

**Political Accountability and the Room to Maneuver:
A Search for a Causal Chain***

Thomas Sattler
ETH Zurich
Center for Comparative and
International Studies
Weinbergstrasse 11
8092 Zurich, Switzerland
Phone: 01141 44 632 6768
E-mail: sattler@ir.gess.ethz.ch

John R. Freeman
University of Minnesota
Department of Political Science
267 19th Avenue South
Minneapolis, MN 55455
Phone: 612 624 6018
Fax: 612 626 7599
E-mail: freeman@umn.edu

Patrick T. Brandt
University of Texas at Dallas
School of Economic, Political
and Policy Sciences
P.O Box 830688
Richardson, TX 75083
Phone: 972 883 4923
Fax: 972 883 6297
E-mail: pbrandt@utdallas.edu

March 05, 2007

Abstract

Many studies of the Room to Maneuver make no provision for popular evaluation of policy. They assert rather than demonstrate popular satisfaction with policy choices and macroeconomic outcomes. We present a framework that explicitly models channels for popular preferences to influence policies and outcomes. Our results for economic policymaking in Britain do not support the Room to Maneuver thesis. In our sample (1981-1997) the British government was responsive to changes in political evaluations, and its policy choices effectively fed back into popular evaluations of government policy. However, this accountability mechanism worked outside the real economy. Shifts in popular evaluations induced changes in policy but had no impact on inflation and economic growth. Government capacity to shape macroeconomic outcomes was limited and popular influence over economic policy was ineffectual. This form of accountability probably existed because British citizens had difficulty gauging the real impacts of their government's policies.

* An earlier version of this paper was presented at the inaugural meeting of the Society for International Political Economy, Princeton University, November 17-18, 2006 and at the Annual Meeting of the Midwest Political Science Association, Chicago, April 20-23, 2006 and at the Colloquium of the Center for Comparative and International Studies / ETH Zurich. Brandt's and Freeman's research is sponsored by the National Science Foundation under grants numbers SES-0351179, SES-0351205 and SES-0540816. Sattler's research is supported by the Swiss National Science Foundation under grant number 101412-962. We thank Thomas Bernauer, William Bernhard, Chetan Dave, Nathan Jensen, David Leblang, Simon Hug, Michael Ward, Stefanie Walter, the participants at the IPE Society meeting at Princeton and the CIS Colloquium at ETH Zurich, and three anonymous referees for comments. The data and code used in this paper are available from Patrick Brandt. The authors are solely responsible for the contents.

1. Introduction

Most scholars now agree that, despite globalization, national governments have substantial room to maneuver in economic policy and macroeconomic outcomes. Studies show that, contrary to earlier pessimistic predictions, policies have not been converging in advanced industrialized countries (see, among others, Garrett and Mitchell 2001; Mosley 2000; Quinn 1997; Swank and Steinmo 2002). From this evidence, researchers conclude that governments still are able to produce distinct economic outcomes and retain considerable control over their macroeconomies. Thus, elected officials are accountable for their decisions. Through political participation, citizens evaluate their representatives' policies and hold them accountable for them.

This wisdom rests on very weak footings. Studies of the room to maneuver make no provision for popular evaluation of policy: they *assert* rather than demonstrate popular satisfaction with policy choices and macroeconomic outcomes.¹ Most omit channels for popular preference feedback into policies and outcomes (see, e.g., Clark and Hallerberg 2000). Thus we lack an understanding of the causal chains that connect policy choices to macroeconomic outcomes, to popular evaluations, and then back again to policy choices. Extant work fails to draw distinctions between short- and medium-term consequences of policy choice, and to provide any estimates of the magnitudes and durations of policy outcomes. Without scientifically sound estimates of these outcomes, we have no idea *how much, if any*, room to maneuver democratic governments retain.

We develop a framework that addresses these issues. It is genuinely interdisciplinary since it endogenizes both the open economy and the polity. We use current research—from new open macroeconomics, government approval research and the political economy of financial markets—to identify this model. We then extract three competing arguments about the causal chains that connote popular sovereignty over the economy. Using a Bayesian structural time

series model we test these arguments. The test-bed for our analysis is the United Kingdom, a political economy distinctive for being highly open to trade and finance and producing a high degree of clarity of responsibility for its governments. If political accountability exists anywhere in the OECD, it ought to exist in this critical case (see, e.g., Mosley 2000).

Our results do not support the Room to Maneuver thesis or its application to the UK. They are only partly consistent with past research about the existence of political accountability in open economies. In our sample (1981-1997) the British government was responsive to changes in political evaluations, specifically sociotropic economic expectations. Its policy choices fed back into popular evaluations of government policy, particularly vote intentions. A visible link from popular evaluations to policy and back to popular evaluations existed. There is evidence, consistent with theoretical work on political monetary cycles (e.g., Lohmann 1999) that prices but not output increased before elections. Net of this electoral effect, the accountability mechanism was *outside* the real economy. Shifts in popular evaluations of the British government induced policy changes that had no impact on inflation and economic growth. This suggests, contrary to past research, that government capacity to shape macroeconomic outcomes was limited and popular influence over economic policy was ineffectual. This accountability probably existed because British citizens had difficulty gauging the real impacts of government policies.

2. Connecting the Polity and the Economy: Competing Views of Popular Accountability

Models of economic voting are a natural starting point for analyzing the connections among popular evaluations, government policy and economic outcomes. In these models, voters continuously evaluate the economic outcomes of government policy and hold policymakers accountable for them (Clarke et al. 2004; Erikson et al. 2002; Lewis-Beck 1988). When objective economic indicators suggest that the economy is good, subjective evaluations become more favorable (Sanders 1991).² These subjective evaluations then are transmitted to vote intentions

both directly and via prime ministerial approval (Clarke et al. 2000; Clarke and Stewart 1995; Clarke et al. 1998; Sanders 1991; 2005; Sanders et al. 1993).

While these studies ignore feedback from the polity to the economy, recent research in open macroeconomics yields detailed insights about how government policy influences the macroeconomy. Analyses of theoretical models with inflexible prices and monopolistic competition suggest that monetary policy may affect both domestic and foreign economic performance (Obstfeld and Rogoff 1995). Empirical analyses show that monetary contractions lead to persistent increases in exchange rates (Clarida and Galí 1994; Eichenbaum and Evans 1995). The impact of policy on the real economy is more ambiguous. While some researchers find a considerable effect of a monetary shock on domestic and foreign output (Betts and Devereux 2001; Kim 2001), others find that this effect is rather small (Cushman and Zha 1997).

This research in political science and economics illuminates the workings of the polity and the economy, but the connections between them in economically open democratic systems are not well understood.³ The political monetary (business) cycle literature generally studies closed economies and equates popular accountability with electoral politics. How fast governments react to changes in popular evaluations is usually an assumption in a formal model rather than an empirical question. There is consensus that these reactions are inflationary, but policy has little lasting effect on the real economy (Lohmann 1999). This research provides few results about the speed and magnitude of policy outcomes in economically open democracies.

Uncertainty about the existence and impacts of political accountability in open economies is central to the room to maneuver debate. The debate centers on several aspects of the political economy. The first is whether political shocks have direct or indirect impacts on public policy. Shocks in political variables may directly affect interest rates or they may affect exchange rates and then the changes in exchange rates (indirectly) affect interest rates. The second is the *speed*

of reaction of political and economic actors to unexpected political and economic shocks. If foreign exchange traders react instantly to political shocks, and governments react to exchange rate changes with a delay, then there is a (indirect) lagged effect of politics on policy. Although market participants can anticipate the government's reaction when they observe a political shock, they might be unable to adjust immediately because of nominal economic rigidities. Finally, the amount of political accountability in open economies depends on the *magnitude* and the *duration* of the political, policy and economic effects. If political shocks lead to sharp but short-lived changes in policy, then their impacts disappear quickly and there is little political accountability.

