

The Dynamics of Reciprocity, Accountability, and Credibility ¹

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Abstract

Do public opinion dynamics play an important role in understanding conflict trajectories between democratic governments and other rival groups? We interpret several theories of opinion dynamics as competing clusters of contemporaneous causal links connoting reciprocity, accountability and credibility. We then translate these clusters into four distinct Bayesian structural time series models. The models are fit to events data from the Israeli-Palestinian conflict with variables for U.S. intervention and Jewish public opinion about the prospects for peace. We find that a credibility model, which allows Jewish public opinion to influence U.S., Palestinian, and Israeli behavior within a given month, fits the data best. For the credibility model there is evidence that more pacific Israeli opinion leads to more immediate hostility by the Palestinians toward the Israelis. The direction of this response suggests a negative feedback mechanism in which low level conflict is maintained and momentum toward either all out war or dramatic peace is slowed. In addition, a forecasting model that includes Jewish public opinion is shown to forecast *ex ante* better than a model that ignores this variable.

Keywords: conflict dynamics, Bayesian inference, Israel-Palestine, forecasting

1 Introduction

Much progress has been made recently in the analysis of conflict processes. Reciprocal behaviors, uncovered in the Balkans and Middle East, it is argued, are the bases for cooperation and peace.

The same is true for the triangular relationships that researchers find in these and other conflicts. Third party intervention in conflicts, especially by great powers, also can promote cooperation and peace. What has not been studied is how and when public opinion affects conflicts. Does public opinion discourage or encourage local leaders to reciprocate a rival's behavior? Do local publics monitor international conflicts and hold leaders accountable for policies that do not match public preferences? Do leaders use public opinion in a rival to gauge the credibility of signals they receive from those adversaries? We will not understand how conflict depends on domestic politics, including democratic politics, until we focus on this interplay between the domestic and international arenas.²

Up to this point answering these questions has been difficult for several reasons. First, domestic politics is embedded in the conflict system. This is a system of multiple relationships (equations) between the behaviors of several governments. Any model purporting to capture domestic politics must be of moderate to large scale. Endogeneity is a second problem. Political accountability, if it exists, implies that opinion formation and expression are both a cause and a consequence of government policy. Reciprocity and triangularity imply endogeneity as well. Models that impose strong exogeneity restrictions therefore are liable to produce results that are biased. Finally, any link between conflict and domestic political dynamics is likely to exist at a sub-annual level of temporal aggregation. Public opinion likely reacts quickly to hostile actions, and leaders may monitor these reactions and rapidly translate them into policies.

We assess the impact of domestic politics on international and inter-group conflict in a way that solves these three problems. Reciprocity, accountability, and credibility are interpreted as particular causal links between governments' behaviors and public opinion. Expectations about these linkages are described and translated into a framework that captures competing claims about the structure of contemporaneous relationships among the measures of dyadic behavior and public opinion. These specifications can be contrasted with the common practice of using a recursive identification scheme, a scheme that assumes one-way contemporaneous causality. Our competing specifications are key elements of multi-equation, Bayesian time series models with complex,

endogenous relationships among variables. These models are fit to data for the Israeli-Palestinian conflict with provisions for U.S. intervention. This case is especially useful for testing the competing theories because the Kansas Event Data System (KEDS) and other event databases provide temporally disaggregated records of the behaviors of the belligerents and of the U.S. Equally important, the Tami Steinmetz Center for Peace Research regularly polls Israeli citizens about prospects for and impacts of peace initiatives. For the first time in a major conflict, the impact of public opinion on reciprocity, accountability and credibility can be assessed.³

The paper has three parts. Part One derives competing arguments about the impact and origins of public opinion on conflict dynamics. The research design in Part Two translates the competing arguments into four Bayesian time series models. These models are presented in Part Three. We find that a cross-level credibility model that supports asymmetric reciprocity between democratic and non-democratic belligerents best fits the data. In this model there is evidence that more bellicose Israeli opinion leads to more immediate cooperation by the Palestinians. This supports the credibility model since Palestinians account for changes in Jewish public opinion. The direction of this response suggests a negative feedback mechanism whereby low level conflict is maintained and momentum toward all out war or dramatic peace is slowed. Finally, in order to further demonstrate the importance of public opinion on conflict dynamics, we evaluate two reduced form forecasting models. The first incorporates Jewish public opinion. It is used to forecast *ex ante*, nine months forward from March 2005. The forecasts show a rapid deterioration in Israeli-Palestinian relations. These *ex ante* forecasts predict steadily deteriorating relations between the Israelis and Palestinians even if Kadima and Hamas had not won elections in that year. The risk of a significant increase in conflict—based on the confidence regions—is high. The forecasts based on the model incorporating Jewish public opinion also show that the level of violence and support for peace move in opposite directions. The alternative forecasting model omits the Jewish public opinion series. It performs much worse because it ignores the predictive impact of public opinion and thus accountability and credibility on the conflict dynamics.

2 Reciprocity, Accountability and Credibility

Figure 1 presents the possible relationships that may exist between leader behaviors in two rivals A and B where, as in our study, systematic public opinion information is only available for one rival. In what follows we review different theoretical arguments about the linkages depicted in this diagram.

[Figure 1 about here.]

2.1 Reciprocity

One important branch of international relations and conflict research investigates the role of reciprocity in foreign policy. Building on Axelrod (1984) and repeated non-zero sum games (e.g., iterated prisoners' dilemma), many scholars have found that cooperative diplomacy from one actor (foreign policy behavior of A to B) begets cooperative diplomacy from the target (foreign policy behavior of B to A). This theoretical result suggests that cooperation can be built upon bilateral strategies even when temporary incentives to defect exist. For instance, if one group has an opportunity to win disputed territory from another, it may choose not to attack since this could discourage cooperation in the future. The prevalence of these tit-for-tat strategies has been empirically identified in Cold War relations, and triangular relations between the U.S., U.S.S.R. and China (Goldstein and Freeman, 1990), in Indian-Pakistani relations (Ward, 1982), in the Middle East (Goldstein et al., 2001) and in the Balkans (Goldstein and Pevehouse, 1997). Scholars have been able to show that similar action-reaction sequences exist in sub-national conflicts (Moore, 1998; Shellman, Reeves and Stewart, 2007).

Extensions of the reciprocity literature relate bilateral cooperation to third party intervention or mediation (Goldstein and Freeman, 1990; Brandt and Freeman, 2006; Hudson et al., 2006). Goldstein et al. (2001) report that the U.S. was able to alter Iraqi behavior toward its neighbors and Israeli behavior toward the Palestinians in the 1980s. The modeling of these triangular relations has allowed reciprocity-related research to focus not only on spirals of conflict and cooperation,

but also to explain more complex multi-actor situations.

Despite the strong evidence of reciprocity and action-reaction sequences in international affairs, there are at least three remaining issues. First, some tests of reciprocity miss the implications of endogeneity and lagged relationships. Two approaches have been employed. One is used in almost every empirical model that claims evidence for reciprocity and triangularity. This is Granger causality analysis. This method looks only at the bivariate relationship between how *past* actions affect today's actions. It ignores the endogeneity of multiple belligerents, third-parties, and outside pressures (e.g., Goldstein and Pevehouse, 1997; Goldstein et al., 2001). A second approach looks at the contemporaneous and dynamic responses (i.e., the structural relationships) between belligerents. But most of these works employ a naive causal chain where the shocks to the equations for each actor enter the model in a pre-specified, recursive order (e.g., Goldstein and Freeman, 1990).⁴ This implies that a surprise action by one actor (A to B) can have a simultaneous impact on the behavior of another actor (B to A), but that the targeted actor's surprise action (B to A) behavior can only influence the first actor's behavior (A to B) with some pre-specified time lag. The assumption is that no two variables in the model have contemporaneous, two-way causality within the period of analysis. While this set of assumptions may be useful in some applications, and identification requirements must be met for estimation and interpretation in all models, we believe that there is no theoretical or practical reasons to assume conflict dynamics form a simple one-way causal chain. Here, we will offer an alternative non-recursive approach to reciprocity and other conflict dynamics.⁵

Second, we have a very poor understanding of what causes deviations from tit-for-tat behavior. Why do some leaders such as Gorbachev during the twilight of the Cold War, step out on a limb and offer cooperation to a rival? Why do other leaders feign cooperation and then attack an adversary as in Operation Barbarossa during World War II? Deviations from reciprocity reflect dramatic historical events. If this unexplained variance follows a predictable pattern, what theories can help us explain it?

Finally, reciprocal behaviors may be asymmetric across groups with one government or au-

thority reacting more strongly than another (Ward, 1982). What explains this action-reaction mismatch? Since democratic leaders must pay attention both to foreign and domestic conditions for political survival (Bueno de Mesquita et al., 2003), and likely rivals know this, public foreign policy support for cooperation and conflict may explain the variation in reciprocal behaviors, unilateral deviations, and dyadic asymmetry.

2.2 The Intersection of Domestic and World Politics

A branch of research extending reciprocity models explains conflict and cooperation as a function of domestic institutions and politics. Putnam (1988), Fearon (1994, 1998), and Bueno de Mesquita et al. (2003) view world politics as a two-level game where elites sit at the insticese of foreign and domestic politics. Leaders must worry about whether their constituents support the agreements they negotiate with particular groups and with other countries. Within identifiable institutional contexts citizens can hold leaders accountable for their foreign policy choices. Specifically, we view accountability as the linkage between public support in country A for cooperation with country B and foreign policy behavior of country A to B (see Figure 1). Leaders who ignore their public's support for cooperation/conflict with a given group (country) may be voted out of office, for example. A potential repercussion of this accountability process is that leaders who can generate high audience costs for their policies can more credibly communicate resolve in international conflict situations (Fearon, 1994; Martin, 2000). For this reason, some international relations forecasters argue that scenario generation must anticipate public opinion changes (Sylvan, Keller and Haftel, 2004; Sirriyeh, 1995).

