

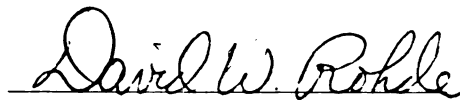


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**HOMOGENEOUS PREFERENCES, HETEROGENEOUS INFORMATION,
AND THE DYNAMICS OF PRESIDENTIAL ACCOUNTABILITY**

presented by
RENEE MARIE SMITH

has been accepted towards fulfillment
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HOMOGENEOUS PREFERENCES, HETEROGENEOUS INFORMATION,
AND THE DYNAMICS OF PRESIDENTIAL ACCOUNTABILITY

VOLUME I

By

Renée Marie Smith

A DISSERTATION

Submitted to
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ABSTRACT

HOMOGENEOUS PREFERENCES, HETEROGENEOUS INFORMATION, AND THE DYNAMICS OF PRESIDENTIAL ACCOUNTABILITY

By

Renée Marie Smith

The central argument in this work is that a president's aggregate approval rating reflects the underlying distribution of citizens' normative beliefs about desired presidential performance as well as information about the common outcomes for which they hold the president accountable. Because citizens have stable, homogeneous preferences for ideal presidential performance, changes in their decisions to reward or punish the president with their approval or disapproval are driven by the media information they receive about desired outcomes. However, because citizens vary in terms of their awareness, they are exposed to changes in information at different times and do not all reward or punish the president instantaneously. Instead, the flow of salient information across citizens over time stimulates opinion change at the time the information is received. Hence, the diffusion of information over time is hypothesized as the source of dynamic movements in a president's aggregate approval rating. The empirical results, obtained using error correction models and tests for cointegration, show that changes in aggregate levels of approval are a function of mass economic forecasts and accurate information about inflation and unemployment. Since the empirical evidence also shows that changes in mass

economic forecasts are influenced by the inflation rate and the level of accurate information about inflation, the importance of economic information to changes in public opinion about the president's job performance is firmly established.

To the memory of my mother

ACKNOWLEDGEMENTS

"I'm not going to school tomorrow or ever again," the dark-haired kindergartner boldly declared to her mother.

"You have to go to school. It's the law," her mother said matter-of-factly.

"Well, if I go, I'm not going by myself," said the girl as her bravado vanished into tears.

"What happened? You like school. Why don't you want to go any more?" her mother asked gently, suddenly realizing the seriousness of the situation.

"That big kid Brian pushed me today and I spilled my crayons on the sidewalk. And the big black dog on the corner barks at me. And I can't walk to school by myself. I'm just too little, and I can't do it," said the girl between sobs.

"Hey, I know a story about someone who wasn't sure he could do something either. Would you like to hear it?" my mother asked.

I remember that day like it was today. Within minutes we were nestled on the living room couch, and I was listening to the story about the little train who got up the hill when others could not. I don't know if I'd ever heard the story before, but that day, I lived it.

"Let's say it together," my mother urged.

"I think I can. I think I can."

"I think I can. I think I can. I think I can. I think I can. I think I can. I think I can."

And soon, we were propelling ourselves around the room, arms forward, then back, forward, then back, my voice drowning out hers.

"So try to remember, that when you think you can't, you really can. And if you get scared, then just say, 'I think I can. I think I can,' and pretend you're like the little train," my mom said as we sat down to eat lunch.

I doubt if my mom ever realized that I took her advice literally and spent the year churning my arms and whispering those words to myself as I navigated my way past the barking dog. And I doubt if she ever realized how many times that day, those doubts, and that phrase would cross my mind in the ensuing years -- before the opening tip in an important high school basketball game, during a college entrance exam, after getting a "C" on a college biology exam, before heading off to

graduate school, during the first class I ever taught, after accepting a job at the University of Rochester, and today.

And so now, with this project complete and graduate school finished, I dedicate this dissertation to the memory of my mother. Thanks, mom, for that special moment and for giving me a reason to agree with Robert Fulghum that "all I really need to know I learned in kindergarten."

+ + + + + + + + + + +

Of course, I didn't quit school that day or any other day over the past 25 years, and I want to thank the others who made intellectual, emotional, and financial contributions. First, I thank my father, Wayne Smith, my sisters, Cherie and Jessica, and my brother, Jacob, for their support. Second, I extend a heartfelt thanks to the members of my dissertation committee -- Dave Rohde, Richard Baillie, Scott Gates, Jim Granato, and Jeff Hill. I especially thank Dave Rohde, who wore the hats of committee chair, employer, and friend. This dissertation is better because he suggested that I develop a stronger micro-level link to the aggregate-level model, and I am a better political scientist having observed the way he conducts his research and interactions with others. In addition, I thank John Freeman of the University of Minnesota and Robert Jackman of the University of California-Davis, each of whom helped me when I was on the job market. And thanks to Jim Granato and Paula Kearns for their advice and friendship.

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CHAPTER ONE

INTRODUCTION

This dissertation is a theoretical and empirical investigation of the behavioral forces underlying a president's level of public support. The research question addressed is: By what process do citizens' standards of presidential accountability influence movements in aggregate levels of presidential approval over time? Because issues of presidential power and of political accountability for its exercise intersect within public opinion of the president's job performance, this question is not trivial.

Investigating the determinants of public opinion about the president's job performance is of fundamental importance to a full understanding of the institution of the modern presidency. Modern presidents increasingly appeal to and use public opinion to justify their actions. Furthermore, as Hodgson (1980) suggests, the increasing emphasis by pollsters and the media on public evaluations of the president has created "a sort of perpetual election" that heightens executive accountability to the public. Crespi (1980, 42) describes the influence of public opinion on modern executive accountability and leadership as follows:

[P]residential approval ratings have created a pseudo-parliamentary situation, whereby the president faces a monthly vote of confidence from the total electorate. While not binding in any sense, this vote of confidence is accepted by both politicians and political analysts as an indicator of the president's political clout and, therefore, of his ability to govern effectively.

Hence, favorable public opinion potentially empowers presidents, while messages of disapproval constrain presidential decision making and actions.

For instance, the level of a president's approval rating has been linked to the amount and timing of presidential veto activity and to the reaction of members of Congress to presidential vetoes (Rohde and Simon 1985) as well as to the probability that a president will use major military force in response to international problems (Ostrom and Job 1986). These findings lend support to Neustadt's (1980, 69) observation that:

a president's prestige is ... a factor that may not decide the outcome in a given case but can affect the likelihoods in every case and therefore is strategically important to his power.

Given that presidential approval is interpreted by the president and other elite actors as an indicator of citizens' levels of satisfaction with presidential actions and with current national outcomes and conditions and since a president's approval ratings are part of the context within which presidents act, analyzing the forces underlying public opinion about the president can shed light on both the modern citizen-to-leader message system and the timing and nature of executive exercises of power.

PRESIDENTIAL POWER AND POLITICAL ACCOUNTABILITY

Recent accounts of the modern presidency¹ note the following paradox of executive leadership: Although the range

of presidential power strategies has expanded over time, presidential exercises of power are becoming increasingly constrained. For instance, Kernell (1986) and Tulis (1987) argue that the growing use and legitimation of presidential appeals to the public represents an enlargement of the repertoire of presidential power strategies. Unlike presidents past, modern presidents increasingly appeal directly to the public in attempts to gain either general presidential support or specific policy backing that can be used to influence the behavior of other elites and to meet presidential goals of re-election and fame.

But the use of this power strategy has not been inexpensive for presidents because, in return, citizens expect their chief executives to solve "the public trouble pressing on their lives" (Neustadt 1980, 74). So high are public expectations of the president, says Lowi (1985), that citizens tend to label as failures any presidential actions that fall short of complete success. Despite increases in the potential powers of the president, the likelihood that a president will fail to satisfy citizens' expectations is, according to Lowi (1985, 11), "always tending toward 100 percent." Public dissatisfaction can, in turn, lead to unfavorable public evaluations of the president that decrease the likelihood of a president achieving his or her goals. Thus, public opinion is like a double-edged dagger that, if handled carelessly, can generate self-inflicted presidential wounds.

But how can it be that within the context of the leader-citizen relationship the president is becoming both more and less powerful? Why is it that public opinion can be both a source of executive strength and the Achilles' heel of presidential power? The purpose of this chapter is to explore answers to these questions by examining changes in presidential power and political accountability since the founding. My argument is that this *paradox of presidential power* is a modern restatement of the age-old tension between grants of power to leaders and political accountability for the exercise of that power. Because of changes in the definition of presidential accountability that have occurred since the founding, modern presidents have both a potentially greater range of power and a greater degree of responsibility for its use.

Presidential Power Domains

Let me begin this discussion by defining presidential power as the legal and extra-legal capacity of a president to produce political effects; that is, to influence either directly or indirectly the authoritative allocation of value. Because this capacity is based in part upon a tangible set of constitutionally-enumerated powers, presidential power is sometimes thought of as an attribute of the officeholder. But, power really only exists in terms of relationships between and among individuals. When one person can influence another to do something, that person is exercising power. The

fact that power is a relation of influence is what allows Dahl (1969, 158) to draw an analogy between power and causality:

The closest equivalent to the power relation is the causal relation. For the assertion "C has power over R," one can substitute the assertion, "C's behavior causes R's behavior." If one can define the causal relation, one can define influence, power, or authority and vice versa.

Because power is relational, Dahl argues that to understand its effects, one needs to specify its *domain* -- the people or things over which power is exercised.

Modern presidents have been characterized as exercising power in at least four domains: governmental, partisan, international, and national. Neustadt (1956) argues that these domains represent four different presidential constituencies. For instance, the members of the president's *governmental* constituency include all civil servants and elected and appointed officials in the legislative and executive branches of government, while a president's *partisan* constituency consists of any bureaucrats, voters, or members of Congress who identify with the president's party. In addition, the president is said to have an *international* constituency, which is made up of citizens and officials from other countries, and a *national* (or public) constituency, which consists of all individuals and citizens' groups that look to the president for responses to their needs. According to Neustadt (1980), this latter constituency is "actually an aggregate of publics as diverse and overlapping as the claims Americans and allied peoples press on Washington." In

contrast to Neustadt's 20th century view, the founders' definition of the domains of presidential power was more restrictive. For instance, they did not envision the rise of a partisan constituency as we know it, nor did they think of foreign relations in terms of an international constituency that a president might need to satisfy.

The fact that Neustadt calls these four executive power domains "constituencies" indicates his recognition of another important aspect of any power relation -- the degree to which power is *reciprocal*. Power is reciprocal when other actors can influence the president's behavior as the president attempts to influence theirs. In addition to their more limited view of the domains of presidential power, the framers of the Constitution also had a more restricted view of the degree to which presidential power should and would be reciprocal. For example, the founders specifically put in place a number of institutional mechanisms to insulate the executive from pressures from the governmental and national constituencies. First, by creating a unified executive that derived its formal powers from the Constitution, they attempted to make the president independent of the legislature. Second, and more importantly for the arguments to follow, by setting up an indirect mode of presidential election and by giving the president a four-year term of office, they hoped to insulate the president from pressures from the national constituency.

Strategies for Exercising Presidential Power

The existing literature on presidential power outlines four major strategies that a modern president might use when exercising his or her power across the four domains; these are: command, bargaining, "going public," and making rhetorical appeals. Sperlich (1969) suggests that the particular power strategy that a president chooses will be a function of the domain within which the president wishes to act. Thus, we can expect presidents to use distinct power strategies when dealing with actors in the governmental, partisan, international, or national constituencies.

Command as a Power Strategy. One of the power strategies that a president can employ is to exercise power via direct *command*; that is, presidents, on the basis of their constitutional authority can order certain actors to act. Whether a presidential command yields compliance depends on a number of conditions (Neustadt 1980, 16-21), including whether the individuals ordered to act see the president's command as legitimately derived from his formal authority. The use of a command strategy can be costly for presidents because it can circumvent policy aims and future exercises of power by creating resentment and resistance among those forced to act. In addition, because actors in some of the president's power domains are equally or mutually powerful, presidential attempts to command compliance may not work. Because of the costs associated with command, Neustadt argues that modern

presidents will use this power strategy only after other efforts to induce desired behavior fail.

Bargaining as a Power Strategy. According to Neustadt, a more effective and less costly strategy for a president to use when exercising power is to *bargain* with the actors he or she wants to move to action. By bargaining, Neustadt means the trading of advantages with other political elites. Thus, bargaining is not a power strategy that can be used with the president's mass national constituency. The use of a bargaining strategy is, however, often necessary when dealing with other elites because of the reciprocal nature of formal and informal relationships between the president and elite actors who hold either equal or mutual power. For example, presidents attempting to exercise power in the international domain are faced with the fact that each nation is sovereign. Because some of these sovereign nations are militarily and economically powerful relative to the United States, presidents may be required to bargain with their leaders to achieve desired goals.²

A second area in which a bargaining strategy is likely to be used is with respect to the president's governmental constituency. In fact, Neustadt's discussion of bargaining was confined solely to this domestic power domain. According to Neustadt, the Constitution provides the president with formal *vantage points* from which to bargain with members of Congress because legislators often need the president to

exercise his or her legal authority in order to realize their own goals. But because members of Congress have constitutionally-enumerated rights of their own, they can check the president's formal authority, and hence bargains must often be made. As Neustadt (1980, 28) notes:

Status and authority yield bargaining advantages. But in a government of "separated institutions sharing powers," they yield them to all sides. With the array of vantage points at his disposal, a president may be far more persuasive than his logic or his charm could make him. But outcomes are not guaranteed by his advantages. There remain the counter pressures those whom he would influence can bring to bear on him from vantage points at their disposal. Command has limited utility; persuasion becomes give-and-take.

Note that Neustadt uses the word "persuasion" to refer to presidential effectiveness in striking the bargain and influencing the final outcome. When a president trades advantages with members of Congress, these elites are "persuaded" to act as the president wishes. Practical and effective presidential power, Neustadt says, revolves around the power to persuade and the power to bargain.

In addition to the vantage points flowing from his formal authority, a president holds informal advantages over members of the governmental constituency. One of these advantages is found in the president's *professional reputation* as an effective leader. Because "Washingtonians" often operate according to the "law of anticipated reactions," a president who has a reputation for skillfully using his or her formal vantage points has even greater effective influence over others. When a member of Congress believes that the president

can influence the behavior of other legislators, that member may anticipate the president's reaction and change his behavior accordingly. Thus, the president's professional reputation is an instrument or tool that can make it easier for him or her to get members of the governmental constituency to act as he or she desires.

A second informal presidential advantage is provided by a president's *public prestige*, which Neustadt defines as public opinion about a president's job performance. Because legislators are jointly dependent with the president upon voter reactions to their behavior, public prestige can provide a president with an additional bargaining chip that Neustadt (1980, 68) suggests works as follows:

[P]restige ... works on power just as reputation through the mechanism of anticipated reactions Most members of the Washington community depend upon outsiders to support them or their interests Dependent men must take account of popular reactions to their actions. What their publics may think of them becomes a factor, therefore, in deciding how to deal with the desires of a president. His prestige enters into that decision; their publics are a part of his.

The most commonly used indicator of a modern president's public prestige has been the aggregate survey response to the following query: *"Do you approve or disapprove of the way _____ is handling his job as president?"* When positive responses to this question are high, public prestige can provide the president with additional leverage, or with what Neustadt calls *leeway*, because it can decrease the number of formal power bargains that the president must strike to get

members of Congress to do what the president wants. Consequently, both a president's public approval rating and his or her professional reputation among Washington elites are instrumentally important for effective executive influence.

"Going Public" as a Power Strategy. Because public prestige can provide a president with an additional vantage point in his or her interactions with members of Congress, presidents have a strong incentive to "go public." Kernell (1986) defines "going public" as any activities that presidents undertake to promote either themselves or their policy views. Although these appeals are made to members of the president's public constituency, the ultimate objects of influence are not citizens per se, but rather members of the governmental constituency many of whom share a common electoral fate with the president. As Kernell notes, in some instances, going public can remove obstacles to elite policy negotiations. However, presidents also can use a strategy of going public to avoid bargaining with elites. For instance, presidents may try to "go over the heads" of members of Congress to stir up public opinion about a policy issue and thereby place pressure on legislators to comply with the president's wishes.

Unfortunately, Kernell uses the phrase "going public" to refer both to presidential activities undertaken to generate general public support for the president as well as to activities that are used to cultivate favorable opinions for

specific presidential policies. But as Kernell acknowledges, presidential success in activating and mobilizing public opinion on specific policy issues is heavily dependent upon the degree to which the public approves of the president's general performance in office (see also Page and Shapiro 1984). Thus, Kernell's definition is conceptually confusing since going public to maintain or increase favorable evaluations of the president's job performance is causally distinct from and is often temporally prior to presidential attempts to activate citizens' policy opinions.

In this work, I will use the term "going public" to refer only to presidential activities that are undertaken to maintain or increase favorable evaluations of the president's job performance; that is, president's *go public* to improve their levels of public prestige. Activities that fall under the rubric of the power strategy of going public include speeches that the president gives for the purpose of appearing presidential or to claim credit for a domestic or international policy success, foreign travel undertaken to generate positive presidential publicity, and photo opportunities and other public relations efforts to make the president look presidential. As Kernell (1986, 83) notes, modern presidents and their advisors increasingly seem to believe that these public relations efforts

perform the homeostatic function of maintaining public support of the president. Whenever the president's popularity begins to wane or press coverage appears

unduly critical, the White House compensates with increased public relations.

According to Kernell, going public to maintain public support has become the hallmark of modern presidential leadership.

Kernell suggests that increases in the number of times presidents "go public" have been caused by: weaker institutional, partisan, and coalitional ties among Washington elites, the growth of both the modern welfare state and mass communications technology, and significant changes in the nominating process for presidential candidates. Each of these factors has created disincentives for long-term bargaining between and among elites and has instead created incentives for each elite actor to be concerned with his or her individual career. Because of the trend toward more atomistic and individualized elite interactions, presidents and other public servants and bureaucrats are more susceptible to the influence of public opinion. Kernell laments this state of affairs because he argues that it opens the floodgates for presidents to use public opinion to circumvent the bargaining process.

Rhetoric as a Power Strategy. Conceptually distinct from going public are presidential uses of rhetoric. By *rhetoric* I mean any public statements by presidents that are made in an attempt to activate and/or mobilize mass opinion about public policy. This definition of presidential rhetoric is consistent with that implied by Tulis (1987) in his discussion of the rhetorical presidency. Tulis suggests that the

increasing use of rhetoric by 20th century presidents, "marks a change in the American meaning of governance" (Tulis 1987, 6). Unlike other power strategies such as bargaining or command, which Tulis argues were foreshadowed in the framers' writings, the use of rhetoric as a power strategy was condemned rather than encouraged by the founders.

Because they feared the tyranny of majority faction that they thought would arise from demagoguery and popular leadership, Tulis (1987, 30) notes that the founders attempted to:

narrow the range of acceptable demagogic appeals through the architectonic act of "founding" itself, and to mitigate the effects of such appeals in the day-to-day conduct of governance through the particular institutions they created.

Consequently, Tulis says, the framers' theory of rhetoric is not found in a set of written principles, but is instead reflected in their discussions of institutions. According to Tulis, the specific institutions that the founders set up to limit demagoguery³ include: indirect election of the president, different lengths of tenure for officeholders, an independent executive, and separate structures and powers for each branch of government.⁴ These mechanisms, says Tulis, generated a set of institutional norms or mores that proscribed the use of rhetoric as a power strategy.

Although Tulis documents increases in the amount of presidential rhetoric over time, he does less well at disentangling the underlying cause(s) of these changes.⁵ To

the extent that a cause is mentioned, Tulis implies that changes in elite opinions of leadership lead to an increased use of rhetoric. However, Tulis never explains what caused changes in elite views about leadership other than to suggest that rhetoric itself probably helped to change these ideas.

But in their discussion of the "new institutionalism," March and Olsen (1984) argue that organizational norms, rules, and standard operating procedures are best viewed as indicators of the exogenous impact of institutions on ideas rather than as signs of the autonomy of the ideas or the norms themselves. The endogeneity of institutional norms is important to keep in mind when thinking about presidential uses of rhetoric and attempts to go public. Because institutional mechanisms provide presidents with incentives and disincentives to use particular power strategies, an examination of these structural changes can help to identify the causes underlying the practices of going public and using rhetoric. But more importantly, an examination of institutional changes associated with the rise of going public and increased uses of rhetoric can help us understand the *consequences* of these practices for democratic governance. As discussed below, the founders expected certain institutional mechanisms to play the dual role of enhancing presidential power and providing citizens with the ability to hold presidents accountable for their actions. As a result, any

changes in these mechanisms should be expected to affect both presidential power and political accountability for its use.

THE FOUNDERS' DILEMMA

The fundamental dilemma faced by the founders of the United States Constitution was that of concentrating enough power in the hands of various political leaders to guarantee national self-preservation and the enactment of public policies reflecting the public good without providing officeholders with the ability to trample individual rights. Nowhere is this tension more apparent than in Alexander Hamilton's discussion of the institutional structure and expressed constitutional authority associated with the office of the president. For instance, in *Federalist* Nos. 70-77,⁶ Hamilton contrasts executive *energy* with republican *safety* in an attempt to refute Anti-Federalist claims that "a vigorous executive is inconsistent with the genius of republican government."

According to Hamilton's explication of the founders' views, without a potent executive, citizens would have no guarantee of protection from foreign attack, the stable administration of laws, the protection of property, or the maintenance of liberty. As Hamilton notes, the founders saw energetic executive action as a requisite for good government:

A feeble executive implies a feeble execution of the government. A feeble execution is but another phrase for a bad execution; and a government ill executed, whatever it may be in theory, must be, in practice, a bad government.

But given a desire for energetic action, the question arises as to how to constitute a vigorous executive while simultaneously avoiding absolutism. Hamilton's answer to this question provides insight into the founders' views on the tyranny versus liberty dilemma and, in turn, on their definitions of presidential power and political accountability.

Executive Energy and Presidential Power

Although initially divided on the issue of how the national executive was to be constituted, delegates to the Constitutional Convention did agree that the Articles of Confederation should be rejected and a stronger central government established. Hamilton personally supported an executive arrangement analogous to an elected monarchy, but delegates eventually adopted a plan similar to one suggested by James Wilson.⁷ In the plan adopted, the founders defined presidential power, which they referred to as executive energy, as more than the sum of a president's expressed, inherent, or implied authority. Instead, they saw energy in the executive as composed of four ingredients: unity, duration, an adequate provision for executive support, and competent powers. These elements can be divided into (a) constitutional grants of authority (the competent powers) and (b) institutional structures (unity, duration, and adequate support) that create incentives for firm and swift executive action. Executive energy results from the interaction of

presidential exercises of formal authority and the institutional context within which those actions occur.⁸

The framers of the Constitution expected the institutional mechanisms of unity, duration, and adequate support to enhance the president's capacity to use his competent powers and any other powers that these mechanisms left unconstrained. By shoring up the independence of the executive via these mechanisms (and by leaving some ambiguity about the powers of each branch), the founders hoped to provide a president with additional energy or power to maintain national security during times of crisis. Thus, to fully understand the framers' views of presidential power, one must examine the ingredients of executive energy.

The Power Core: Legal Authority. Providing the legal basis for presidential power are the *competent powers*, which refer to the constitutionally-enumerated powers of the executive. These include the power to: veto legislation, command the military, grant reprieves and pardons, convene Congress under unusual circumstances, and, with the consent of the Senate, make treaties and appoint ambassadors and judges. Of these powers, the founders gave primacy to the president's ability to veto legislation, which they said served a twofold purpose. First, this qualified negative enables the executive to defend itself from legislative encroachment, and second, veto powers provide a check against the effects of majority faction on public policy. In the founders' view, the veto

contributed to executive energy and thus presidential power by buttressing the president's resolve to stand firmly in the face of "an immediate attack upon the constitutional rights of the executive." In addition, other presidential powers, such as the role of commander in chief, the ability to grant pardons and reprieves, and the power to convene Congress, were thought to contribute to energetic national self-preservation.

Institutionally-Induced Extra-Legal Powers. In addition to the core competent powers, the framers expected the institutional mechanisms of unity, duration, and adequate support to enhance presidential power. First, *unity* enhances presidential power or executive energy because it increases the likelihood of decisiveness, action, secrecy, and prompt response. A unified executive is free, when necessary, to take charge and to act swiftly and is thus more likely to achieve the objective of national self-preservation than would a divided, deliberative legislative body (Tulis 1987, 43).

Second, the constitutional provision for a four-year term (an adequate *duration*) subject to electoral removal and legal punishments enhances executive energy by increasing the likelihood that a president will act firmly on the basis of the long-run interests of the citizenry without being swayed by the transient impulses of an erroneous public. In contrast, a chief executive in office for only a short time has little incentive to risk independent exertions of power

and is more likely to be tossed about by public breezes of passion.

Such pliancy contradicts the framers' definition of energy as firmness of resolve, and it also goes against the republican principle of deliberative public policy. As Hamilton notes, although citizens generally intend to pursue the public good, they sometimes misperceive it, and such perceptual errors call for executive firmness and action:

When occasions present themselves in which the interests of the people are at variance with their inclinations, it is the duty of persons whom they have appointed to be the guardians of those interests to withstand the temporary delusion in order to give them time and opportunity for more cool and sedate reflection.

Should a president need to oppose public passions, a four-year executive term gives the president enough time to educate the public about the rationale for these actions and allows the president to resist attempts by members of the legislative branch to persuade citizens against re-electing him or her. By giving the executive "a considerable interval in which the prospect of annihilation would be sufficiently remote," the founders hoped to make the executive independent of the violence of both citizen- and legislature-based majority faction.

In addition to the advantages of a four-year term, duration in office supplemented by reeligibility advances executive energy in two other ways. First, it gives officeholders an incentive to pursue the public good with zeal because it makes "their interest coincide with their duty."

When the option of electoral renewal is closed, an executive knows that "no exertion of merit on his part could save him from the unwelcome reverse." Therefore, Hamilton argues, few executive officeholders will pursue the public good with vigor and some may even turn to corrupt, tyrannical exercises of power. Hamilton concludes that "the most to be expected from the generality of men, in such a situation, is the negative merit of not doing harm, instead of the positive merit of doing good."