To address which political shocks affect the economy and with what speed, magnitude and duration, we identify three possible causal chains. The first causal chain implies that government is slow to react to political shocks or is inattentive to popular preferences. Political shocks have little or no subsequent effect on policy. Suppose governments react to shocks in popular evaluations with a delay. This can occur for a number of reasons. For instance, government decision-making is time consuming because policy changes require consultations with relevant actors and careful evaluation of policy alternatives. Under this scenario, the government decision-making process is at least as slow as the private sector price adjustment mechanism. Both the financial and real sectors observe shocks in popular evaluations and anticipate the government's reaction. The result is slightly higher prices without an impact on output. When public officials believe that economic agents will thwart their efforts to alter macroeconomic outcomes they do not attempt to satisfy citizens' wishes. The reaction of government to political shocks is so minimal (nonexistent) that popular preferences are not satisfied. Room to maneuver is ruled out in this case.

The second chain implies that governments react immediately to political shocks but the effects of policy quickly disappear. The impact of policy on the economy is not lasting for two

reasons. Foreign exchange markets incorporate political information in investment decisions and anticipate the policy change when observing political shocks. Thus, policy variables and the exchange rate react immediately to political shocks. Although this drop in the exchange rate has initial positive effects on output, this disappears in the medium-run. Expansionary monetary policy partially increases domestic output at the expense of foreign economies. Foreign governments react to the domestic policy change and take measures to offset this shift of world demand toward domestic products. Moreover, if the exchange rate decreases, then prices increase in the medium and long run, so the effect of policy on the open economy disappears.

The immediate and lagged effects of decreasing interest rates on subjective evaluations and political approval are small or not existent in this second chain. First, these variables may not react to policy instantaneously (Sanders 1991). The delayed impact of low interest rates on political variables is offset as voters infer from a declining exchange rate that future inflation will rise. Voters then expect a decrease in real wages, depressing same-period subjective economic expectations. At times, the exchange rate has a symbolic value reflecting the overall strength of a country (Hibbs 1982). A falling exchange rate then has negative, contemporaneous effects on evaluation of government policymaking. Finally, the effect of policy on the real economy does not persist and policy change does not have lagged effects on either subjective or objective political evaluations. Policy reflects citizens' preferences but it is not able to bring about citizens' preferred macroeconomic outcomes. There is no meaningful room to maneuver in this case.

In the third causal chain government is a responsive and an influential actor in the political economy. Government constantly monitors citizens' preferences through opinion polls, voting and political participation, and reacts instantaneously to changes in political evaluations. If the government learns that the public is dissatisfied with the economy, it adjusts policy immediately to alter economic outcomes consistent with citizens' preferences. Government

policy is effective because the domestic real economy adjusts to political shocks only slowly. Economic rigidities imply that government—if it reacts fast enough—can lead the real economy and effectively respond to changes in political evaluations. Although private actors, such as firms and wage setters, anticipate the government’s reaction to a political shock, they are bound by contracts and cannot adjust prices instantaneously. When economic actors in the real sector adjust with a delay the effect of government policy on output is strong and persistent (Galí 2003).

International economic integration reinforces the effect of policy on the economy. Unanticipated monetary expansions have a positive and lasting impact on foreign economies. Thus, foreign demand for domestic goods increases over time strengthening the duration and magnitude of economic growth (Betts and Devereux 2001; Kim 2001). The unanticipated policy change feeds back to popular evaluations. Lower interest rates immediately increase subjective personal and national economic expectations; lower interest rates have an instantaneous, positive impact on government support (Sanders 2005). The effect of policy on approval persists because citizens benefit from the improving macroeconomic conditions. In this third view, political accountability exists in an open economy because government reacts quickly to shocks in approval and its policy changes are substantial in magnitude and effective (because of rigidities and market imperfections). In this sense, government retains room to maneuver.

Figure 1 summarizes the predictions of the three competing causal chains. The white arrows mean there is a weak, delayed, or no effect from one variable to another. The grey arrows imply that there is a strong and persistent effect. In the No Accountability Model, government does not react to changes in political evaluations. In the second, Policy Response Model, the government reacts to shocks in evaluations. This policy change does not influence economic activity and there is no feedback. In the Accountability Model, government reacts to changes in political evaluations. Evaluations and the economy adjust when the government changes policy.

[Figure 1 about here]

3. Research Design

3.1 Case and Data

We test the competing claims about political accountability in open economies using multivariate time series analysis of monthly economic and political data for the United Kingdom from 1981 to 1997. This case is well suited for this analysis since Britain has a high clarity of responsibility and a history of openness to trade and capital flows. Mosley (2000: 751) argues that British elections in the 1990s were meaningful contests between parties with contending views about how Britain should exploit its room to maneuver in the world economy.

Compared to other industrialized democracies, the British system largely concentrates political power in the hands of the central government. Its majority-plurality electoral system produces single-party governments that are fairly independent of other political actors. Unlike countries where two or more coalition partners participate in government, there is little hidden bargaining among the parties during the policy formulation process that makes it difficult for voters to assign the final policy decision to a single, specific political player. The absence of vertical division of power and the unicameral legislature offer political opponents few opportunities to alter government policies (see Powell and Whitten 1993).

Moreover, the British government had full control over economic policymaking during the period of analysis. During the first half of the 1990s, the incumbent Conservative Party blocked efforts to delegate monetary policy to an independent central bank. Between 1970 and 1997 the Bank of England was one of the least independent in the industrialized world. The Bank was granted greater independence after the Labour Party's victory in the May 1997 general election (Bernhard 2002: chapter 7). Even after this date the Bank was gauging public satisfaction with its performance through its inflation attitudes survey. The British government also was

analyzing its accountability to Parliament.⁴ Finally, while British monetary policy may have followed those of other European countries during the crisis of the early 1990s, in our sample period, it was largely unconstrained by the European Monetary System.⁵

Measures of economic openness show that by late 1970s Britain had a relatively open economy. By Quinn's (2000) openness indicators, the British government had lifted nearly all restrictions to capital mobility and most on trade by 1979. The current and capital account openness measures reach their maximum values in 1979 and remain there until 1999 when the indicator ends. Quinn's measures also show that Britain was an open economy in relative terms. The indicator of overall openness using both current and capital account openness increases from 3.5 in 1950 to the maximum value 14 in 1979. Average overall openness in OECD countries varies from 4.2 in 1950 to 9.7 in 1979 and 13.4 in 1999.