Research on the causes of reciprocal behavior suggests that domestic preferences play an important role in explaining conflict. McGinnis and Williams (2001) aver citizens' preferences constrain leaders' tit-for-tat interactions. In their "rivalry-as-prison" or Goldilocks hypothesis, the public prefers conflicts to remain in some limited range of interactions. Policies that are too dramatic in either a cooperative (too cold) or bellicose (too hot) direction are costly domestically. Again, their policies may cause voters to remove incumbents. Under such constraints, leaders

spend their time reciprocating each other's limited cooperative or bellicose policies. Guisinger and Smith (2002) and McGillivray and Smith (2000) hypothesize that in democracies the public prefers to pocket the gains that accrue from reciprocated cooperation rather than to defect for a one-time payoff that makes long term cooperation impossible. For these reasons, the public is expected to punish a leader who does not engage in reciprocity. In these explanations, the public constrains a leader's behavior and supports reciprocal outcomes. But this begs the question: can deviations from reciprocity be explained by changes in the public's foreign policy preferences? If so, then public preferences on foreign policy processes could aid in forecasting and understanding international conflict.

2.3 Counterclaims: A Flock of Followers

All scholarly voices do not sing the praises of domestic political explanations. Lippmann (1922), Almond (1965), Morgenthau (1967), and Rosato (2003, 599) question the public's ability to comprehend, process, and intelligibly guide foreign policy. Because of knowledge and interest deficits between the public and foreign policy elites, it is hypothesized that leaders can manipulate citizens. These authors point to the rally-'round-the-flag effect as evidence that when a leader tells the public to jump, approval jumps. Thus a leader is not constrained by the public since citizens will follow and rally to the government. This follower model predicts that information on public preferences is not useful in understanding policy.

Evidence for the rally-effect and public knowledge deficits is mixed. While there is some evidence that a rally-'round-the-flag effect exists in the U.S. and Britain, this does not mean that public preferences are meaningless in predicting international events in these cases. Colaresi (Forthcoming) shows that the rally varies considerably from crisis-to-crisis in ways that can be predicted from an accountability-based signaling model of foreign policy decision-making. Aldrich, Sullivan and Borgida (1989), Page and Shapiro (1995), and Holsti (1996), argue that public opinion is more stable and reasonable than either Almond or Lippmann credit. The empirical question remains, however, in foreign policy, who is the leader and who is the follower?

Challenging the public-as-follower model, Wlezien (1996), Eichenberg and Stoll (2003), Baumgartner and Jones (2005) show that in many circumstances not only do leadership cues fail on defense issues, but the public reacts in the opposite direction. When holding public preferences constant, and a leader changes his policy toward conflict, the public is likely to react not by changing its mind to support more conflict but by pulling in the opposite direction and supporting more cooperation. This is identified by Baumgartner and Jones (2005) as a negative feedback mechanism. This negative feedback is consistent with the McGinnis and Williams' (2001) Rivalry-as-Prison effect since the public hems in policy rather than blindly following leadership cues.

There are competing claims about the effects of foreign policy change on public preferences in the public-as-follower model. The public-as-follower model suggests that the public is attracted to a leader's policy. A leader's shift to a more cooperative international policy creates more cooperative public preferences. Alternatively the negative feedback mechanism of Baumgartner and Jones (2005) implies that the public will be repulsed by a change in policy. Instead of following a cooperative policy, people are likely to move in a bellicose direction and hold their leader accountable for his or her policies.

2.4 On the Other Side(s): Cross-level Credibility

Rivals and potential mediators may base their policies on the accountability dynamics of their adversary. Putnam (1988), Fearon (1994), and Martin (2000) suggest that leaders look across the water's edge to gauge the credibility of any bargaining strategies. An important component of Putnam's two-level game framework is that leader B will examine the public preferences constraining leader A to determine if an offer/action is a bluff. The greater the constraints on leader A from leader B's perspective (the farther the public preferences in country A are from leader B's ideal outcome), the greater the credibility of an uncompromising offer from leader A. If the relevant public is unsupportive of peace, regardless of the offers made by leader A, leader B does not have an incentive to offer extreme cooperation.⁶ Even if the other side offered to reciprocate, it is unlikely that this cooperation would be ratified. For instance, Shlaim (2001) notes that Nasser

avoided cooperative gestures toward Israel for fear of both his own public's negative reactions, *as well as the Israeli public's negative reactions*. Conversely, as a public becomes more supportive of collaboration, a peace-seeking rival may suggest greater cooperation, since citizens are now more likely to support any agreement. This implies that there is a relationship between the foreign policy behavior of country B to A and public support in A for cooperation with B (see Figure 1).⁷ But the dynamics of credibility may not be unidirectional. Page and Shapiro (1995) and Holsti (1996) suggest that the public bases its support of or opposition to cooperation on available information, including a rival's actions.⁸

2.5 From Theory to Models: Problems and Solutions

In this section the preceding arguments are organized into four models of international conflict, which are then applied to the Israeli-Palestinian case. The translation of these theories into testable models of conflict and cooperation is nontrivial. These models suggest a highly dynamic, endogenous, and large scale data generation process. For example, reciprocity, triangularity, accountability and credibility relationships imply that international actions and public preferences are dynamic. Previous changes in policy/preferences are likely to affect *current* changes in policy/preferences. These frameworks also suggest that current changes in many variables simultaneously affect other variables. If a leader is worried about political punishment for deviating from public preferences, a surprise change in those public preferences may lead to a simultaneous change in policy to bring conflict and cooperation into line with those preferences. Similarly, a watchful public might alter its opinion about a conflict immediately after witnessing a surprise change in a rival's policy toward its country. The temporally aggregated data used in many existing studies often masks this kind of public reaction (thus increasing the role of endogeneity). Finally, focusing on the directed-dyadic behavior of two rivals, allowing for great power intervention, and taking into account the possibility of accountability and credibility, produces a model that includes at least seven or more equations. Allowing lagged effects of variables, the number of parameters in the model will grow exponentially as we add relevant actors and more equations.

To cope with these problems, the ideas described above are represented as four competing sets of relationships. Schematically, Figure 1 is translated into Table 1. This table captures the possibility of different “two-way” interactions embodied in the concepts of reciprocity and credibility. The model of interactions assumes there is a separate behavior equation for each of the dyadic interactions between rivals. In the table, the foreign policies of actor A (B) toward actor B (A) is denoted by $Policy_{A \rightarrow B}$ ($Policy_{B \rightarrow A}$), and public opinion in the political jurisdiction of actor A as $Public_A$. The column labeled $Policy_{Z \rightarrow A}$ represents outside intervention by Z toward A. The rows are the behavioral relationships (equations) to be modeled for each of the four theories of rivalry and public interactions. The columns are the independent variables, the surprise changes or “shocks” in policy and opinion. A “Yes” represents an expectation that the column variable will influence the row equation simultaneously. A “No”-entry indicates an expected zero restriction.

The first set of ideas, the *bystander model*, contends that the public plays no role in foreign policy. The public pays little attention to conflictual and cooperative events. In this view, previous scholarship on reciprocity and triangular relationships is correct in ignoring public opinion in its empirical specifications. This thesis predicts that 1) a surprise change in conflict and cooperation either sent or received by one actor will have no systematic affect on public preferences and 2) a shift in the public’s preferences will not lead to changes in the policies of its home government toward an adversary.

The second model allows the public to follow but not lead foreign policy toward a rival. This *follower model* mirrors the logic of the patriotic rally-’round-the-flag literature. The public’s government acts toward an adversary and the public supports that action. Public preferences react to government policy but government policy does not react to changes in public preferences. Therefore, changes in foreign policy are independent of public preference shifts.

In the third model, the public not only reacts to foreign policy but also can lead that policy. Under this *accountability model* government policy reacts to changes in public preferences. If public support of conflict or cooperation toward a rival changes, its’ government’s policies reflects this in some way. This third perspective contends that the public is paying attention not only to

what their government does (actor A), but also to what the rival (actor B) may be doing. Thus there should be a bi-directional relationship between conflict (cooperation) and public opinion.

The final model incorporates the belief that if accountability relationships exist within one group (country), its rival is likely to use that information to formulate its own foreign policy toward that group (country). In this *credibility model*, public preferences in one rival are likely to affect the policies of its adversary toward that rival. If the public has relevant ratification power, as suggested by the accountability model, that information is unlikely to be ignored by its adversary.

[Table 1 about here.]

Another process relevant to both accountability and credibility is external third-party intervention (rival Z in Table 1). Following previous work on triangularity, localized conflicts are likely to react to great power interventions by encouraging or discouraging cooperation between the belligerents. To keep the analysis here simple, we assume that the public does not immediately react to the policies of foreign governments in the same way it reacts to the policies of its own government. On the other hand, the credibility model suggests that third parties are likely to take public opinion into account when calculating the expected costs and benefits of cooperation and conflict. (Goldstein and Freeman, 1990; Brandt and Freeman, 2006).

It is important to note that theories of reciprocity, accountability and credibility can not be represented by either a single equation or even by a recursive multiple equation model. The hypothesized relationships are bi-directional and contemporaneous, not solely lagged. The foreign policy of one actor is likely to react to the policies of the rival, and *vice versa*. A recursive model would only allow one rival to react without a lag. Further, the accountability and credibility models predict that the public both leads and responds to foreign policy. A recursive model would necessitate contemporaneous and atheoretical zero restrictions on the response time of either public opinion or foreign policy. This raises three questions that we answer in the next two sections. First, is information available that allows us to systematically test the hypothesized accountability and credibility models versus the others? Second, even if we locate both relevant foreign policy

and public opinion data, how can we empirically analyze these hypothesized non-recursive structural models? And third, how do we analyze foreign policy and opinion dynamics in a model with contemporaneous effects?