Second, a four-year term with reeligibility subjects the officeholder to an electoral decision about the adequacy of his or her performance; that is, it allows citizens to send the president a message about whether his or her performance has been sufficiently "energetic." When a president's actions exhibit a swift response and firmness of resolve, the president's performance is labeled "energetic," and by implication, good. The opportunity to judge the officeholder's performance contributes to executive energy by allowing citizens either to rid themselves of a feeble executive or to maintain a wise and vigorous administration.

Adequate financial support is the third and final institutional ingredient of executive energy that Hamilton identifies. By constitutional provision, the framers guaranteed that a president's salary could be neither decreased nor increased between elections. This provision was

instituted to ensure executive independence from the legislature. As Hamilton notes:

It is evident that without proper attention to this article, the separation of the executive from the legislative department would be merely nominal and nugatory. The legislature, with a discretionary power over the salary and emoluments of the Chief Magistrate, could render him as obsequious to their will as they might think proper to make him. They might, in most cases, either reduce him by famine, or tempt him by largesses, to surrender at discretion his judgment to their inclinations.

Thus, an adequate provision for support contributes to executive energy by making the president immune to positive and negative financial inducements from the legislature.

Republican Safety and Political Accountability

In response to Anti-Federalist criticisms that the Constitution's grants of executive power actually undercut the Federalists' stated republican goals, Hamilton argues that the structure and powers of the executive not only contribute to executive energy but are likewise compatible with republican safeguards for individual liberty, which he identifies as "a due dependence on the people and a due responsibility." According to Hamilton, a *due dependence* on the people follows from the fact that the Constitution was to be voted on by representatives of the people of each state. This form of dependence helps to ensure republican safety since it means that the components of executive energy are (albeit indirectly) rooted in the people.

In addition, republican safeguards for individual liberty follow from a *due responsibility* to the people, which Hamilton says takes two forms -- legal punishment or electoral censure. With respect to the former, Hamilton points to the constitutional provision that the president can be "impeached, tried, and upon conviction of treason, bribery, or other high crimes or misdemeanors, removed from office." However, since he expected presidential illegalities to occur rarely, Hamilton says that the more important form of responsibility flows from the ability of citizens to revoke a president's power through the electoral process.

Just as the institutional mechanisms of unity, duration (with reeligibility), and an adequate provision for executive support promote executive energy, so too do they contribute to a *due responsibility* or accountability to the people. Adequate executive support plays a limited role in ensuring that the "executive should be independent for his continuance in office on all but the people themselves" in the sense that members of the legislature cannot try to make the executive accountable to them by withholding funds. In addition, a four-year term (duration) with reeligibility based on electoral approval provides a mechanism by which accountability can be judged. And finally, the unity of the executive contributes to a *due responsibility* since when there is a single officeholder citizens can easily detect the locus of responsibility for executive decisions and can hold the

officeholder accountable for those actions. In contrast, a plural executive negates the restraining influences of electoral expressions of public opinion because citizens may be unsure of whom from among the multiple actors deserves which degree of blame.

The ability of the public to express its disapproval of executive management and to take away a president's power by removing him or her from office helps to make individual rights safe from the abuses of tyranny by making the president accountable for exercises of power. Note, however, the nature of presidential accountability as defined by the founders. First, the opportunity to hold an executive accountable was a *discrete* phenomenon occurring only once every four years. This helped to insulate the president from more frequent pressures from the electorate. Second, the object of presidential accountability is the president's *performance* in office. According to the framers, a four-year term with reeligibility based on electoral approval

... enables the people, *when they see reason to approve of his conduct*, to continue him in the station in order to prolong the utility of his talents and virtues, and to secure to the government the advantage of permanency in a wise system of administration. (emphasis added)

Third, the founders' view of presidential accountability emphasized that it was to be a *complete* grant or revocation of presidential power rather than merely a curtailment or incremental increase in power. Feeble executives would be removed from power via a system of electoral accountability.

And finally, presidential accountability to the public was to be *indirect*. The founders did not make the president directly responsible to the general citizenry, but rather proposed that presidents be elected by an intermediate body of electors within each state. The framers of the Constitution expected that these electors would exercise independent judgment and would refine the preferences of the mass public. By using this indirect process, the founders hoped to dampen the pressures of contentious public passions on executive decision making; that is, they hoped to decrease the reciprocal nature of power between the president and the public.

According to Hamilton, the ingredients that contribute to executive energy coincide with those required to safeguard individual liberties. In other words, executive energy and republican safety are two sides of the same coin, and the balance between them is knife-edged. Without executive energy aimed at national self-preservation, republican safeguards for individual liberty cannot operate. However, executive energy becomes tyranny without a citizen-based system of legal and political accountability for exercises of power. The tension that Hamilton highlights between executive energy and republican safety is synonymous with the tension between presidential power and political accountability for its use. However, their equivalence may not be entirely apparent

because the definitions of both presidential power and political accountability have changed since the founding.

The institutional arrangements for executive accountability set up by the founders gave citizens an *indirect* opportunity to evaluate the officeholder's *performance* in office and to revoke or to renew *completely* grants of executive authority at regular, but *discrete*, intervals. This definition of political accountability as a discrete, complete, indirect, and performance-based phenomenon had distinct consequences for the nature of the relationship between presidential power and political accountability. As long as citizens' judgments of executive accountability could be rendered only indirectly at four-year time intervals, constraints and pressures on presidential power from the public domain were minimal and presidents had little or no incentive to engage in appeals to the public. However, transformations in the features of executive accountability over time now provide presidents with new incentives to appeal to the public and thereby allow public opinion to become a potential source of presidential power. But because of the fundamental tension between power and accountability, these changes in presidential power also produced a greater degree of executive responsibility to the public for exercises of this power.

CHANGES IN ACCOUNTABILITY SINCE THE FOUNDING

A fundamental change in the founders' definition of executive accountability has been the change from an indirect to a more direct system of presidential accountability to the public. To temper the influence of majority factions on the actions of presidents, the framers of the Constitution set up an indirect system of election based on the Electoral College, rather than a system of direct popular election of the executive by citizens writ large.⁹ The plan for an Electoral College adopted at the Constitutional Convention was a compromise between delegates from the large and small states that allowed each state to use whatever system it wished to select a set of electors who would later meet in each state capital and vote for a president and vice president.¹⁰

In the initial period after ratification of the Constitution, members of the Electoral College were chosen by state legislatures. Because state legislatures were considered to be quite open to popular demands, their role in selecting the electors to the Electoral College was expected to ensure the influence of the mass public on executive selection. However, public passions would be muted because the founders thought members of the Electoral College would have greater knowledge of the candidates and greater deliberative abilities than the mass public. Thus, Hamilton notes in Federalist No. 68:

It was desirable that a sense of the people should operate in the choice of the person to whom so an

important a trust was to be confided It was equally desirable that the immediate election should be made by men most capable of analyzing the qualities adapted to the station and acting under circumstances favorable to deliberation, and to a judicious combination of all the reasons and inducements which were proper to govern their choice.

Despite the founders' desire to avoid direct popular election of the executive, by 1832 all states except South Carolina had switched to electing members of the Electoral College by systems of direct popular vote.¹¹

The switch to direct election of electors followed the elite-driven presidential nomination and selection process that developed during the Jeffersonian Era. With the election of Jefferson in 1800, partisan politics became a part of the presidential selection system. As Ceaser (1979) notes, in the ensuing years, the parties began to nominate their presidential contenders within caucuses of their congressional delegations. This resulted in a loss of control over the nominating process by the electors from each state, whose only remaining job was to choose between the presidential aspirants. Because this period was dominated by a single party, the consequences of this system were such that:

The caucus endorsement became tantamount to election only because of the existence of a one-party system. Hence the party system rather than the nominating system could be viewed as the chief factor denying the president an independent constituency in the electorate Whatever difficulties the caucus system presented, it nevertheless served to discourage popular leadership in the selection process by focusing the ambitions of contenders on winning the initial support of an "elite" group.

Ultimately, the criticisms against the monopolistic practices of "King Caucus" led to the collapse of this initial party system.

The collapse of this system also resulted in the four-candidate presidential race of 1824, which had to be decided in the House of Representatives. To ensure that future elections would not end up in the House, more and more states instituted direct popular election of the members of the Electoral College. Although the change to direct elections of electors does not represent a change in the Constitution itself, it does represent a change in the institutional rules or structure that governed executive selection. And this change from an indirect to a more direct form of political accountability was a necessary condition for later uses of going public and rhetorical power strategies because it de-insulated the executive from the influence of popular opinion.

Necessary But Insufficient Conditions

Although a more direct system of political accountability was a *necessary* condition for increases in presidential appeals to the public, it was not *sufficient* to generate the pattern of rhetorical uses documented by Tulis. For instance, since many states had switched to popular election of Electoral College members by 1824, one might expect to see an increase in the use of presidential rhetoric beginning at that time. Tulis's empirical evidence, however, indicates that both the average number of presidential speeches to the public

as well as the purposes of those speeches did not change until about the time of the Civil War. This lag represents a significant time delay between the time of institutional change and the time of changes in presidential practice.

Why did presidents not immediately begin to make popular appeals to the public once direct elections of electors were instituted? A large part of the answer to this question lies in the type of party system that developed following the collapse of the Jeffersonian Era party system. Although the system of two-party competition that developed after 1824 was more mass-based than its predecessor and was often justified by politicians on the basis of its democratic appeal, the new political parties were not dominated by presidential candidates who made popular appeals to the public. Instead, because these parties were coalitional in nature, the candidates for president that arose from them were constrained by their need to broker and bargain with their partisan constituency (Ceaser 1979). Hence, these candidates had little incentive to make direct popular appeals that would force them to take a strong stand on an issue.

A second reason that presidents did not immediately begin to appeal to the public can be seen by considering a president's motivation for going public or using rhetorical appeals. First, a president is likely to appeal to the public for support when he or she is trying to take action to satisfy citizens' demands. But as Lowi (1985) notes, prior to the

Civil War, the bulk of citizen demands were handled at the state rather than the federal level. In addition, the demands that reached the federal level were narrow enough to be handled solely by congressional action without causing deadlock.

Finally, a president is likely to utilize such public appeals when he or she thinks that it will result in the activation or mobilization of citizen opinion in support of either the administration or of certain salient policy questions. This opinion activation can benefit the president by convincing other governmental actors such as members of Congress that the president has either the general backing of the public or at least widespread support on a specific policy issue. Since members of Congress are elected by the same citizens, they may come to believe that they should act in a way that is consistent with public opinion.

However, in the years preceding the Civil War, public opinion was dominated by a number of divisive issues including slavery. Because these issues could not be handled via congressional action alone, the president may have had some incentive to appeal to the public. But since these issues bitterly divided the electorate, presidential attempts to mobilize public opinion could potentially have fanned the flames of divisiveness rather than helped to coagulate public opinion around a particular policy option. Thus, Lincoln's decision to remain silent when publicly asked questions about

slavery and impending war, which Tulis cites as evidence of Lincoln's understanding of a doctrine of governance proscribing the use of rhetoric, could just as easily be interpreted as a practical necessity for a president faced with an electorate divided by an issue that threatened to destroy the fabric of society.

Additional Influences on Accountability

Following the Civil War, technological advances in transportation and communication greatly facilitated the dissemination of information from leaders to citizens and vice versa. In addition, the growth of the nation placed new demands on the federal government and the president. Furthermore, by the turn of the century, the party structure was beginning to change. As a result, presidents more frequently exploited the new incentive structure as evidenced by the increasing number of public speeches they gave. Tulis notes this "substantial increase" in presidential speechmaking following the Civil War and he also finds "some change in its purposes." However, because he says few speeches in this post-war period contained policy rhetoric, Tulis concludes that "the development of the railroad rather than a major doctrinal shift accounts for the rise in the amount of speechmaking toward the end of the century."

Implicit in Tulis's remark is an additional necessary condition for increases in going public and using rhetorical appeals -- technological changes that enhanced both the

president's ability to communicate with the public and the relaying of citizens' opinions back to the president and other elites. It is difficult to envision why a president would want to try to mobilize public passions unless there was an avenue for feedback so that the president and other actors that he or she wished to influence could tell when public opinion had been mobilized. To be effective, the strategies of going public or using rhetoric require feedback from citizens to elites about citizens' views on either the president's performance or about the specific policy appeals that have been made. Although feedback of this sort could be directly obtained by a president's assessment of the reaction of a crowd hearing a presidential speech, the rise of the popular press and technological innovations in transportation and the mass media greatly improved the leader-to-citizen-to-leader message system and enhanced presidential incentives to go public and use rhetoric. The ability of presidents to get more frequent feedback about public opinion changed the definition of political accountability from a discrete occurrence to a more continuous phenomenon.

The President as Interpreter

Tulis presents evidence to indicate that following the Civil War, presidents began to take advantage of the new incentive structure created by institutional and technological changes. For instance, Tulis finds that Andrew Jackson frequently made rhetorical appeals to the public. In

addition, Tulis argues that presidents Cleveland through McKinley (1885-1901) "flirted" with appeals to the public regarding specific legislative issues. As both the demands on the federal government and mass media technology continued to grow, this flirtation became a courtship under President Teddy Roosevelt who used his presidential "bully pulpit" to lead public opinion and put pressure on Congress to pass the Hepburn Act of 1906. Thus, the practices of going public and making rhetorical appeals started to become routinized in the sense that presidents more frequently used these power strategies.

This routinization was aided by Woodrow Wilson's 1908 articulation of a theory of presidential leadership. Wilson's theory of energetic executive leadership emphasizes the role of the president as an activist interpreter of public opinion. According to Wilson, presidential interpretation of public opinion involves the president sifting through seemingly disparate public opinions to discern the core majority view and then educating citizens about their true preferences. In this way, a president can lead public opinion, mold it into a mandate, and use this mandate to influence congressional debates on policy matters. Wilson argued that presidents should take an active role in proposing legislation and lobbying Congress to pass policies the public favors because presidents have "no means of compelling Congress except through public opinion." The influence of this power resource

on legislators is hard to resist, says Wilson (1908, 114), because the president has

... the only national voice in affairs If he rightly interprets the national thought and boldly insists upon it, he is irresistible; and the country never feels the zest of action so much as when its President is of such insight and calibre.

Such energetic executive action was necessary, Wilson said, because of a fragmented congressional power structure that was increasingly deliberating itself into deadlock.

PUBLIC OPINION AND MODERN PRESIDENTS

As nearly all presidential scholars suggest, the presidency underwent a modernizing transformation during the years in which Franklin Roosevelt was president. At this time, two additional factors converged to further redefine presidential accountability to the public. The first of these is the rise of public opinion polling, which increased the frequency and objective quality of feedback from the public to the president both with regard to the president's general performance and with respect to public opinion about specific policies. As Hodgson (1980) suggests, the increased frequency of opinion polls about a president's job performance as well as of media reports and interpretations of poll results reinforced the previously-noted trend from discrete to nearly continuous public judgments of presidential accountability. In addition, this "perpetual election" further redefined the definition of political accountability that applies to modern presidents such that political accountability now includes

both complete (via elections) and partial (via public opinion polls) revocations of presidential power by the president's mass constituency.

A second significant change in the nature of political accountability for modern presidents that occurred during the FDR years was a change in the definition of energetic or good executive performance. Under FDR, the functions of both the federal government and the president expanded. The president became the manager of a wide array of agencies to which Congress had delegated fairly broad powers (Lowi 1985, 56). During these years, the presidency became closely associated in citizens' minds with the implementation of policies with widespread consequences for all citizens, and "an almost overnight rise in expectations about the appropriate duties of the chief executive" occurred (Greenstein 1978, 47). With respect to these expectations, Lowi (1985, 51) notes:

Since the New Deal, or at least since 1946, part of the test of good government has been productivity - service delivery, of what, to whom. Representation continues to be important, but the test of service delivery now outweighs it.

Thus, as the federal government became increasingly enmeshed in citizens' lives, citizens' definitions of effective presidential job performance became associated with the outcomes that a president produced.

Roosevelt continued the growing trend of going public and he also made a few rhetorical appeals. In addition, Roosevelt was the first president to appoint a press secretary to handle

media relations. Presidents after FDR continued these trends, stepping up the volume of policy rhetoric and appeals to the public for general support. The tremendous growth in these practices under later presidents were spurred by further technological advances in the mass media, the weakening of political parties, and the change to direct primaries for nominating presidential candidates. All of these factors helped to create an even closer and more direct president-public link.

The Consequences of Public Appeals

Kernell (1986) suggests that presidential uses of the going public and rhetorical power strategies, especially as practiced by modern presidents since JFK, have changed the nature of elite interactions from a situation of institutionalized pluralism to one of individualized pluralism. Under the former, Kernell says, presidential appeals to the public were less often used to circumvent the bargaining process between the president and members of Congress. However, as presidents more frequently attempt to "go over the heads" of Congress by mobilizing public opinion in support of presidential policy views, they more frequently "deny elites their place at the bargaining table."

Under a system of institutionalized pluralism, bargains are struck between elites on the basis of their shared formal powers. The role of public opinion in these bargains is only to "passively color the bargaining process" by making clear to

members of Congress their need to bargain with the president. But when public opinion is used unilaterally as a substitute for elite negotiations, Kernell suggests that these public appeals become another form of command. As he describes the distinctions (1986, 44):

Under institutionalized pluralism, popularity worked at the margin, giving the president greater latitude in negotiation with other politicians who relaxed their demands for fear of being viewed at home as uncooperative with the popular leader. Coalition building remained, however, a process of exchange. Under individualized pluralism, popular presidents will frequently seek to mobilize public pressure to alter the preferences of other politicians and thereby avoid exchange altogether.

Kernell bemoans the increased use of presidential rhetoric and attempts to go public because he says it heightens politicians' "sensitivity to the breezes that blow into Washington" and hence more frequent uses of rhetoric are likely to generate volatility in policy outcomes over time.

The potentially damaging consequences of going public and rhetorical appeals are reinforced by the way in which the availability of these power strategies have changed the strategic calculations of presidents. First, as the connection between the president and the public has grown closer, the mutual dependence of each on the other means that alternative courses of presidential action are increasingly likely to be assessed strategically in terms of their impact of public opinion of the president. Under this scenario, democratic governance becomes less deliberate and more instrumental (Kernell 1986).

But as presidents more frequently court general and specific public opinion, they reinforce public perceptions that they alone are accountable for resolving national problems. Consequently, going public and making rhetorical appeals are potentially dangerous because they simultaneously forge a greater dependence of the president on the public and heighten citizen expectations of the president's future performance. In other words, at the same time that going public and using rhetoric can potentially make the president more powerful relative to members of Congress or other elite actors, these strategies create public expectations about future outcomes. If these expectations go unfulfilled, public dissatisfaction can create negative evaluations of the president that will constrain future presidential exercises of power. This is the paradox of modern presidential power -- a closer connection to the public simultaneously enhances and constrains effective presidential leadership.

Modern Presidential Power

Given the trend of modern presidents to go public and to make rhetorical appeals, Kernell's discussion of breakdowns in the bargaining process could lead to pessimistic conclusions about effective policy making. However, his argument is based on the premise that presidents will increasingly resort to rhetorical appeals to circumvent, rather than to enhance, the bargaining process. But had he more carefully made a distinction between going public and using rhetoric, he might

have realized that many of the activities in which presidents engage can be viewed as attempts to increase general levels of public support for the president's performance rather than to incite mass policy passions. To be sure, presidents do make rhetorical appeals, and some of these are attempts to "force" Congress to pass legislation the president prefers. However, not all presidential speeches or activities are of this form; many instead represent presidential attempts to bolster sagging public approval ratings of the president's general job performance.

Page and Shapiro (1984) show that although presidents can influence public opinion on policy issues, the success of such rhetorical appeals depends upon whether the public already approves of the president's overall job performance. According to Page and Shapiro (1984, 652), presidents with high approval ratings can affect public opinion, while those with low approval ratings "had no effect at all or perhaps even a negative impact, actually dissuading the public from their policies." Page and Shapiro (1989, 67) conclude that even popular presidents face an uphill battle as opinion leaders:

[E]ven popular presidents, with all the communications resources they command, must ordinarily work intensively for months to win a 5- or 10-percentage-point increase in support for their favorite policies. We have not identified many cases in which a misleading persuader -- presidential or other -- has been able to create a large swing in public opinion.

Page and Shapiro's conclusions are further supported by both Kernell's and Tulis's specific examples of rhetorical speeches made by presidents Wilson, Truman, Johnson, and Reagan. As these examples show, sometimes presidential rhetoric leads to opinion change on policy issues and sometimes it does not. Thus, presidential rhetoric (a) does not always circumvent the bargaining process and (b) generally only has the potential to do so when the public's overall approval rating of the president is high.

Summary

Modern presidents are increasingly going public and making rhetorical policy appeals. A necessary condition for the growth in these trends was the removal of an institutional barrier -- election of Electoral College members by state legislators -- set up by the founders of the U.S. Constitution to insulate presidents from the effects of mass public opinion. The change from an indirect to a more direct system of presidential accountability in conjunction with advances in transportation and media technologies, increasing public demands for federal action, and more frequent feedback on citizen opinion from public opinion polls simultaneously redefined the nature of executive accountability and provided presidents with incentives to forge closer linkages between themselves and their national constituency. In response to these incentives, presidents have increasingly used the power strategies of going public and making rhetorical appeals to

accomplish their goals. However, the results of these practices in terms of effective presidential leadership have been mixed. Although individual presidents occasionally win short-run policy victories, the institution of the presidency grows increasingly dependent upon an expectant public for its power.

The nexus between presidential power and executive accountability is exhibited in aggregate public opinion of the president's job performance, which is potentially both a resource for and a constraint on presidential action. The focus of this dissertation is on presidential approval as an indicator of the degree to which citizens hold the president accountable for his or her actions. Because the citizen-to-president messages underlying this indicator of political accountability represent grants to and revocations of presidential power, investigating the determinants of presidential approval is an important precursor to understanding the paradox of modern presidential power.

1. The modern presidency is generally defined as beginning with FDR and continuing through the present (Neustadt 1980; Greenstein 1978; Lowi 1985) although Rose (1991) argues that Carter may have been the first postmodern president. See also Skowernek (1984) for a contrasting view.

2. The need for a president to bargain with other heads of states is likely to increase now that the United States is no longer the world's dominant military and economic power. Rose (1991) argues that increases in the relative power of other nations in conjunction with the growing trend toward global economic interdependence have put new pressures on effective presidential leadership, pushing the presidency from a modern to a postmodern era.

3. Demagogues are those who make popular appeals to the public in an attempt to sway popular passions and incite members of factions (Tulis 1987, 28).

4. The latter would limit demagoguery by encouraging distinct types of political behavior from leaders in each branch. For instance, Tulis (1987, 43) suggests that the structure and powers of Congress would promote popular will, those associated with the presidency would encourage national self-preservation, and the institutional arrangements for the judiciary would cultivate popular rights.

5. Causal arguments are antithetical to Tulis's approach since he treats ideas as "semi-autonomous factors in political development."

6. All references to *The Federalist Papers* are from Clinton Rossiter (ed.). 1961. *The Federalist Papers*. New York: New American Library Penguin Inc.

7. James Wilson proposed a single executive, an absolute executive veto, direct election by the people, unlimited reeligibility, and a short term (Page and Petracca 1983, 25).

8. This bifurcated definition of executive energy is related to Neustadt's definition of presidential power as consisting of both formal and informal components.

9. A second reason for relying on the electoral college and indirect election was that direct elections would give large, populous states greater weight in the selection of the executive, and this was something that delegates from smaller states opposed.

10. Many delegates to the Constitutional Convention thought that the electoral college would be dominated by electors from large states who would each vote for a "favorite son," none of

whom would be capable of earning a majority. As a result, delegates predicted that presidential elections would commonly be resolved in the House of Representatives where small states could band together in the selection process to choose a candidate from a list of candidates produced by the electoral college.

11. South Carolina changed to this method in 1856.

CHAPTER TWO

EXISTING THEORIES OF THE APPROVAL DECISION

Because public opinion about a president's overall job performance can both enhance and constrain presidential actions, a complete understanding of modern presidential power and political accountability requires an investigation of the determinants of a president's aggregate approval ratings. These aggregate levels of public support are a function of the decisions that individuals make about whether to approve of the president. Unfortunately, there is a paucity of panel data available to test individual-level hypotheses and models of the decision to approve of the president, and hence, those interested in changes in approval evaluations over time have generally been limited to estimating statistical models using aggregate data.

Perhaps because of the lack of data to sort out competing theoretical claims about individual opinion change or perhaps because many micro-level behavioral process can be consistent with the same macro-level model, existing studies of approval contain few theoretically complete treatments of the choice problem faced by individual citizens. Although there are a number of interesting theoretical ideas about the individual approval decision, these insights are not well-synthesized. However, I think that a more explicit consideration of the decision making processes of individuals and of the link(s) between micro-level approval decisions and a president's

aggregate approval rating can help us to understand the "message" implicit in a president's aggregate level of public support. Hence, the purpose of this chapter is to review existing theories of the individual-level approval choice problem as a precursor to the development of a theory of this decision process. Once developed, this theory will be used to inform specification of an aggregate-level model of presidential approval.

INDIVIDUAL-LEVEL MODELS AND AGGREGATION

Beck (1992) argues that there is little use in developing micro-level models of the approval decision because he thinks that the assumptions analysts must make to aggregate across individuals are either untenable and misleading or provide us with no analytic leverage over the aggregation problem. Beck's criticisms are aimed primarily at the work of Hibbs and his colleagues (Kernell and Hibbs 1981; Hibbs, Rivers, and Vasilatos 1982; Hibbs 1987). To move from an individual- to an aggregate-level model of approval, these authors assume that each person perceives the economy and other influences on approval in exactly the same way.

Beck compares Hibbs's aggregation assumption to an alternative view using the following illustration. First, suppose a_{it} represents the degree of approval of the president's job performance held by a single individual at time t . And then suppose that x_{it} is that individual's perception of an economic condition such as inflation and that

e_{it} captures any unmeasured variables. In this case, the individual's decision would be expressed as:

$$a_{it} = \beta_1 x_{it} + e_{it} \quad (2.1)$$

Aggregating across this approval function for a sample of individuals based on Hibbs's assumption that all citizens perceive inflation in the same way would produce the following macro-level approval model:

$$a_t = \beta_1 x_t + e_t \quad (2.2)$$

By invoking this assumption, Hibbs can interpret β_1 as the effect of inflation on the "typical" individual. Beck (rightly) criticizes this assumption as too unrealistic.