We use monthly data from November 1981 to April 1997. The political time series are from the Gallup Organization (King and Wybrow 2001). Vote intentions (VI_t) capture the percentage of voters who respond that they intend to vote for the incumbent party. Prime ministerial approval (PM_t) measures the percentage of respondents who are satisfied with the performance of the incumbent Prime Minister. Subjective personal expectations (PE_t) are the difference between the proportion of people who expect that their personal financial situation will improve during the next year and the proportion of people who think that their situation will deteriorate. Subjective sociotropic expectations (SE_t) capture the difference between the proportion of people who expect the national economic situation will improve and the proportion of people who think that the situation will worsen. To capture electoral dynamics, we use an electoral counter taking (resetting to) the value 1 in the month after each British general election and increasing linearly to the next general election. We also estimated specifications without such a counter and with three counters for the different electoral periods in our time period.⁶

The economic series are from the *International Financial Statistics* (IFS) from the IMF (CD-ROM version). The exchange rate is the monthly average of the \$/£ nominal exchange rate (IFS line rf); it corresponds to the number of U.S. dollars per British Pound (XR_t). Following the macroeconomic literature, we use the British and U.S. Indices of Industrial Production (IFS line 66) to measure monthly domestic and foreign output (IIP_t and $USIIP_t$). The domestic and foreign price levels (CPI_t and $USCPI_t$) are from the British and U.S. Consumer Price Indices (IFS line 64). Domestic and foreign monetary policies (IR_t and $USIR_t$) are the monthly average of short-term interest rates in the two countries (IFS line 60b).⁷

3.2 Model and Structural Identification

To test the competing claims about the degree of political accountability in open economies, we use Bayesian Structural Vector Autoregressive Regression (B-SVAR) models. These are appropriate for a problem like ours where model scale, endogeneity, persistence, and specification uncertainty are present at the same time. B-SVAR models subsume more familiar models like VARs, ECMs, and VECMs allowing for sounder statistical inferences, e.g., the avoidance of knife-edge inferences about unit roots.⁸ Details of the general B-SVAR model are described elsewhere (Brandt and Freeman 2006a; 2006b).

In a B-SVAR model, our discussion of competing causal accounts of political accountability is represented by different contemporaneous and lagged relationships among the variables. The political and economic literatures imply a core set of relationships between variables *within* the polity and the economy. Each competing causal account (chain) implies different contemporaneous relationships *across* the polity and economy: the immediate impact of political shocks on economic variables and the immediate impact of economic shocks on political variables. Inferences about the direction, magnitude, and duration of shocks in key variables can be made on the basis of the impulse responses of the B-SVAR models. These impulse responses

reveal the *combined* impact of contemporaneous and lagged relationships between the political and economic variables in the three structural specifications.

Table 1 represents the contemporaneous relationships among the variables for the three competing models. The core model represented in the upper part of Table 1 implies a causal nexus with no political accountability. Each row in this table corresponds to an equation capturing the contemporaneous effect of the column variable on the row variable. Empty cells are restrictions that mean the column variable is assumed to have no contemporaneous impact on the row equation. The X's represent "free parameters" meaning that the respective column variable can have an immediate impact on the row equation. The three competing causal chains imply different X's at the intersections of the polity and economy, the grey-shaded fields in the upper right and lower left of the three model specifications in Table 1. The core model—in all three causal chains—implies structural specifications in the non-shaded rectangular fields on the upper left and lower right of each model specification in Table 1.

We rely on government approval research in Britain (Clarke et al. 2000; Clarke and Stewart 1995; Clarke et al. 1998; Sanders 1991; 2005) to identify the core political model in the lower right corner of each model in Table 1. The literature suggests that a lower-triangularized, contemporaneous order of SE_t , PE_t , PM_t and VI_t is appropriate. The single-equation models of government approval used by researchers imply that both sociotropic and personal subjective economic expectations affect approval and vote intentions contemporaneously.⁹ These political models suggest that Prime Minister (PM) satisfaction instantaneously influences vote intentions. At the same time, PM satisfaction is weakly exogenous to vote intentions implying that there is no contemporaneous effect of VI_t on PM_t . These models also imply that citizens learn about objective economic indicators in the Production sector only with a delay.¹⁰

Following empirical models in macroeconomics, we divide the open economy into three sectors of equations that differ in terms of how fast they adjust to shocks in the other variables (Leeper et al. 1996). Variables in the “Information Sector” adjust to shocks instantaneously and include financial markets. These markets process new information about changes in other sectors very quickly. For all three competing causal chains the Information Sector reacts instantaneously to shocks in the macropolity (Bernhard and Leblang 2006). We do not require that policy is weakly exogenous. The “Policy Sector” represents the government reaction functions and specifies the variables to which policymakers respond immediately. Variables in the “Production Sector”, economic output and prices, adjust sluggishly to shocks in other variables.

[Table 1 about here]

We rely on work by Cushman and Zha (1997) and Sims and Zha (2006) to specify the speed of adjustment of the specific variables in the open economy. The exchange rate adjusts immediately to all domestic and foreign economic variables. As these authors note, governments have immediate access to information on the exchange rate and monetary policy of other governments. However, policymakers do not observe data on output and prices within the same month and only react with a delay to shocks in those variables. Open economy models are distinguished from closed economy models by variables that are likely to respond to changes in the foreign economy. Thus changes in U.S. monetary policy lead to an immediate reaction of the British government, but not the opposite. Similarly, the British Production Sector responds to the U.S. Production Sector, but not vice versa. The resulting matrix of contemporaneous economic relationships is in the upper-left rectangular field of the models in Table 1.¹¹

The three competing causal accounts depicted in Figure 1 now can be represented as three distinct contemporaneous specifications, or three distinct contemporaneous causal structures in B-SVAR models. The identification of the polity-economy intersections (the grey-shaded areas)

in the upper part of Table 1 represents the idea that political accountability does not exist in open economies. The distinguishing feature of this “No Accountability Model” is the restriction that the government does not react immediately to political shocks. The cells representing the influence of the Macropolity on monetary policy in the upper right corner are blank. Similarly, there is no impact of policy on the polity, as the cells for the impact of government policy on the Macropolity in the lower left corner of the No Accountability specification are empty.

The second model in Table 1 modifies the upper right hand block of the No Accountability model. This modification represents the “Policy Response Model” that allows the government to react immediately to political shocks, but with no contemporaneous feedback through the Macropolity. The specification in the middle of Table 1 shows the modification of the matrix of contemporaneous relationships that allow the government to respond to political shocks but leaves the zero restrictions in the lower left of the core model intact. The R’s in the second model of Table 1 represent the four additional free parameters in the Policy Response Model in comparison to the No Accountability Model.

The third “Accountability Model”—the model that is necessary for any Room to Maneuver—allows for additional free parameters relative to both the No Accountability and the Policy Response models. This model holds that governments react immediately to political shocks and that policy choices are immediately evaluated and feedback through the Macropolity. The A’s in Table 1 represent the additional free parameters that are necessary to allow for such contemporaneous government reaction and feedback. The Accountability model thus has four (eight) more free parameters than the Policy Response (No Accountability) models.

4. Results

We estimated B-SVAR models for the three structural identifications. Each model employs a separate equation for each of the 11 endogenous variables. Each equation includes 6

lagged values of each of the 11 variables, a constant, and a single exogenous covariate that is an election trend for the UK.¹² The interest rate, exchange rate, and political variables enter the model as proportions and the other economic variables enter the model in natural logarithms. Since the model is Bayesian, we employ an informed prior for Bayesian SVARs (Brandt and Freeman 2006a; 2006b; Sims and Zha 1998).¹³ The model is estimated using a Gibbs sampler proposed by Waggoner and Zha (2003). (for details, see Brandt and Freeman 2006a; 2006b).

We use the log marginal data density (MDD) to assess the posterior model fit of the three models. The log MDD measures the log density for the sample data under each model.¹⁴ The log MDDs are 8419 for the No Accountability model, 8432 for the Policy Response model and 8478 for the Accountability model. The best log MDD is one with the largest value, or the results for Accountability model. The log MDD differences are log Bayes factors that describe the weight of the evidence for or odds of one model versus another (Kass and Raftery 1995). The log Bayes factor is $(8432 - 8419 =) 13$ for the Policy Response model versus the No Accountability Model, and $(8478 - 8419 =) 59$ for the Accountability model versus the No Accountability model. The log Bayes factor of the Accountability model versus the Policy Response model is $(8478 - 8432 =) 46$. These large positive values are strong evidence that the Policy Response model is preferred to the No Accountability model and the Accountability model to both of the others. Overall, the Bayes factors indicate that there is substantially higher probability that the Accountability model better explains the data than the other two models.