3 Research Design

3.1 The Case

We analyze Israeli-Palestinian interactions as our test case. This protracted conflict is one of the most enduring of our time. Its significance is widely recognized; *The Economist* (February 21, 2004: 24) writes that this conflict is “where the world’s fault-lines meet: divides between rich and poor, secular and religious, Islam and the West.”

Political scientists have studied this conflict for many years. Goldstein et al. (2001) find a complex set of behavioral relationships, including evidence of reciprocity between the two rivals as well as of “triangularity” in U.S. behavior toward the Israelis and Palestinians. Schrodt and Gerner (2004) report similar findings about triangularity. The role of the U.S. in this conflict is echoed in other quantitative works like Organski and Lust-Okar (1997) and qualitative work like Sirriyeh (1995). Organski and Lust-Okar include the U.S. as a moderator while Sirriyeh bases his qualitative forecasts for Israeli-Palestinian relations on U.S. intervention.⁹

These studies do not consider the possibilities of accountability or credibility. This is in spite of the fact that leaders like Israel’s Yitzhak Rabin commissioned and examined polling data (Auerbach and Greenbaum, 2000). Rabin apparently sought to learn from the polls how best to build credibility at a crucial turning point in the conflict, during the secret negotiation of the Oslo Accords. Existing studies thus cannot help sort out the competing theories discussed above.

These rivals have somewhat different electoral histories. Israel is considered a mature democracy by POLITY and Freedom House. Since the first Oslo agreement major efforts have been made to create a democratic Palestinian state (Brown, 2003). Elections for the Palestinian Executive Authority and the Palestinian Legislative Council were held in 1996. In late 2005 some local

Palestinian elections were held. And Hamas won an upset victory in Palestinian Legislative Council elections in January 2006 (national election). So electoral forces are becoming relevant for both these rivals. Since the 2006 election, Palestinian politics has become much more contentious. We therefore restrict our analysis to the period up to April 2005. We forecast *ex ante* from that point only to the end of that same year.

3.2 Data

Like Goldstein et al. (2001) and Schrodtt and Gerner (2004), we use events data to measure the directed behaviors of the Israelis, Palestinians, and the U.S. Events for directed behaviors among the U.S., Israel, and the Palestine (WEIS coding) were extracted from Kansas Event Data System (KEDS) from *Agence France Presse* news stories. Because this and other news sources do not distinguish the Palestinian Authority from Islamist groups here we treat the Palestinians as a single actor. We acknowledge the challenges this decision presents for the interpretation of certain of our results below.¹⁰ The events are scaled with Goldstein scores and aggregated into monthly averages.¹¹ The variable mnemonics used to represent the directed behavior denote the governments of Israel, Palestine, and the U.S. by I, P, and A, respectively. So $A2P_t$ represents the level of conflict/cooperation directed by the U.S. toward the Palestinians at time t . Our estimation sample is monthly from April 1996 to March 2005. Again, we reserve the remaining 2005 data for out of sample forecasting.

In addition to being politically important and salient, the Israeli-Palestinian conflict provides a unique source of relevant public opinion data that allows an analysis of accountability and credibility relationships. The public opinion measure is from polls conducted by the Tami Steinmetz Center for Peace Research (TSC). The TSC is a multidisciplinary academic enterprise composed of faculties at Tel Aviv University. These polls should be less prone to the journalistic biases that has been found in U.S. polling (Gaubatz, 2001). We use the TSC's peace index for Jewish respondents only. This index does not yield the kind of detailed insights about specific policies that were obtained from polls like those which Rabin commissioned. But it provides a continuous

sounding of the Israeli public's evaluation of their governments effort to create peace and of the prospects for peace.¹² A few of the peace index observations are missing — out of the 108 months in the estimation sample, eight have missing values in 2003. The missing values were inputted via an ARIMA model.¹³ The Jewish peace index, denoted as JPI_t , and the six event data series are shown in Figure 2.

[Figure 2 about here.]

To capture coalitional, electoral forces, and trends in violence nine exogenous dummy and trend variables are employed. Three of these are dummy variables for the identities of the Israeli prime ministers in each month (one each for Netanyahu, Barak, and Sharon, with Rabin/Peres treated as the reference category). These variables capture changes in conflict dynamics due to leader (coalitional) idiosyncrasies in Israel (Sylvan, Keller and Haftel, 2004; Sirriyeh, 1995). For each of the four prime ministerial regimes a separate time counter that starts at the value 1 in the month after each Israeli election and increases monotonically until the time of the next constitutionally mandated election (and is zero otherwise) is used. These four trend variables capture electorally-motivated cooperation and especially electorally-motivated violence in the run-up to elections.¹⁴ Finally, two dummy variables are included to capture changes in the trends of the mean level of conflict. The first is for the period from the start of the second Intifada to the start of the Battle of Jenin (October 2000–April 2002). The second is a dummy variable for the post-Battle of Jenin period (May 2002–March 2005).¹⁵ Together, because they absorb some of major increases and decreases in directed behavior between the Israelis and Palestinians, the use of these dummy variables produce a stringent test of the competing theories.¹⁶

3.3 Model

A structural Bayesian time series approach is used to evaluate the four theories in Table 1. This approach addresses the problems of model scale, endogeneity, and specification uncertainty. The web appendix describes the actual model, a Bayesian Structural Vector Autoregression (B-SVAR).¹⁷ A

fuller explication this model and explanation of its value in macropolitical analyses can be found in Brandt and Freeman (2006, 2007). The B-SVAR model has seven equations—six for the dyadic interactions for the Israelis, Palestinians, and U.S., and one for the Jewish opinion about the peace process. Test statistics support using two lagged values of each of these seven endogenous variables.¹⁸ Each equation in the B-SVAR includes the nine exogenous variables described earlier. The next sections describe elements of the empirical model that allow us to capture the essence of the theoretical models.

3.3.1 Structural Identification

The theories about reciprocity, accountability and credibility can be represented as competing claims about the *contemporaneous* relationships among seven variables. The claims about contemporaneous relationships concern the speed of the response of some variables to shocks in others, especially about 1) the immediate effects of shocks in Jewish opinion on directed behaviors of Israel and Palestine, and 2) the immediate reaction of Jewish opinion to these behaviors. Operationally, these claims are restrictions in the matrix of coefficients for contemporaneous relationships in the model. The four theories all allow for the possibility of reciprocity and triangularity between the Israelis, Palestinians and the U.S. since no restrictions are imposed on any of the coefficients for these specific contemporaneous relationships. The theories do differ in the zero restrictions they imply for the contemporaneous relationships for Jewish opinion.

Previous empirical models that purport to analyze reciprocity, accountability and credibility relationships must account for these hypothesized two-way relationships. For comparison, we present a recursive structural model of the variables of interest at the top of Table 2. This is the default pattern of identification restrictions used in the interpretation of existing event data analyses using vector autoregression models.¹⁹ The sets of seven rows each in Table 2 represents the contemporaneous relationships among the variables of interest. We will refer to each distinct contemporaneous identification scheme as an A_0 matrix.²⁰ The rows of Table 2 correspond to the equations for each directed-dyad or Jewish public opinion equation. The columns are the

contemporaneous shocks that enter each equation. The X's (or other letters) in the cells represent the "free" parameters to be estimated. The empty cells are zero restrictions. A zero restriction indicates no contemporaneous relationship is hypothesized between a column variable residual and a given row equation. Note that in the recursive scheme all relationships above the diagonal are assumed to be zero. This implies that we have no expectation of any contemporaneous two-way relationships, or that the errors propagate in a recursive chain through the equations. To the extent that there is a contemporaneous, within month for example, correlation between changes in one equation and another, that correlation is assigned by the recursive model in *one direction only*.

All four of the other models imply a constellation of zero restrictions and "free" parameters that make the matrix of contemporaneous relationships non-recursive and over-identified.²¹ Consider first the bystander model. Like the others, this model allows for contemporaneous reciprocal and triangular relationships in directed behaviors. The bystander model holds that the Israeli public does not react immediately to the behavior of its own government nor of the Palestinians and, at the same time, that none of the governments react immediately to changes in Jewish public opinion (as implied by the empty cells in the last column and the last row). The public does not pay attention to the behaviors of the three governments and the three governments ignore changes in public opinion. The absence of these contemporaneous relationships are represented as blanks are the zero order restrictions imposed by this first theory.²²

[Table 2 about here.]

The other theories allow for additional contemporaneous relationships. These theories are presented in the remaining three model blocks of Table 2. Moreover, they are nested: the follower model is implied by the accountability model which is implied by the credibility model. The block of relationships for each model are thus similar to the bystander model for the contemporaneous reciprocal and triangular behaviors. The follower, accountability and credibility models differ by allowing additional contemporaneous relationships. The possibility that Jewish citizens monitor and react immediately to the actions of their government toward the Palestinians but the Israeli government does not react to shifts in Jewish opinion is represented by an F in the seventh row and

first column of the follower block. This relationship and the possibilities that Jewish citizens react immediately to the actions of the Palestinians toward the Israelis and that their government reacts immediately to shifts in Jewish opinion are denoted by the A's in the accountability block. Finally, the theory that all these contemporaneous relationships exist and that 1) the Israeli, Palestinian, and American governments monitor and react immediately to shifts in Jewish opinion and 2) Jewish opinion immediately reacts to the directed behaviors of the Israelis and Palestinians are denoted by the C's in credibility block of Table 2. Each of these blocks is the structural identification for one of the four B-SVAR models presented below.