According to Beck, analysts will obtain precisely the same aggregate approval function from Equation [2.1] by averaging across a sample of individuals. In this latter case, β_1 in Equation [2.2] represents the average effect of the *individually-varying* perceptions of the economic condition (x_{it}). However, says Beck, this second approach provides no analytic leverage over the aggregation problem since many analysts would specify an approval function exactly as in Equation [2.2] even if they had never thought about individual-level decision mechanisms. Hence, Beck concludes:

[S]tarting with a specification of individual-level approval may well lead to an inferior aggregate specification. In short, there seems little to be gained in practice from modeling individual approval and then aggregating. At best, we end up with the same aggregate model we would have written directly, and, at worst, we fool ourselves. Among the mistakes that can be induced are believing that there is some direct correspondence

between the estimated aggregate parameters and individual-level parameters, that we have considerably more information than in fact we do, and that there are no error dynamics.

Although I agree with Beck that the assumption that Hibbs makes is unrealistic, I disagree with Beck's assertion that "there seems little to be gained ... from modeling individual level approval." I think that explicitly considering the links between micro-level theories and models of behavior and aggregate-level models of approval can lead to important methodological and substantive insights.

The Representative Agent Assumption

Hibbs's assumption that perceptions of the economy are homogeneous across individuals is the type of assumption implicit in many "representative agent" models. Under this approach to model specification, a macro-level approval function is generated by solving an individual-level optimization problem and then treating the aggregate data as if they are consistent with the optimal behavior of a single citizen. But as many authors have noted (Pesaran 1987; Stoker 1986), representative agent models provide accurate depictions of individual-level behavior in only two highly restrictive settings: (a) when all individuals make decisions on the basis of the same aggregate variables; that is, when $x_{it} = x_t$, or (b) when the marginal reactions of individuals to aggregate changes coincide; that is, when β_i in Equation [2.1] is the same across all individuals.¹

The assumption that $x_{it} = x_t$ for all i represents a behavioral restriction that all individuals perceive the economy in precisely the same way. The assumption that $\beta_i = k$ for all i implies that the effects of the economy are translated into a decision to approve of the president in precisely the same way by each individual, that is, that the marginal effects of an economic condition differ across individuals. In most cases, such assumptions will not hold, and hence, Stoker (1986, 765) argues that the parameter estimates from aggregate-level models will be a confounded mixture of behavioral differences and shifts in the distribution of individuals with characteristics that are associated with the differing marginal effects. Unless the distribution of citizens along relevant dimensions is controlled for, "results from representative models must be biased, with no valid interpretation in terms of microeconomic behavior" (Stoker 1986, 765).

To investigate the effects of bias that result from shifts in the distribution of individuals over time, Stoker suggests using data on the over time percentages of individuals in group categories (i.e.; cell proportions) as regressors in an aggregate-level model. Using this approach, Stoker shows that, within the context of U.S. commodity expenditures, a static aggregate model that controls for shifts in the distribution of citizens is statistically equivalent to a dynamic macro model that incorporates first-

order autoregressive behavior. Lippi (1988) gives Stoker's empirical conclusions a firmer analytic footing by using statistical theory to show that aggregation across distributions of heterogeneous individuals is "a source of dynamics for macroequations" even when the micro-level behavioral equations are themselves static. And thus, Lippi (1988, 584-85) concludes that "the usual interpretation of the macroequations, being based on the representative agent, may be responsible for an overstating of the importance of dynamic microbehaviors."

As these remarks make clear, from a methodological and technical standpoint, there are problems in linking micro-level decision making theories and models to aggregate statistical models. These difficulties result from at least two sources: (a) there are behavioral differences across individuals such that the set of all factors that influence citizens may contain both different variables and different values of the same variable and (b) the marginal effects of the same variable can vary across distributions of individuals.

Because of differences in behavior and changes in the distribution of individuals over time, many individual-level models do not "admit a tidy theory of aggregation" (Sargent 1978, 1016); that is, aggregating across varying individual behavior or distributions of behavior may lead to an aggregate-level specification that differs from the original

micro-level model (Lippi 1988). Only by making simplifying assumptions that citizens perceive outcomes in the same way or that any particular factor has the same marginal effects on all people can analysts guarantee that individual- and aggregate-level models will be identical. Although moving from the individual to the aggregate level can be problematic when such assumptions are relaxed, the difficulty of these issues does not justify failing to think theoretically about the micro-level approval decision and its links to a president's aggregate approval rating. Taking up this challenge may yield important methodological and substantive insights.

Micro-Level Theory and Methodological Insights

For instance, if Kramer (1983) had not considered the individual-level behavior underlying the aggregate effects of income change on vote choice, he would have missed some important methodological and substantive insights. Kramer hypothesized that discrepancies between micro- and macro-level empirical work on the relationship between income changes and vote choice were a statistical artifact. These differing results arose because net changes in an individual's income are a function of an unobservable government-induced change in individual income and unobservable idiosyncratic, personal factors. Based on this hypothesis about citizens' behavior, Kramer was able to show that individual-level estimates of the

effect of income changes on voting suffer from more bias than their aggregate-level counterparts.

According to Kramer, the confounding of politically-relevant governmentally-induced factors and politically-irrelevant personal components of income biases both aggregate- and individual-level estimates of the effects of income change on voting behavior. These biases are such that macro-level estimates will tend to understate the true effect while individual-level estimates will be unstable and will primarily be a function of spurious correlations between idiosyncratic factors and vote choice. Given his findings, Kramer (1983, 93, emphasis in the original) concludes:

... of the two kinds of analyses, it is the *aggregate* time-series evidence -- rather than that based on individual-level survey data -- which is most likely to yield valid inferences about the underlying individual-level behavioral effects we are trying to measure.

My point here is not so much to advocate one level of empirical analysis over another, but to suggest that without considering individual-level behavior, Kramer may never have reached this non-obvious conclusion.

Micro-Level Theory and Process Explanations

But beyond the methodological insights that analysts might obtain, developing theories and models of individual behavior is necessary because they are an important ingredient of any causal explanation of the determinants of presidential approval. I am not convinced, as Beck seems to imply, that we can make *theoretical* advances in explaining movements in

aggregate presidential approval without explicitly considering underlying micropolitical processes. And I agree with Lakatos (1978) that only when we make theoretical advances do we truly achieve scientific progress.²

Herbert Simon (1981, 222-224) argues that the principle task of a scientist is to turn a state description of a phenomenon into a process explanation. According to Simon, a *state description* characterizes the world as we sense it; some examples are photographs, blueprints, most diagrams, and chemical structure formulas. In contrast, a *process explanation* characterizes the world as acted upon and outlines the actual steps or process for producing objects or behavior with the desired characteristics. Hence, recipes, differential equations, and equations for chemical reactions are examples of process explanations. Simon's distinction between a description of a state and a causal explanation of a process also can be applied to presidential approval. For instance, consider the following state description of presidential approval:

$$\text{Approval}_t = f(\text{inflation}_t)$$

This state description tells us that presidential approval is a function of current inflation. But then we must ask, in what way is approval a function of inflation? What is the process by which inflation influences presidential approval?

The aggregate approval function specified previously in Equation [2.2] offers one view of that process, suggesting

that aggregate presidential approval is a linear function of inflation. Therefore, a theory that leads us to specify Equation [2.2] moves us a small step away from a simple state description toward a process explanation. However, suppose that a president wants to produce a given level of presidential approval. Without a theory about the behavior of individuals, the macro-level Equation [2.2] tells us only that to increase the mean level of approval, the president must lower the inflation rate. While such advice is non-trivial, an analyst might be able to offer a president better advice after considering the link between equations [2.1] and [2.2]. Only by thinking about both the effects of the economy on an individual's approval decision and the links between this micro-level behavior and the aggregate data that it generates will scholars be able to create a complete, causal process explanation of the connection between economic conditions and presidential approval.

THEORIES OF THE APPROVAL CHOICE PROBLEM: A REVIEW

Although many of the arguments used to justify specifications of aggregate models of approval imply hypotheses about the underlying behavior of individuals, few authors develop a micro-level theory and even fewer discuss links between the micro and macro levels. Table 1 provides a summary of the major studies that provide theoretical insights into the individual-level approval choice problem. Although some of these studies could be placed under more than one

heading, I have grouped them into six different categories based upon my view of their key substantive contribution. The six categories identified in Table 2.1 are encompassed by two overarching themes:

(a) How do citizens decide to approve of the president; that is, what are the major features of the process by which the approval decision is reached?

(b) To which types of stimuli do citizens respond; that is, what is the content of the inputs to the decision to approve of the president?

Existing theories that address the process of reaching an approval decision can be divided into three subcategories: the role of approval evaluations in citizens' mass belief systems, the existence of a critical threshold of opinion change, and the standards of accountability that citizens use to evaluate the president's job performance. Current theories that address the content or inputs to the approval decision process focus on: the types of factors that stimulate opinion change, the orientation and temporal directions of citizens' evaluations, and the general issue of the effects of different amounts of information on citizens' opinions of the president.

Presidential Approval and Mass Belief Systems

Some explanations of the decision to approve of the president outline the role of the approval evaluation within a citizen's overall belief system. For instance, according to Fiorina, citizens' attitudes and opinions are linked both temporally and hierarchically within their belief systems.

Table 1 Behavioral Explanations for Approval Decision

| (1)
STUDY | (2)
KEY BEHAVIORAL HYPOTHESES | (3)
LEVEL OF EMPIRICAL
ANALYSIS |
|-------------------------------------|--|---------------------------------------|
| | I. Approval and Mass Belief Systems | |
| Fiorina (1981) | Assessments of presidential performance are mediated retrospective evaluations that subsume simple personal and national economic evaluations and which are themselves encompassed by forecasts of the economic future. | individuals |
| MacKuen (1983) | The duration of the effects of changes in external outcomes and events on an approval evaluation depends upon whether the outcome taps deeply held psychic needs for presidential authority or more superficial attitudes toward presidential competence. | aggregate |
| Peffley and Williams (1985) | Attributions of responsibility intervene between a citizen's economic evaluation and his or her approval decision; therefore, beliefs about presidential responsibility play an important role in judgments of the president's performance. | individuals |
| Ostrom and Smith (1993) | Because they tap deeply held attitudes, the effects of outcomes related to a citizen's self interest will anchor his or her approval evaluation, leading to attitude persistence and reequilibration in response to superficial reactions to dramatic but distant events. | aggregate |
| | II. A Critical Threshold of Opinion Change | |
| Kernell and Hibbs (1981) | The decision to approve of the president depends upon a citizen's location along a latent approval index that contains a critical threshold above which the citizen will approve but below which he or she will withdraw presidential support. Net changes in aggregate presidential approval are a function of shifts in partisan distributions of approval, which have different means along this continuum. | partisan subgroups |
| | III. Standards of Accountability | |
| Hibbs, Vasilatos, and Rivers (1982) | Citizens have long memories and evaluate the president on the basis of a comparison of the past performance of the president's party to that of the outparty and with respect to a comparison of the performance of the current administration to that of past administrations. | aggregate |

Table 1 (cont'd).

| | | |
|---|--|--------------------|
| Ostrom and Simon (1985) | Citizens compare observed outcomes to those promised by the specific president and to those they think any president should provide. Citizens punish presidents for discrepancies between actual and expected outcomes as a way to minimize their utility losses. | aggregate |
| Hibbs (1987) | Citizens compare the utility they are receiving under the incumbent administration to that they would have received under the outparty, and they reward or punish the president with respect to whether the differences in the utility incomes from these two sources is positive or negative. | partisan subgroups |
| IV. Means, Ends, and Opinion Change | | |
| Neustadt (1960) | Citizens' expectations of desired presidential actions interact with their evaluations of observed outcomes to produce satisfaction or frustration with a president's performance. | none |
| Mueller (1970) | Single-issue minority groups respond negatively to presidential policy initiatives and decisions. | aggregate |
| Chappell and Keech (1985) | Sophisticated citizens who understand economic policy constraints and tradeoffs reward and punish the president based on their interdependent evaluations of economic outcomes and in light of long-run desired outcomes. | aggregate |
| V. The Orientation and Temporal Direction of Citizen Evaluations | | |
| Alt (1979) | Citizens incorporate information about future economic conditions that they obtain from media reports of elite forecasts into their own forecasts of the future. These forecasts in turn influence their evaluations of the government's performance and their vote intentions. | aggregate |
| Monroe and Levi (1983) | The uncertainty associated with future changes in inflation influences citizens' evaluations of the president. High uncertainty about future inflation leads individuals to disapprove of the president. | aggregate |
| MacKuen, Erikson, and Stimson (1992) | Citizens incorporate information about future economic conditions that they obtain from media reports of elite forecasts into the set of information that they use to evaluate the president's performance. | aggregate |

Table 1 (cont'd).

VI. General Information Effects

Brody and Page (1975)

Citizen's evaluations of the president exhibit a large degree of inertia, but opinion change does occur in response to the discrepancy between the valence of fresh news and prior opinion of the president's performance. Citizens do not respond to events and outcomes per se, but to the balance of news about these events and outcomes.

aggregate

Iyengar and Kinder (1987)

Television news can prime citizens to use certain standards when evaluating the president's performance. The more attention television news pays to a problem, the larger the influence of that problem on a citizen's presidential approval decision. In addition, the more television news reports portray a problem as the result of presidential actions, the more influence those news reports will have on a citizen's evaluation of the president.

individuals

Ostrom and Simon (1988)

Partisanship can bias and constrain the decision to approve of the president, but the dominant effects come from the citizen's awareness of specific environmental changes. Citizens monitor and notice only a limited number of external outcomes. There are two types of citizens -- those who have information about a specific environmental change and those who do not.

individuals

Zaller (1990)

Differential information flows lead to different probabilities of opinion change for citizens as a function of their level of awareness of particular streams of information.

individuals

Brody (1991)

The balance of positive and negative information from elites about environmental outcomes leads citizens to evaluate the president homogeneously in response to certain dramatic events whereas information generates more variety in response to everyday economic outcomes. Differences in the information generated by elites also account for the lack of effects of policy proposals and the dominance of performance outcomes on a citizen's decision to approve of the president.

aggregate

The temporal connections, Fiorina says, represent a "true developmental sequence" that moves from evaluations of the past to assessments of the future. With respect to the hierarchical bonds, Fiorina argues that individuals evaluate observed outcomes separately and then combine these distinct evaluations with their opinions about the capabilities of government and their partisan beliefs to form broader evaluations. The effects of external evidence on these broader judgments are constrained by prior opinions like partisanship, resulting in a mediated evaluation. These mediated evaluations are then combined with other mediated opinions to form even more global mediated judgments of which the evaluation of the president's job performance is one example.

Fiorina argues, and his empirical work provides evidence in support of the claim, that a citizen's evaluation of the president's job performance is influenced by that person's partisan predisposition as well as other simple and mediated evaluations of "the problems of the day." Given Fiorina's definition of partisanship as a running tally of evaluations of the past, his characterization of approval implies that citizens are primarily evaluating the president on the basis of the past. In fact, Fiorina (1981, 121) labels citizens' assessments of the president's performance "quintessential mediated retrospective evaluations." *Retrospective* because they appear to summarize assessments of past, rather than

future, economic outcomes. *Mediated* because the approval decision is biased both by a citizen's beliefs about the government's ability to handle economic and other problems and by an individual's partisan predispositions. And *quintessential* because unlike responses to other survey questions, answers to questions about the president's job performance represent an amalgamation or "summary judgment" of impressions about a general set of experiences rather than a direct response to a single stimulus.

One shortcoming of Fiorina's argument is that although he suggests that simple retrospective evaluations of observed economic outcomes are filtered through intervening evaluations about national economic conditions and general government performance and that these in turn influence assessments of the president's job performance, he does not develop a theory of how citizens determine the degree of reward or punishment to levy on a president nor does he provide any insight into the psychological constraints that might be operating within this specific-to-general belief system. The only belief constraint that he considers in detail is the mediating influence of past partisanship on other evaluations. But given his interpretation of partisanship as a continuously updated summary of retrospective evaluations, Fiorina's arguments imply that citizens' politically-relevant attitudes are fairly unconstrained and easily adjusted in the face of new external stimuli.

The picture painted by Fiorina of citizens' mass belief systems and of the role of the approval decision in that configuration is one of fluid attitude change in response to external evidence about the president's job performance. However, MacKuen (1983) argues that changes in a citizen's decision to approve of the president may not be as mobile as Fiorina suggests since such assessments likely reflect *both* external evidence and internal psychological constraints. Because of psychological constraints from factors such as partisanship and from more deeply-seated emotional needs, some attitudes, says MacKuen, are more strongly embedded or integrated into an individual's belief system than are others. Although firmly anchored attitudes might be temporarily disturbed in response to external occurrences, pressures from internal psychological constraints generally force them to revert back to their prior state.

MacKuen argues that evaluations of the president's job performance provide an example of this psychological arrangement. The reason that evaluations of the president's performance can change for short periods before returning to their previous state is because these attitudes are composed of two parts -- one related to beliefs about presidential authority and another that is associated with simpler evaluations of presidential competence. According to MacKuen, beliefs about presidential authority are conceptually linked

to an individual's deeper psychic needs while attitudes about presidential competence are much more superficial.

Because of approval's two attitudinal components, MacKuen suggests that the duration of the effects of an exogenous event on a citizen's evaluation of the president should vary depending upon which part of the attitude the event taps. For instance, external occurrences that tap into and contradict in some fashion a citizen's psychic needs should be able to generate permanent changes in a citizen's evaluation of the president whereas other environmental occurrences should have transitory effects. Given this, MacKuen suggests that we ought to think of an individual's evaluation of the president in terms of an *attitude equilibrium* that can be perturbed for short periods of time by simple presidential blunders and successes, but which shifts permanently only in response to more fundamental external events that call into question "the president's ability to control the course of political outcomes."

MacKuen does not very clearly define what he means by a psychic need for presidential authority versus an evaluation of presidential competence. At one point he defines a need for presidential authority as an affective desire for certainty or reassurance (1983, 167), while at another point he suggests that it refers to any presidential action that is symbolic, having no direct bearing on a citizen's self interest (1983, 167). These two definitions are potentially

inconsistent. If citizens do have an emotional need for presidential control over political outcomes, I would expect such a need to be more closely related to events that directly impinge upon a citizen's material self interest. If this were the case, then events that evoke concerns among citizens about their material welfare should be able to provoke persistent and fundamental changes in opinions about the president's job performance while symbolic events that are not as directly related to their self interest should have only a transitory impact. Unfortunately, MacKuen does not outline a set of *a priori* hypotheses about the duration of the effects of different types of events on a citizen's approval decision.

To determine whether the effects of various events and outcomes on approval evaluations do differ, MacKuen identifies a set of *dramatic political events* that represent symbolic or non-experiential occurrences. In addition, he examines the effects of more directly experienced outcomes such as those associated with the Vietnam War and with national economic conditions. His empirical results show that these symbolic events have a substantial and moderately long-lived impact on approval assessments relative to the effects of peace and prosperity outcomes, whose effects endure for shorter periods of time. In addition, MacKuen finds that the effects on approval from a small subset of the dramatic political events persist for an even longer period of time. MacKuen labels

these seven events extraordinary and notes that they are associated with issues related to presidential authority.

Ostrom and Smith (1993) rely on MacKuen's idea that an individual's approval assessment is a function of distinct attitudinal evaluations -- some of which are persistent and others of which are more visceral -- to argue that aggregate levels of presidential approval should appear to respond differently to various outcomes and events because of these underlying patterns of attitudinal shocks, persistence, and reequilibration. However, based upon Fiorina's ideas that the approval evaluation is a global summary judgment of experienced conditions, Ostrom and Smith discard MacKuen's argument that the causes of attitude reequilibration are emotional and symbolic. Instead, they argue that equilibrium levels of presidential approval are a function of the persistent attitudinal effects of outcomes such as inflation, unemployment, and battle deaths that are associated with the citizenry's overall quality of life and of extraordinary political events such as Watergate or the Iran-contra scandal that cause citizens to worry about the president's ability to control outcomes related to their material needs. Short-run disequilibrium between aggregate levels of presidential approval and the levels of quality-of-life outcomes, according to these authors, results, in part, from citizens' visceral attitudinal reactions to ordinary dramatic political events

(MacKuen's symbolic events) that do not directly affect the self interest of citizens.

Another study that places the approval decision within the framework of citizens' belief systems is that of Peffley and Williams (1985), who argue that citizens faced with the decision of whether to approve of the president make two evaluations. First, they must assess the external evidence from observed conditions, and second, they must assign blame or praise to the president for these outcomes. According to Peffley and Williams, these "second-stage" attributions of responsibility mediate the relationship between external evidence and judgments of the president. As they (1985, 397) argue:

... the attribution of responsibility is a crucial step in the process of translating economic concerns into political behavior. Before economic discontents take on political significance, people must believe either that the government produced them or that it is the government's job to remedy them. The attribution of blame thus comes close to constituting a necessary condition for the subsequent politicization of economic events, in that the impact of economic perceptions on political behavior is mediated by judgments of accountability.

Thus, the translation of blame need not be automatic, but reflects an additional evaluation or decision that citizens make.

The key contribution of Peffley and Williams lies in their argument that the assignment of blame to a president is potentially influenced by three types of beliefs that citizens may have about presidential responsibility. First, a citizen

could hold a president responsible for observed outcomes because he or she believes that the president personally caused the conditions. To the extent that exogenous rather than personal influences are thought to have caused a particular outcome, citizens holding a belief about the *causal responsibility* of the president would not punish the president as severely. Second, citizens might hold a president accountable based on their beliefs about a president's *moral-legal responsibility*; that is, the more control a president is thought to have over an outcome, the greater will be his degree of responsibility for preventing unfavorable conditions. For instance, a citizen who believes the president can control the economy would punish the president more strongly for poor economic conditions than would a person who did not believe the president could influence economic outcomes.

Finally, evaluations of a president could be influenced by a citizen's belief about what a president should do simply because he or she is president. The decision mechanism implied by such beliefs about the president's *role responsibility* is one in which citizens compare actual to expected presidential performance and then punish the president for failures to fulfill his or her perceived role. According to Peffley and Williams, citizens' expectations about what a president should do are a function of the perceived economic performance of past presidents.

Examining individual-level data, Peffley and Williams find that judgments of the president's job performance are a function of a citizen's partisan predispositions as well as of all three types of beliefs about responsibility. However, their measure of role responsibility relies on a question about whether past presidents have been able to solve problems of inflation and unemployment. This does not seem to me to be an appropriate measure of citizens' expectations. I think that citizens' beliefs about role responsibility will be strongly tied to their beliefs about the formal and informal powers of the president. Hence, respondents who say that presidents have been unable to control inflation or unemployment over the last 10 years may or may not have changed their expectations; that is, if citizens have a normative belief about the "presidential job description" (Cronin 1975), this belief is not likely to be changed just because a previous president failed to live up to it.

The principal insights to be gleaned from these belief system theories of the approval decision is that this choice is likely constrained and mediated by internal psychological relationships between the approval judgment and other attitudes such as partisanship and beliefs about presidential authority, accountability, and competence. Unfortunately, these studies generally tend to ignore the specific process by which the approval decision is reached. For instance, if Peffley and Williams really think that citizens first evaluate

economic outcomes and then attribute blame based upon their beliefs of presidential responsibility, then they need to model the approval decision as a two-step process rather than using survey measures about perceptions of both economic conditions and presidential responsibility in the same individual-level model. The same criticism could be leveled at Fiorina although he does a somewhat better job of assessing the separate effects of simple and mediated retrospective evaluations on presidential approval. In addition, although the idea that changes in both individual and aggregate approval attitudes endure for different lengths of time is important, MacKuen lacks a set of theoretical hypotheses about which events and outcomes cause which types of approval change. Also, Ostrom and Smith need to show, rather than assert, how attitude persistence at the individual level is related to approval reequilibration at the aggregate level.

A Critical Threshold of Opinion Change

Unlike the previous authors who are concerned with the links between many different beliefs, attitudes, and opinions, Kernell and Hibbs (1981) focus exclusively on presidential approval evaluations. These authors argue that an individual's decision to approve of the president can be characterized as a response along an unobserved approval index ranging from $-\infty$ to $+\infty$. The latent approval decision is translated into an observable assessment of the president's job performance depending upon how far the response is from a

critical threshold of approval; that is, the unobservable a_{it}^* is related to the observable, a_{it} as follows:

$$a_{it} = \begin{cases} 1 & \text{if } a_{it}^* > c \\ 0 & \text{if } a_{it}^* \leq c, \end{cases}$$

where c is a critical threshold that Kernell and Hibbs assume is constant across individuals. Kernell and Hibbs also argue that a citizen's initial location relative to this threshold is a function of that person's partisanship, with members of the same partisan group normally distributed around a mean partisan predisposition to approve of the president.

The ideas of a critical threshold of approval and partisan distributions of opinion centered at different points along an approval continuum imply that the marginal impact of a change in an economic factor such as inflation on approval varies for Republican, independent, and Democratic subgroups. As Kernell and Hibbs note, this further implies that net changes in a president's overall aggregate approval ratings can be thought of as a function of shifting distributions of partisan approval. As individual partisans cross over the threshold from approve to disapprove or vice versa, each partisan distribution shifts and this causes changes in the distribution of approval.

Based on the assumption that all members of a particular partisan subgroup react to changes in exogenous variables in the same fashion, Kernell and Hibbs move from their individual-level arguments to estimation of separate approval models for aggregate levels of approval among in-party

identifiers, independents, and out-party identifiers during Republican (Eisenhower-Nixon) and Democratic (Kennedy-Johnson) administrations. Their empirical evidence provides no support for the hypothesis that members of different social or occupational classes respond differently to changes in inflation or unemployment. However, they do find support for the hypothesis that partisan identifiers react to changes in economic factors differently depending upon whether they identify with the same party as the president. They also find that changes in economic conditions have a larger impact on the opinions of out-party identifiers than on the approval levels of the other two subgroups.