One should not judge the explanatory power of a B-SVAR solely on these fit statistics (Brandt and Freeman 2006b). The main inferential tool should be impulse response analysis—analyzing the speeds and magnitudes of adjustment of policy to politics and adjustment of politics to policy over time. Impulse responses trace out the dynamic responses to shocks to the various equations in the political-economic system. This is critical to showing the

macroeconomic consequences of any political accountability that might have existed in Britain in this period. In a B-SVAR model, the initial responses follow a contemporaneous causal structure based on the structural identification for each model. The evolution of dynamic response of a shock to an equation is then traced out using the reduced form dynamics of the estimated model. All of the dynamic responses presented here are median estimates in percentage points over 12 months with 68% (pointwise) highest posterior density regions (Brandt and Freeman 2006b).¹⁵

Figures 2 and 3 present impulse responses that trace out the responses of the key policy and political variables in the three models.¹⁶ Of interest are three sets of responses for each model. The first, are the responses of the policy variable UK interest rates (IR_t) to shocks to the political variables sociotropic expectations (SE_t), personal expectations (PE_t), prime ministerial satisfaction (PM_t) and vote intentions (VI_t). These responses summarize the causal linkages between popular evaluations of government and government policy. The second, are the responses of these four political variables to shocks in the UK interest rate and the exchange rate. These responses summarize part of the causal chain from economic policy to popular evaluations.

Figure 2 presents the responses of UK interest rates to the shocks in the four political variables. Each graph traces out the response of UK interest rate equation in the three models to a (positive) one standard deviation shock to the respective political variables.¹⁷ The solid lines are the responses from the No Accountability model; dashed, for the Policy Response model; and dotted, for the Accountability model. For the No Accountability model, a shock in sociotropic expectations (SE_t) leads to a brief, positive response in interest rates, while for the Policy Response model this same shock causes interest rates to decline. In the Accountability model, surprise increases in sociotropic expectation lead to a positive and more lasting increases in interest rates. The Accountability model result is most plausible, since expectations that the economy will improve put pressure on policymakers to raise interest rates (to stave off inflation).

[Figure 2 about here]

The response of UK interest rates to shocks in subjective personal expectations (PE_t) generally is negative. For the No Accountability model, interest rates decline with a 68% confidence region that is below zero. For the Policy Response and Accountability models, the median responses are negative, but the confidence regions always include zero. Thus, omitting endogenous interest rate responses to personal expectation shocks leads to the incorrect inference that interest rates respond negatively when there is likely no response. Models that assume that the policy is exogenous of the polity are subject to an endogeneity error and produce biased inferences about the response of policy to politics.

In the No Accountability and Policy Response models, innovations in prime ministerial satisfaction (PM_t) lead to increases in UK interest rates after about 6 months. When the endogeneity of interest rates to prime ministerial approval is included as in the Accountability model, this effect disappears with a large confidence region including zero. Thus the introduction of the accountability chain in the model produces a null effect. A shock in vote intentions leads to an initial decline in interest rates that lasts 4-6 months in the No Accountability and Policy Response models. The Accountability model shows vote intentions have less effect on interest rates since the confidence region for a shock in vote intentions always includes zero.

The results in Figure 2 have two implications for the room to maneuver debate. First, in the No Accountability and Policy Response models policy appears responsive, but in an anomalous direction. This is because the contemporaneous impact of policy on prime ministerial approval is omitted from these models. Models assuming that the economy is weakly exogenous to politics generate spurious findings of policy responsiveness. Second, the means by which the public influences the direction of interest rates in the UK are innovations in sociotropic

expectations. Interest rates react positively in an immediate and sustained way to changes in the public's economic expectations.

The other dynamics of interest for evaluating political accountability are the response of the political variables' equations to changes in interest and exchange rates. The response of the political variables to changes in policy show feedback from economic policy to the public and that the public reacts to economic policy. Figure 3 presents the responses of the political variables to positive shocks in exchange and UK interest rates. The left (right) column of Figure 3 presents the responses to the exchange rate (UK interest rate) shocks. A positive shock in the exchange rate (XR_t) is a surprise appreciation of the dollar. Such exchange rate shocks lower sociotropic and personal expectations with a lag in the No Accountability and Policy Response models. The responses of prime ministerial satisfaction and vote intentions to exchange rate shocks are positive and small in the No Accountability model. For the Policy Response model, prime ministerial satisfaction responds weakly positively, but the response of vote intentions has a confidence region spanning zero. In contrast, the Accountability model political responses to a positive exchange rate shock are all more uncertain with 68% error bands spanning zero. This is evidence that the political responses to shocks in the exchange rate in the Accountability model causal chain are highly uncertain. The responses in the first column of Figure 3 mean that positive exchange rate shocks have weak to null effects on the U.K. macropolity in this period.

[Figure 3 about here]

In contrast, the responses of the political variables to interest rate shocks (IR_t)—direct evidence of accountability—are consistent with public reacts to economic policy. The sociotropic expectations, personal expectations, and prime ministerial satisfaction equations do not respond to interest rate innovations in any of the models. For the No Accountability and Policy Response models where no contemporaneous accountability or endogenous feedback from policy to politics

is specified, shocks to interest rates produce no lagged change in vote intentions. The response of the vote intentions equation in the Accountability model provides direct evidence of reactions to policy. For the accountability chain that allows for contemporaneous endogeneity from policy to vote intentions, a positive one standard deviation shock to interest rates leads to a decline in vote intentions. This drop is large and constant at nearly -0.05 points for each of the twelve months in the response horizon. Cumulatively this is a substantial change, since it means that over 12 months it accounts for more than half a point change in vote intentions.

The responses of the political variables to exchange and interest rate shocks in Figure 3 show that policy changes generate a response in the public evaluations of government. But this causal mechanism is apparent only in a model that explicitly allows for contemporaneous accountability. From the interest rates responses to the political variables in Figure 2, assuming that there is exogeneity from the economic policy variables to the political variables as in the No Accountability and Policy Response models lead to findings that politics does not respond to policy. In fact, allowing for contemporaneous effects interest rate shocks produce changes in vote intentions.

Key links in the economic-politics causal chain in the Room to Maneuver debate are the impact of policy on the real economy and of the real economy on the political variables. Figure 4 shows the responses of UK CPI_t and IIP_t to changes in UK interest rates. These responses are central to economists' claims about the effects of policy in the presence of price stickiness and nominal rigidities. All three models produce the same inferences for monetary policy. Positive interest rate increases lead to small (less than 0.0002%) increases in prices and output with confidence regions spanning zero. This is consistent with Sims and Zha (2006) who found relatively weak effects of unexpected monetary policy changes on the real economy in the U. S.

[Figure 4 about here]

The final component of the accountability causal chain is the impact of the real economy on the polity. Earlier political science work showed that the impacts of the real economy were small relative to the impacts of the expectational, approval and vote intention variables all the while assuming that economy was exogenous of the polity. In our models with endogenous economic and political linkages, the impacts of the real economy can be evaluated after accounting for the documented endogenous relationships for the economic policy and politics.

Figure 5 shows the responses that address the impact of the real economy on the polity. Responses of the political variables are traced out for shocks to British CPI_t and IIP_t . The former are unresponsive to innovations in real output, as shown by the non-responses to IIP_t innovations in the second column. The impacts of price innovations or inflationary pressures (positive CPI_t shocks) vary widely across the three models. For the No Accountability model, there are no political responses to inflationary shocks (the median and 68% bands are right on zero). In the Policy Response model, one standard deviation increases in prices lead to a nearly two point decline in sociotropic expectations with a confidence region below zero over twelve months. In the short term, inflationary pressures lead to a three-month decline in personal expectations after which the error bands span zero. After that, these responses mimic the inference of the Accountability model and show no response to price innovations.