3.3.2 Dynamics

The lagged relationships between the variables describe how changes in directed behavior and opinion are related through time. What distinguishes the B-SVAR model is that these relationships explicitly depend on the contemporaneous causal relationships. The responses of the system to unexpected changes in the endogenous variables or shocks, as revealed by an analysis of its reduced form, reflects both the lagged relationships and the (competing) restrictions on the contemporaneous relationships between the variables.²³

Unlocking the dynamics of the system is difficult due to the problem of scale. The model contains a large number of parameters and the parameter uncertainty makes it difficult to draw causal inferences and policy analysis.²⁴ To cope with this problem, we employ a modified version of the Sims and Zha (1998) prior. This prior addresses model scale by putting lower probability on non-zero values for the coefficients at the most distant (largest) lags. But rather than imposing exact (possibly incorrect) restrictions on these coefficients and, in effect, deleting lagged variables, the prior imposes a set of inexact restrictions on the lagged coefficients. These inexact restrictions are prior beliefs that many of the coefficients in the model—especially those for higher lags—have a prior mean of zero and small variances. The prior on the model coefficients is then correlated across equations in a way that *depends on the contemporaneous relationships among the variables*. This allows beliefs about the structure of the system to be included in the prior. Finally, the prior

is centered on a random walk model, allowing beliefs about degrees of persistence in behavior.²⁵ Details of this prior are in Sims and Zha (1998) and Brandt and Freeman (2006, 2007).²⁶

3.3.3 Model evaluation

Model scale also creates challenges for model evaluation. Complex, highly parameterized models are bound to overfit the data, making conventional (frequentist) fit statistics less useful. The current time series literature and Bayesian statistics employs Bayesian posterior probability measures to summarize model fit (Sargent, Williams and Zha, 2006; Sims and Zha, 2006; Brandt and Freeman, 2007). The accountability, bystander, credibility, follower and recursive models differ only in their structural identification specifications or A_0 matrices in Table 2. The relevant quantity to compare across the models is then the probability of each contemporaneous specification, conditional on the data, the other parameters for the lagged effects, the lag length, and the hyperparameters. The items on which we condition the probability of the contemporaneous effects are the same across all of the models, so we collectively refer to this information as the *Model*. The quantity we use to compare the models is then $Pr(A_0|Model) = \frac{Pr(A_0, Model)}{Pr(Model)}$ which is a standard conditional probability statement that can be computed from draws of the posterior distribution.²⁷ We will present these comparisons as log probabilities since this is a more numerically stable way to compute them and because we can then compare the log odds of the various contemporaneous specifications.

Equally important, we analyze the dynamics of each model to see which produces the most plausible set of key impulse responses. Significantly, it is only with impulse-response analysis that we can track the sign of the dynamic changes and whether they are consistent with the underlying theories. Using Bayesian methods provides meaningful error bands for these responses.

In order to further assess the importance of public opinion dynamics in this rivalry system two sets of out of sample forecasts from April–December 2005 were constructed. One set of forecasts includes the JPI series, while the other omits this series from the model. These forecasts are original in terms of their time span and because past studies of the Israeli-Palestinian conflict have not been able to produce specific timing predictions. Our use of Bayesian methods allows us to

produce meaningful error bands for these forecasts as well.²⁸

4 Results

4.1 Model fit and selection

Table 3 presents the posterior probability of the five different structural models—recursive, bystander, follower, accountability, and credibility. Moving down the rows of this table, each model contains more contemporaneous parameters (in its A_0 matrices), with the exception of the recursive model. The best fitting model, with the largest log probability is the credibility model. The other column of Table 3 is the posterior probability. The probability of the credibility identification conditional on the data and the model is $\exp(-0.56) = 0.57$ which is several orders is magnitude larger than the next best bystander model, $\exp(-2.29) = 0.10$. The credibility model has much larger posterior odds when compared to the other four models: it is 5-25 times more likely than the other non-recursive models. This is very strong evidence for the credibility model over the other contemporaneous specifications.²⁹

[Table 3 about here.]

The restrictions on the contemporaneous impacts of Jewish support for the peace process implied in the bystander, follower, and accountability models are not as likely as those in the credibility model. Theoretically this means that conflict dynamics and public opinion dynamics are interconnected. To be more specific, the Jewish public does monitor and react to the behaviors of their government and(or) the Palestinians, the Israeli government reacts to Jewish public opinion and the Palestinians are sensitive to the constraints (opportunities) imposed (created) by Jewish public opinion.

Next, we look at the dynamics implied by the structure of the credibility model relative to its competitors. This helps us understand exactly how conflict and opinion dynamics are connected.

4.2 Impulse responses

Impulse response analysis, tracing out the response of the system of equations to shocks in selected variables, summarizes the complex dynamics of our system of variables. The full set of impulse responses for the systems estimated here include 245 responses (49 responses per model \times 5 models). Rather than present all these responses, we focus on those of greatest substantive interest: the responses of I2P and P2I to surprise American interventions and to Jewish public opinion shocks and the responses of Jewish public opinion to cooperative shocks. These are the most theoretically relevant comparisons across the contemporaneous specifications in Table 2.

Given correlated uncertainty about the dynamics responses in these models, the error bands for the impulse responses are computed using an eigenvector decomposition method (Brandt and Freeman, 2006).³⁰ The reported error bands are 68% (posterior) confidence regions around the median estimates. They provide a summary of the general trend and shape of the responses. The impulse responses presented here are for positive shocks to the B-SVAR model system of equations. Positive shocks are chosen since they can naturally be interpreted as “surprise” movements toward peace, less conflict, or increases in the support for the peace process.

We begin with the way the two rivals respond to cooperative surprises by their adversaries. We show that in terms of the way they respond to unexpected cooperation at least, specifications as different as the bystander and credibility models produce similar dynamics. Figure 3 depicts the responses of the I2P, P2I, A2I, and A2P equations to shocks in the same variables. The rows in this figure are the responses of these equations to shocks in the column variables.³¹ The bystander (credibility) model average Goldstein scaled responses and error bands are shown with solid (dashed) lines. Begin with the bystander model (solid lines). The response on the average Goldstein scale of I2P to a positive shock in P2I is positive; the error bands for this response do not include zero. The bystander model thus implies reciprocity by the Israelis to surges of cooperation by the Palestinians. Now consider the second row of the figure for the bystander model. Again the I2P is positive. Here the response in P2I is briefly positive but soon this response turns negative. This shows a belligerent response by the Palestinians to cooperative shocks from Israel.

[Figure 3 about here.]

Responses for the credibility model are similar. Reading across the top row of Figure 3 for this model (dashed lines), the response of I2P to a positive shock in P2I is positive and is reciprocal. Row two shows that for this model a positive innovation in I2P also produces a clear, sustained inverse response in the average of P2I. This finding that only the more democratic member of the conflict dyad reciprocates cooperation (and conflict) is consistent with the work of Guisinger and Smith (2002) and McGillivray and Smith (2000) who suggest that democratic institutions create incentives for leaders to use reciprocal strategies. Conversely, their model implies that when the public finds it difficult to hold leaders accountable, elites may defect from cooperation. Therefore, we expect to see a pattern of non-democratic conflict in response to cooperative gestures from a rival. This “tit-for-take-that” behavior is consistent with an interpretation of Palestinian policy making that emphasizes the weakness of their central authority. Even for the data from before the Hamas election victory in 2006, the results show that when Israel cooperates the Palestinian Authority fails to rein in militants who might attempt to scuttle the peace process. When Israel is hostile, the Palestinians can not escalate in kind due to their lesser military capabilities.³²

In addition, this figure shows some evidence of triangularity. Surprise cooperation by the Americans generates no response by the Israelis toward the Palestinians or by the Palestinians toward the Israelis (per the upper right two-by-two set of responses). American reaction to unexpected Israeli and Palestinian behaviors (the bottom left two-by-two set of responses) are positive and with a lag. This is evidence that U.S. actions do not drive changes in I2P and P2I, but that American actions are supportive of surprise cooperation by the Israelis and Palestinians.

The reciprocal and non-reciprocal responses in Figure 3 do not directly demonstrate accountability. Accountability in the dynamic model presented here means that Jewish public opinion responds to unexpected changes in behavior by their government and the Palestinians (and vice versa). A comparison of the responses for the follower and credibility models show how the latter implies a much higher level of accountability. This comparison is in Figure 4. This figure shows the responses of Jewish support for the peace process (JPI) to unexpected positive or cooperative

one standard deviation shocks in Israeli actions toward the Palestinians and vice versa. The solid (dashed) lines are the responses from the follower (credibility) model. For the follower model, there is a small negative response—indicating an inverse public reaction to surprise in average cooperation. For the credibility model response in Figure 4, the mean response in JPI to a positive shock in I2P is more than five times as large as that of the follower model. The follower model allows only for a public reaction to rival behavior (I2P), while the credibility model also includes contemporaneous relationships between Jewish opinion and the behaviors of both belligerents. The reason for the different magnitudes of the responses is omitted endogeneity. In the credibility model which allows endogeneity between the Jewish support for the peace process and conflict, the presence of accountability and credibility mechanisms generates a strong public opinion response to changes in the level of cooperation. The response is the opposite of what a follower model of public opinion would expect. Instead of echoing elite policy, public opinion constrains and reacts inversely to policy. This is consistent with the arguments of such scholars as Wlezien (1996), Eichenberg and Stoll (2003), and Baumgartner and Jones (2005).

[Figure 4 about here.]

The final component of the reciprocity-accountability-credibility causal linkage is the dynamic response of the Israelis and the Palestinians to unexpected changes in Jewish opinion about the peace process. If the Palestinian reaction to the Israelis (P2I) responds to shocks in public opinion (JPI), then this demonstrates credibility. A comparison of the responses of the accountability and credibility models best illustrates this important feature of the latter model. Figure 5 shows the accountability and credibility models' impulse responses for the I2P, P2I, A2I, and A2P equations for innovations in Jewish opinion. The main difference between of the credibility model and the others are the impacts of surprise changes in JPI on the other equations in the system that represent triangular relationships, specifically the impacts of innovations in JPI on I2P, P2I, A2I and A2P. In Figure 5 the rows are the responses of the average Goldstein scaled I2P, P2I, A2I and A2P equations to a surprise increase in Jewish support for the peace process. Again, the

comparison here is between a model that allows for contemporaneous political accountability (but not credibility) and a model that allows for both political accountability and cross-rival credibility.