Kernell and Hibbs make an important contribution to an understanding of net changes in aggregate presidential approval by linking them to the ideas of partisanship and a critical threshold of opinion change. But the work of these authors lacks a theory of how citizens evaluate economic or other outcomes and how they translate evaluations of these outcomes into judgments about the president's job performance. In addition, their critical threshold theory of opinion change only considers direct changes from approval to disapproval and does not consider that an individual may have no opinion. Other analysts also make the assumption that citizens completely reverse their opinions once a threshold is reached, but the empirical evidence on this issue is mixed. Using an indirect ecological test of this assumption, Wanat (1982)

finds support for it, while Tedin (1986), who relies on a more direct individual-level test, finds evidence that the no opinion category is an intermediate opinion that citizens give as they shift their opinions from approval to disapproval or vice versa.

Standards of Accountability

Hibbs, Rivers, and Vasilatos (1982) also incorporate the idea of a critical threshold of opinion change in their discussions of the individual-level approval choice problem, and they attempt to fill the gap in Kernell and Hibbs's previous work by developing ideas about the way in which citizens evaluate presidential performance. According to Hibbs et al., a citizen's location along the latent approval index is a function of two comparisons -- one between the past performance of the Democratic and Republican parties and the other between the performances of the current and past administrations. The former interparty evaluation is a comparison of the discounted cumulative performance of the party in power and the discounted cumulative prior performance of the opposition party, while the administration-specific evaluation is a comparison of the discounted cumulative performance of the current administration to the discounted cumulative performance of all previous administrations. Hibbs and his colleagues hypothesize that in making these comparisons, citizens more heavily weight current performance and exponentially discount past performance.

Hibbs, Rivers, and Vasilatos (1982) operationalize performance as a set of economic outcomes (the rates of unemployment and inflation and the rate of change of per capita real personal disposable income) supplemented by variables for the Vietnam War, Watergate, and dramatic international events. And to link their individual- and aggregate-level models, they assume that all individuals react homogeneously to these outcomes and events. Their empirical results suggest that the effects of past economic outcomes on presidential approval die out slowly, and hence they (1982, 440) conclude, "Clearly, the American mass public is not as myopic as several previous analyses of political support have implied." In addition, they find that the effects of the past performance of the president's party have a substantial impact on the approval rating of the current administration.

There are at least two important implications of the Hibbs et al. argument. First, their estimates from a distributed lag model of aggregate presidential approval do suggest the importance of past outcomes on the current approval ratings of the president. Although studies prior to that of Hibbs et al. had assumed that citizens were retrospective, they had not examined the dynamic effects of economic or other factors on presidential approval. But more importantly, the arguments of Hibbs, Rivers, and Vasilatos rely on the idea that citizens hold the president accountable using a set of *relative* standards of accountability that shift

from administration to administration. The idea implicit in their argument is that past party performance and the performance of previous administrations form a set of minimum requirements or expectations of current presidential performance. The problem here is that Hibbs et al. do not provide any theoretical discussion of *why* citizens would be evaluating outcomes and hence the president in this relative fashion nor do they discuss the source of citizens' expectations.

In a later study, Hibbs (1987) attempts to give these hypothesized retrospective comparisons between parties and administrations a stronger theoretical footing by discussing the decision to approve of the president in terms of utility maximization. According to Hibbs (1987), citizens will approve of a president when the difference between the utility received from the *i*th president's performance (U^i) and the utility that they think they would have obtained if the out-party were in power (U^o) is positive;³ that is,

$$a_{it} = \begin{cases} 1 & \text{if } (U^i - U^o) > 0 \\ 0 & \text{if } (U^i - U^o) < 0 \end{cases}$$

where U^i and U^o are weighted averages of the above-mentioned party and administration comparisons. The larger the gap between in-party and out-party performance, the higher the probability that an individual approves of the president.

By linking the utility comparisons to a citizens's critical threshold of approval, Hibbs is implicitly assuming that the critical threshold of opinion change is a relative

one, varying across administrations. But here again, Hibbs gives us no insight into why citizens are making these relative comparisons. Are citizens really maximizing their utility by requiring presidents only to be relatively better than those from other parties or those from the past? Is a relative point of reference the most accessible frame of reference in a citizen's mind? Do the use of relative standards of accountability serve as heuristics that reduce either uncertainty or information costs? Hibbs never addresses these issues.

To test this model of individual choice, Hibbs again invokes a representative agent assumption and estimates approval models for partisan subgroups. In this work, Hibbs's performance variables include the gap between the current unemployment rate and its natural rate, the inflation rate, the percentage rate of change in per capita real personal disposable income, and the rate of change of energy prices as well as measures for the Vietnam War, Watergate, and dramatic international events. His empirical results suggest that the gap in unemployment has a greater effect on levels of approval among Democrats than among Republicans or independents. In addition, he finds that citizens calling themselves independents are likely to be near the critical threshold of approval. Hence, he concludes that independents will "have a greater tendency than other groups to drift into and out of a president's base of support" over time.

An alternative view of citizens' standards of accountability is offered by Ostrom and Simon (1985) who argue that citizen evaluations of the president are based upon *both* relative and absolute standards of accountability. The absolute standards that citizens use to evaluate the president are related to their expectations about the formal and informal powers of the office of the presidency while their relative standards are a function of promises that each particular president makes to citizens. Hence, the former, which Ostrom and Simon call *institution-based expectations*, are imposed absolutely upon all presidents, while the latter, which they call *occupant-based expectations*, vary from administration to administration. Their discussion suggests that citizens' institution-based expectations will revolve around the valence issues of peace, prosperity, and integrity, while their occupant-based expectations will be associated with personal and policy outcomes.

Ostrom and Simon argue that these absolute and relative performance expectations can be thought of as a set of preferences or ideal points, and they suggest that citizens' preferences for presidential action can be subdivided into those outcomes that are related to the formal powers of the presidency and those that are associated with the promises made by the current occupant. They further classify these as either anticipated or unanticipated within one of three domains -- international, domestic, or personal. This yields

a total of 12 types of *presidentially-relevant outcomes* for which citizens hold the president accountable.

Implicit in Ostrom and Simon's (1988) argument is the idea that individuals are making two decisions rather than a single decision. In the first decision, individuals are assessing the difference between actual outcomes and those they expect the president to provide, and in the second decision, individuals are translating these deviations from the ideal into judgments about whether to approve of the president's handling of his or her job. More specifically, Ostrom and Simon argue that discrepancies between realized outcomes and the preferred outcomes that would be supplied by an ideal president represent a loss of utility that citizens would like to avoid or minimize. Formally, Ostrom and Simon express this loss as:

$$L_{ijt} = f [(O_{jt} - O_{ijt}^o) N_{ijt}] \quad (2.3)$$

where L_{ijt} represents the perceived benefit to citizen i at time t from the j th outcome the president provides, O_{jt} is a vector of j observed presidentially-relevant outcomes, O_{ijt} is a vector of the j ideal outcomes expected by the i th individual at time t , and N_{ijt} represents the degree to which the i th individual notices at time t deviations of the j th observed outcome from that expected (and preferred). By incorporating this notice factor to capture citizen awareness, Ostrom and Simon recognize that assessments of loss are also a function of information about presidentially-relevant

outcomes. Thus, under this decision calculus, the perceived loss to a citizen can be zero when realized outcomes match the presidential ideal or when the citizen has no information about (i.e.; fails to notice) performance discrepancies.

To avoid loss, all else equal, citizens translate deviations from the ideal into judgments of the president's job performance. Ostrom and Simon express a citizen's decision to approve of the president as follows:

$$Pr(a_{it}=1) = \beta_{10} + \sum_{j=1}^J \beta_{1j} [(O_{jt} - O_{jt}^e) N_{ijt}] + e_{it} \quad (2.4)$$

where $a_{it} = 1$ when the individual approves of the president and zero otherwise and where j indexes presidentially-relevant outcomes. According to Ostrom and Simon, an individual's calculated loss or benefit influences the individual's probability of approving of the president in proportion to the size of noticed deviations from the ideal. By rewarding and punishing presidents in proportion to the size of experienced loss, citizens are able to hold the president accountable for his or her job performance.

Ostrom and Simon invoke a representative agent assumption so that they can estimate a macro-level model of presidential approval. They also assume that citizens' absolute and relative expectations of the president are homogeneous. By making this homogeneity assumption, Ostrom and Simon are able to avoid measuring these expectations. Instead, they just assume that all citizens expect either a very high or a very

low value for each of the 12 presidentially-relevant outcomes. Hence, they can interpret changes in the observed outcomes themselves as indicators of movement toward or away from the expected outcome. Ostrom and Simon's empirical results show that war and economic factors, weighted by the percentage of the public that notices them (actually, weighted by the percentage that names that factor as one of the nation's most important problems), have a substantial impact on aggregate approval as do outcomes associated with a president's legislative success on domestic policy and with his or her general legislative activity. Superpower foreign policy outcomes also influence aggregate approval whereas domestic policy initiatives do not.

Note that the decision mechanisms hypothesized by Hibbs and by Ostrom and Simon each conceptualize utility in terms of distance. However, the key differences between the two theories are that Ostrom and Simon suggest that citizens compare some observed outcomes to an absolute standard that is constant across presidents and they compare the rest to a relative standard that varies as a function of the promises a president makes. In contrast, Hibbs et al. and Hibbs assume that citizens only measure utility with respect to relative standards. In addition, the relative party and administration standards discussed by Hibbs change only as citizens forget the past; that is, they are exogenous to current presidential actions until well into the term whereas the relative

presidential expectations posited by Ostrom and Simon are endogenously generated and controlled by the current officeholder.

Both Hibbs and Ostrom and Simon use similar economic indicators in their aggregate models of presidential approval. Because there is some overlap in their aggregate model specifications and because citizens' expectations of the president are implied rather than directly tested, neither model can distinguish between arguments of absolute versus relative standards. Thus, the arguments of these authors with respect to citizens' expectations remain at the level of assertion. I will examine additional survey evidence in Chapter Three to shed some light on this matter, but in the meantime, let me discuss why I think Hibbs's characterization of citizen behavior is implausible.

Hibbs's argument that citizens compare observed outcomes to both past party performance and to the performance of previous administrations suggests that citizens think of the decision to approve of the president as a competition between two different alternatives; that is, Hibbs's implies that individuals see the approval choice as both a partisan and a historical competition. The problem here is that the survey question about whether you approve of the way the president is handling his or her job does not pit the president against an alternative. When making a decision about whether to approve of the president, citizens are not faced with a direct choice

between two tangible partisan alternatives. In fact, the question seems to me to focus entirely on the current officeholder. Furthermore, the citizens Hibbs describes just slowly forget past party and presidential performance. But why should information from the fairly immediate past be the only information that citizens rely on as they form their images of a hypothetical presidential alternative? For instance, an individual who thought Franklin Roosevelt was a great president might be inclined to make historical comparisons on the basis of information from long ago rather than from the immediate past.

Means, Ends, and Opinion Change

Neustadt identifies a president's standing with the public (i.e.; public prestige) as one of the vantage points that a president can exploit when exercising his or her powers. According to Neustadt (1980, 70), judgments of the president's job performance are a function of the interaction of citizens' views of the "oughts of office" with their evaluations of real-life circumstances:

[W]hat a president should be is something most men see by light of what is happening to them. Their notions of the part a President should play, their satisfaction with the way he plays it, are affected by their private hopes and fears. Behind their judgments of performance lie the consequences in their lives.

Because of the interaction between expectations and reality, Neustadt says, citizens' opinions of a president reflect the outcomes that a chief executive produces. Hence, citizen

frustration with real-life circumstances presents a fundamental danger to a president's levels of public support.

The idea that citizens monitor and hold the president accountable for final outcomes or the ends of presidential action stands in contrast to the arguments of Mueller (1970) and Chappell and Keech (1985) who argue that approval evaluations are influenced by the policy decisions (i.e.; the means) that presidents implement. According to Mueller, because every presidential policy decision is likely to alienate some segment of the citizenry, over the span of an administration, these policy decisions create a growing coalition of minorities who disapprove of the president's performance. Thus, with the exception of temporary spurts in approval caused by citizens rallying to support the president during times of international crisis, Mueller's coalition-of-minorities hypothesis implies that aggregate presidential approval will follow a deterministic, negative time path.

Mueller tests his coalition-of-minorities hypothesis by placing a variable measuring time into the term into an aggregate-level model of presidential approval. But as Kernell (1978) and others have noted, this time trend has no theoretical meaning, and could be consistent with many other hypotheses that predict a deterministic decline in approval. In addition, the coalition-of-minorities hypothesis suggests that any presidential policy decision will alienate some segment of the population, but if so, how do presidential

policy proposals affect the individual-level decision process? Which citizens switch to disapproval in response to which policy decisions? How do cross-pressured citizens respond? And why do citizens never renew their support for a president once they withdraw it? Mueller leaves these questions unanswered.

Chappell and Keech (1985) also hypothesize that citizens evaluate presidents on the basis of policies rather than outcomes. More specifically, Chappell and Keech's argument assumes the existence of a short-run Phillips curve tradeoff between inflation and unemployment. According to these authors, a sophisticated citizenry would understand that a president's short-run economic policy choices are constrained by this tradeoff. Hence, these citizens would reward the president for economic policy actions that promoted desired long-run conditions even if this meant praising the president for temporary increases in inflation or unemployment. This sophisticated response can be juxtaposed with the behavior of a naive citizenry whose members are unaware of constraints and relationships between economic factors. These naive citizens merely punish the president for current and past inflation and unemployment outcomes.

As Chappell and Keech note, sophisticated citizens who understand the future implications of current policies can avoid presidential attempts at political manipulation whereas a naive citizenry, even one whose members have long memories,

is vulnerable to political business cycles induced by the president. To test whether the sophisticated or naive characterization of citizens is appropriate, Chappell and Keech estimate two aggregate-level models of presidential approval -- one including constraints for economic policy tradeoffs and one without these constraints. As their empirical results show, the model based on a view of citizens as capable of understanding economic policy constraints performs as well as a model based on a view of citizens as naive evaluators of past and present outcomes.

The arguments of Chappell and Keech suggest that citizens may evaluate economic outcomes interdependently rather than separately. Such a theory implies that sophisticated citizens both will understand economic policy and will have quite accurate point estimates of the inflation and unemployment rates. But as Conover, Feldman, and Knight's (1986) empirical evidence shows, citizens do not often have such specific information about economic outcomes. And because gathering such information is potentially costly, the question arises as to whether citizens will seek to obtain this information. Thus, to be more plausible, Chappell and Keech's argument needs to be bolstered by additional hypotheses about the incentives that citizens have to obtain information about economic policy and observed outcomes.

One of the big differences between the arguments of Mueller and those of Chappell and Keech about the effects of

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presidential policy decisions on the chief executive's approval ratings is that Mueller's citizens are concerned only with a single non-economic policy issue and do not stop to consider any political or economic constraints on presidential decision making. In contrast, Chappell and Keech's sophisticated citizens are primarily concerned with economic policy and do give the president "the benefit of the doubt" when they think that a presidential policy decision may lead to a desired long-run outcome. In a sense, these sophisticated citizens respond to anticipated policy results, while Mueller's citizens respond to past policy initiatives.

Orientation and Temporal Direction

Unlike Mueller and Chappell and Keech, most scholars side with Neustadt in arguing that citizens judge presidential performance on the basis of the outcomes that the president provides. The existing literature suggests that outcomes for which citizens share a common preference, such as economic prosperity, integrity, and security,⁴ substantially influence an individual's decision to approve of the president. In addition, the general political science literature addresses in considerable detail the types of economic outcomes that citizens use as inputs to their political decisions. Within this general literature and within the literature on the determinants of presidential approval, citizens' economic evaluations have primarily been classified along two dimensions -- one representing the *orientation* (personal or

sociotropic) and the other the *temporal direction* (retrospective or prospective) of these judgments.

The orientation of an economic evaluation refers to whether economic conditions are perceived in terms of *personal* financial circumstances or are a *sociotropic* function of concerns with the nation's economic condition (Kinder and Kiewiet 1981, 132). At the individual-level, political scientists have found only limited evidence of the effects of personal financial assessments on political outcomes (Brody and Sniderman 1977; Kinder and Kiewiet 1979, 1981; Feldman 1982; Kiewiet 1983; Kinder and Mebane 1983). This paucity of empirical evidence contradicts assumptions of personal "pocketbook" behavior made in many early aggregate-level analyses of economic and political outcomes.

The individual-level evidence suggests that citizens generally form both personal and sociotropic evaluations, but that sociotropic evaluations have a greater impact on political outcomes (Kinder and Kiewiet 1979, 1981; Kiewiet 1983). Sociotropic evaluations tend to dominate political behavior and outcomes because of the close connection between the orientation of an economic evaluation and citizens' attributions of responsibility for solving the problem (Brody and Sniderman 1977, 338). According to Brody and Sniderman, individuals with a personal (or self-located) economic viewpoint perceive both the cause of the problem and the responsibility for solving it as theirs individually, while

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those with a sociotropic (or socially-located) economic perspective blame the national government for causing economic problems and hold it responsible for solutions.

Some researchers hypothesize that different orientations and patterns of causal attribution across economic outlooks stem from an underlying "ethic of self-reliance" that is deeply etched into America's political culture (Sniderman and Brody 1977; Feldman 1982). Attitudes of economic individualism lead a large proportion of the nation's population to

think they should take care of virtually any problem on their own, without any government help whatsoever, except when the problem that concerns them manifestly defies the power of any one person to deal with it entirely by himself (Brody and Sniderman 1977, 339).

As a result of this ethic, respondents often blame personal financial problems on idiosyncratic, individualistic causes. This tendency to "morselize" experiences and attribute personal financial problems to particularistic causes "works to nullify the political meaning latent in the economic setbacks and achievements of everyday life" (Kinder and Mebane 1983, 167, emphasis added). Based on these theories, one might expect political outcomes to be a function of sociotropic evaluations rather than of concerns with personal finances.

Much of the work on whether citizens monitor personal or national economic outcomes has been concerned with determining which of these two types of factors influence an individual's

vote choice. Within the context of the decision to approve of the president, many analysts have used national economic indicators as proxies for the outcomes that citizens monitor, sometimes assuming these measures approximate the effects of personal financial conditions but more frequently assuming that they reflect assessments of national problems. Evidence from both the individual and aggregate levels suggests this latter assumption is probably more appropriate. For instance, Fiorina (1981) finds that citizens' evaluations of their personal financial state are subsumed by their assessments of national economic conditions and that these sociotropic evaluations remain statistically significant predictors of the approval decision even when measures of citizens' perceptions of government economic performance are included in a model of the approval choice problem.

In addition to Fiorina's evidence, a study by Ostrom and Simon (1988) finds that variables representing period-to-period change in objective indicators of inflation and unemployment influence the individual-level decision to approve of the president. MacKuen, Erikson, and Stimson (1992) also show that the effects of aggregate measures of personal financial conditions on approval are wiped out after controlling for measures of national conditions in an aggregate statistical model. Taken together, the empirical evidence from these studies supports the argument that the direct political effects of citizens' economic evaluations on

approval are a function of their sociotropic, rather than personal, assessments.

In addition to their orientation, citizens' economic evaluations also can be classified with respect to their temporal direction; that is, they can be categorized by whether they are a function of the *retrospective* monitoring of past outcomes or the *prospective* forecasting of future outcomes. Political scientists have long been preoccupied with theories of retrospective evaluations of political leaders. This preoccupation is primarily the result of two forces -- one methodological and the other theoretical. First, because forecasts of future conditions are often unobserved, early analysts were forced to specify models that assumed that citizens were retrospective. Second, the substantive emphasis by political scientists on retrospective evaluations of economic outcomes stems from early theoretical discussions of the impact of citizens' economic views on vote outcomes. For instance, V.O. Key (1966, 52, emphasis added) observes that:

[T]he electorate responds most markedly and most clearly to those events it has experienced and observed, vicariously and directly *The prospects for the future may generally tend less to engage the voter or to govern his actions. Those prospects tend to be hazy, uncertain, problematic.* Voters respond most assuredly to what they have seen, heard, experienced. Forecasts, promises, predicted disaster, or pie in the sky may be less moving.

Although he does not rule out prospective or forward-looking economic evaluations, Key (1966, 61) concludes that voting

patterns "reflect the electorate in its great, and perhaps principal, role as an appraiser of past events, past performance, and past actions."

If Key is correct and citizens are appraisers of the past, then just how good are their judgments? According to Conover, Feldman, and Knight (1986), citizens' retrospective appraisals exhibit a noticeable degree of accuracy with respect to knowledge about the general trend in macroeconomic indicators. Examining data from a three-wave panel, Conover et al. find that a large proportion of respondents were able to assess accurately past patterns in unemployment without possessing specific knowledge about its rate. In contrast, actually knowing the inflation rate produced more accurate retrospective evaluations of inflation. However, for both economic factors, Conover, Feldman, and Knight (1986, 577) find substantial evidence "that the general trend may be learned over time even in the absence of specific knowledge."

Even at the time that Key wrote, an alternative view of citizens' economic evaluations existed in the work of Anthony Downs (1957). In the context of elections, Downs (1957, 41) argued that voters do make retrospective economic judgments, but that the purpose of assessing the past is to draw inferences about the economic future and about future party policies. According to Downs (1957, 41, emphasis added):

In effect, every election is a judgment passed upon the record of the incumbent party When the opposition's policies in period *t* have differed from those of the incumbent's, the judgment

expresses the voters' choice between the future projections of these two policy sets.

Downs's arguments influenced Kramer (1971) who argued that the impact of retrospective economic evaluations on vote outcomes arises because assessments of the past are used to predict the ability of the president and his party to manage the economy effectively in the future.

More recently, Fiorina (1981) follows Downs and Kramer in positing that citizens are more than retrospective and that their prospective evaluations (of which economic forecasts are a subset) result from extrapolating from the past. Fiorina's empirical evidence shows that when predictions of party competence and forecasts of economic conditions are considered, the effects of simple retrospective evaluations of observed outcomes, mediated retrospective evaluations, and party identification on vote choice diminish. According to Fiorina, this occurs because these forecasts encompass previous evaluations. Hence, Fiorina (1981, 197) concludes that

... future expectations reflect a true developmental sequence. Directly experienced and/or perceived events and conditions first contribute to performance evaluations, and both in turn contribute to future expectations Future expectations are so important empirically because they are the end of the chain, the distillation of numerous evaluations and experiences from a voter's past.

If Fiorina is correct and citizens' forecasts do reflect a distinctly developed opinion, then scholars should consider

just how such predictions might influence the decision to approve of the president.

Very few authors have examined the influence of citizens' prospective economic forecasts on presidential approval, although Monroe and Levi (1983) and MacKuen, Erikson, and Stimson (1992) are two notable exceptions. Monroe and Levi (1983) analyze the relationship between presidential approval and predictions of business conditions made by elites. Their empirical evidence shows that uncertainty about future changes in inflation as well as the gap between predicted and actual economic growth have a statistically significant influence on changes in aggregate presidential approval.

According to Monroe and Levi, this empirical evidence provides support for two hypotheses. First, because the gap between predicted and actual growth affects changes in approval, they argue that an expectations hypothesis drawn from "the traditional theory of a revolution of rising expectations" is supported. The problem with their claim is that Monroe and Levi are confusing two possible uses of the word *expectation*. One use of this word is to refer to predictions, forecasts, or estimates of future economic conditions. This definition is primarily used in the economics literature (e.g.; Muth 1961). In literature from other disciplines, including psychology and political science, the word *expectation* is used to refer to a preferred state of affairs.⁵ However, the gap between actual growth and

forecasts of growth as predicted by business elites has little to do with elite preferences and is more closely associated with elite forecasting errors. Given this, Monroes and Levi's empirical evidence does not bear on hypotheses about rising expectations.

Monroe and Levi also outline an uncertainty hypothesis. Borrowing heavily from literature in economics, these authors argue that the social costs and benefits of inflation are such that the effects of anticipated inflation on political outcomes will be different from the effects of unanticipated inflation. They summarize their argument as follows (Monroe and Levi 1983, 221):

[W]hen no one knows in advance if they will be gainers or losers from inflation, even if they are as likely to gain as to lose from an inflationary performance that differs from what they had anticipated, there still may be residual political consequences which are negative simply because people do not like living with uncertainty. This suggests that increasing uncertainty should have an unambiguous depressing effect on political popularity, quite apart from past errors in predicting inflation and even apart from the expected course of future inflation.

As they note, if uncertainty about future economic conditions does influence political outcomes, then this means that presidential attempts to generate a political business cycle could backfire since these efforts could make the future more volatile and unpredictable for citizens.

More recently, MacKuen, Erikson, and Stimson (1992) find empirical evidence that citizens' predictions of business conditions five years hence strongly influence aggregate

presidential approval. From these results, MacKuen, Erikson, and Stimson (1992, 605-606) conclude:

Political scientists have searched long and hard for strong evidence that the economy matters We suggest that the search has looked in the wrong temporal direction. Instead of finding the source of current changes in presidential approval somewhere in the economic past, we should find it in the immediate economic future.

In fact, MacKuen et al. find that the effects of these predictions of business conditions dominate the effects from subjective measures of personal financial conditions, retrospective business conditions, and personal financial forecasts and override the influence of objective measures of unemployment and inflation on presidential approval.

MacKuen, Erikson, and Stimson suggest that their empirical findings are consistent with a citizenry that uses information rationally. Although the economic predictions of citizens are not necessarily rational in the sense of being fully accurate or efficient (e.g.; Muth 1961), MacKuen et al. argue that they are qualitatively similar to such rational forecasts because they are formed by conditioning on an expanded set of information. MacKuen et al. argue that citizens obtain information about the future from media reports about economic news and "merely by noting that most forecasters say good (bad) times are ahead, the public becomes subject to the causal influence of the professionals' more esoteric tools."

The argument that media reports of future economic conditions influence citizens' forecasts of the future and in turn citizens' satisfaction with the performance of incumbent political leaders was made previously in a detailed study by Alt (1979) who investigated these phenomena within the context of British politics. According to Alt's *communication model* of economic forecasts:

Some of the economic events under discussion are not entirely haphazard, and are the subject of predictions by professional economists and others. Within broad limits, these predictions are accurate, and they are communicated to the broader public at great length and in great detail by the media Thus, by and large, the popular expectations series will be determined by unofficial and official forecasts prevalent at the time the popular expectations are recorded. Insofar as the official projections are roughly accurate, popular expectations will be roughly accurate.

This is the same conclusion that MacKuen, Erikson, and Stimson reach when they argue that aggregate measures of citizens' forecasts of business conditions should show the same "intelligence" as the forecasts of the economic experts who generated the predictions.