[Figure 5 about here]

These inflation effects are not produced in the Accountability model where inflationary pressures generate macropolity responses with error bands including zero. Prime ministerial approval does not respond to price changes in any model. Domestic price increases lead to no responses in vote intentions for the No Accountability and Policy Response models since the respective confidence regions include zero. The Accountability model vote intention response to price innovations moves in the correct direction, but has a confidence region that includes zero.

The Policy Response model assumes that the macropolity is weakly exogenous to the real economy and policy. Including contemporaneous policy endogeneity—as in the Accountability model—the real effects of inflation on the polity are zero.¹⁸

The exogenous election counter(s) may capture the impacts of politics on the economy. Each of the 11 equations includes an exogenous election counter; so the responses described above are net of these electoral trends. We also estimated models 1) without any electoral trends and 2) with separate counters for each electoral period. For each election counter specification, the Accountability model fits best. There is no evidence of any impact of policy on the real macroeconomy in the Accountability model, regardless of the electoral counter specification. The density estimates for the single election counter coefficients are identical across the three models. For each additional month closer to the election, the exchange rate and interest rates drop and have densities that do not include zero. A similar, but substantively smaller result is seen for US prices and output. The political variables' equations respond more strongly to the election run-up and have election counter coefficients with densities that do not include zero. The impacts of the election counter on the political variables' equations are two to three orders of magnitude larger than the effect of the election counter on the information, policy and production variables. These results are consistent with Lohmann's (1999) model of political monetary policy accountability. Lohmann's model predicts that prices, but not output, respond to election cycles. Our election counter densities support these predictions. But the main point is that the *non-electoral* dynamics reveal no lasting real, macroeconomic effects of political accountability (Figure 4). So, political accountability exists outside the real economy: a condition for the room to maneuver is not met.

5. Conclusion

Scholars repeatedly point to Britain as a case where the government enjoyed significant room to maneuver during the period of analysis (e.g., Mosley 2000). Thus, political

accountability existed in that the British government effectively used this room to maneuver and continuously produced economic outcomes consistent with the wishes of British citizens.

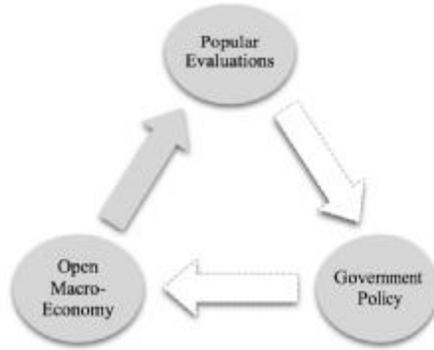
Our results are only partially consistent with this argument. We find that British governments reacted to changes in subjective expectations about future national economic development. The public can induce changes in government policy and thus exerts some influence over policymaking. Voters then reward the government for its policies and the proportion of citizens intending to vote for the incumbent government increases. But there is no evidence that the government can effectively influence real economic outcomes. Therefore the accountability mechanism works *outside* the real economy. In terms of the full relationship between the economy and the polity described in Figure 1, there is no transmission of policy through the economy to popular evaluations. The links from policy to the economy and from the economy to popular evaluations are missing, at least in the short- and medium term. We did not examine the effects of the reforms during Tory incumbency on long-run growth and inflation, i.e. over a decade or more. The ability of the Tory government to spur long-run growth in the 1980s and 90s may be interpreted as a form of long-run accountability. But it is unlikely that citizens' time horizons cover a decade or even more when they evaluate the performance of their government.

There are several explanations for our finding. One is that British citizens rewarded their government for policies that affected their personal situation more than for impacts on the macroeconomy. But like Clarke et al., (2004) we included a variable for Personal Expectations (PE_t). In the Accountability model it shows no response to exchange or interest rate policy (Figure 3). Another explanation is "group attribution bias." Conservatives may credit their government for outcomes that are not the result of monetary policy. But then Labour supporters ought to disapprove of macroeconomic outcomes and this should counterbalance the positive

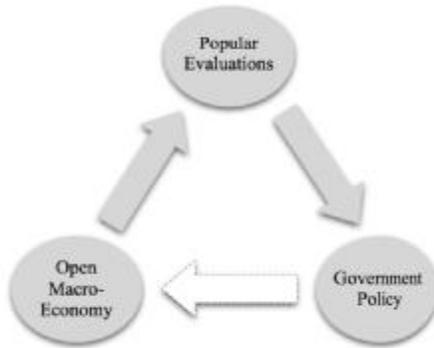
evaluations of their Tory counterparts. Yet, we find in the Accountability model that the vote intentions of the British electorate as a whole respond as expected to interest rate shocks (Figure 3). A plausible explanation is that British citizens simply have trouble gauging the efficacy of monetary policy. They approve of the policies but simply are not able to determine if they have their intended impacts. This is not surprising when one realizes that economists continuously debate the effectiveness of monetary policy and of well-established relationships like the impact or minimum wage laws on employment (Blinder and Krueger 2004, fn. 39).

The results for our competing models show that assumptions about the exogeneity of the macropolity or of the marcoeconomy, as in most comparative political economy research, may be problematic. Multiple equation models that account for the simultaneous dynamics between voter preferences, government policy and economic outcomes are likely to improve our understanding of modern political economies.

Future research should examine how the relationship between citizens, policymaking and outcomes changes under alternative political and economic conditions. Changes in institutions and the use of alternative policy instruments, especially fiscal policy, may create different causal linkages that connote political accountability. Analysis of the period after 1997 in Britain would be illuminating. In these years, the British central bank became much more independent and the Labour party—a party prone to use fiscal policy to pursue its objectives—took office. The possibility political accountability existed between 1997 and 2006 will be the subject of the sequel to this paper.



No Accountability Model



Policy Response Model



Accountability Model

Figure 1: Competing Models of Political Accountability

	Sector	Variable	XR _t	IR _t	USIR _t	CPI _t	IIP _t	USCPI _t	USIIP _t	SE _t	PE _t	PM _t	VI _t
No Accountability Model	Information	XR _t	X	X	X	X	X	X	X	X	X	X	X
	Policy	IR _t	X	X	X								
	Policy	USIR _t	X		X								
	Production	CPI _t				X	X	X	X				
	Production	IIP _t					X	X	X				
	Production	USCPI _t						X	X				
	Production	USIIP _t							X				
	Macropolity	SE _t								X			
	Macropolity	PE _t								X	X		
	Macropolity	PM _t								X	X	X	
Macropolity	VI _t								X	X	X	X	
Policy Response Model	Information	XR _t	X	X	X	X	X	X	X	X	X	X	X
	Policy	IR _t	X	X	X					R	R	R	R
	Policy	USIR _t	X		X								
	Production	CPI _t				X	X	X	X				
	Production	IIP _t					X	X	X				
	Production	USCPI _t						X	X				
	Production	USIIP _t							X				
	Macropolity	SE _t								X			
	Macropolity	PE _t								X	X		
	Macropolity	PM _t								X	X	X	
Macropolity	VI _t								X	X	X	X	
Accountability Model	Information	XR _t	X	X	X	X	X	X	X	X	X	X	X
	Policy	IR _t	X	X	X					A	A	A	A
	Policy	USIR _t	X		X								
	Production	CPI _t				X	X	X	X				
	Production	IIP _t					X	X	X				
	Production	USCPI _t						X	X				
	Production	USIIP _t							X				
	Macropolity	SE _t		A						X			
	Macropolity	PE _t		A						X	X		
	Macropolity	PM _t		A						X	X	X	
Macropolity	VI _t		A						X	X	X	X	