[Figure 5 about here.]

The error bands for the response of Israeli policy toward the Palestinians to a positive innovation in JPI nearly include zero for the accountability model, but not for the credibility model. For the accountability model surprise increases in Jewish support for the peace process essentially produce a short term positive and then negative response in average Goldstein scaled P2I over 24 months. In contrast, for the credibility model, a positive innovation in JPI initially produces a strong negative response; the P2I response and its error bands are below zero and stay there over 24 months. Therefore, in a model that ignores the contemporaneous two-way relationship between opinion innovations and Palestinian actions produces a much different response; it misses the link between Jewish opinion and Palestinian policy toward Israel. For the credibility model—a specification in which the instantaneous feedback between opinion and events is explicitly modeled—a cross-level (domestic to international) pattern of asymmetric interaction is evident. The Palestinians react immediately to public support for peace with conflict and opposition to peace with cooperation. This response, like the asymmetrical reciprocity finding discussed above (Figure 3), is that Palestinian actions counteract rather than reinforce changes in public opinion.³³

Finally, note American reactions to the belligerents when Jewish support for the peace process increases. The U.S. response toward Israeli cools when Jewish support for the peace process increases; in contrast U.S. reaction toward the Palestinians is initially negative, but then rebounds and is cooperative. This latter reaction is slower and smaller in the credibility model. One explanation of this is that the U.S. is reacting to what it perceives as actual or potential cooperation with Islamist militant elements of the Palestinians.³⁴

In sum, the impulse response analysis illuminates the dynamic implication of the connections between rivalry and public opinion. Figures 3, 4, and 5 show what the credibility model implies about the interplay between conflict and opinion dynamics, and how these implications differ markedly from those of other, less empirically powerful models of this conflict.

4.3 Forecasts

In order to demonstrate further that conflict dynamics are an outgrowth of opinion dynamics, we evaluate the forecasting performance of reduced form models with and without our public opinion variable.³⁵ Two different monthly forecasts for April 2005 to December 2005 were produced. The forecasts, based on the posterior coefficients, account for parameter uncertainty and uncertainty about the residuals. The forecasts assume no structural changes in the model and the election counters and other dummy variables are continuations of those that ended in the estimation sample in March 2005.³⁶ In other words, they are based on the state of the world in March 2005 and do not include events or information about events as Ariel Sharon's split from Likud and formation of Kadima, his illness and removal from office, the outcomes of recent Palestinian and Israeli elections, or the recent Fatah-Hamas conflicts. These are what an analyst using a model that included the JPI variable (equation) might have forecast *ex ante* in March 2005. For the seven equation model we included the Jewish peace index (JPI) variable in each equation and there is a separate equation for JPI as a function of the other variables in the model. We then produced a second set of forecasts for a (six equation) model with no Jewish peace index variable or JPI equation.

The results are depicted in Figure 6. This figure shows the nine month forecasts from April 2005 for the models with and without the JPI variable (equation). The figure shows the mean forecasts with 68% error bands that provide an assessment of the risk or uncertainty of the forecasts. The KEDS data for April-December 2005 are superimposed on the figure using dashed lines.³⁷ The first row of forecasts include the JPI equation and the lags of JPI in each equation. The second row shows the forecast results excluding the JPI variable from each equation and omitting the JPI equation from the model.

For the model that includes JPI, the forecasts for Israeli and Palestinian dyadic actions (I2P and P2I) rapidly deteriorate over the course of 9 months. The risk—based on the confidence region—places most of the posterior probability in the region of greatly increased conflict which matches the data over this period. These forecasts are for some of the most severe conflict since

the second Intifada. The forecasts for American actions show more cooperation toward the Israelis and less cooperation toward the Palestinians over the 9 months—a forecast that is borne out by a comparison to the actual data for this period. The changes in Israeli and Palestinian actions toward the Americans change very little over the forecast period and are generally within the confidence regions of the forecasts.

The model that includes JPI, forecasts a slight decrease in JPI over 9 months. By December 2005, the forecasted mean level of JPI is 54 which is just below its historical sample mean of 57 (the standard deviation of JPI is 5.3). This downward trend in support of peace by the Israeli public is closely related to the trends in Israeli-Palestinian violence.

[Figure 6 about here.]

For the model omitting the JPI variable the forecast performance is best described as “poor”: the 68% confidence regions rarely cover the actual data. Further, even the forecasted trends in the data are hard to discern. The actual series for the main series of interest—I2P and P2I—are outside the 68% forecast interval. Finally, the forecast errors for the I2P and P2I variables for the model including the Jewish public opinion data are much smaller: the forecast root mean squared errors for the I2P and P2I series are 1.3 times smaller in the model that includes the Jewish peace index versus the model that excludes this variable (equation). This indicates the strong predictive capacity of the public opinion measure in this case and its general relevance to understanding and interpreting reciprocity, accountability and credibility in the earlier structural models. Table 4 presents the root mean squared forecast error for each equation in each model. There is a large improvement in the forecast error for I2P and P2I when the JPI series is included in the model. This improvement in forecast performance is mainly due to the reduction in the bias of the forecasts with the inclusion of the JPI variable.

[Table 4 about here.]

5 Conclusion

This paper makes at least two contributions to the literature on conflict and cooperation between rivals. First, we demonstrate the complex interconnections between public opinion and inter-group conflict/cooperation and international mediation. Our results support the conclusion that Jewish public opinion is one key component in the system of conflict between the Israelis and Palestinians. Our credibility model, which allows for simultaneous responses in and between foreign policy behavior and Jewish public opinion, provides the best fit to the in-sample data. Using this opinion series produces substantially more accurate forecasts of cooperation and conflict in this case. In the process, we show how Bayesian structural time series models allow us to relax the restrictive and atheoretical recursive assumptions used previously by scholars of international conflict. For example, event data analysts attempting to test reciprocity hypotheses premised their findings on uni-directional causality assumptions. Our theoretically-informed models uniquely illuminate asymmetric reciprocity whereby the more democratic Israel reciprocates while Palestinians do not.

Second our results add support to the credibility model's well-developed micro-foundations (Fearon, 1994). New experimental work on human subjects also supports the idea of audience costs, the key concept on which the credibility model rests (Tomz, 2007). This macro dynamic analysis complements both lines of work since it supplies both a contemporaneous and lagged temporal structure to the credibility processes and it analyzes the behavior of actual belligerents in an important conflict. The impulse response and forecast analyses show how the credibility model can be used to perform substantively and theoretically useful counterfactual analyses as well as to produce early warnings.

Of course, the Levant must be studied further. We need more fine-grained data that allows us to separate the Palestinian Authority from various Islamist militant groups. With these discrete series we can employ similar, albeit more complex, Bayesian models to learn if the relationships we have illuminated apply to Israel's relations with these specific Palestinian groups, and how these more specific relations depend on Jewish public opinion and vice versa. In this context, it is important to determine if some of the unexpected relationships we uncovered—for instance, the propensity

of the U.S. to respond to positive shocks in JPI with less cooperation toward Israel—still hold. We also want to find a better way than dummy variables to model conflict and cooperation phase shifts in this and other conflicts. The Markov switching Bayesian vector autoregression model is a promising technology in this regard (Brandt and Appleby, 2007).

Our analysis should be of interest to scholars studying not only localized conflicts around the globe but also international relations. One of the central debates in IR theory involves the role of domestic politics in the foreign policy process. (see Colaresi, Forthcoming, for a summary). Is the public relevant or does foreign policy operate independently from its' domestic context? We finding that 1) the public does not blindly follow elite cues, and 2) local rivals (and external interveners) pay attention to changes in public opinion. The results are consistent with theories that take the dynamic two-way linkages between domestic and world politics seriously.

Clearly, additional cases of conflict should be studied in future research. We now have evidence that collecting consistent public opinion information within rivalries over a significant period of time aids in both the analysis and forecasting of conflict and cooperation. This implies that if the same type of information could be collected in other democracies that are involved in rivalries (e.g., India, Greece, Cyprus, Taiwan, and South Korea) our understanding of those specific conflicts as well as conflict and cooperation processes in general would be deepened. These extensions could tell us if credibility is a unique feature of the Levant or, as theory predicts, a common characteristic of democratic rivals.

Bringing the power of Bayesian time series analysis to bear on rivalries around the world will produce deeper insights on comparative conflict dynamics. This will answer whether there exists a negative feedback mechanism that prevents both all out war and dramatic peace in the Levant and in other parts of the globe. Further, future research has the possibility to uncover additional evidence as to whether democracies, but not non-democracies, are more likely to reciprocate conflict and cooperation. More precise knowledge of asymmetric reciprocity between democracies and non-democracies, as well as of cross-level credibility relationships would enhance our ability to provide *ex ante* forecasts (early warnings) to policy makers and *ex post* analysis of foreign policy behavior.

Notes

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²In this paper we refer to international conflict as conflict between organized, self-identifying groups that may or may not control territory (nations). This has become standard in the event data literature, where many of the actors of interest—rivals—represent nations in this sense, but fall short of unanimous classification as states (e.g., Palestinian Authority, Kosovo, Taiwan, and Hong Kong). For a lucid explanation of the differences between state and pseudo-state actors see Lemke (2007).

³The novelty and importance of the Steinmetz Center data results from the consistency of the relevant questions over time, periodicity of the polling increments (monthly rather than quarterly or yearly) and relatively large number of time points for which data is available (over 100 months). While public opinion databases for a small number of countries tend to share one or two of these traits, no other source of information that we are aware of meets all three criteria.

⁴The only exception to this assumption that we are aware of can be found in McGinnis and Williams (2001).