General Informational Effects

When considering the factors that serve as inputs to the approval decision, it can often become unclear whether an author is talking about the content of an evaluation or the process by which it is formed. For instance, if we say citizens' economic evaluations are retrospective, are we saying that citizen's look backward and hold the president accountable for the past because this is the process by which

citizens reach an approval decision? Or are citizens' economic evaluations retrospective simply because information about the past is all that was immediately available to citizens? Similarly, do citizens evaluate national economic outcomes because of an internal processing constraint related to beliefs about self reliance? Or do they merely focus on national outcomes because interpretations of and information about these outcomes are readily available to them?

The reason that it becomes difficult to separate the process from the content of an approval decision is because the information to which citizens attune may be influenced by their internal frames of reference. This is the argument that Alt (1979) makes in his development of the concept of an economic outlook. According to Alt (1979, 89), an economic outlook is "an evaluative filter through which external events pass." The bases of evaluation within this filter are three dimensions representing distinctions between personal versus national perspectives, retrospective versus prospective viewpoints, and whether circumstances are evaluated with respect to a citizen's aspirations. Although Alt suggests that an economic outlook is dynamic and can change rapidly with changing economic conditions and aspirations, his arguments still seem to imply that the citizens' internal psychological mindsets and motivations influence the evaluational approach that they take to incoming external information. As a result, the content of citizens'

evaluations becomes a function of the particular internal frame of reference that individuals use when processing information.

But what if human psychology is more benign, and citizens' economic evaluations are primarily influenced by the external evidence that citizens have available to them? For instance, an alternative explanation for the dominance of citizens' sociotropic evaluations on political outcomes suggests that the American mass media influence the orientation of citizens' economic evaluations by the types and amounts of coverage they give to economic issues (Iyengar 1987; Abramowitz, Lanoue, and Ramesh 1988). According to Mutz (1992), such "sociotropic priming" occurs when the media present an economic problem in terms of national rather than personal outcomes. Citizens exposed to these media reports are more likely to provide causal explanations for the problem that focus on systemic rather than personal factors (Iyengar 1987). However, if the media present an economic problem within the context of a particular individual suffering financial hard times, citizens are more likely to attribute that individual's hardships to dispositional or particularistic factors (Iyengar 1987, 822).

A number of recent studies of presidential approval have focused more explicitly on the types and amounts of information available to citizens. For instance, Ostrom and Simon (1988) test an individual-level model of the approval

decision that contains a number of the features of their previously-discussed citizen-as-evaluator model. In this later work, they operationalize the concept of notice with a dummy variable that takes on the value of 1 when an individual names either inflation or unemployment as the nation's most important problem. Hence, Ostrom and Simon's model implies that there are informational differences within the citizenry. However, their model restricts these differences in levels of information to one of only two conditions -- citizens either have no information or complete information about an environmental change.

Ostrom and Simon's work raises questions about how citizens become aware of changes in the environment. For instance, are certain types of people more likely to be aware of environmental changes than others? Are some segments of the population more likely to be aware of changes in specific types of environmental changes? Who are these people that are aware of these changes and how are they the same or different from those who are unaware?

Discussions of differences in citizen awareness and in their levels of information lead to questions about whether citizens acquire information about external events through direct experience or through channels of communication. Given the evidence that national rather than personal financial conditions affect presidential approval, the mass media and other forms of communication loom large as influences on the

amounts and types of information that citizens have. For instance, because individuals do not experience directly most major national events, Brody and Page (1975) argue that opinions about a president's job performance will be a function not of events per se but of media reports or news of those occurrences. And they hypothesize that "good" news leads to increases in aggregate presidential approval, while "bad" news generates declines.

In addition, Brody and Page suggest that opinion change is a response to discrepancies between the balance of fresh news and citizens' prior opinions of the president; that is, changes in citizens' evaluations of the president occur in response to changes in the balance of good and bad news promulgated by the media. When the balance of good and bad media news stays constant, citizens' opinions of the president will not change. Although wars and economic outcomes can be measured in terms of a balance of good and bad news, Brody and Page note that some events and outcomes do not readily lend themselves to a good news/bad news interpretation. For instance, the rally 'round the flag response of citizens to international crises does not seem explicable in terms of this framework since the public seems to rally in short-term support for the president regardless of whether the event is positive or negative.

Despite this, Brody (1991) notes that the rally phenomenon can still be explained in terms of types and

amounts of information that citizens have. Brody (1991, 64, emphasis added) hypothesizes that the rally effect occurs because "crises alter the incentives for most opinion leaders to speak out on the issues, [and] they likewise will affect the *normal* mix of evaluative comment available to the public through the media." Because rally events cause uncertainty for both elites and masses, Brody conjectures that fewer elites will comment publicly on the president's actions in the immediate aftermath of a crisis, and of those who do, not many will respond negatively. Thus, Brody suggests that shocks to the flow of information from elites to masses cause the rally 'round the flag effect.⁶

Although Brody never uses the phrase, in a broad sense, his theory is consistent with the idea that the media through reports of elite opinion of environmental evidence and the president's performance, prime the public to respond in certain ways. Iyengar and Kinder (1987), who investigate some specific types of media effects on the opinion of individuals, define *priming* as the media's ability to influence the standards by which presidents and other leaders are judged simply by calling attention to some matters while ignoring others. According to these authors, priming influences public opinion by making certain pieces of information more accessible within citizens' minds.

Using data collected in controlled experiments in which individuals watched television news shows, Iyengar and Kinder

find that assessments of the president's overall job performance by viewers who were shown television news stories about specific problems were more likely to be dominated by evaluations of the president's performance on that particular problem. In addition, their empirical evidence suggests that when news stories linked the president's actions to a particular problem, that problem had a greater effect on judgments of the president's job performance. Interestingly, Iyengar and Kinder note that the strongest of these priming effects occurred for problems such as the energy crisis that were fairly new to the American agenda, while these effects were smaller for more familiar problems such as inflation or unemployment.

Many studies on the influence of information on presidential evaluations can be synthesized using concepts from the work of Zaller (1990), who argues that attitude formation and change are influenced by differential flows of information over time. For instance, Zaller argues that a campaign for the U.S. House of Representatives can be conceptualized as a set of competing messages with different intensities. Attitude changes during the campaign are responses to changes in the net balance of information that citizens have about the incumbent and challenger. Zaller's key hypothesis is that an individual's probability of opinion change depends upon the intensity of different messages, which in turn determines whether a citizen will be exposed to it.

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Zaller argues that thinking of opinion change as a function of information flows provides an improved explanation for Converse's finding that attitude change is sometimes non-monotonic across subpopulations of individuals with different degrees of awareness.⁷

Zaller explains Converse's evidence by arguing that the opinions of the highly aware show stability because the highly aware are the only subgroup within the population that is exposed to both the incumbent's and the challenger's message; that is, the lack of opinion change occurs because "exposure to the challenger's campaign gives highly aware persons a basis for resisting incumbent-dominated campaigns that less aware people do not have." Whether both streams of information penetrate to the moderately aware or to the least aware segments of society depends upon how intense each message is. Because the incumbent's message is generally more intense than the challenger's, the attitudes of the moderately and least aware will appear to be highly responsive to the incumbent's message simply because it dominates within the set of all information that those citizens have.

The ideas of Zaller about how opinion change is influenced by the balance of information from competing messages can be well-integrated with Brody and Page's arguments simply by thinking of two countervailing streams of information -- one containing "good" news and the other consisting of "bad" news. In addition, Zaller argues that his

exposure-acceptance theory of opinion change can help to explain the existence of priming effects on presidential approval. However, the most important contribution of Zaller's work is the link he draws between his individual-level theory and the resulting aggregate patterns of attitude change. As he shows, the effect of a particular piece of information on different subgroups within the overall population may run monotonically from high to low levels of awareness. This in turn implies that net changes in aggregate public opinion are a function of different marginal effects across individuals.⁸

Zaller's information flow model also can be synthesized with Brody's explanation of the rally 'round the flag effect on aggregate presidential approval. First, in response to the occurrence of a rally event, Brody argues that information flows will be one-sided in the positive direction as elites suspend their criticisms of the president. In addition, because of the dramatic nature of these events, all portions of the population will be hit with the same information at the same time. Taken together, these patterns of information cause a rally of support for the president. Brody suggests that elites will not actually change their opinions of the president, but simply will keep quiet about them generating a one-sided flow of positive information. In contrast, consider exposure to information about the economy. It seems plausible that citizens are exposed to messages about a time t change in

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the economy at different points in time with the highly aware exposed first. Thus, we might expect the opinions of the highly aware to change first with the moderately and least well aware changing at some later point in time after they receive the information.

Summary

Two themes of fundamental importance emerge from this review of the existing literature on the decision to approve of the president. First, this choice is a function of *both* constraints from internal beliefs and information about external changes in the environment. For instance, I agree with Iyengar and Kinder that the reason priming effects are stronger for problems like energy than for inflation or unemployment is because citizens are certain that a president is responsible for solving economic hardships whereas, at least in the late 1970s, they were less certain about the president's role in solving energy problems. What this suggests is that information alone is not responsible for the final approval decision. And hence, a complete theory of the approval choice problem also must include a discussion of citizens' beliefs about presidential responsibility.

Brody and Page (1975, 141, emphasis added) reach a very similar conclusion when they note that:

"Good" and "bad" news are theoretically defined in terms of peoples' values and beliefs; the valence of a particular news event depends on the empirical content of those values and beliefs. *The utility of news valence as an explanatory concept depends on ascertaining, at the*

individual level, what the relevant beliefs and values are, or -- better yet -- establishing what the consensus is in a particular population.

Thus, while a citizen's approval decision may be affected by external evidence about "good" and "bad" news, the evaluation of this news and the attribution of blame or reward to the president can only occur in relation to a citizen's internal beliefs. Although nearly all of the studies discussed above recognize that partisan beliefs operate as one such constraint, very few of these authors make any attempt to link the standards of accountability implied by their statistical models to citizens' beliefs about the president or about leadership in general; that is, none of these studies do a very good job of identifying "what the relevant beliefs and values are" or establishing "what the consensus is in a particular population."

The second important theme to be gleaned from this literature is that individuals vary with respect to the amounts of positive and negative information that they have about environmental outcomes. And I agree with Zaller (1990, 182) that we need to move away from building models "that implicitly assume citizens are equally informed about politics and hence differ mainly in their preferences and interests." Because of individual-level heterogeneity, any realistic theory of the approval choice problem and of net changes in aggregate presidential approval also must address the types and amounts of information that are available to citizens.

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The literature on the decision to approve of the president contains numerous hypotheses about how the choice is made. Most studies, however, tend to emphasize either internal constraints or the content of the inputs to the process without considering the interface between them. The challenge of expanding, revising, and integrating hypotheses about citizens' internal beliefs and levels of external information into a theory of approval will be taken up next.

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1. When β_i is the same for all i , then β_i in Equation [2.1] equals β_1 in Equation [2.2].
2. Lakatos (1978, 31-32) says scientific progress occurs when a theory can account for everything its rival explains as well as can predict novel facts (theoretical progress) and when some of this excess empirical content is supported (empirical progress).
3. Hibbs assumes that U^i never equals U^o .
4. Presidents are often said to be responsible for outcomes associated with peace, prosperity, and integrity. I use the word *security* in its broadest sense to replace the word *peace*. Citizens do not always desire peace. For instance, to the extent that Americans agreed on issues associated with the Persian Gulf War, they did not desire peace. Instead, they desired security, which sometimes involves going to war to obtain.
5. For instance, when Ostrom and Simon (1985) refer to the absolute standards by which citizens judge a president as their institution-based expectations, they are referring to preferences for, rather than predictions of, outcomes. My use of the word *expectation* has been and will be in reference to a preferred state of affairs. I will use the word *forecast* to refer to a prediction or estimate of future conditions.
6. Brody also focuses on the nature of elite opinion and its influence on mass opinion in his discussion of why citizens focus on national outcomes rather than policy proposals. According to Brody, because citizens prefer to minimize uncertainty and because policy proposals often tend to generate elite debate and uncertainty, citizens will put more emphasis on actual outcomes that indicate presidential success or failure.
7. Converse finds that individuals who have a high degree of political awareness will sometimes appear to be resistant to attitude change while the moderately aware show a great deal of change. Converse attributes the resistance of the highly aware to the large amounts of stored partisan information that these citizens possess. This lode of information gives the opinions of the highly aware ballast that the moderately and least aware lack.
8. Zaller's argument is not that aggregate opinion change cannot be monotonic, but only that non-monotonicities can be caused by exposure to different information flows.

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CHAPTER THREE

HOMOGENEOUS PREFERENCES AND HETEROGENEOUS INFORMATION

Because the decision to approve of the president can be influenced by citizens' internal belief structures as well as by information about external environmental changes, a complete theory of the determinants of public support for the president should address each of these factors and the causal links between them. The purpose of this chapter is to develop a behavioral theory of the individual-level approval decision that addresses these issues. This theoretical framework will, in turn, be used to inform the specification of an aggregate-level statistical model of presidential approval.

Few of the theoretical arguments discussed in the last chapter effectively address the nature of the beliefs that citizens have about the responsibilities of the president. And yet, beliefs about the causal, moral-legal, or role responsibilities of the president (Peffley and Williams 1985) mediate the effects of external information on the decision to approve of the president in at least two ways. First, a citizen's beliefs about presidential responsibilities function as a useful decision-making heuristic, providing the citizen with a "script" that can enhance the efficient gathering and processing of information about the president (Kinder and Fiske 1986). By relying on such frames of reference, citizens narrow the amount of information that they must monitor. Second, different types of beliefs about presidential

responsibilities are associated with certain decision rules. Hence, a citizen's beliefs about presidential responsibilities also supply that individual with a decision rule for assigning executive rewards and punishments.

For instance, suppose a citizen has a set of beliefs about the *role responsibility* of the president; that is, the citizen has beliefs about what any person in the role of the president should do. These beliefs about what a president should do are not likely to encompass all possible presidential activities, but are instead likely to consist of a smaller number of items that the citizen believes are highly important presidential functions. As a result, these beliefs limit the types and amounts of information that the individual need process when evaluating the president's job performance. Because they encompass the set of factors for which the individual holds the president responsible, a citizen's normative beliefs about the president's role establish the citizen's standards of presidential accountability. Second, a citizen using beliefs about a president's role responsibilities as an evaluative frame of reference thereby acquires a decision mechanism for assigning blame or praise to the president. This decision rule can be summarized as follows: Compare actual to expected performance and reward or punish a president to the degree that he or she fulfills the anticipated executive role.

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As Peffley and Williams (1985) note, the decision mechanism associated with beliefs about the role responsibilities of the president is different from that related to beliefs about the causal or moral-legal responsibilities of the president. Under beliefs about causal responsibility, citizens give greater rewards or punishments to a president on the basis of whether the president personally produced existing conditions. And under a moral-legal view of presidential responsibility, citizens assign larger punishments to a president depending on the extent to which they believe the president controls instruments that could have led to a different state of affairs. In my view, beliefs about a president's role responsibilities encompass citizens' beliefs about the causal and moral-legal responsibilities of the president. In other words, when citizens believe a president can personally influence (or control) an outcome, they are also likely to believe that he or she *should* do so.

CITIZENS' PREFERENCES FOR PRESIDENTIAL PERFORMANCE

Because citizens' beliefs about the role a president should play subsume many of their beliefs about causal and moral-legal responsibility, I will base my theory of the approval decision on the assumption that citizens evaluate a president's job performance in terms of the president's successes or failures in fulfilling the perceived presidential role. This in turn implies that citizens possess a normative

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conception about the ideal or perfect president that they use as a yardstick to gauge the performance of the current president. Because citizens believe a president should fulfill certain roles, their expectations become a set of standards that the president is responsible (i.e.; accountable) for upholding. Deviations from these standards result in executive rewards or punishments.

By assuming that citizens' beliefs about a president's role (i.e.; their expectations) represent their standards of accountability, I am accepting the idea that citizens compare actual or observed presidential actions and/or outcomes to those expected from the ideal president. In this vein, recall Ostrom and Simon's suggestion that we think of deviations from a presidential ideal as representing a loss of utility that citizens would like to minimize. To minimize loss, citizens are expected to punish or reward the president *in proportion* to the size of the discrepancy between actual and expected conditions. By levying these rewards and punishments, citizens hope to send the president a message about whether action is needed.

But if citizens are punishing and rewarding the president in response to deviations from expected conditions, then my theory needs to say more about the nature of these expectations. How many expectational dimensions are contained in the set of beliefs? Do these expectations vary across individuals? And are these expectations the same for all

presidents over all time periods or do they vary from administration to administration?

Role Responsibility and Citizens' Expectations

The existing quantitative studies of presidential approval exhibit a noticeable lack of theory and evidence with respect to citizens' expectations about a president's responsibilities. Many authors analyzing aggregate levels of approval assume away the influence of citizens' beliefs on the approval decision by stating that citizens want peace, prosperity, and integrity and that they punish presidents when they do not get these outcomes. Although this assumption may be true, it says nothing about where such preferences come from or the process by which the approval decision is made, and it thus renders these theories of little use for linking micro-level behavior and the aggregate data that it generates.

This theoretical deficiency with respect to citizens' expectations is ironic given that a majority of historical, descriptive, and/or normative accounts of the modern presidency (e.g.; Brownlow 1949; Greenstein 1978; Hodgson 1980; Lowi 1985) emphasize the detrimental constraints that citizens' expectations place on the power and actions of American chief executives. For instance, in discussions of the paradox of modern presidential power, advocates of reform often suggest that citizens have unreasonably high expectations of the president. According to authors like Hodgson (1980) or Lowi (1985), these exorbitant expectations

cause citizens to judge even partial presidential successes as failures, and in turn, create negative public opinion that can constrain future presidential exercises of power. Because these authors think that success in meeting citizens' expectations requires actions that are beyond the practical capacity of the chief executive, they often call for changes in citizens' normative conceptions of an ideal president. For instance, Hodgson (1980, 246) concludes:

The president of the United States still has awesome power. Only in the terms that matter most to him, perhaps, is it utterly inadequate. It does not enable him to meet the expectations of the American people The modern presidency was not designed ... for the task of lowering expectations either at home or abroad. It is not well adapted for that task. Yet expectations must be lowered.

Despite their emphasis on citizens' expectations as a problematic constraint on presidential power, these authors do not generally go beyond such normative statements to investigate systematically the features of citizens' beliefs or their link to evaluations of the president.

To the extent that they do examine the sources of citizens' expectations, these authors generally point to Franklin Roosevelt's administration as the time in which beliefs about the modern presidency were established. Under FDR's activist presidency, the argument runs, "precedents" for presidential action were set, and citizens grew to believe that all presidents could and should uphold them. For example, Greenstein (1978, 50), suggests that FDR:

undoubtedly enhanced his ability and that of his successors to muster public support in times of perceived national crisis. But he also undoubtedly established unrealistic and even contradictory standards by which citizens tend to judge both the personal virtue of Presidents and their ability to solve the typically controversial social and political problems that arise during their administrations.

In short, these authors portray citizens' expectations as a set of absolute standards that citizens want all presidents to uphold.

Institution-Based Expectations

I too contend that citizens evaluate presidents by using a set of absolute, rather than relative, standards. And I also hypothesize that these standards have been stable during the era of the modern presidents. But to show the plausibility of these statements, I must first address the nature of the actions or outcomes that citizens expect from their presidents. To begin, consider Neustadt's (1980,70) discussion of citizens' expectations in which he distinguishes expectations of the office of the president (an "image of the office") from expectations associated with a specific president (an "image of the man"). According to Neustadt, the former dominate citizens' beliefs and have a large impact on their evaluations of the president's job performance.

Neustadt's distinction foreshadows those made by later authors. For example, Seligman and Baer (1969) contrast diffuse with specific expectations of the president. Ostrom and Simon (1985) draw a distinction between institution-

versus occupant-based expectations of the president. The key difference these authors emphasize is between expectations of the office of the presidency in general versus those associated with a particular officeholder. Ostrom and Simon's definition of *institution-based* expectations is especially insightful in this regard. As they (1985, 336, emphasis added) argue:

[T]here are particular expectations that are directed not at the specific occupant of the White House but rather toward the institution of the presidency itself. More specifically, all presidents are expected to maintain peace, prosperity, domestic tranquility, and both the authority and integrity of the office itself. Regardless of the president's stated philosophy, party identification, or prior experience, these institution-based expectations are imposed by the public because *it is believed that the office provides any president with the necessary means to ensure that these desirable conditions are maintained.*

Implicit in this definition is the idea that these expectations represent a set of *preferences* that citizens desire presidents to satisfy. In fact, Ostrom and Simon argue that citizens' expectations of the president can be thought of as ideal points. Also, notice that these absolute standards are associated with the institution of the presidency, and hence, remain constant over time despite changes in the particular White House officeholder.¹

Brody (1991) points out that the difference between institution- and occupant-based expectations parallels Stokes's comparison of valence issues with position issues. According to Stokes (1966, 170), *position* issues are "those that involve advocacy of government action from a set of

alternatives over which a distribution of voter preference is defined." Thus, position issues are those for which the public has diverse or heterogeneous preferences about governmental courses of action (i.e.; means or policies). In contrast, valence issues (Stokes 1966, 171) are "those that merely involve the linking of the parties with some consequence that is positively or negatively valued by the electorate." Citizens' preferences for valence issues are homogeneous and reflect desired outcomes (i.e.; ends). For instance, Butler and Stokes (1974, 370) identify economic prosperity as the purest of all valence issues because "[i]f we conceive of economic issues in dimensional terms, the electorate is not spread along a continuum of preference extending between good times and bad; its beliefs are overwhelmingly concentrated at the good times end of such a continuum."

Pluralism and Homogeneous Standards

I will argue below that citizens' evaluate executive job performance by holding the president absolutely accountable for discrepancies between realized and expected outcomes along the valence issue dimensions of economic prosperity, security, and integrity. Because citizens share a common set of preferences for these valence outcomes, their standards of presidential accountability are homogeneous. But this homogeneity claim flies in the face of pluralist arguments about the diversity of demands on governmental actors.

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According to pluralist arguments (e.g.; Lindblom 1977), competition, bargaining, and coalition building among groups with non-homogeneous preferences are the primary ingredients of politics. Implicit in pluralist arguments is the idea that citizens will hold leaders accountable for policy initiatives and policy results.

Brody (1991) tests the hypothesis that policies rather than valence outcomes influence aggregate presidential approval and finds that media reports of policy proposals have no influence on a president's aggregate level of public support.² From this he concludes (1991, 170) that the public "is more pragmatic about results than ideological about means." Brody's results provide empirical support for the argument that evaluations of the president's job performance are a function of homogeneous rather than diverse preferences.

But if pluralist arguments about diverse standards of accountability are rejected, then important questions must be answered about how and why valence outcomes are evaluatively linked to political leaders. First, from a decision-making standpoint, monitoring and evaluating policy initiatives rather than valence outcomes places a heavier computational burden on citizens who first have to assess the implications of a policy and then determine the probability that the policy will yield desired results. Thus, focusing on outcomes rather than policy decisions helps to reduce the uncertainty citizens face when deciding whether to approve of the president (Brody

1991; Ostrom and Simon 1988). Second, evaluating the president with respect to how well he or she satisfies citizens' absolute desires is also psychologically more efficient than reaching a judgment on the basis of relative standards. Citizens using a stable set of preferences like those associated with valence outcomes will not be faced with setting up a new set of standards each time a different president takes office or each time a president or presidential candidate makes another promise.

Rational Control of Public Officials

But in addition to the potential increase in decision-making efficiency, Ferejohn (1986; 1990) argues that another reason citizens might rely on a common conception of the ideal president as their standard of presidential accountability is because such homogeneity can materially benefit citizens individually and collectively. For instance, assume that citizens do desire to minimize loss as previously suggested. The question then arises as to how this could be accomplished? Since most citizens have no control over prosperity, security, or integrity outcomes, they must rely on someone who does (or who they think does) to bring about desired conditions. Consequently, we can characterize the relationship between the president and the public as one of principals and an agent (Ferejohn 1986, 1990; Beck 1989; 1991) where the citizens are principals who "hire" an agent -- the president -- to work on their behalf.

In a manner analogous to many other principal-agent relationships, citizens are faced with the problem of monitoring the amount of effort that a rational president puts into pursuing citizens' preferred goals rather than his or her own. In a democratic system, control potentially can be achieved by holding the president accountable for his or her actions or failures to act; that is, citizens can use a system of rewards and punishments to limit or increase a president's power. As suggested in Chapter One, until the election of the president became more directly linked to the mass public, the president was really an agent of a smaller subset of political elites and had little incentive to meet public needs. Hence, in that period, the president was more of a trustee than a delegate (see also Beck 1989). But a more direct president-public link in conjunction with the rise of certain media technologies and of public opinion polling gave citizens more frequent opportunities to limit or increase a president's power. In other words, the rise of public opinion polling gives the citizens, as a collection of principals, potentially greater control over the actions of their presidential agent because it allows them to signal the president about the acceptability of the outcomes produced under his or her administration.

If citizens could monitor all aspects of the agent's behavior at all times, the president would have an incentive to act on behalf of citizens' interests. However, because

monitoring presidential effort is both costly and difficult, the president is likely to have a huge informational advantage about his or her true amount of effort and hence could deceive citizens about this and shirk his or her responsibilities. Alternatively, if the president was an agent for only a single principal, that single citizen could theoretically control the president by having well-defined preferences for presidential actions across all sets of circumstances the president might face. But in reality, the public is not a single principal and its members have potentially diverse preferences. Ferejohn (1986, 1990) shows that when citizens' preferences are non-homogeneous, the president can exploit this diversity by shirking with respect to the preferences of all but the majority requiring the least amount of effort. This in turn causes other groups of citizens to lower the amount of effort they require from the president. The result is competition among groups of citizens to become the majority that requires the least amount of presidential effort until, eventually, the amount of effort required from the president is zero, and all citizens are left with an agent who completely shirks his or her responsibilities.

