian War



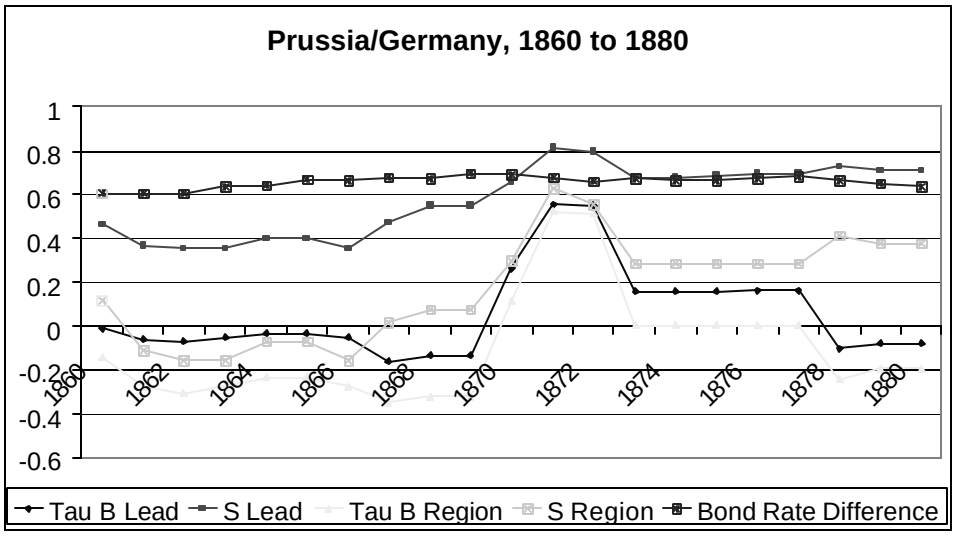
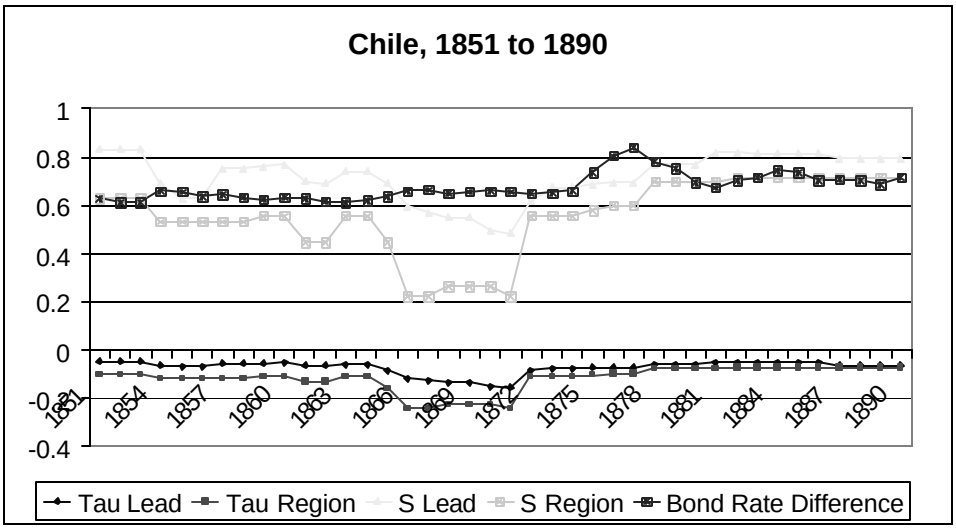
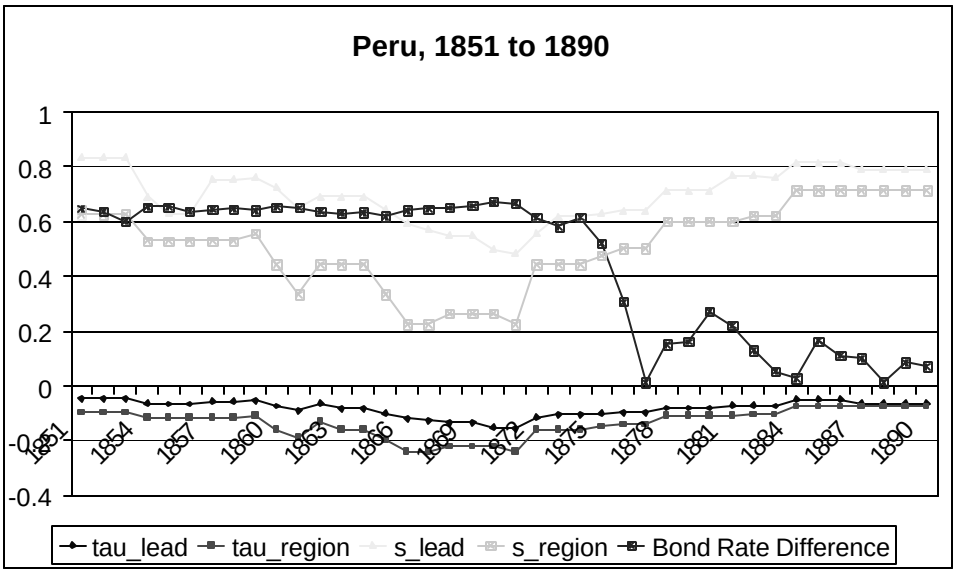


Figure 2: Satisfaction Measures and the Spanish-Chilean War





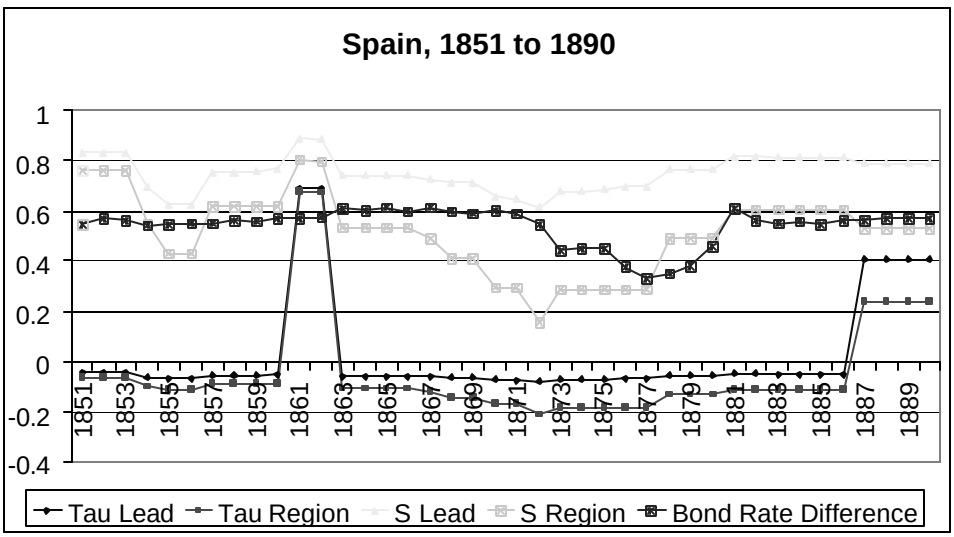


Figure 3: Satisfaction Measures of the System Leaders, 1916 to 1960