⁵There is considerable confusion surrounding the idea of endogeneity and Granger causality in vector autoregressive analysis. The usual practice is to estimate a reduced form model and then produce impulse response functions to trace out the implied dynamics. In order to give the resulting coefficients and plots a political meaning, assumptions need to be made that map the estimated reduced form into an interpretable structural-form. A recursive structure, as noted, assumes away all simultaneous two-way relationships. The confusion arises because most studies use Granger causality tests to specifically deal with two-way relationships. However, the only two-way relationships that are directly modeled in a Granger causality framework are those in which one of both variables operate on the other with lags. This is why the speed of adjustment in a Granger causality framework is important. The data can tell us the lagged effects. We need to make identification restrictions to understand the simultaneous effects. Recursive models represent one set of identification restrictions—a Wold causal chain. As explained below, despite their convenience, recursive structures do not necessarily lend themselves to tests of conflict behavior such as reciprocity, accountability and credibility.

⁶This only holds if public preferences are negatively related or unrelated to a rival's actions (see below).

⁷Note that if accountability does not hold and the public are followers/bystanders, then credibility is irrelevant.

⁸Putnam (1988) described this dynamic as foreign-to-domestic reverberation. Rivals that cooperate (attack) may signal to the public that cooperation is safe (unsafe) and (not) profitable.

⁹Sylvan, Keller and Haftel (2004)'s experts place less emphasis on the role of the U.S. in this conflict, but acknowledge that their experts might take the role of the U.S. for granted in generating their forecasts.

¹⁰Results reported here are similar if we use the KEDS events coded from Reuters' news wire reports. On the importance of employing multiple sources see Shellman, Reeves and Stewart (2007).

¹¹Monthly averages of Goldstein-scaled events are employed because they place the event data on a scale similar to the public opinion data (which is the average of respondents in the polls) and because we believe that policymakers are concerned with deviations from the average level of an on-going conflict. The dynamics of the average and total Goldstein scaled data are similar. For an analysis using totals instead of averages see Brandt and Freeman (2006).

¹²The peace index is composed of two questions. The first is, "In general do you consider yourself a supporter or opponent of the peace process between Israel and the Arabs?" The possible responses : greatly opposed (0), somewhat opposed (1), in the middle (2), somewhat supportive (3), greatly supportive (4) and don't know/no opinion. The second question is: "Do you believe that in coming years there will be peace between Israel and the Arabs?" The responses are: certain there will be peace (4), think there will be peace (3), in the middle (2), think there will not be peace (1), certain there will be no peace (0), and don't know/no opinion. The two scores for each respondent are averaged and then multiplied by 25. So each person's final score is between 0 and 100. The index's monthly values are averages over about 500 respondents per survey. It is important to acknowledge that a slight wording change recently was made in one of the questions with the term "peace process" replaced by "negotiations."

¹³This imputation uses an ARIMA(9,0,0) model for the data before the break. The ARIMA specification was chosen as the most parsimonious fit using the Box-Jenkins method.

¹⁴The election counters are reset at the May, 29, 1996 general election, the May 17, 1999, February 2, 2001, and January 28, 2003 direct prime ministerial elections. Another election was held on March 28, 2006, which is outside the sample. Illustrative of electorally-motivated violence were the suicide bombings against Israeli civilians that Hamas reportedly engineered just before the 1996 election. These bombings were intended to help defeat Peres and help the more hawkish Netanyahu. *The Economist* January 28, 2006, p. 11. The time counters create linear drift in the (moving) behavioral equilibrium among the three actors.

¹⁵The Battle of Jenin occurred in April of 2002 and involved the largest scale of military force in the West Bank since the Six Days War.

¹⁶As explained in the conclusion, it would be best to use a Markov-switching model to account for these phase shifts in the character of the conflict. But this would greatly complicate the models and the analysis. We use dummy variables in this investigation.

¹⁷This is available at the Journal's website or from the first author.

¹⁸F-statistics and Akaike information criteria support using two lags. We also looked at the posterior distribution summaries for models with more lags and found that they fit worse than two lag models.

¹⁹For example programs like STATA and RATS default to a recursive ordering of variables when orthogonalized impulse response functions are calculated for a reduced form model, like those in the current literature.

²⁰For more information on the model see the appendix on the Journal's website.

²¹In this seven equation (variable) model given the formulation of the B-SVAR, there are at most 28 free parameters in this matrix of coefficients, A_0 . All four models imply fewer than this number of free parameters, or more zero restrictions than are necessary to identify the model.

²²Of course, the data may not move the free coefficients denoted by the X's off zero if there are no such relationships. But the zero order restrictions impose zeros in the posterior for the coefficients denoted by blanks regardless of the information in the data.

²³If A_+ is the matrix of coefficients on lagged values of the variables in the structural model and A_0 is the matrix of coefficients for the contemporaneous relationships among the variables, then the reduced form coefficients of the model are $B = A_+A_0^{-1}$.

²⁴The weekly model of Goldstein et al. (2001, 607, fn. 33) has 24 variables each with nine lags. Thus, it has 217 coefficients per equation or more than 5000 coefficients overall. Because of such scale, meaningful causal inferences about the dynamic responses of their system will be difficult to make. For this reason investigators usually do not even try to analyze dynamics, conduct innovation accounting or produce forecasts. There is good reason to believe that most of the coefficients for the high frequency dynamics in their model are close to zero. To ignore this belief is to use a *flat prior* or allow the prior variance on the coefficients on all lags to be the same.

²⁵This prior serves as a benchmark and does not mean that the data follow random walks. If it is inconsistent with the data, the estimated posterior will reflect this.

²⁶The hyperparameter values for the Sims-Zha prior were set at values based on experience with events data and discussions with leading international relations scholars like Philip Schrodtr (Brandt and Freeman, 2006). The hyperparameter values used in all four models were $\lambda_0 = 0.8$, $\lambda_1 = 0.1$, $\lambda_2 = 1$, $\lambda_3 = 1$, $\lambda_4 = 0.1$, $\lambda_5 = 0.05$, $\mu_5 = 0$, and $\mu_6 = 5$. Other values yield qualitatively similar results and inferences to those reported here. These results are available from the authors.

²⁷The numerator here is the likelihood multiplied by the prior distribution and the denominator is the marginal data density multiplied by the posterior probability of the common non-contemporaneous parameters in the model. It is important when estimating these probabilities to assess the sensitivity of the results to the prior specification for each model. In the present case, the posterior is insensitive to the choice of the prior hyperparameters. Also, the results are similar across two independent posterior sample chains for each model.

²⁸Many existing forecasting methods suffer from “off-on-timing” problems. An example is the expected utility approach (Bueno de Mesquita, 1997). The respective model can have timing elements incorporated in it, but the expected utility model only tells us if a particular decision is likely to be made after a short or long series of deliberations; “it cannot say how long in clock-time a round of negotiations will last” (*ibid.* p. 264). Measures of forecast uncertainty (error bands) are absent, for example, in the work of the Political Risk Service (PRS), International Crisis Group (ICG), and in more sophisticated analyses using hidden Markov models (Schrodt, 2006; Schrodt and Gerner, 2000).

²⁹We also ran models that 1) excluded the exogenous control variables from the B-SVAR models and 2) included more lags of the endogenous variables. These models produce the same inference, namely that the credibility model is superior to the other specifications.

³⁰The eigenvector decomposition of the variance of the impulse responses decomposes the variation of the responses over time. This is a better summary of the overall shape, skewness and location of the error bands since it accounts for the correlation in the responses. The variation explained by the first eigenvector of each response is between 65% to 100% of the variation in the impulse responses. (for details see Brandt and Freeman, 2006).

³¹These are one standard deviation shocks of the residuals from the respective equation in the B-SVAR model.

³²It is important to reiterate that because of the way news sources report events in the Middle East, we combine the Palestinian Authority and Islamist militant groups in the same measure. Our results therefore could be more indicative of the way that the Islamist groups respond to unexpected cooperation toward the Palestinians by the Israelis than by the Fatah led Palestinian Authority. The use of average Goldstein scores rather than total Goldstein scores appears not to be responsible for the results. The analysis for total scores yields the same inverse response of P2I to shocks in I2P.

³³Once more this response of P2I may be more indicative of the Islamist militant groups of which the variable is composed than of the actions of the Palestinian Authority.

³⁴Another explanation is that in this period, despite its rhetoric, American administrations were not supportive of a peace agreement between Israel and the Palestinians.

³⁵One could do this exercise with the B-SVAR rather than the BVAR models. The results will be the same, since the B-SVAR version just decomposes the reduced form residuals of the BVAR. This decomposition is critical for the earlier model selection and interpretation of the impulse responses. Forecasting, however, is a reduced form exercise and is invariant to structural specifications.

³⁶The election counters and dummies continue forward just as they would if we coded the data through December 2005. The Kadima and Hamas election victories come in January 2006 and thus are outside our forecasting window.

³⁷These data were not used in the estimation, so this exercise serves as a cross-validation of our Bayesian vector autoregression models.