Consequently, Ferejohn says, a divided citizenry has no control over the actions of the president. However, this "problem of agency" can be dampened if the public can find some way to "commit itself to act as though it is a simple principal with a one-dimensional set of rewards."³ According

to Ferejohn, citizens can control the president's actions if they, as principals, can "commit to a schedule of rewards and punishments that depends on the outcomes of the agent's actions" (Ferejohn 1990, 6, emphasis added). Or as Ferejohn (1990, 9) more eloquently states:

If electors could somehow bind themselves not to listen to the blandishments of officials seeking to play one group off against another -- if, to use Elster's metaphor, they could lash themselves to the mast -- officials would be unable to exploit divisions among them. Thus, to the extent that methods of arranging such commitments can be devised, the problem of control may be mitigated.

One method of "lashing themselves to the mast," according to Ferejohn, is for citizens to hold the president retrospectively accountable for the aggregate sociotropic outcomes that the president produces rather than holding the president responsible for either (a) presidential policy actions or (b) their individual shares of aggregate outcomes. Since the sociotropic outcomes that citizens focus on are associated with valence issues, citizens will have homogeneous preferences for them, and hence, they can exert greater control over a president if they use these as a basis for judgment. To ensure the greatest degree of control, citizens would need to hold the president accountable for a single valence outcome.

A citizenry with homogeneous institution-based expectations for a small number of favorable valence outcomes comes close to fitting Ferejohn's criteria for an electorate that can indeed control presidential behavior and reduce

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shirking. Thus, one reason the use of homogeneous standards may be beneficial is because this allows citizens to influence the behavior of presidents in such a way as to minimize loss (i.e.; the distance between observed and ideal conditions).⁴ However, Ferejohn's arguments suggest that citizens could increase their utility by holding the president accountable in this manner. That is, by using a set of homogeneous preferences as their standards of accountability, citizens increase the likelihood that the president will do what he or she can to satisfy their preferences.

In addition, Ferejohn notes that control of the president's actions requires a balance between the costs that citizens levy on the president and the rewards that the chief executive receives from holding office. For instance, if citizens set their sights too low and levy few punishments, a president will find it so easy to meet citizens' standards of accountability that he or she will still be able to shirk and society will not obtain optimal levels of presidential effort. If citizens require benefit levels that are too high and if they levy exorbitant punishments, the president may decide that the benefits of re-election or historical fame require too much effort (i.e.; costs > benefits) and will give up and shirk anyway. Consequently, Ferejohn's arguments seem to imply that to gain optimal control citizens must appropriately *match* executive reward and punishments to the observed outcomes they desire the president to control. The assumption

that citizens reward or penalize a president in proportion to the degree to which the outcomes he or she provides deviate from those expected is consistent with Ferejohn's argument.

The Existence of a Presidential Ideal

Although it may be psychologically efficient and individually and collectively rational to hold a president absolutely accountable for producing non-ideal valence outcomes, questions arise as to whether citizens actually do share a consensus about the features of an ideal president? And, if so, have these beliefs been stable over time? Given the importance of this concept to my argument, a brief examination of the empirical evidence on this matter is in order.

As Iyengar and Kinder (1987) discuss, there is a conceptual difference between the beliefs citizens have about a president's general job performance and the beliefs they hold about a president's character. Citizens' assessments of presidential character have been found to revolve around the more abstract themes of personal competence and integrity (Kinder and Abelson 1981). In contrast, judgments of the president's general job performance "are presumably some average sense of how well they see the president managing unemployment, foreign relations, and other pressing national problems" (Iyengar and Kinder 1987, 75, emphasis added). Unfortunately, very few researchers have investigated the existence of beliefs about the expected job performance of the

ideal president. But, taken together, the available evidence does provide some information about the characteristics of citizens' beliefs or expectations about ideal presidential performance.

As noted earlier, many authors contend that citizens' expectations of the modern president congealed under the administration of Franklin Roosevelt. If this is true, then one place to start looking for evidence about these expectations is by examining citizens' perceptions of FDR. I could not find any surveys of expectations of FDR administered while he was in office. However, in 1949, Sanford asked a representative sample of 963 Philadelphia residents open-ended questions about what they thought made FDR either a good or a poor leader.⁵ Responses ranged from personal attributes such as FDR's interest in the people to mentions of his functional competence to more performance-oriented characteristics such as his national accomplishments and his actions on the behalf of lower socioeconomic groups. As Sanford's data show, a large percentage of the respondents who called Roosevelt a good president did so because he met their material needs. Thus, Sanford (1951, 197) concludes:

Here again one is inclined to see an element of material dependency, an emphasis on solid, practical pay-off. "I'll follow a leader who gets things done," these respondents seem to be saying, "particularly if he does things that are of practical benefit to me."

If FDR's actions did influence the institution-based expectations of citizens, then Sanford's data suggest that

these beliefs likely include expectations that the president's performance will benefit citizens' economic welfare.⁶

In a study carried out in the early 1960s, Roberta Sigel investigated citizens' expectations of the president by presenting a representative sample of Detroit residents with a list of potential presidential qualities from which they were told to choose the three most important. This list of 10 executive qualities included one performance-oriented characteristic, two qualities associated with integrity, two features of personal competence, and five characteristics related to the president's personal demeanor. Sigel (1966) found that the respondents identified honesty (78.4%), intelligence (55.2%), an independent thinker (44.8%), and a careful spender of public money (35.8%) as the most important executive qualities. These data, broadly construed, show a degree of citizen consensus that an ideal president should be concerned both with integrity and with national financial management. And more importantly, Sigel's results show a great deal of agreement among citizens that the ideal president must be professionally competent at his or her job rather than personally warm or friendly. Thus Sigel concludes (1966, 304, emphasis in original), "Appearance, it would seem from this hierarchy of preferences, counts far less than *performance*."

Additional evidence of citizen consensus about institution-based expectations of the president is provided in

Seligman and Baer (1969), who presented a sample of Republican and Democratic activists with 18 hypothetical presidential decision situations. For each situation, respondents were asked to select which one of four actions the president should take. These hypothetical actions were drawn up to reflect either moral ends, moral means, expedient ends, or expedient means. Seligman and Baer's results show a high degree of bipartisan consensus that presidents are expected to take moral rather than expedient actions, which implies that citizens do expect *integrity* from the ideal president. Second, the responses were dominated by a bipartisan preference for moral *outcomes* rather than means. These empirical patterns held regardless of whether respondents were asked specifically what Eisenhower or Kennedy should do or if they were asked what a modern president in general should do.

The findings of Sanford (1951), Sigel (1966), and Seligman and Baer (1969) support the idea that citizens' expectations of the ideal president are dominated by their preferences for presidential competence in bringing about desired outcomes. Unfortunately these studies provide little help in identifying more specifically what the desired outcomes might be. However, Kinder, Peters, Abelson, and Fiske (1980) provide strong evidence about the existence in the public's mind of a normative conception of the ideal president and about the specific outcomes that citizens expect him or her to provide. In their study, respondents were

presented with a list of 16 potential presidential performance outcomes (eight positive and eight negative) from which they identified the four most important outcomes that they thought a president *should* provide and the four most important outcomes that they thought a chief executive *should not* provide. Table 2 summarizes their results. As indicated in the second column of this table, these desired outcomes can be summarized along valence issue dimensions representing economic prosperity, national security, and the integrity of the office of the president.

The most important result from the Kinder et al. study is the high degree of consensus among individuals about the performance required from an ideal president. This strong agreement crosses typical political boundaries -- including party lines -- as they (1980, 320-321) note:

Conceptions of an ideal president cut across standard demographic and political groupings. Republicans and Democrats, liberals and conservatives, young and old, men and women, Southerners and Northerners, and the well-educated and the less well-educated all partake of a common conception of Presidential character and performance.

Thus, the Kinder et al. results provide empirical support for the existence of homogeneous institution-based expectations of the president that represent a set of preferences for favorable outcomes along the valence issue dimensions of economic prosperity, security, and integrity.

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Table 2. Profile of an Ideal President's Performance^a*An ideal president should:*

| | | |
|--|------------|--------------------|
| Provide strong leadership | | 75.2% ^b |
| Appoint good advisors | | 64.4% |
| Solve our economic problems | prosperity | 62.6% |
| Develop good relations with
other countries | security | 53.6% |

An ideal president should not:

| | | |
|---|-----------|-------|
| Get us into unnecessary wars | security | 73.6% |
| Use office of president for
personal gain | integrity | 62.1% |
| Hide things from public | integrity | 55.4% |
| Not stand up for the U.S. in
foreign affairs | security | 53.6% |

Source: Kinder, Peters, Abelson, and Fiske (1980, 319).

^aOriginal data are from the 1979 CPS National Survey (N=280).

^bThe numbers in this column are the percentage selecting the performance outcome as important.

Because so little data exist on citizens' expectations of the president's performance, it is difficult to investigate directly the stability over time of citizens' preferences for economic prosperity, security, and executive integrity. The limited evidence discussed thus far indicates that expectations of economic prosperity and integrity have existed since the time of FDR, and it seems likely that beliefs about internal and external security have as well. But we can take a different look at the evidence of citizens' expectations of the president by making an assumption that citizens expect presidents to solve the nation's pressing problems. Hence, looking at trends over time in citizens' assessments of the nation's most important problem can serve as indirect evidence about citizens' expectations for executive performance. Table 3 lists citizens' aggregate judgments of the nation's most important problem from 1935-1992. Although the problems that citizens identified as most important have fluctuated over time, they have been confined to the three previously-discussed valence issue dimensions; that is, clearly, economic prosperity, national security (internal and external), and the integrity of the executive have preoccupied citizens' minds since the time of FDR. It seems likely that citizens expect presidents to manage and/or resolve these problems.

Sources of Citizens' Homogeneous Expectations

Given evidence of the homogeneity and stability of citizens' expectations of the president, the question arises

as to the source of these commonly-shared preferences. Although it may be rational and efficient to use such homogeneous standards, Ferejohn (1986, 23) notes that his arguments neglect "the question of how voters might come to agree on a particular sociotropic rule." There are at least three important explanations for the homogeneity of citizens' expectations of the ideal president. These include: the textbook presidency view (e.g.; Cronin 1974, 1980; Greenstein 1961, 1965); the priming hypothesis (Iyengar and Kinder 1987; Mutz 1992); and the self-interest explanation (Kiewiet 1981; Ferejohn 1986, 1990). None of these explanations necessarily imply conscious agreements among citizens to use expectations about valence outcomes as their standards of presidential accountability, but each offers a plausible rationale for how this homogeneity might arise without such formal or informal agreements.

The textbook presidency explanation. One factor that might induce citizen consensus about the standards of accountability used to evaluate presidents is if important agents of socialization influence individuals to expect certain actions from the president. Hess and Easton (1960) and Greenstein (1961, 1965) find empirical support for the idea that citizens' preferences for presidential action may be learned before adulthood. For instance, Greenstein (1961) finds that as children grow older, they tend to conceptualize the president in terms of performance of executive duties

Table 3. Nation's Most Important Problem, 1935-1992

| Year | Problem(s) | Year | Problems(s) |
|-------------|------------------------------------|-------------|--------------------------------------|
| 1935 | unemployment | 1964 | Vietnam, race relations |
| 1936 | unemployment | 1965 | Vietnam, race relations |
| 1937 | unemployment | 1966 | Vietnam |
| 1938 | keeping out of war | 1967 | Vietnam |
| 1939 | keeping out of war | 1968 | Vietnam, cost of living |
| 1940 | keeping out of war | 1969 | Vietnam |
| 1941 | keeping out of war,
winning war | 1970 | Vietnam |
| 1942 | winning war | 1971 | Vietnam, cost of living |
| 1943 | winning war | 1972 | Vietnam |
| 1944 | winning war | 1973 | cost of living, Watergate |
| 1945 | winning war | 1974 | cost of living, Watergate,
energy |
| 1946 | cost of living | 1975 | cost of living, unemployment |
| 1947 | cost of living, labor unrest | 1976 | cost of living, unemployment |
| 1948 | keeping peace | 1977 | cost of living, unemployment |
| 1949 | labor unrest | 1978 | cost of living, energy |
| 1950 | labor unrest | 1979 | cost of living, energy |
| 1951 | Korean War | 1980 | cost of living, unemployment |
| 1952 | Korean War | 1981 | cost of living, unemployment |
| 1953 | keeping peace | 1982 | unemployment, cost of living |
| 1954 | keeping peace | 1983 | unemployment, cost of living |
| 1955 | keeping peace | 1984 | unemployment, fear of war |
| 1956 | keeping peace | 1985 | fear of war, unemployment |
| 1957 | race relations,
keeping peace | 1986 | fear of war, unemployment |
| 1958 | unemployment, keeping peace | 1987 | fear of war, unemployment |
| 1959 | keeping peace | 1988 | drug abuse, budget deficit |
| 1960 | keeping peace | 1989 | drug abuse |
| 1961 | keeping peace | 1990 | drug abuse, budget deficit |
| 1962 | keeping peace | 1991 | Kuwait/Iraq, unemployment |
| 1963 | keeping peace,
race relations | 1992 | economy (general),
unemployment |

Sources: For 1935-1984, Gary King and Lyn Ragsdale. *Discovering Statistical Patterns in the Presidency*, pp. 374-375. For 1985-1992, *The Gallup Report*, September 1986, p. 29; May 1987, p. 7; *The Gallup Poll 1987*, p. 89; *The Gallup Poll 1988*, p. 165; *The Gallup Report 1991*, pp. 12, 53, 96, 125, 197, and 244; *Gallup Poll Monthly*, January 1991, p. 4; September 1992, p. 11.

rather than in terms of personal attributes. Over time, their beliefs become more presidency-centered such that they view the president as a powerful leader to whom members of Congress are subordinate. In addition to these childhood agents of socialization, Cronin (1974, 1980) argues that many high school and college textbook discussions of the president reinforce previously learned views about a powerful executive because many endorse an activist view of the presidency and portray presidents as omnipotent. This emphasis on presidential power is also magnified because many authors of textbooks rely on case studies that look at presidential leadership during times of crisis.

The priming explanation. A second explanation for the use of common standards to evaluate the president involves the influence of the media on citizens' attributions of blame. As Mutz (1992) argues, the media can "prime" the public to blame the president for sociotropic rather than personal economic problems by the way in which the news is reported. Mutz finds that high amounts of exposure to economic news increase the influence of sociotropic concerns and decrease the impact of personal economic problems on political evaluations of incumbent officeholders. And Iyengar and Kinder (1987) find that an increase in exposure to news about a certain national problem can heighten the influence of that problem on citizens' evaluations of the president's performance. Iyengar and Kinder (1987) also find that citizens exposed to media

reports that attribute responsibility for a problem to the president are more likely to hold the president accountable for that problem as they judge his or her performance. Thus, they conclude (1987, 88) that "the influence of television news coverage on Americans' assessments of presidential performance depends partly on how the news portrays his responsibilities."

The self interest explanation. Although Ferejohn's arguments imply that evaluating political leaders on the basis of sociotropic valence outcomes is rational for citizens as a group, and therefore is self interested, he is concerned that individuals may not recognize this. If citizens are individually rational, then they may not be able to reach agreement about using a single or a small number of valence outcomes as their standards for executive achievement, since any group effort to bind citizens to such a rule could fall prey to the collective action problem. However, Kiewiet (1983) suggests that one reason citizens may monitor sociotropic valence outcomes and use information about them for their political decisions is because information about national economic conditions can serve as "an indicator of how well the incumbent administration promoted their own ... welfare." If Kiewiet is correct, then citizens might be in a situation where individual rationality does lead to group rationality so that self-interested individuals have no

incentive to deviate from the use of common standards of evaluation.

The Evaluative Influence of Citizens' Expectations

Socialization, media priming, and rational calculations of self interest provide three plausible reasons for *why* citizens would evaluate a president's job performance using common, homogeneous standards of accountability, but the question of whether citizens *do* evaluate presidents using institution-based expectations remains. To investigate the issue of whether citizens use these expectations to evaluate presidents and candidates for president, Kinder et al. (1980) asked respondents how well the 1980 presidential candidates -- Carter, Ford, Kennedy, and Reagan -- fulfilled each of the potential presidential performance expectations shown previously in Table 2. The Kinder et al. (1980) evidence shows that citizens' profiles of the ideal president are strongly associated with citizens' vote preferences for the incumbent president Carter, but are not related to their vote preferences for the other presidential contenders.

On the basis of this evidence, Kinder et al. (1980, 321) conclude that "the evaluative implications of citizens' ideal presidential prototypes may be confined to their approval of the incumbent president." Although this conclusion is based on a single test from a small sample, it represents the only existing *direct* test of the evaluative influence of citizens' expectations on assessments of political leaders. Moreover,

this evidence supports the claim that citizens' expectations are genuinely *institution*-based since citizens appear to use them only to evaluate sitting presidents, whom they presumably believe have institutional powers that candidates for the presidency do not have.

Belief Constraints and Attitude Change

Taking the evidence of a common set of normative beliefs or expectations about the valence outcomes that an ideal president should and should not provide in conjunction with the assumption that citizens evaluate loss relative to these expectations, I contend that changes in citizens' opinions of the president's job performance will be driven by evaluations of outcomes along the prosperity, security, and integrity issue dimensions. Because citizens reward or punish presidents based on the degree to which valence outcomes match those expected, evaluations of these valence outcomes should dominate the decision to approve of the president.

In addition to the fundamental effects of the interaction of citizens' expectations with external evidence about valence outcomes, the decision to approve of the president is likely influenced by other internal beliefs as well. For instance, although Kinder et al. (1980) find a high degree of bipartisan consensus about preferred executive performance, this does not imply that partisan beliefs do not influence the decision to approve of the president. Kernell and Hibbs (1981) suggest that an individual's partisanship provides a citizen with an

initial condition for the approval decision; that is, each person has a predisposition to approve of the president that is based on the individual's partisan beliefs. This predisposition locates a person either above, below, or near a critical threshold of approval depending upon whether the individual's partisan affiliation matches that of the president.

This view of partisan effects on the approval decision is also hypothesized in Ostrom and Simon (1988, 1101) who suggest that partisanship

influences the propensity to support the president in an *a priori* sense. If the president and a citizen share the same party label, for example, the citizen will be -- independent of the prevailing environment -- predisposed to view presidential performance more favorably.

However, although partisanship acts as an initial condition for the approval decision, it is likely that once a first approval judgment is rendered for a particular president, the effects of partisanship on future approval decisions are subsumed by the individual's prior opinion of the president's job performance. The reason a citizen's prior opinion of the president is expected to influence his or her current opinion is because prior approval summarizes a citizen's previous evaluations of events and conditions, and this summary judgment of the past acts as a baseline for the next approval decision. This is not to suggest that approval assessments will not change over time, but instead implies that these changes are structured and are systematically responsive to

deviations of observed from ideal conditions (Ostrom and Simon 1988).

Evaluations of valence outcomes provide the fundamental stimuli for approval judgments because they interact with citizens' persistent expectations and beliefs about a president's responsibilities. But both MacKuen (1983) and Ostrom and Smith (1993) suggest that approval evaluations are a function of two distinct attitudinal components. Ostrom and Smith (1993) argue that one of these components is based on firmly-held attitudes of self interest that are stimulated by valence outcomes, while the other is a visceral and transitory approval opinion that changes in response to what MacKuen (1983) calls dramatic political events. For instance, evaluations of economic prosperity are clearly related to a citizen's deeply-held beliefs about his or her material welfare and self interest. In addition, other valence outcomes such as Watergate or the Iran-contra scandal are related to a citizen's self interest because "they provide striking evidence about the president's ability to control the course of political outcomes" (MacKuen 1983, 178).

In contrast, dramatic political events, such as the *Challenger* explosion, the *Achille Lauro* highjacking, or the terrorist bombing of a Marine barracks in Beirut, are more tangential to a citizen's immediate self interest. These latter events influence approval because citizens believe either that the president is responsible for the occurrence of

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the event or for a response to it. However, because they tap different attitudinal components of the approval judgment, the effects of outcomes related to prosperity, security, and integrity issues should persist over time while the effects of dramatic political events should be transitory. In other words, valence outcomes directly associated with citizens' self interest generate long-run or persistent changes in approval evaluations while dramatic political events cause only short-run or temporary changes in approval judgments.

EXTERNAL INFORMATION AND APPROVAL EVALUATIONS

Although valence outcomes and dramatic political events may stimulate different *internal* attitudinal components of the global approval evaluation, these two types of occurrences also differ with respect to the degree to which information about them is obtained by citizens. For instance, Mueller (1970, 1973) suggests that the specific, dramatic, and sharply focused nature of some events ensures widespread public attention and interest. When identifying the class of dramatic international events that he says evoke a "rally 'round the flag" response from citizens, Mueller (1973, 209, emphasis added) notes:

important events that transpire gradually, no matter how important, are excluded from consideration *because their impact on public attitudes is likely to be diffused*. Thus, sudden changes in the bombing levels in Vietnam are expected to create a [rally] reaction, but the gradual increase of American troops is not.

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Mueller implies that the unexpected and dramatic nature of certain events leads to an *immediate* change in citizens' evaluations of the president while less dramatic outcomes that occur "continuously" generate opinion change over a longer period of time.

Mueller's arguments suggest that the timing of citizens' responses to various events and outcomes depends upon the degree to which citizens are aware of them. In the case of rally 'round the flag and other such events, their dramatic nature generates a highly concentrated burst of media coverage. As a result, information penetrates all levels of the citizenry contemporaneously and generates an immediate across-the-board change in citizens' approval evaluations. In contrast, citizens are gradually exposed to information about changes in many economic, security, or integrity outcomes. Consequently, the effects of this information are not concentrated at a single point in time.

From a decision making viewpoint, Mueller's arguments imply that citizens have different degrees or levels of up-to-date information about outcomes such as the levels of inflation, unemployment, battle casualties during war, or the fallout from executive political scandals. The idea that citizens are differentially exposed to information is an important theme that is being re-emphasized in recent analyses of individual-level opinion change (e.g.; Bartels 1988; Zaller 1992). In many of these studies, analysts focus on the idea

that citizens are stratified with respect to their active engagement with political and economic affairs, and therefore, at any single point in time, they are not all equally informed (MacKuen 1984; Popkin 1991; Zaller 1992). However, under certain conditions, the less aware and less well informed obtain facts and information about elite opinion from the mass media.

Viewed within this framework, citizens' internal beliefs do influence opinion change, but primarily via their interaction with the exogenous media information to which citizens are exposed. As these authors emphasize, exposure to and the use of new information is neither instantaneous nor inevitable for all citizens. Instead, citizens are exposed to information at different times as part of a dynamic process of *information diffusion*.

Informational Differences

For instance, Popkin (1991) suggests that many citizens have no incentive to engage in costly information searches (see also Downs 1957), and therefore, they acquire political and economic information as a by-product of activities in which they engage for other reasons. With respect to economic issues, Popkin says that informational by-products can come from (a) the day-to-day interactions that each individual has with personal economic and financial matters, (b) interpersonal communication with local opinion leaders, and (c) attention to national opinion leaders whose views are

expressed in the mass media. Because making personal financial decisions, discussing economic and political life with others, and watching and reading media reports are common activities in which people engage for other reasons, Popkin argues that citizens can obtain economic information cheaply and thereby reduce the degree of uncertainty they face when making political decisions. According to Popkin, the reliance by one part of the citizenry on interpersonal and media information from experts is rational because it reduces citizens' costs of acquiring and processing information. Using an analogy from the legislative oversight literature, Popkin (1991, 49) explains:

Just as fire alarms alert fire fighters to fires, saving them the effort of patrolling to look for smoke, so do information shortcuts save voters the effort of constantly searching for relevant facts. Since they are uncertain about the accuracy or meaning of information anyway, it makes more sense for them to act like fire fighters than like police -- to use the information shortcuts provided by trusted local and national commentators

Thus, according to Popkin, the diffusion of information from well-informed to less well-informed citizens occurs because there is a two-step flow of information from opinion leaders sounding fire alarms to the rest of the citizenry.⁷

Although Popkin emphasizes both media and interpersonal contact as important sources of information, most other analysts (e.g.; Iyengar and Kinder 1987; Page, Shapiro, and Dempsey 1987; Bartels 1988; Page and Shapiro 1992; MacKuen, Erikson, and Stimson 1992; Zaller 1992) focus on the dominant

influence of the media as a source of information for citizens. For instance, Bartels (1988) argues that during primary campaigns, a citizen's support for a candidate is a function of the amount of information (primarily media information) that an individual has about each candidate. Without first obtaining enough information to push them beyond a threshold, citizens are unlikely to indicate any degree of support for a candidate. But even after a threshold of information is reached, a citizen's level of information influences support for a candidate by reducing the uncertainty that the individual has about whether his or her own political predispositions and issue positions are in accord with those of a candidate. Bartels (1988) shows that the aggregate-level phenomenon of "momentum" in a primary campaign is a function of citizens learning (i.e.; receiving and accepting new information) about the candidates during the course of the campaign.

A more general theory of opinion change that potentially encompasses some of the arguments of Bartels and Popkin is offered by Zaller (1990a, 1992). Zaller (1992) argues that a citizen's level of chronic awareness is positively associated both with the reception of and with resistance to new information. Zaller's theory implies that whether a citizen's beliefs about and evaluations of an object (i.e.; considerations⁸) generate opinion change depends on the degree to which a person receives (i.e.; is exposed to and

comprehends) and then either accepts or resists new information. In addition, the direction and magnitude of opinion change depends upon the number of salient considerations that a person has accessible in memory. According to Zaller, an individual's answer to a survey question is reached by averaging over all salient, accessible considerations.⁹

Zaller refers to the subset of salient considerations upon which a survey response is based as a sample from the population of all considerations, and he argues that "the flow of information in elite discourse determines which considerations are salient." The logical consequence of this idea is that the samples of considerations that citizens draw are not independent. Instead, the exogenous influence of media information on citizens' considerations and on the salience of these considerations, all else equal, makes one citizen's sample systematically correlated with those of other citizens. However, the degree of this correlation varies both across individuals and over time. For instance, because not all citizens are equally aware, they are not all exposed to media information at the same time and so these systematic correlations kick in at different times. In addition, because awareness is also associated with the number of salient considerations over which an individual averages, all else equal, the highly aware should have a larger number of salient considerations in mind. As a result, new information will be

less likely to affect their probabilities of opinion change because it contributes much less weight within their sample of considerations. The aggregate result of these differential rates of exposure to and acceptance of information is the dynamic phenomenon of information diffusion in which *shifts in the underlying distribution of information across individuals over time* generate individual, subgroup, and aggregate opinion change.¹⁰

Given these theories and evidence, it seems that an individual-level model of the approval decision must allow citizens to have different levels of information. Thinking of individuals as having *heterogeneous* levels of information about prosperity, security, and integrity outcomes is much more realistic than assuming that citizens are equally informed. Hence, I contend that the population of all citizens should be thought of as being divided into subsets of people who are distributed along a continuum of information. One subset contains citizens whose level of information includes *up-to-date* information about past, current, and perhaps future outcomes, while the remaining subgroups include those individuals whose most recent information about valence outcomes includes only information from the past. The *high-information* subgroup is considerably smaller than the total of those in the *low-information* subgroups and contains society's most attentive and knowledgeable citizens. These are individuals who, for whatever reasons, pay close attention to

national economic affairs and attempt to reduce decision making uncertainty by actively searching for additional information. Some of these people will be economic and political experts whose opinions will be featured in the mass media while others will be ordinary citizens in local communities.