Table 1: Contemporaneous Relationships for No Accountability, Policy Response and Accountability Models. Each model block specifies the contemporaneous relationships and restrictions for an associated B-SVAR model (A_0 matrix)

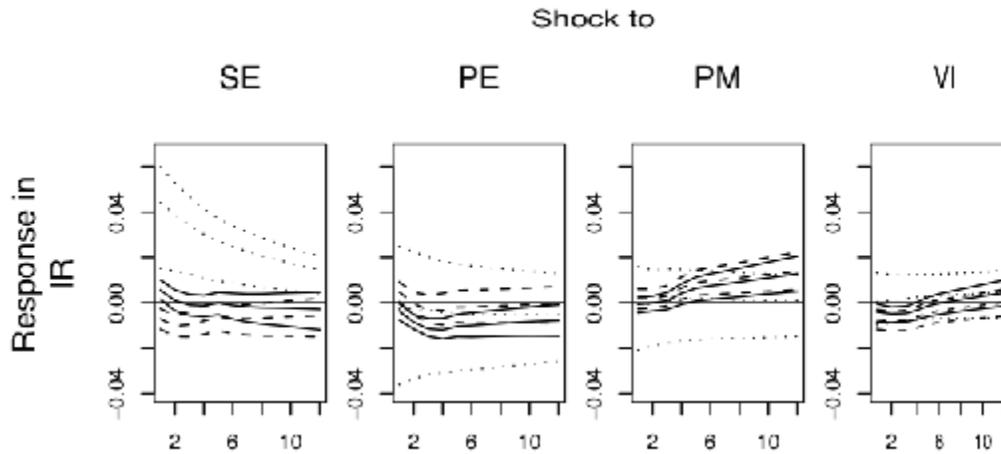


Figure 2: Responses of UK interest rates to innovations in the political variables for the three models. The solid lines are the median responses from the No Accountability model; dashed, for the Policy Response model; and dotted, for the Accountability model. Responses include 68% pointwise empirical error bands to assess uncertainty.

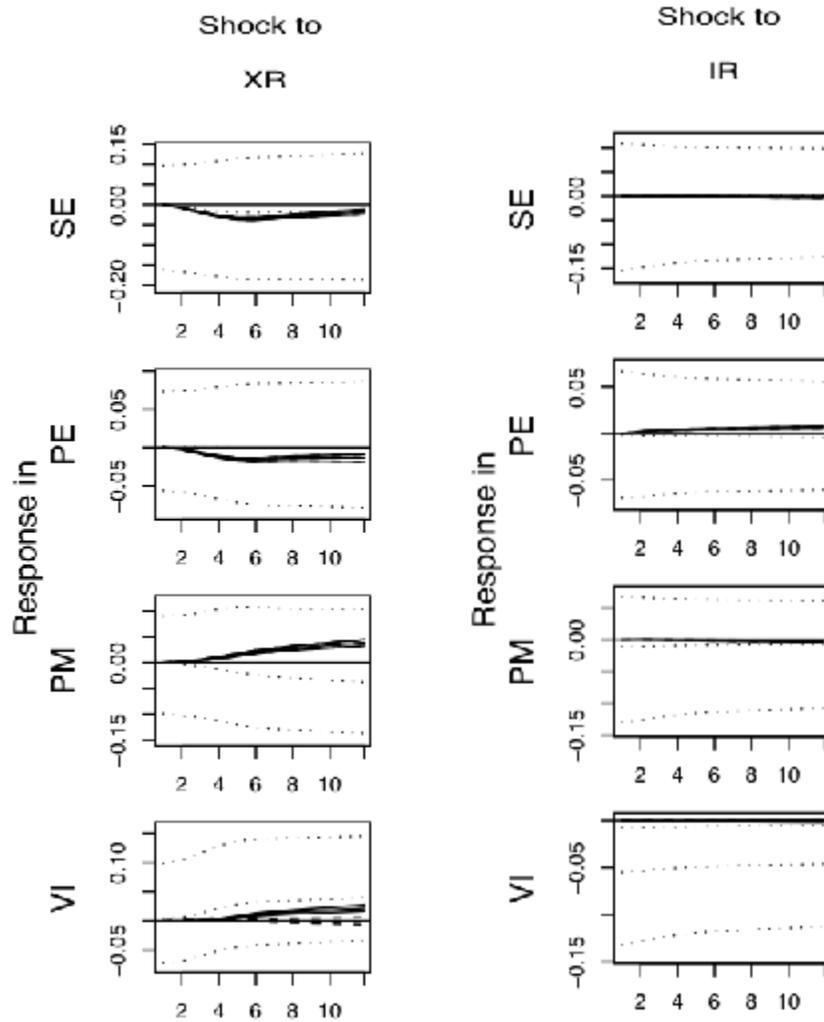


Figure 3: Responses of political variables to innovations in UK interest rates and the exchange rate (XR) for the three models. The solid lines are the median responses from the No Accountability model; dashed, for the Policy Response model; and dotted, for the Accountability model. Responses include 68% pointwise empirical error bands to assess uncertainty.

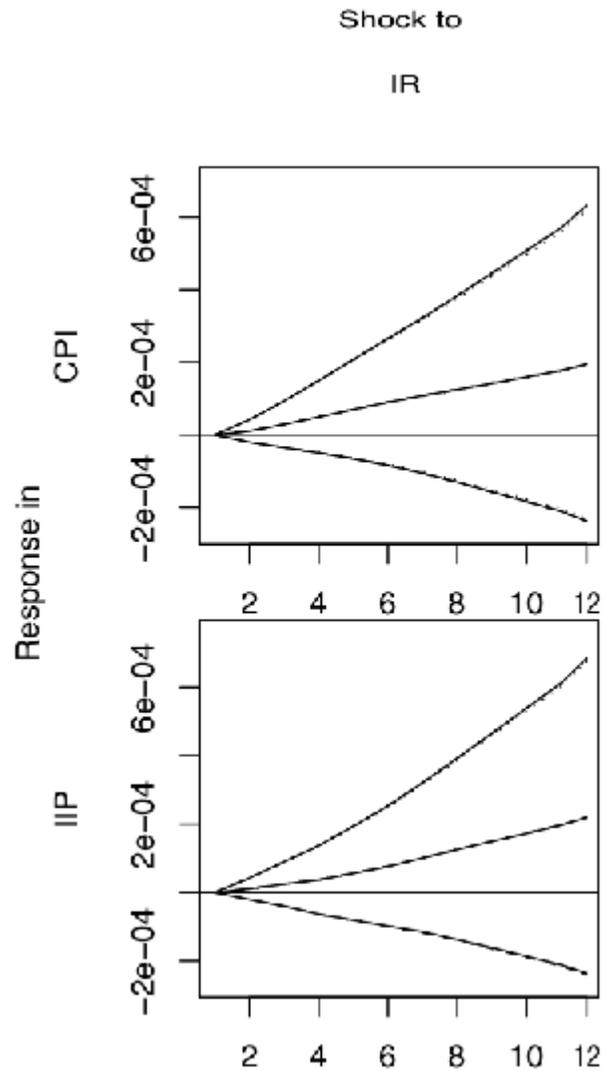


Figure 4: Responses of UK Production Sector to innovations in UK interest rates (IR) for the three models. The solid lines are the median responses from the No Accountability model; dashed, for the Policy Response model; and dotted, for the Accountability model. Responses include 68% pointwise empirical error bands to assess uncertainty.