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<i>Model</i>	<i>Response in</i>	<i>Shock in</i>			
		<i>Policy_{A→B}</i>	<i>Policy_{B→A}</i>	<i>Policy_{Z→A}</i>	<i>Public_A</i>
Bystander	Policy _{A→B}	-	Yes	Yes	No
	Policy _{B→A}	Yes	-	Yes	No
	Policy _{Z→A}	Yes	No	-	No
	Public _A	No	No	No	-
Follower	Policy _{A→B}	-	Yes	Yes	No
	Policy _{B→A}	Yes	-	Yes	No
	Policy _{Z→A}	Yes	No	-	No
	Public _A	Yes	No	No	-
Accountability	Policy _{A→B}	-	Yes	Yes	Yes
	Policy _{B→A}	Yes	-	Yes	No
	Policy _{Z→A}	Yes	No	-	No
	Public _A	Yes	Yes	No	-
Credibility	Policy _{A→B}	-	Yes	Yes	Yes
	Policy _{B→A}	Yes	-	Yes	Yes
	Policy _{Z→A}	Yes	No	-	Yes
	Public _A	Yes	Yes	No	-

Table 1: Four Models of Foreign Policy Behavior: Reaction in Row to Change in Column

Model block	Variable	$I2P_t$	$P2I_t$	$A2I_t$	$A2P_t$	$I2A_t$	$P2A_t$	JPI_t
Recursive	$I2P_t$	X						
	$P2I_t$	X	X					
	$A2I_t$	X	X	X				
	$A2P_t$	X	X	X	X			
	$I2A_t$	X	X	X	X	X		
	$P2A_t$	X	X	X	X	X	X	
	JPI_t	X	X	X	X	X	X	X
Bystander	$I2P_t$	X	X	X				
	$P2I_t$	X	X		X			
	$A2I_t$	X		X		X		
	$A2P_t$		X		X		X	
	$I2A_t$			X		X		
	$P2A_t$				X		X	
	JPI_t							X
Follower	$I2P_t$	X	X	X				
	$P2I_t$	X	X		X			
	$A2I_t$	X		X		X		
	$A2P_t$		X		X		X	
	$I2A_t$			X		X		
	$P2A_t$				X		X	
	JPI_t	F						X
Accountability	$I2P_t$	X	X	X				A
	$P2I_t$	X	X		X			
	$A2I_t$	X		X		X		
	$A2P_t$		X		X		X	
	$I2A_t$			X		X		
	$P2A_t$				X		X	
	JPI_t	A	A					X
Credibility	$I2P_t$	X	X	X				C
	$P2I_t$	X	X		X			C
	$A2I_t$	X		X		X		C
	$A2P_t$		X		X		X	C
	$I2A_t$			X		X		
	$P2A_t$				X		X	
	JPI_t	C	C					X

Table 2: Contemporaneous Relationships for recursive, bystander, follower, accountability and credibility models Each model block specifies the contemporaneous relationships and restrictions for the seven equations in the associated B-SVAR model (A_0 matrix). Rows correspond to equations and the columns to variables or changes in the variable in a contemporaneous equation. The X's in the cells represent the "free" parameters or those estimated while the empty cells are zero restrictions. A zero restriction indicates no contemporaneous relationship is hypothesized between a column variable and a given row equation.

Model	$\log(\text{Pr}(A_0 \text{Model}))$	$\text{Pr}(A_0 \text{Model})$
Recursive	-22.29	2.1×10^{-10}
Bystander	-2.29	0.10
Follower	-3.84	0.02
Accountability	-2.49	0.08
Credibility	-0.56	0.57

Table 3: Posterior model summaries. Right column probabilities are the base e exponent of the log probabilities.

	With JPI	Without JPI	RMSE ratio
I2P	2.36	2.99	1.26
P2I	1.09	1.38	1.27
A2I	0.41	0.40	0.98
A2P	0.37	0.38	1.02
I2A	0.31	0.27	0.87
P2A	0.24	0.24	1.02
JPI	5.16		

Table 4: Root mean square error of the forecasts versus the actual data for models with and without the JPI equation. Estimates based on an average over 200,000 Bayesian posterior forecasts from April-December 2005. Final column shows the ratio of the RMSEs for each equation for the model without the JPI equation to that with the JPI equation.

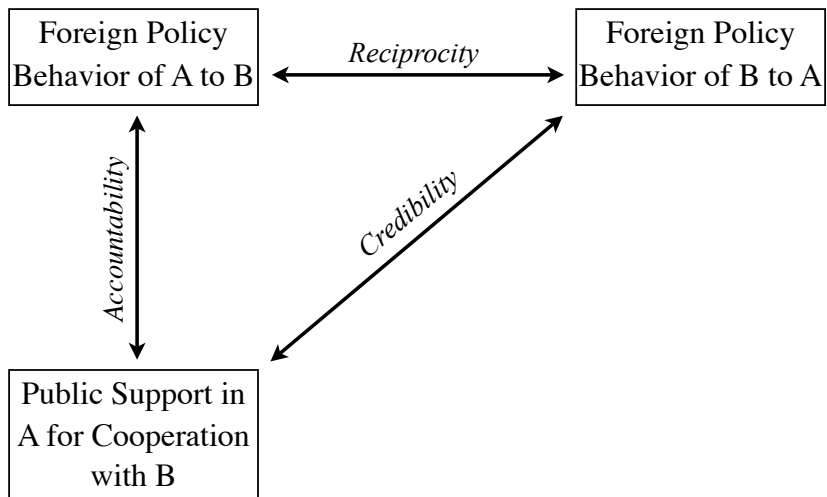


Figure 1: A Roadmap of Two-way Streets: Reciprocity, Accountability and Credibility

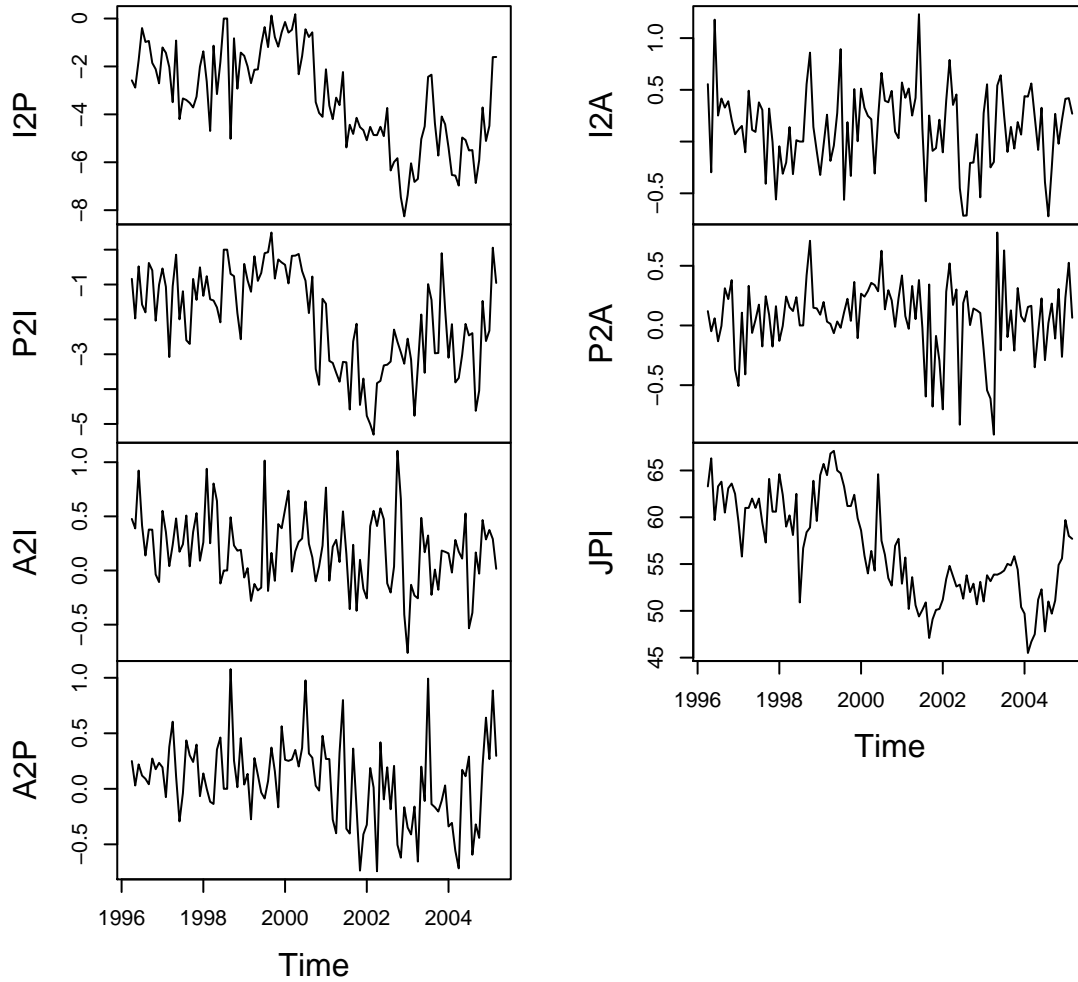


Figure 2: Average Monthly Relations Between Israel, Palestine, and U.S. and Jewish Public Opinion Data, April 1996-March 2005