In contrast, members of the low-information group expend less effort in obtaining information about prosperity, security, and integrity outcomes, but do utilize information that they can acquire cheaply. This subgroup is further divided into smaller groups with varying levels of low information depending upon the lag time between their most recent economic information and actual prevailing conditions. Because members of these low-information subgroups do not have up-to-date information about these outcomes, the effects of contemporaneous changes in these conditions on the overall population of citizens are, as Mueller suggests, diffuse and unconcentrated.

More than Retrospective

Because they actively monitor national and international outcomes and base their approval decisions on an up-to-date set of information, I also expect individuals in the high-information group of society to search for information about future conditions and to engage in forecasting economic upswings and downturns. After obtaining information relevant for predicting the future and after generating a forecast,

these citizens compare their current forecasts of economic outcomes to the future outcomes that they expect the president to provide and then levy executive punishments or rewards in proportion to the size of the discrepancy between their forecast and the future condition they think the president should provide.

Just as with information about observed outcomes, the less well-informed citizens will be exposed to these forecasts of the future via the mass media. Alt (1979, 55) makes a similar argument in his *communication model* of economic forecasts:

Some of the economic events under discussion are not entire haphazard, and are the subject of predictions by professional economists and others. Within broad limits, these predictions are accurate, and they are communicated to the broader public at great length and in great detail by the media Thus, by and large, the popular expectations series will be determined by unofficial and official forecasts prevalent at the time the popular expectations are recorded. Insofar as the official projections are roughly accurate, popular expectations will be roughly accurate.

Hence, rather than assuming that citizens who are not in the high-information subgroup are looking forward or backward, my assumption is that they are looking up and are acting on the basis of changes in media information about facts and elite viewpoints. To the extent that media information makes salient citizens' evaluations of the past, changes in their evaluations of the president will likely appear to be retrospective, while if this information makes salient their evaluations of the future, opinion change will likely be a

function of prospective evaluations. Thus, as citizens compare outcomes to those they expect the ideal president to provide, they may be comparing realized outcomes to those expected or they may be comparing forecasts to the future conditions they expect the ideal president to provide.

Penetration of Available Information

Given the arguments above, an important question to address is whether media information about elite opinions will penetrate into the general populace. Existing analyses of media effects suggest that public opinion is strongly influenced by views expressed in the mass media. According to Page, Shapiro, and Dempsey (1987), the influence of media information on public opinion depends heavily upon the particular provider of that information. Their evidence shows that news commentators and reporters, technical experts, and popular presidents are three heavily influential sources of information for citizens.

Page, Shapiro, and Dempsey suggest that the influence of information from news commentators and technical experts on public opinion occurs because these individuals are considered to be experienced and nonpartisan. Furthermore, they observe that "it is not unreasonable for members of the public to give great weight to experts' statements and positions, particularly when complex technical questions affect the merit of policy alternatives." Since predicting the future path of the economy is a fairly complex task, the arguments of these

authors imply that media reports of experts' forecasts will affect citizens' economic predictions.

BELIEFS, INFORMATION, AND PRESIDENTIAL APPROVAL

Taking my arguments about the ability of some citizens to forecast future outcomes and about the diffusion of information in conjunction with my arguments about citizens' internal beliefs and expectations, I have identified seven important characteristics of the individual-level decision to approve of the president. These features, which represent the key components of the approval decision making process, are:

- (1) *Presidential accountability as a function of citizen self interest.*
Citizens' expressions of approval or disapproval of the president represent the degree of blame or reward that they assign to the president for the level of benefit that they receive under his or her tenure (see also Ostrom and Simon 1985; Peffley and Williams 1985; Brody 1991).
- (2) *Homogeneous standards of accountability.*
Citizens have homogenous standards of accountability that are associated with the valence issues of economic prosperity, national security, and executive integrity. These standards of accountability arise from their beliefs about the performance of the ideal president.
- (3) *Deviations from ideal yield proportional rewards and punishments.*
Citizens determine their level of benefit by comparing information about observed and forecasted prosperity, security, and integrity outcomes to those outcomes they prefer and believe the ideal president should provide, and they reward or punish the president in proportion to the size of deviations from the ideal.
- (4) *Mass reliance on elite cues.*
Few citizens actively seek information about prosperity, security, and integrity outcomes (see also Conover, Feldman, and Knight 1986, 1987). The majority of citizens instead use facts and cues from elites that are presented in the mass media (see also Brody and Page

1975; Brody 1991; Page, Shapiro and Dempsey 1987; Iyengar and Kinder 1987). Hence, citizens' evaluations are not solely retrospective or solely prospective, but can appear to be retrospective, prospective, or a combination of both depending upon the type of information that citizens have available to them.

- (5) *Heterogeneous exposure to information.*
Citizens vary in their levels of information because they vary in the degree to which they are exposed to media information about outcomes along these valence issue dimensions (see also MacKuen 1984; Zaller 1992).
- (6) *Prior opinion serves as a baseline for opinion change.*
A citizen's prior opinion of the president serves as a baseline for the next period's evaluation of the president such that approval evaluations remain stable until stimulated by changes in outcomes associated with valence issues or by the occurrence of dramatic political events.
- (7) *Distinct attitudinal components of approval.*
Approval evaluations are rooted in an integrated system of beliefs and expectations related to a citizen's material welfare. This makes the effects of observed and forecasted outcomes on citizens' judgments of the president's performance persistent and fundamental. However, approval evaluations also contain a visceral component that is stimulated by dramatic political events.

Thus, my theory of the approval decision attempts to synthesize some existing assumptions about this decision with arguments about individual differences in awareness and levels of information.

The Split Population Model

Taken together, these seven features provide the basis for the following individual-level model of the approval decision:

$$\begin{aligned}
a_{ht} &= \beta_0 + \beta_1 a_{ht-1} + \beta_2 d_t + \sum_j \beta_j (O_{hj t} - O_{jt}^*) + \sum_j \gamma_j (O_{hj t}^f - O_{jt}^{f*}) + \epsilon_{ht} \\
a_{it} &= \alpha_0 + \alpha_1 a_{it-1} + \alpha_2 d_t + \sum_j \alpha_j (O_{ij t} - O_{jt}^*) + \sum_j \eta_j (O_{ij t}^f - O_{jt}^{f*}) + \epsilon_{it}
\end{aligned} \quad (3.1)$$

where $h = \{1, 2, \dots, N_1\}$ refers to citizens with high levels of information; $i = \{1, 2, \dots, N_2\}$ refers to those with low levels of information; a_t is presidential approval; d_t represents exogenous shocks from dramatic political events; O_{jt} refers to an observed outcome along the j th valence issue dimension; O_{jt}^* is the ideal expected outcome along the j th valence issue dimension; O_{jt}^f represents a forecasted outcome along the j th valence issue dimension; O_{jt}^{f*} is the preferred and expected future outcome along the j th valence issue dimension.¹¹

I call the system of equations in [3.1] the *split population model of approval* because this model allows individuals to have heterogeneous levels of information. The key assumptions in this model are that $O_{hjt} \neq O_{ijt}$ (and likewise for the forecasted outcomes) and that $O_{ijt} = f(O_{ijt-p})$ where p indexes a previous time period that varies for different subgroups of people with low levels of information (and similarly for the forecasted outcomes). In other words, the current information that individuals in the high-information subgroup have differs from the "current" information that individuals in the low-information subgroups have. Those in low-information subgroups do not have up-to-date information.

Notice, however, that shocks from dramatic political events (the d_t) enter the decision calculi of both the high-

and low-information citizens contemporaneously as would be expected given the intense media attention and widespread discussion that these events evoke. In addition to these features, the model also allows forecasts of future conditions to influence approval evaluations. As specified, this model implies that approval evaluations are always a function of prior opinion and information about realized and forecasted outcomes, but that they are not necessarily a function of current information about those outcomes. Although the split population model potentially could be operationalized and tested, the paucity of appropriate panel data makes this problematic. Thus, for the purposes of this dissertation, I consider this model to be a heuristic device that can be used to inform the specification of an aggregate-level model of presidential approval.¹²

Aggregate Implications of the Theory

The behavioral relationships and mechanisms specified in the *split population model of approval* have important implications for movements in aggregate levels of presidential approval over time. First, because citizens share a common conception of the ideal president and use these homogeneous standards when assessing loss and evaluating the president's performance, I expect aggregate levels of presidential approval to be driven by evaluations of outcomes along the prosperity, security, and integrity issue dimensions. Because citizens reward presidents in proportion to the degree to

which observed and/or forecasted outcomes correspond to those desired outcomes that the public expects, outcomes associated with these valence issues will "provide the moving factor" (Neustadt 1980, 70) for a president's aggregate approval rating. Although shocks to individual approval evaluations from dramatic political events will generate sporadic aggregate-level booms and busts in approval, the more fundamental valence issue outcomes will, over time, drag and drive citizens' individual approval assessments.

But citizens' responses to changes in observed and forecasted outcomes associated with valence issues have two additional features with important aggregate-level consequences. First, since citizens attempt to minimize loss by punishing the president in proportion to the size of deviations from expected outcomes, this implies that, at the aggregate level, for every combination or "mix" of observed and forecasted presidentially-relevant outcomes, there exists a corresponding aggregate level of presidential approval. Furthermore, because of the enduring effects of evaluations of prosperity, security, and integrity outcomes on judgments of the president's performance and because of the desire of citizens to match executive rewards and punishments to existing conditions (realized and forecasted), aggregate presidential approval should "move together" or share a common trajectory with prosperity, security, and integrity valence outcomes; that is, the aggregate level of presidential

approval should exhibit a similar dynamic pattern of persistence as that found in indicators of outcomes along these valence issue dimensions. For example, as the economy improves, the valence aspects of its evaluation suggest that approval, all else equal, will increase in proportion to the extent of the improvement because conditions are becoming more ideal. Similarly, as the economy deteriorates, the valence aspects of its evaluation suggest that approval will decrease, all else equal, in proportion to the extent of the deterioration because conditions are far from those that citizens expect the president to provide.

Whenever a proportional relationship holds between the aggregate level of presidential approval and the levels of observed and forecasted presidentially-relevant outcomes, I will say that the aggregate system of attitudes and outcomes has reached an *accountability equilibrium*; that is, given the joint distribution of internal beliefs and external information about deviations from ideal outcomes, an equilibrium is reached whenever the president has been held fully accountable for his or her performance. Because prosperity, security, and integrity outcomes change over time, so too will the aggregate-level contextually-appropriate amount of executive reward or punishment. This in turn implies that the accountability equilibrium is a *state* in which the president receives full reward or punishment rather than a single point or a constant value. Thus, the system

contains a dynamic, moving equilibrium that is attained whenever the president's reward or punishment for observed and forecasted outcomes is complete.

My arguments about this equilibrium relationship are summarized in the following *accountability equilibrium hypothesis*:

H₁: The Accountability Equilibrium Hypothesis

Because citizens employ homogeneous standards of accountability and because their assignments of rewards or punishments for deviations from these standards are proportional to the size of the deviations, the aggregate level of presidential approval will, all else equal, be proportional to the levels of observed and forecasted valence outcomes. When this proportional relationship holds, an accountability equilibrium has been reached.

The *accountability equilibrium hypothesis* is different from many previous hypotheses about movements in aggregate levels of presidential approval. For instance, in his initial argument, Mueller (1970, 22) states:

In tandem, the concepts underlying the coalition of minorities and rally round the flag variables predict that the President's popularity will continually decline over time and that international crises and similar events will explain short term bumps and wiggles in this otherwise inexorable descent.

Based on this argument, Mueller (1970, 19) posits, "... a general downward trend in each president's popularity" that is linear and deterministic over the course of a presidential term. Although others later moved away from arguments of linearity (e.g.; Stimson 1976) and from the coalition of minorities concept (e.g.; Kernell 1978), this early characterization of the time path of presidential approval was accepted by many as the conventional wisdom. Indeed, remnants

of this "myth of inexorable descent" linger to this day.¹³ However, rather than an inevitable negative trajectory with occasional bumps and wiggles, the *accountability equilibrium hypothesis* suggests that approval will exhibit both upturns and downswings.

Although the *accountability equilibrium hypothesis* suggests that aggregate levels of presidential approval will, over time, be in an equilibrium relationship with observed and forecasted prosperity, security, and integrity outcomes, at any specific point in time, the hypothesized equilibrium relationship may not hold. In other words, there may be periods of disequilibrium in which the level of presidential approval is too high or too low given the current combination of these outcomes. This disequilibrium, or lack of full accountability, results from two distinct sources: (1) uneven levels of information about contemporaneous valence outcomes, and (2) visceral attitudinal responses to dramatic political events.

First, because not all citizens obtain information about the values of prosperity, security, or integrity outcomes at the same time, the uneven or heterogeneous levels of information that citizens have creates a delay or time lag between a time t change in observed or forecasted outcomes and complete executive rewards and punishments. The length of the delay depends upon the rate at which information about the change penetrates all subgroups of citizens. Depending upon

the intensity of media information about these outcomes, information eventually spreads to the less well informed. Upon receipt of this information, individuals with low levels of information respond to what they think is new and current information by adjusting their approval evaluations to punish or reward the president for the degree to which the outcomes that they have information about match those they expect to receive.

Because citizens with low levels of information receive information at different times, changes in aggregate presidential approval will appear to be generated by a dynamic adjustment process that is driven by the diffusion of information across individuals over time. My arguments about the effects of this underlying information diffusion process are captured in the following *dynamic information adjustment hypothesis*:

H₂: The Dynamic Information Adjustment Hypothesis

Because individuals vary in the degree to which they are exposed to mass media information, information about contemporaneous prosperity, security, and integrity outcomes will be unevenly and incompletely distributed in a single period. This creates a delay or time lag (i.e.; disequilibrium) in the complete reward or punishment that the president receives for a particular time *t* valence outcome. But, all else equal, as this information penetrates the heterogeneous informational subgroups of citizens, individuals respond by changing their approval evaluations. At the aggregate level, these delayed responses result in dynamic partial adjustments or "corrections" to the aggregate levels of presidential approval eventually moving approval to a contextually-appropriate equilibrium state.

Notice that under this hypothesis, disequilibrium arises because of heterogeneous levels of information across

citizens, and equilibrium results from citizens' responses to "new" information about valence outcomes.

If a president's aggregate level of approval was only a function of dynamic adjustments to information, then presidential approval ratings disaggregated by levels of citizen information should show that the approval levels of citizens with high information are "leading indicators" of the approval levels of citizens with lower levels of information. But in reality a pattern of this sort is not likely to exist because there is a second source of aggregate-level disequilibrium caused by exogenous shocks to citizens' approval evaluations from dramatic political events. Because they are so dramatic and highly publicized, the effects of these events on approval assessments occur immediately for all citizens so that no one group leads or lags another in terms of information or changes in approval evaluations. At the aggregate-level, these immediate responses cause sharp booms and busts in the aggregate level of approval depending upon whether the dramatic event is of the approval-enhancing or approval-diminishing type. However, the disequilibrium these events cause should dissipate over time because dramatic political events evoke only transitory, short-run changes in opinions of the president's job performance. My arguments about the aggregate effects of dramatic political events on approval are summarized in the following *exogenous shock hypothesis*:

H₃: *The Exogenous Shock Hypothesis*

Dramatic political events will have immediate but transitory effects on approval evaluations. Aggregate disequilibrium caused by these events, all else equal, results in error corrections to approval such that the level of presidential approval returns to its pre-event equilibrium state.

Hence, the disequilibrium caused by these events also will appear to be "corrected" over time, as citizens' return to their more fundamental approval attitudes based on their evaluations of prosperity, security, and integrity outcomes.

There is an important difference between the dynamic adjustments toward equilibrium that result from the diffusion of information about valence outcomes and the re-equilibration that occurs after an exogenous shock from a dramatic political event. The difference lies in the state of presidential rewards and punishments to which aggregate approval moves after it is perturbed. Because dramatic political events generate visceral and transitory changes in approval evaluations, as the effects of these events subside, citizens' approval evaluations and hence aggregate levels of approval will, all else equal, return to their pre-event state. In contrast, changes in prosperity, security, and integrity outcomes generate fundamental changes in citizens' approval attitudes. As a result, the disequilibrium that arises due to uneven levels of information about contemporaneous values of these observed and forecasted outcomes is eventually corrected over time such that approval re-equilibrates to a new equilibrium level (a new state of rewards and punishments).

The Presidential Accountability Model

Taken together, the *accountability equilibrium*, *dynamic information adjustment*, and *exogenous shock* hypotheses suggest that an aggregate-level model of presidential approval must be able to approximate (a) the distinct short-run and long-run effects of different events and outcomes on presidential approval, (b) an equilibrium that can move up or down, and (c) a mechanism by which disequilibrium is corrected. A model appropriate for this task has been developed by Davidson, Hendry, Srba, and Yeo (1978). This model, called an *error correction model* (ECM), allows analysts to specify the effects of short- and long-run behavioral relationships on changes in an endogenous variable. In addition, the portion of an ECM that captures the persistent effects of certain variables on changes in the endogenous variable can be thought of as representing deviations from a long-run equilibrium relationship. Because an ECM can represent equilibrium behavior as well as the relationship between transitory (short-run) and persistent (long-run) influences on a particular endogenous variable, I hypothesize that presidential approval can be modeled as an error correction process; that is, specifying an aggregate ECM for changes in approval is consistent with my theory of the micro-level approval decision process and its aggregate-level implications as expressed in the three hypotheses above.

In its general form, the aggregate-level *presidential accountability model* that I specify can be expressed as:

$$\Delta a_t = \delta_0 + \sum_{k=1}^K \delta_k d_{kt} + \alpha_1 (a_{t-1} - \sum_{j=1}^J \beta_j x_{jt-1}) + \epsilon_t \quad (3.2)$$

where a_t is aggregate presidential approval; the x_{jt} are aggregate-level indicators of valence outcomes related to prosperity, security, and integrity valence outcomes; the d_{kt} are dramatic political events; and where Δ is the first difference operator such that $\Delta a_t = (1-L)a_t = a_t - a_{t-1}$. As represented in Equation [3.2], the presidential accountability ECM specifies changes in aggregate levels of presidential approval as a function both of exogenous shocks from dramatic political events and dynamic adjustments that occur as deviations from equilibrium (i.e.; errors) are "corrected" over time.

The aggregate-level *presidential accountability model* is not based on a representative agent assumption, and hence does not represent the decision calculus of either those with high information or those with low information. Instead, the *presidential accountability model* represents the aggregate-level process that results from each subgroup using a distinct set of information when making a decision about whether to approve of the president. Notice too that "error corrections" or *dynamic* adjustments toward an aggregate-level equilibrium state result from micro-level decision processes that are, in a sense, *static*. For instance, assuming that the effects of

prior opinion on current approval evaluations are strong, I could re-express the micro-level split population model as:

$$\begin{aligned}\Delta A_{ht} &= \beta_0 + \beta_2 q_t + \sum_j \beta_j (O_{hjt} - O_{jt}^e) + \sum_k \beta_k (O_{hkt}^f - O_{kt}^e) + e_{ht} \\ \Delta A_{lt} &= \alpha_0 + \alpha_2 q_t + \sum_j \alpha_j (O_{ljt} - O_{jt}^e) + \sum_k \alpha_k (O_{lkt}^f - O_{kt}^e) + e_{lt}\end{aligned}\quad (3.3)$$

where $\Delta a_{ht} = a_{ht} - \beta_1 a_{ht-1}$; $\Delta a_{lt} = a_{lt} - \alpha_1 a_{lt-1}$ and where all other components are defined as in Equation [3.1].

In this case, the behavioral interpretation of the decision process for those with low information is not that they have accurate information about contemporaneous changes in prosperity, security, and integrity outcomes but make mistakes in meting out executive rewards and punishments. Nor is the interpretation that they observe time t changes in these outcomes but simply misperceive the magnitude of these changes as Ostrom and Smith (1993) argue. Instead, the interpretation of the model in [3.3] is that these individuals punish or reward the president just as the high-information citizens do once they receive information about time t changes in prosperity, security, and integrity outcomes.

However, in any particular time period, these citizens respond not to contemporaneous information but only to the "new" information of which they are aware. Because of delays in their receipt of this information, their assignments of blame or praise do not occur in the same period as the initial change in the valence outcome, which results in incomplete presidential accountability and disequilibrium at the

aggregate level. In other words, the dynamic macro-level error corrections that result from changes in valence outcomes (but not from dramatic political events) occur because of the dynamic process of information diffusion across individuals.

Although the *presidential accountability model* contains lagged regressors and allows the effects of equilibrium shocks (caused by movements in the x_{jt} variables) to die out exponentially over time, these dynamic effects are not hypothesized to occur because citizens are retrospective. For instance, my arguments about the behavior of individual citizens do not assume that individuals consciously retain and discount information about past valence outcomes. This point is worth emphasizing because it fundamentally differentiates my arguments from previous theories set forth by Hibbs, Rivers, and Vasilatos (1982), Chappell and Keech (1985), and Hibbs (1987) among others. These authors model aggregate levels of presidential approval using distributed lag specifications that are based on assumptions that all citizens have long memories of past outcomes and homogeneously discount or weight more lightly outcomes from the very distant past relative to those outcomes from the more recent past.

Summary

My three hypotheses stand in stark contrast to the long-held "myth of inexorable descent" that was stimulated by Mueller's (1970) seminal work. Instead, my hypotheses are synthetic in the sense that they lay out the connection

between the two forces that Mueller (1970) argues influence presidential support: (a) outcomes that affect approval's trend and (b) events that lead to "bumps and wiggles" around this trend. My arguments also provides a stronger theoretical base for the idea of an aggregate-level approval equilibrium than those of MacKuen (1983) or Beck (1987, 1991).¹⁴ Finally, my work expands on the arguments of Ostrom and Smith (1993) who assume that citizens have homogeneous levels of information and who argue that citizens consciously correct errors that they make in assigning executive rewards and punishments.

In addition to its substantive implications, the *presidential accountability model* in Equation [3.2] has important statistical implications that can be exploited to test the three hypotheses discussed above. I will discuss these issues in Chapter Five. But first I will briefly address the determinants of citizens' forecasts of future economic conditions.

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1. Recall that Ostrom and Simon think that citizens use both absolute and relative standards of presidential accountability. Therefore, they also identify a set of occupant-based expectations that represent preferences for action that are specific to each president and are variable over time.

2. Brody (1991) provides indirect evidence about the evaluative function of citizens' preferences for valence outcomes. His evidence shows that media reports of policy proposals have no influence on a president's aggregate level of public support while media reports about both valence issue and policy outcomes do affect a president's aggregate level of public support. Brody argues that policy outcomes affect approval because media reports about them are cast in terms of "good" and "bad," and citizens react to this information in the same homogeneous, valence-like manner that is associated with their responses to information about valence outcomes. Unfortunately, Brody's news measure combines media reports about prosperity, security, and integrity (i.e.; valence) outcomes with media reports about policy (i.e.; position) outcomes, so it is not immediately clear whether media reports of position issues have an influence on aggregate levels of presidential approval that is distinct from the effects of valence issue outcomes.

3. Ferejohn's remarks do not apply to situations in which the contract is dynamically renegotiated. In that case, even a unified principal facing no monitoring costs may not have complete control because it is difficult to write a contract for every contingency.

4. But using a small number of institution-based expectations about valence outcomes does not guarantee that observed outcomes will match expected ones. The ability of citizens to attain zero loss and maximum utility is predicated on the assumption that presidents can produce the outcomes that citizens desire.

5. Almost all respondents (96 percent) called Roosevelt a good president.

6. Note, however, that the percentage of respondents (43.3%) identifying these performance characteristics as the reason for viewing FDR positively is only slightly higher than the percentage of respondents (38.8%) who labelled FDR a good leader because of personal competence characteristics such as honesty, intelligence, and kindness. In addition, a large percentage of the sample (17.8%) is listed as providing "other" answers as to why Roosevelt was a good leader.

7. When first introduced in the 1940s, the two-step flow of communication argument suggested that "ideas flow from radio and print to the opinion leaders and from them to the less active sections of the population" (Lazarfeld, Berelson, and Gaudet 1944, 151, emphasis in original). However, Popkin argues that changes in

the format of television news have created an additional two-step media flow of information. Because television news now frequently provides commentary from well-known public figures in response to events and changes in conditions, "their comments allow voters to mediate new information and watch for 'fire alarms' through the media as well as through conversation" (Popkin 1991, 48).

8. Zaller (1992) defines a consideration as a reason, consisting of both a belief and an evaluation, that spurs an individual to favor one side or another of a political issue. An example of a consideration that might lead someone to approve of the president is: "I expect business conditions to be better in the future because the unemployment rate is falling." This consideration consists of a belief about the factors that contribute to good or bad economic conditions as well as an evaluation of future conditions.

9. Because most citizens have a number of possible considerations upon which they might base their opinions, absent any new information, they are often prone both to favor and to oppose certain issues or alternatives; that is, they are ambivalent. However, when new information is received, citizens form new considerations, and these new considerations are the ones that are likely to be salient and readily accessible.

10. Zaller (1992) accumulates an impressive array of evidence that shows that the rates of individual and subgroup opinion change among those at risk to change exhibit patterns that are consistent with the effects of a dynamic process of information diffusion. Especially relevant to my study are his evidence that (a) the rates of change in citizens' evaluations of Reagan's job performance varied for individuals with different levels of awareness during the Iran-contra scandal, and (b) citizens' prospective evaluations of the economy varied for individuals with different levels of awareness during a period in 1982 when media messages about future conditions were changing.