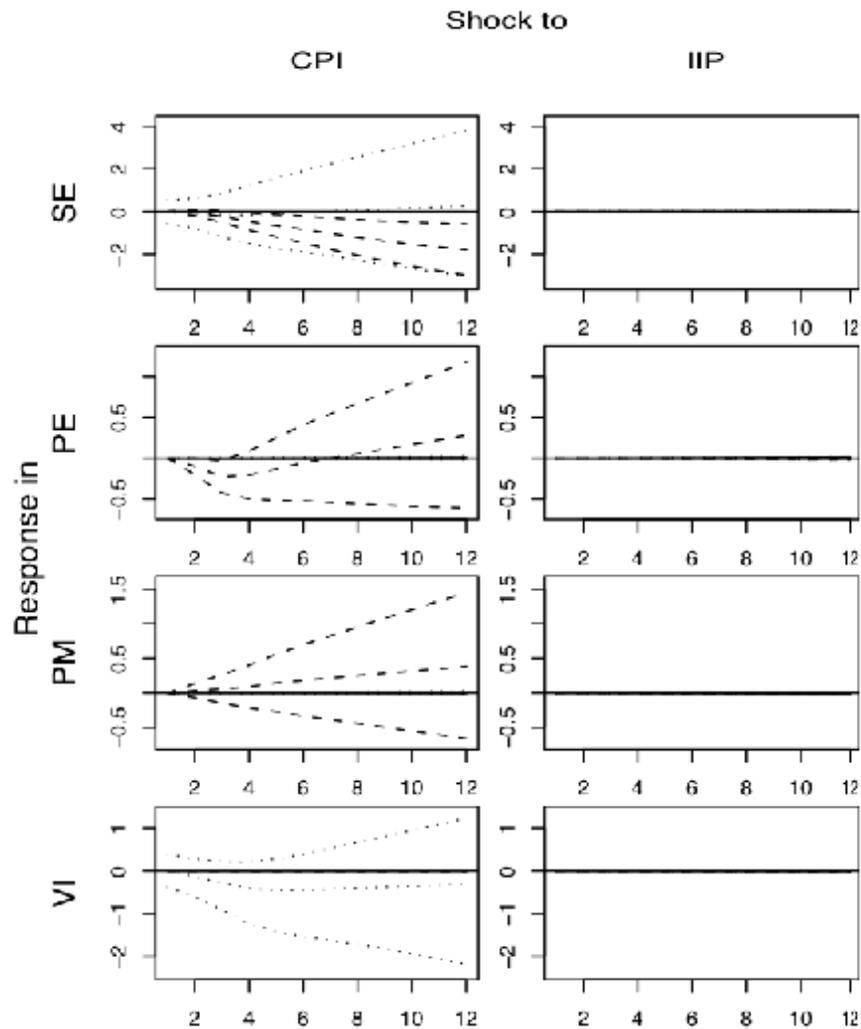


Figure 5: Responses of political variables to innovations in UK CPI and IIP for the three models. The solid lines are the median responses from the No Accountability model; dashed, for the Policy Response model; and dotted, for the Accountability model. Responses include 68% pointwise empirical error bands to assess uncertainty.

References

- Bernanke, B.S. and Blinder, A. S. (1992). The Federal Funds Rate and the Channels of Monetary Transmission. *American Economic Review*, 82, 901-921.
- Bernhard, W. T. (2002). *Banking on Reform: Political Parties and Central Bank Independence in the Industrial Democracies*. Ann Arbor: The University of Michigan Press.
- Bernhard, W. T. and Leblang, D. (2006). *Democratic Processes and Financial Markets: Pricing Politics*. New York: Cambridge University Press.
- Betts, C. and Devereux, M. B. (2001). The International Effects of Monetary and Fiscal Policy in a Two-Country Model. In M. Obstfeld and G. Calvo (Eds.), *Essays in Honor of Robert A. Mundell* (pp. 9-52). Cambridge: MIT Press.
- Blinder, A. S. and Krueger, A. B. (2004). What Does the Public Know About Economic Policy, and How Does It Know It? *Brookings Papers on Economic Activity*, 1:2004, 327-387.
- Brandt, P. T. and Freeman, J. R. (2006a). Advances in Bayesian Time Series Modeling and the Study of Politics: Theory Testing, Forecasting, and Policy Analysis. *Political Analysis*, 14, 1-36.
- Brandt, P. T. and Freeman, J. R. (2006b). Modeling Macro Political Dynamics. Unpublished Manuscript. University of Minnesota, Twin Cities.
- Brandt, P. T. and Williams, J. T. (2007). *Multiple Time Series Models*. Beverly Hills: Sage.
- Clarida, R. and Galí, J. (1994). Sources of Real Exchange Rate Fluctuations: How Important are Nominal Shocks? *NBER Working Paper Series*, 4658.
- Clark, W. R. and Hallerberg, M. (2000). Mobile Capital, Domestic Institutions, and Electorally Induced Monetary and Fiscal Policy. *American Political Science Review*, 94, 323-346.
- Clarke, H., Ho, K. and Stewart, M. C. (2000). Major's lesser (not Minor) Effects: Prime Ministerial Approval and Governing Party Support in Britain Since 1979. *Electoral Studies*, 19, 255-273.

- Clarke, H. and Stewart, M. C. (1995). Economic Evaluations, Prime Ministerial Approval and Governing Party Support: Rival Models Reconsidered. *British Journal of Political Science*, 25, 145-170.
- Clarke, H., Stewart, M. C. and Whiteley, P. F. (1998). New Models for New Labour: The Political Economy of Labour Party Support, January 1992-April 1997. *American Political Science Review*, 92, 559-575.
- Clarke, H. D., Sanders, D., Stewart, M. C. and Whiteley, P. F. (2004). *Political Choice in Britain*. Oxford: Oxford University Press.
- Cushman, D. O. and Zha, T. (1997). Identifying Monetary Policy in a Small Open Economy under Flexible Exchange Rates. *Journal of Monetary Economics*, 39, 433-448.
- Eichenbaum, M. and Evans, C. L. (1995). Some Empirical Evidence on the Shocks to Monetary Policy on Exchange Rates. *The Quarterly Journal of Economics*, 110, 975-1009.
- Erikson, R. S., MacKuen, M. B. and Stimson, J. A. (2002). *The Macro Polity*. Cambridge: Cambridge University Press.
- European Commission (2003). Globalization. Flash Eurobarometer 151b - Taylor Nelson Sofres/EOS Gallup Europe.
- Freeman, J. R. (2006). Democracy and Markets in the Twenty-First Century: An Agenda. Forthcoming in P. Nardulli Ed. *Democracy and Markets in the Twenty-First Century*.
- Freeman, J. R. and Houser, D. (1998). A Computable Equilibrium Model for the Study of Political Economy. *American Journal of Political Science*, 42, 628-660.
- Galí, J. (2003). New Perspectives on Monetary Policy, Inflation, and the Business Cycle. In M. Dewatripont, L. P. Hansen and S. J. Turnovsky (Eds.), *Advances in Economics and Econometrics: Theory and Applications, Eighth World Congress* (pp. 151-197). Cambridge: Cambridge University Press.