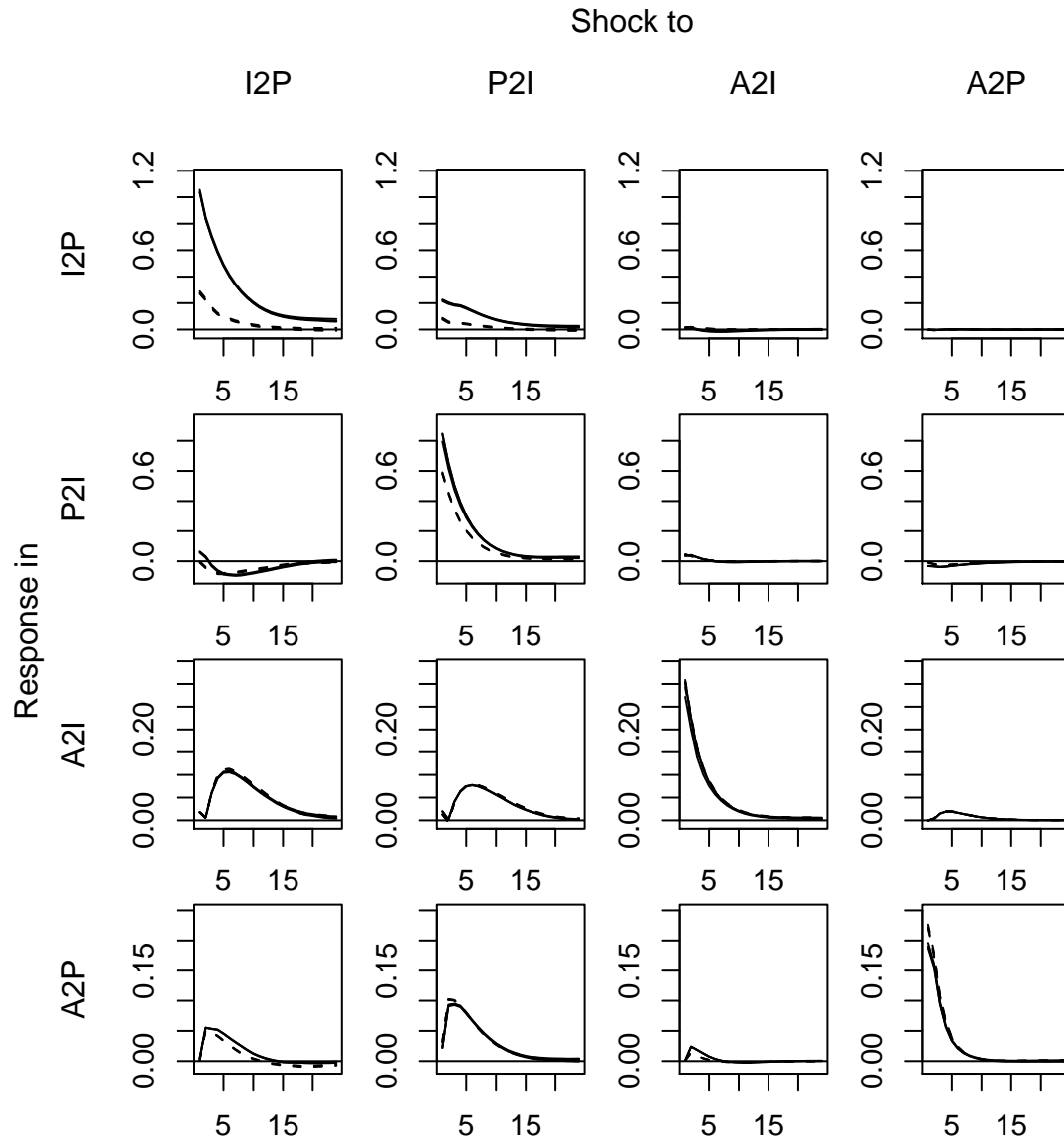


Figure 3: Reciprocity responses for the bystander and credibility models. Bystander model results are shown with solid lines and credibility model results are shown with dashed lines. Responses are mean estimates of positive one standard deviation shocks to each equation with 68% error bands computed by eigenvector decomposition method over 24 months.

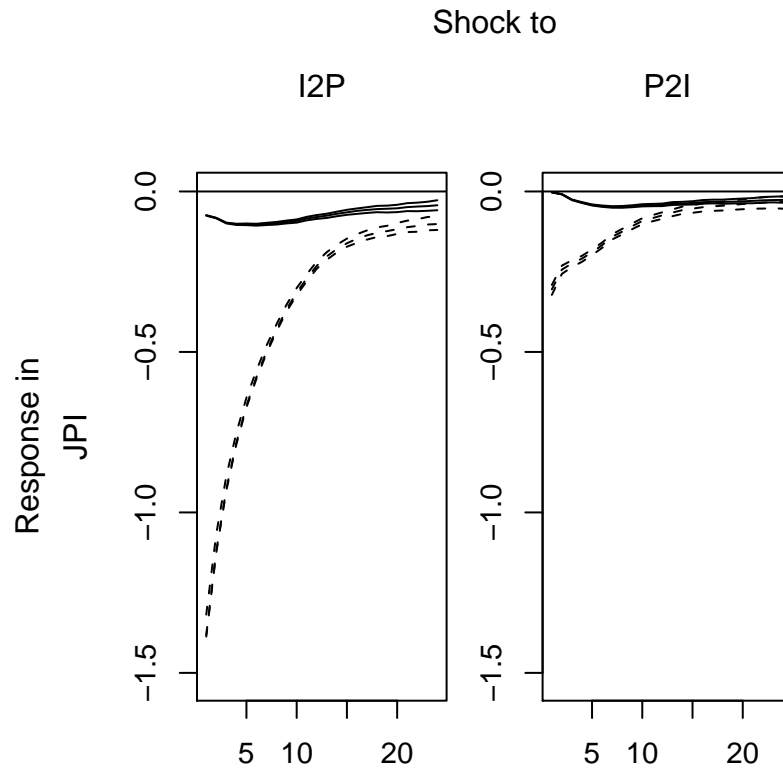


Figure 4: Responses of the Jewish Peace Index to innovations in Israeli actions toward the Palestinians. Follower model results are shown with solid lines and credibility model results are shown with dashed lines. Responses are mean estimates of positive one standard deviation shocks to the column variable with 68% error bands computed by eigenvector decomposition method over 24 months.

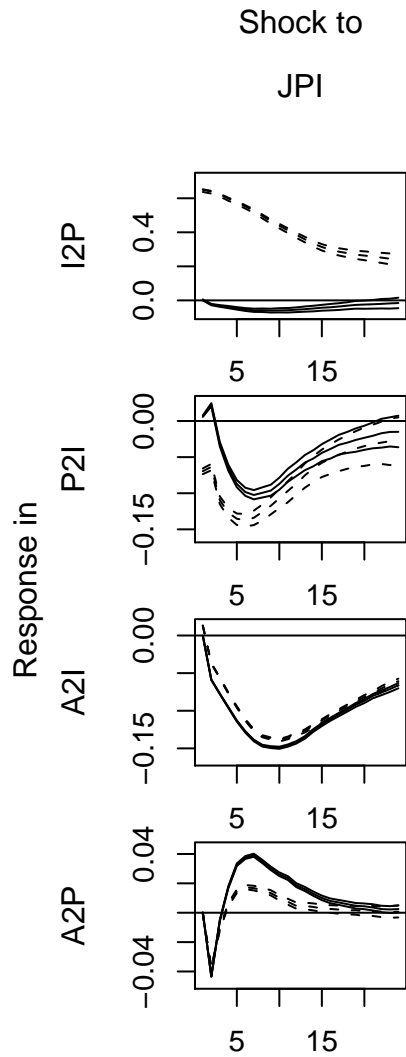


Figure 5: Israeli and Palestinian responses to innovations in the Jewish Peace Index. Accountability model responses are shown with solid lines and credibility model results are shown with dashed lines. Responses are mean estimates with 68% error bands computed by eigenvector decomposition method over 24 months. JPI shocks are positive one standard deviation changes for all equations in both models.

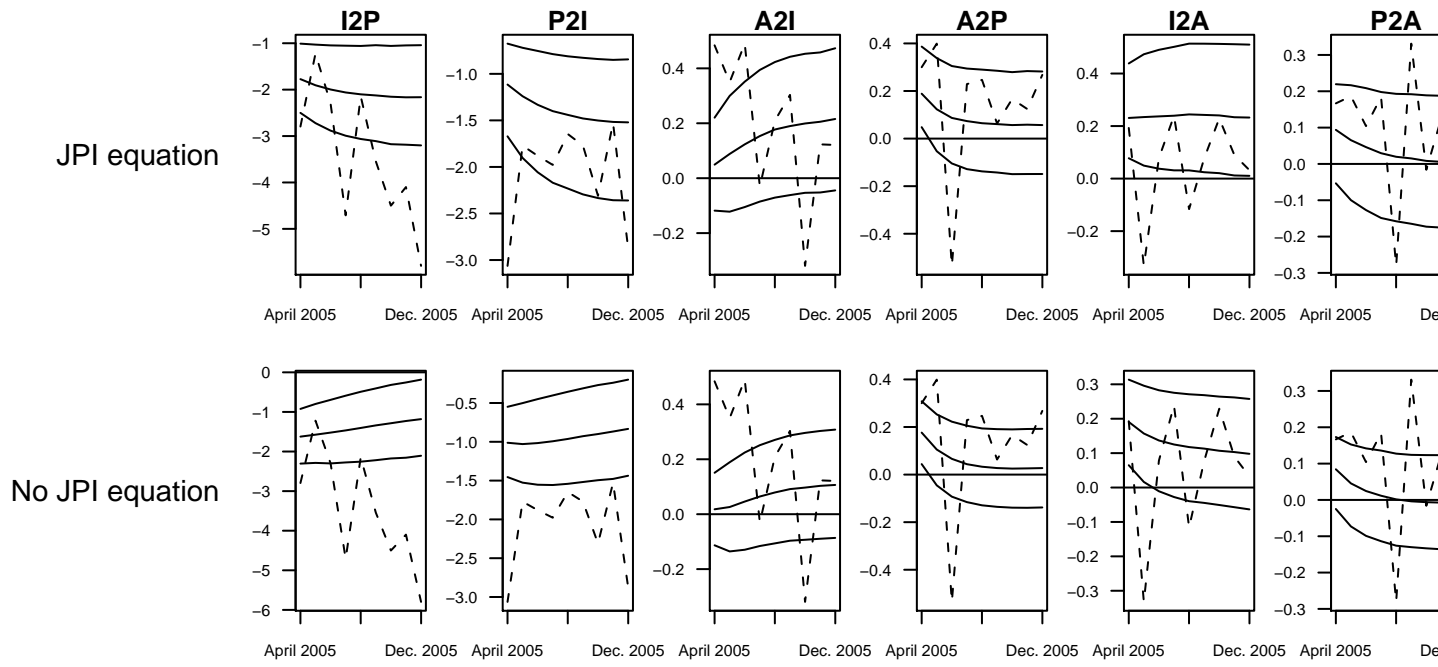


Figure 6: Bayesian VAR forecasts with and without the Jewish Peace Index (JPI) equation, April 2005–December 2005. Solid lines are Bayesian forecast median estimates with 68% eigenvector decomposition posterior confidence regions. Dashed lines are actual series over this period. Top row are forecasts for a model that includes the JPI variable and equation; bottom row excludes the JPI variable and equation from the model.