- Garrett, G. and Mitchell, D. (2001). Globalization, Government Spending and Taxation in the OECD. *European Journal of Political Research*, 39, 145-177.
- Hellwig, T. (2006a). Globalization, Policy Efficacy, and Perceptions of Democratic Performance. Unpublished Manuscript. University of Houston.
- Hellwig, T. (2006b). Globalization, Room to Maneuver Constraints and Vote Choice. Unpublished Manuscript. University of Houston.
- Hibbs, D. (1982). Economic Outcomes and Political Support for British Governments Among Occupational Classes: A Dynamic Analysis. *American Political Science Review*, 76, 259-279.
- Kass, R. E. and Raftery, A. E. (1995). Bayes Factors. *Journal of the American Statistical Association*, 90, 773-795.
- Kim, S. (2001). International Transmission of U.S. Monetary Policy Shocks: Evidence from VAR's. *Journal of Monetary Economics*, 48, 339-372.
- King, A. S. and Wybrow, R. J. (2001). *British Political Opinion 1937-2000: The Gallup Polls*. London: Politico's Publishing.
- Leeper, E. M., Sims, C. A. and Zha, T. A. (1996). What Does Monetary Policy Do? *Brookings Papers on Economic Activity*, 1996, 1-63.
- Leeper, J. and Sterne, G. (2002). Parliamentary Scrutiny of Central Banks in the United Kingdom and Overseas. *Bank of England Quarterly Bulletin*, 42, 274-285.
- Lewis-Beck, M. S. (1988). *Economics and Elections: The Major Western Democracies*. Ann Arbor: The University of Michigan Press.
- Lohmann, S. (1999). What Price Accountability? The Lucas Island Model and the Politics of Monetary Policy. *American Journal of Political Science*, 43, 396-430.
- Mosley, L. (2000). Room to Move: International Financial Markets and National Welfare States. *International Organization*, 54, 737-773.

Obstfeld, M. and Rogoff, K. (1995). Exchange Rate Dynamics Redux. *Journal of Political Economy*, 103, 624-660.

Powell, G. B. and Whitten, G. D. (1993). A Cross-National Analysis of Economic Voting: Taking Account of the Political Context. *American Journal of Political Science*, 37, 391-414.

Quinn, D. (1997). The Correlates of Change in International Financial Regulation. *American Journal of Political Science*, 91, 531-551.

Quinn, D. P. (2000). Democracy and International Financial Liberalization. Unpublished Manuscript. Washington D.C.

Sanders, D. (1991). Government Popularity and the Next General Election. *Political Quarterly*, 62, 235-261.

Sanders, D. (2005). The Political Economy of UK Party Support, 1997-2004: Forecasts for the 2005 General Election. *Journal of Elections, Public Opinion, and Parties*, 15, 47-71.

Sanders, D., Marsh, D. and Ward, H. (1993). The Electoral Impact of Press Coverage of the British Economy 1979-87. *British Journal of Political Science*, 23, 175-210.

Sims, C. A. and Zha, T. A. (1998). Bayesian Methods for Dynamic Multivariate Models. *International Economic Review*, 39, 949-968.

Sims, C. A. and Zha, T. A. (2006). Does Monetary Policy Generate Recessions? *Macroeconomic Dynamics*, 10, 231-272.

Swank, D. and Steinmo, S. (2002). The New Political Economy of Taxation in Advanced Capitalist Democracies. *American Journal of Political Science*, 46, 642-655.

Waggoner, D. F. and Zha, T. A. (2003). A Gibbs Sampler for Structural Vector Autoregressions. *Journal of Dynamics and Control*, 28, 349-366.

Williams, J. T. (1990). The Political Manipulation of Macroeconomic Policy. *American Political Science Review*, 84, 757-795.

¹ Empirical evidence does not support his claim, since majorities in European countries do not think that their governments have enough control over macroeconomic outcomes (European Commission 2003; Freeman 2006; Hellwig 2006a; 2006b). Existing research does not answer the question why citizens lose their faith in their governments' capacity to shape economic developments when these governments are generating economic outcomes that citizens' desire.

² The objective measures generally are unemployment or economic growth, inflation, interest rates and the exchange rate (Bernhard and Leblang 2006: chapter 8; Hibbs 1982; Sanders 1991). Subjective indicators include subjective personal financial and sociotropic economic expectations and retrospections (Clarke and Stewart 1995; Sanders 1991).

³ Freeman and Houser (1998) present dynamic stochastic general equilibrium models that combine the polity and the economy, but this model is for closed economies.

⁴ After a 1997 Treasury Committee Report on Central Bank accountability, the BOE began a survey of the public's understanding of its activities and of how well it is doing in the public mind (Bank of England, Quarterly Bulletins, Summer 2001: 164-168; Summer 2003: 228-234). On the governments' central bank accountability studies see Leeper and Sterne (2002).

⁵ We tested whether UK and German interest rates were cointegrated. The results were ambiguous for the first half of the sample, specifically until German unification in 1990 and the EMS crisis in 1992. In the latter period, we did not find evidence that UK and German interest rates were cointegrated. Tests suggest that the series were not cointegrated for the full sample.

⁶ Our model reveals political dynamics that exist beyond the episodic impacts of elections. We report tests of the alternative specifications of the electoral counter below. To some degree, the timing of elections in Britain is endogenous. Future research could analyze this issue.

⁷ Bernanke and Blinder (1992) show that short-term interest rates are a good indicator of monetary policy.

⁸ Brandt and Williams (2007) is an introduction to multiple time series analyses. For an application, see Williams (1990).

⁹ These models generally regress approval or vote intentions on the contemporaneous values of subjective expectations. Sanders (1991) uses a three month lag for personal expectations. Sanders (2005) introduces personal expectations without a lag.

¹⁰ Sanders (1991) and Clarke and Stewart (1998) present models of vote intentions and government approval that include objective economic indicators. These variables are lagged at least one period implying that there is no contemporaneous influence of the Production Sector on the political variables. This is consistent with Sims and Zha (2006) and Cushman and Zha (1997) where information about output and prices is not immediately available to governments. Thus, this information is not available to voters either. This restriction of contemporaneous relationships does not prevent voters from reacting to the real economy with a lag.

¹¹ The Cushman/Zha identification does not allow for contemporaneous responses of policy to changes in the Production sector. This allows governments to respond to shocks to output and prices. There can be a *lagged* relationship between production variables and policy where the countries respond to output and prices with a lag because this information is received later.

¹² This specification was chosen based on AIC and F-tests.

¹³ The prior applies to the full set of parameters in the system of equations. The hyperparameter values for this prior are set at standard reference values which correspond to the beliefs revealed by political scientists like Clarke, Stewart and Sanders and by macroeconomists like Sims and Zha. The values are $\lambda_0=0.6$, $\lambda_1=0.1$, $\lambda_3=1$, $\lambda_4=0.1$, $\lambda_5=0.05$, $\mu_5=5$, $\lambda_6=5$. We also conducted a

sensitivity analysis using the reduced form representation of the model that employed over 10,000 different sets of these hyperparameters. The prior employed here is among the best fitting from the sensitivity analysis. Other hyperparameter values yield qualitatively similar inferences to those reported here and thus we believe that the model is not sensitive to the prior. These additional analyses are available from the authors.

¹⁴ The log MDD is the log (posterior) probability of the posterior data generating process. Maximizing this measure is similar to minimizing the mean squared error of the residuals in a regression, which is the same as maximizing the probability of the parameters generating the data. If a model fits well, this joint posterior probability or the log MDD is high.

¹⁵ These 68% confidence regions (approximately one standard deviation around the median response) are better summaries the central tendency of the responses (Sims and Zha 1998). Bayesian shape or likelihood based error bands using the eigendecomposition methods in Sims and Zha (1998) and Brandt and Freeman (2006a) produce similar inferences.

¹⁶ The full impulse responses are available upon request. There are $3 \times (11 \times 11) = 363$ of them.

¹⁷ These are one standard deviation of the residuals from the equations in the B-SVAR model.

¹⁸ We have normalized all of the shocks in all of the equations to be positive. While this is useful for interpretation of *individual* responses, the full system and A(0) specifications have shocks that vary in sign across the equations. Allowing negative shocks produces the same inferences reported here.