11. This formulation assumes that citizens with both high and low levels of information have already formed an initial approval evaluation. Prior to forming their first evaluation, the theory suggests that their approval evaluations will be some function of their partisan identification.

12. Note that this model includes components that represent citizens' expectations of current and future valence outcomes. These preferences or ideal points are not likely to be observed even if an appropriate set of panel data was available. Although individual ideal points are unobserved, I do know that citizens' preferences for valence outcomes are homogeneously concentrated at the favorable end of each valence issue dimension. Hence, I can conclude, for example, that as economic conditions worsen, the distance between observed and expected outcomes grows larger, and

all else equal, decreases the probability of a citizen approving of the president.

13. For example, Sullivan (1991, 695) suggests that one explanation for a "bank account" pattern of presidential influence in Congress is "that since presidential popularity declines generally over time, this decline slowly undermines presidential influence."

14. Although he fails to develop a behavioral explanation for such a process, Beck's brief (1987) discussion of re-equilibration foreshadows mine.

CHAPTER FOUR

INFORMATION AND CITIZENS' ECONOMIC FORECASTS

Fiorina (1981, 121) labels presidential approval the "quintessential mediated retrospective evaluation" because his empirical evidence shows that citizens' judgments of the president's job performance summarize their assessments of currently- and previously-observed economic conditions. The idea that citizens' approval decisions are based on the evaluation of past outcomes pervades micro- and macro-level analyses of the subject (e.g.; Mueller 1970; Stimson 1976; Hibbs 1982, 1987; MacKuen 1983; Ostrom and Simon 1985, 1988, 1989). By characterizing approval as a retrospective evaluation, these researchers assume that citizens are naively myopic and either do not look ahead or do not evaluate presidents in light of anticipated future conditions.

But many analysts of presidential approval draw conclusions about the retrospective nature of citizens' evaluations without investigating the influence of citizens' predictions of future valence outcomes -- most importantly, those related to economic prosperity -- on the approval decision. There are, however, a small number of analyses that suggest that citizens' economic forecasts influence presidential approval. For instance, Monroe and Levi (1983) analyze the relationship between presidential approval and the business conditions anticipated by elites. They find that uncertainty about future changes in prices and the gap between

expected and actual economic growth have a statistically significant influence on changes in presidential approval.

More recently, MacKuen, Erikson, and Stimson (1992) provide evidence that political scientists "have been looking in the wrong temporal direction" for the effects of economic valence outcomes on presidential approval. They find that an aggregate-level measure of citizens' forecasts of future business conditions is related to the president's aggregate approval rating. In fact, they argue that "the prospective component fully accounts for approval," and they imply that at least some citizens must be using information about the future as the basis for their approval decisions. However, they also suggest that rather than generating their own economic forecasts, citizens use information about future outcomes that they obtain from media reports of experts' views. Their aggregate-level empirical evidence is consistent with this claim since they find that mass economic forecasts are influenced by the Index of Leading Economic Indicators.

TWO RESEARCH TRADITIONS: A REVIEW

The MacKuen et al. (1992) study calls into question claims about the retrospective nature of citizens' approval evaluations not simply because they find evidence that economic forecasts influence presidential approval, but primarily because their empirical results show that these aggregate forecasts are a function of information about the future rather than information about the past. In the

economics literature, discussions about the amounts and types of information that citizens use for decision making would be cast in terms of the *information set* that citizens have and utilize. Some citizens' information sets may contain only information about past outcomes while the information sets of others consist of all information available at time *t* including information about the economic predictions of others and about the government's role in the economy.

As discussed in Chapter Three, I expect that forecasts of future conditions will influence the decision to approve of the president. However, whether my theory overturns the claims of Fiorina and others depends, in part, upon the type of information and the decision rule that citizens use to generate their predictions of future economic outcomes. For instance, if citizens generate their forecasts of future outcomes by simply extrapolating from information about past trends in economic outcomes, then their prospective evaluations will be difficult to distinguish from their retrospective evaluations. Since the political implications of an extrapolative forecast are potentially different from those associated with economic predictions that incorporate information about the future, investigating the determinants and formation of citizens' economic forecasts is a precursor to understanding the impact of these predictions on political outcomes.

The Political Science Literature

To the extent that political scientists have been concerned with citizens' forecasts of the future, most (e.g.; Downs 1957; Kramer 1971; Fiorina 1981) suggest that citizens' prospective economic evaluations are extrapolations of past economic conditions, perhaps mediated by partisanship and evaluations of general government performance. But tests of the extrapolation hypothesis using survey data have produced mixed results. For instance, Kuklinski and West (1981) find evidence that evaluations of past personal financial conditions and predictions of future personal financial conditions diverge for more than half of the respondents to the 1978 National Election Study. In addition, Conover, Feldman, and Knight (1987) find no evidence to support the hypothesis that citizens use economic information of any type when generating predictions about future economic conditions. Instead, they conclude (1987, 578) that citizens' economic forecasts "obscure the reality of current economic conditions and the presence of economic trends." This obfuscation should be expected, they argue, because the process of forming an economic forecast is more complex than the procedure for generating a retrospective evaluation. The ability to generate accurate economic predictions depends upon a causal understanding of the economy as well as of the government's economic capabilities.

Because more information is needed to generate an economic forecast, Conover, Feldman, and Knight point out that the conditions under which these predictions are formed will be characterized by uncertainty. According to Conover et al., to reduce uncertainty, citizens generate their forecasts using any information available to them, including knowledge of (a) their own personal financial state, (b) the president's approval rating, and (c) their partisan predispositions. On the basis of their empirical evidence, Conover, Feldman and Knight (1987, 578) conclude that when forming economic forecasts "people discount their actual knowledge about the current state of the economy in favor of hopes and personalized and politicized estimates as to what the future will bring."

Evidence provided by Alt (1979) on the determinants of citizens' economic forecasts in Great Britain contradicts the conclusions of Conover, Feldman, and Knight. Alt examines the aggregate-level relationships between survey measures of economic forecasts and British national economic indicators and finds that predictions of unemployment are highly correlated with official reported forecasts of unemployment. For inflation, Alt finds that partisanship influences forecasts only in the short run and that citizens seem to adapt their inflation predictions to past forecasting errors. Because citizens are able to learn from and correct their mistakes in forecasting inflation, Alt argues that predictions

of inflation will, on average, mirror the trends reported in economic indicators.

The View from Economics

Issues related to the formation of economic forecasts have long been discussed in the economics literature where these predictions of the future are called "expectations."¹ The most popular hypothesis about economic forecasts from this literature is that of rational expectations under which actors efficiently use all available information when generating predictions of economic variables. The rational expectations hypothesis was preceded historically by other theories suggesting that individuals' economic forecasts were extrapolative, regressive, or adaptive.

According to the *extrapolative expectations hypothesis*, an individual's time t prediction of a future outcome is a function of observed outcomes. Under this hypothesis, the period-to-period difference in realized conditions leads to changes in citizens' forecasts as follows:

$$\Delta O_t^f = \gamma (O_t - O_{t-1}) \quad (4.1)$$

where O_t represents an observed outcome at time t and ΔO_t^f is the time t change in the forecast of an outcome. Under this decision rule, forecasts change in response to changes in actual environmental outcomes. This means that predictions of the future formed extrapolatively are generated from feedback and are a reaction to changes in past outcomes. When γ is

greater than zero, the extrapolative model implies that citizens expect past trends to continue, while if γ is less than zero, this model suggests that citizens think past trends will be reversed.

An alternative hypothesis is that of *regressive expectations*. Regressive expectations result when forecasts are a function of deviations of observed outcomes from historically normal levels as follows:

$$\Delta O_t^f = \lambda (O_t^n - O_t) \quad (4.2)$$

where $-1 < \lambda < 0$ and where O_t^n is the "normal" or "average" level of a particular outcome and all other components are as defined above. (Note: O_t^n might be defined as a moving average of O_t .) Under this hypothesis, citizens' forecasts change because they expect a regression-toward-the-mean or a return-to-normality effect to occur. For example, when forecasting an economic outcome such as inflation, this decision rule implies that if inflation is currently less than normal, citizens will predict that inflation will increase, and if inflation is presently higher than average, citizens will forecast it to decline.

A third argument about the formation of forecasts is what economists call the *adaptive expectations hypothesis*. This hypothesis suggests that citizens' predictions are an incomplete response to previous forecasting errors. This can be expressed as:

$$\Delta O_t^f = \eta (O_{t-p}^f - O_t) \quad (4.3)$$

where O_{t-p}^f is the forecast or prediction of time t conditions made p periods previously and where $-1 < \eta < 0$. In this case, η represents the rate at which citizens adapt their forecasts in response to their forecasting errors. This type of forecast formation mechanism implies that citizens learn from their mistakes but that their responses to these prediction errors are incomplete in a single period.

The forecast formation processes mentioned above are alternatives to the *rational expectations hypothesis* first introduced by Muth (1961). Intuitively, a rational expectation is a prediction or forecast of an economic variable based on the efficient use of information governing economic variables, including information about the government's role in the economy (Carter and Maddock 1984, 28). More formally, Muth says, when economic agents seek and use information efficiently, the typical firm's perception of the probability distribution of future outcomes (the firm's subjective distribution), conditional on available information, will perfectly coincide with the actual probability distribution conditional on the same information. Muth summarizes his argument as follows:

I would like to suggest that expectations, since they are informed predictions of future events, are essentially the same as the predictions of the relevant economic theory ... The hypothesis asserts three things: (i) information is scarce, and the economic system generally does not waste it; (ii) the way expectations are formed depends specifically on the structure of the relevant

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system describing the economy; (iii) a 'public prediction' ... will have no substantial effect on the operation of the economic system (unless it is based on inside information).

Note that under Muth's arguments, firms are dependent upon knowledge of the structure of the economic system -- especially on the signals given by price -- to generate accurate predictions of future outcomes. Although Muth's discussion centers around firms as information-maximizing unitary rational actors, this hypothesis can, in certain instances, be applied to individual decision making as well.

When individuals have and efficiently use all available information, the rational expectations hypothesis implies that forecasts made at time t of the value of a variable in period $t+p$ will differ from the actual outcome in period $t+p$ either because of random shocks or if an unanticipated structural change in government policy occurs. According to the theory, there should be no bias or systematic pattern in these forecasting errors when individuals are using information efficiently. For example, in the case of a structural change in economic policy, rational citizens will learn the new policy rule and adjust their predictions accordingly. In addition, if forecasting errors are the result of random forces, then over time, these stochastic elements will cancel each other so that the expected value of these errors is zero. One implication of a citizenry that forms forecasts as suggested by the rational expectations hypothesis is that systematic government or business behavior will be known,

anticipated, and taken into consideration when generating forecasts of future outcomes. Hence, under this hypothesis, only *unanticipated* changes in economic outcomes will have any influence on the economic predictions of the future formed in period t . This consequence of the rational expectations hypothesis is often called the neutrality or impotency of policy result.

The version of the rational expectations hypothesis due to Muth is based on two assumptions. The first of these Friedman (1979) labels the *information exploitation assumption* because it suggests that people exploit information until the point at which its marginal product equals its marginal cost. The second of these assumptions Friedman calls the *information availability assumption* because it states that the information available to economic agents is sufficient to permit them to form rational forecasts. Friedman notes that a variety of processes for generating economic predictions -- including extrapolative, regressive, adaptive, and rational mechanisms -- are consistent with the information exploitation assumption. However, each of these alternative processes is based upon different assumptions about the amount and type of information that is contained in each individual's information set. For instance, the information set of a person forming an extrapolative forecast need only contain information about observed conditions, while the formation of a rational expectation or prediction is generally dependent upon complete

information about economic variables and a causal understanding of economic and political relationships. Consequently, Friedman argues "the crucial issue for the macroeconomic implications of the rational expectations hypothesis, therefore, is whether -- or in what circumstances -- the information availability assumption which the hypothesis contains is valid."

Friedman's point is well taken, and I think it becomes even more crucial to discuss the availability of information when trying to apply the rational expectations hypothesis to political decision making. As Schrodtt (1991) notes, political decision problems may not be characterized by a cue that conveys common and accurate information to all parties as prices do in the economic context. Hence, he argues that political science theories that hypothesize that citizens' forecasts are formed as suggested by the rational expectations hypothesis must address the issues of "learning and adaptation, uncertainty reduction methods, and robust knowledge transmission and knowledge maintenance systems." For instance, MacKuen, Erikson, and Stimson (1992) argue that their empirical evidence of a relationship between forecasts of business conditions and presidential approval is qualitatively consistent with the rational expectations hypothesis, but they offer only a brief discussion of the degree to which information needed to form an accurate prediction of the future is available. If their arguments are

to have any theoretical power, then their theory must be more explicit about whether and how the information availability assumption holds for any or all individuals.

Taken together, the economics and political science literatures offer a number of alternative explanations of the process by which citizens form their economic forecasts. Each of these hypotheses can be thought of as a set of restrictions on the amount of economic information in an individual's information set. For instance, the arguments of Conover, Feldman, and Knight suggest that citizens' information sets are devoid of economic content while the rational expectations hypothesis implies complete information and a causal understanding of economic and political relationships. In between these extremes lie the extrapolative, regressive, and adaptive expectations hypotheses.

THE FORMATION OF CITIZENS' ECONOMIC FORECASTS

As discussed in Chapter Three, I contend that the set of all citizens is stratified into subsets of citizens who vary with respect to the degree to which they actively seek and monitor information about national and international outcomes. As a result, they differ in the degree to which they are exposed to information and hence, they differ in their levels of information. I also assume that those with high levels of information have a more complete understanding of the causal connections between the economic and political factors that generate economic conditions such as inflation and

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unemployment. Consequently, those with high levels of awareness, exposure, and information should, all else equal, form more accurate forecasts of future outcomes than would those with lower levels of information.

However, I also assume that all citizens prefer to generate completely accurate forecasts. In other words, they prefer that their forecasts (formed in a previous period) of the j th future outcome exactly match the j th economic outcome the forecast was meant to predict. Stated formally, they prefer that:

$$O_{jt-p}^f - O_{jt} = 0 \quad (4.4)$$

When this relationship holds, there is a perfect correspondence between a citizen's previous economic prediction of the j th outcome and its time t realization. I expect citizens to prefer accurate forecasts of the future to inaccurate ones because as Katona and Strumpel (1978) note, citizens' economic forecasts "play a terribly significant role in shaping their subsequent economic behavior." In addition, the discussion in Chapter Three suggests that these forecasts also form the basis for subsequent political decisions.

Although some individuals in the high-information group may be capable of generating consistently accurate point estimates of economic outcomes, I expect that the majority of those with high levels of information may still make forecasting errors. But because they prefer to generate accurate forecasts they will incorporate information about

previous prediction errors into their information sets and will adjust their forecasts in response to such mistakes. These citizens learn from their miscalculations and form their forecasts as suggested by the adaptive expectations hypothesis. In theory, if the political and economic climate remains stable, these individuals would, over time, reduce the size of their systematic forecasting errors to zero and would thus form a rational expectation in the sense of Muth. By adapting their economic predictions in response to forecasting errors, citizens with high levels of information reduce their degree of *behavioral uncertainty*.²

In contrast to those with high levels of information, I expect citizens with moderate and low levels of information to have different information sets with potentially smaller amounts of accurate economic information. Thus, these individuals face a greater degree of behavioral uncertainty than do those with high levels of information. Because of this uncertainty, most of these citizens will not be able to generate accurate point estimates of distinct economic outcomes, but will instead form forecasts of only the trends (better, same, or worse) of future economic conditions. However, individuals with low levels of information also desire to reduce their degree of endogenous uncertainty. And they attempt to do so as cheaply as possible by relying on media information about the opinions of experts and other

leaders as cues about the trajectory of future economic outcomes.

While the receipt of media information about future economic conditions can reduce the behavioral uncertainty faced by citizens with low levels of information, citizens may still be uncertain about the accuracy of the information they receive. Unlike information about observed outcomes that flows through interpersonal and media channels, information about economic forecasts cannot be checked against reality. Because they face such uncertainty, citizens with low levels of information may rely on at least three other types of information when forming a prediction of the future direction of economic conditions: (a) information about observed outcomes, (b) perceptions of the government's ability to control economic problems, and (c) partisan beliefs. First, information about economic outcomes affects citizens' forecasts because citizens with low levels of awareness and exposure may use information about these outcomes to extrapolate into the future. Recall, however, that as discussed in Chapter Three, citizens with low levels of information do not have up-to-date information about current economic conditions, which means that their extrapolations will not be based on contemporaneous changes in economic outcomes.

Second, Katona and Strumpel (1978) argue that the degree of confidence that citizens have in the government's economic

performance can influence whether citizens think future economic conditions will be better or worse. Although citizens with low information may not completely understand the causal effects of specific economic policies, they do expect government policies and executive actions to influence future economic conditions, which is why their perceptions of government capability can potentially affect their forecasts. Third, citizens with lower levels of information may rely on their partisanship as a cue about whether the president or the government can bring about future economic improvements. For instance, all else equal, these citizens may be more optimistic about the future when they share the same party affiliation as the president. Despite these three types of short-run biases, because all citizens prefer to form accurate forecasts, they will over time, discount these political influences and adjust their predictions of the future in response to media information about the forecasts of experts.

Individual-Level Decision Mechanisms

Based on these arguments, I identify three important characteristics of the micro-level decision mechanisms that citizens use to generate their economic forecasts. These key features are:

- (1) *A preference for generating accurate economic forecasts.*

Because they use their predictions of future economic outcomes in subsequent economic and political decisions, citizens prefer to generate accurate economic forecasts.

(2) *Heterogeneous information.*

The timing of citizens' responses to changes in forecasted economic outcomes varies for different subgroups of citizens due to individual differences in exposure to information and hence in their levels of information.

(3) *Short-run biases.*

Both those with high and those with low levels of information are capable of making systematic forecasting errors. However, biased decisions are especially likely for those with low levels of information who face greater decision-making uncertainty. However, all else equal, citizens' preferences for forming accurate forecasts, leads them to discount political influences and adjust or correct their predictions of the future in response to media information that they receive about future conditions.

Taken together, these three features provide the basis for the following micro-level model of the process by which citizens form their economic forecasts:

$$\begin{aligned}\Delta O_{hj}^f &= \beta_0 + \sum_j \beta_j (O_{hj}^{f-t-p} - O_{hj}^f) + e_{ht} \\ \Delta O_{ij}^f &= \delta_0 + \sum_j \alpha_j O_{ij}^{f-t-p} + \sum_j \gamma_j O_{ij}^f + \sum_k \eta_k b_{ikt} + e_{it}\end{aligned}\quad (4.5)$$

where $h = \{1, 2, \dots, N_1\}$ refers to citizens with high levels of information; $i = \{1, 2, \dots, N_2\}$ refers to those with lower levels of information; O_{jt}^f stands for a forecast made in a previous period of the value of the j th economic outcome at time t ; O_{jt} is the j th observed economic outcome; and the b_{ikt} represent short-run biases such as a citizen's partisanship, level of uncertainty, or views of government economic policy.³

Aggregate Implications

I will call the model in Equation [4.5] the *split population model of economic forecasts* because it also relies on the idea that citizens are stratified with respect to their levels of information just as discussed in Chapter Three. By characterizing individuals as having heterogeneous levels of economic information, my theory and model may potentially be able to reconcile previous individual-level findings about the determinants of citizens' economic forecasts with those from aggregate-level analyses. For example, if one allows for an uneven level of information within the electorate, then Conover, Feldman, and Knight's (1987) micro-level evidence that political factors influence citizens' forecasts may be consistent with the aggregate-level evidence of Alt (1979) and MacKuen et al. (1992) who find that citizens' forecasts are primarily a function of movements in observed and forecasted economic indicators. If, over time, information about observed economic outcomes and economic forecasts does penetrate into the electorate and is incorporated into citizens' decision calculi, then the aggregate-level effects of these short-run biases will be reduced.

Haltiwanger and Waldman (1985) make a related argument when they suggest that rather than assuming that all agents can sophisticatedly form rational expectations, analysts should allow for individual informational heterogeneity and instead think theoretically about whether institutional or

behavioral mechanisms provide either the sophisticated or the naive subgroups of citizens with an incentive to engage in the same behavior as those in the other group. Depending upon the context of the decision, one can then identify cases where the aggregate-level result appears to be dominated by the behavior of one of these two groups even though at the individual level there is informational heterogeneity. One example they provide is the choices that naive and sophisticated individuals might make when trying to pick computer hardware from among a number of newly-developed systems. Because they have low information and use decision making cues, the naive are likely to choose a brand name like IBM. Ironically, precisely because they have a sophisticated understanding of the market for computer hardware and software, those with high levels of information also have an incentive to choose IBM because they recognize that the more people who purchase a particular system, the greater the chance that advanced, compatible software will be developed for that system. In this example, the aggregate-level result would look as if people were only deciding naively on the basis of limited information when in fact the sophisticated are utilizing a larger degree of information but have an incentive to make decisions that reinforce those made by the naive.

Taking the ideas of differential exposure to information in conjunction with citizens' preferences for accurate economic forecasts, I contend that the economic forecasts of

those with low levels of information will, over time, strengthen rather than contradict the aggregate-level effects of the behavior of those with high levels of information. MacKuen et al. (1992) make a similar argument to explain why we should expect aggregate measures of citizens' forecasts of future business conditions to look as if they were generated by a citizenry with rational expectations. As they note:

The experts who translate the economic numbers into good times and bad times attend to more than the standard news. In the business of looking ahead, they absorb news that is critical to professional forecasting but often of little direct interest to the general public. Their translations convey their sophisticated understanding to all. Without trying, the public is exposed to the best information about the economic future that exists: merely by noting that most forecasters say good (bad) times are ahead, the public becomes subject to the causal influence of the professionals' more esoteric tools.

While I agree in spirit with this remark, I do not think those with low levels of information incorporate the forecasts of opinion leaders into their decision calculi in the straightforward manner that MacKuen et al. suggest. Instead, citizens with low levels of information get delayed rather than contemporaneous information about future economic conditions.

The aggregate-level implications of my arguments are summarized in the following two hypotheses:

H_{4.1}: High-Information Convergence Hypothesis

Because all individuals prefer to form accurate economic forecasts, in the aggregate, economic forecasts will appear to be driven by the same forecasting mechanism used by those with high levels of information.

Although citizens' aggregate forecasts will be dominated by reductions in the size of forecasting errors, the aggregate system will not be characterized by instantaneous error corrections. The rate of adjustment for the aggregate system will be incomplete in a single period because individuals with moderate and low levels of awareness receive information about the forecasts of opinion leaders at different points in time. This leads to a second aggregate-level hypothesis:

H_{4.2}: Dynamic Information Adjustment Hypothesis

Because individuals with low levels of information obtain media and interpersonal informational by-products at different points in time, the flow of information across these heterogeneous groups of citizens will be incomplete in a single period resulting in dynamic partial adjustments or error corrections in aggregate economic forecasts as information diffuses across subgroups of the citizenry.

These two hypotheses imply that aggregate-level changes in forecasts of the j th economic outcome can be expressed as follows:

$$\Delta O_{jt}^f = \gamma_0 + \lambda_j (O_{jt-p-1}^f - \beta_j O_{jt-1}) + v_{jt} \quad (4.6)$$

where $-1 < \lambda_j < 0$ and where O_{jt}^f is an aggregate average forecast for the j th economic outcome and O_{jt} is the realized outcome. I will refer to Equation [4.6] as the *economic forecasting model*.⁴ Provided λ_j is in the interval $(-1, 0)$, the model will be stable such that the aggregate level of economic forecasts will, over time, adjust toward zero. Thus, these hypotheses and this model also imply that for the j th economic outcome:

$$O_{jt-p}^f - \beta_j O_{jt} = 0 \quad (4.7)$$

represents an equilibrium toward which aggregate-level forecasts of the j th economic outcome are attracted. Notice that these dynamic adjustments toward equilibrium are hypothesized to arise from the latent diffusion of information across citizens who are exposed to media information at different points in time. This implies that the dynamics of the aggregate forecast formation process are not the result of homogeneous dynamic micro-level behavior, but instead arise because the impact of a change in information about observed and/or forecasted economic outcomes varies across different subgroups or distributions of people due to individual differences in exposure.

Information and Accuracy

One question that my theory and model may bring to mind is whether a subset of the population can generate accurate economic forecasts. My interpretation of the existing political science literature on this question is that researchers have too often focused on whether "the glass is half full or half empty" without really thinking about what a half-full or half-empty glass implies about the distribution of information across citizens. For instance, Peretz (1983) concludes from an examination of aggregate-level data from the University of Michigan's Surveys of Consumer Sentiment that 40 to 60 percent of all individuals accurately perceive the

direction in which inflation moved in the past, but that many of these underestimate its true value when asked to generate point estimates of future inflation. Conover, Feldman, and Knight interpret Peretz's data as providing evidence that citizens' economic forecasts are inherently inaccurate, while Peretz argues that these results show a fair degree of accuracy.

Conover, Feldman, and Knight (1987) also interpret data from their own three-wave panel survey of Lexington, Kentucky, residents as evidence that individuals are unable to generate accurate forecasts of the economic future. However, where they see aggregate inaccuracy, I see enough accuracy to believe that an unobserved process of information diffusion may be occurring. Table 4 reproduces the aggregate results from the Conover et al. paper. As the information in this table shows, when asked whether they expected the effects of inflation to worsen, remain the same, or get better, the percentage of respondents that accurately predicted that conditions would improve remained nearly constant (at about one-third) in each of the three panels. This leads Conover et al. to conclude that citizens' forecasts of inflation are inaccurate.

But what Conover, Feldman, and Knight fail to note is that the percentage of people inaccurately predicting that inflation would get worse dropped by 10 percentage points across the three periods. In addition, as shown in Table 4,

Table 4. Prospective Evaluations of the Economy

| PERIOD:
CORRECT
FORECAST: | INFLATION | | | UNEMPLOYMENT | | |
|--|------------------|--------|--------|---------------------|-----------------|-----------------|
| | 1 | 2 | 3 | 1 | 2 | 3 |
| | BETTER | BETTER | BETTER | WORSE | SAME/
BETTER | SAME/
BETTER |
| FORECAST: | | | | | | |
| WORSE | 20.7 | 13.9 | 10.7 | 34.6 | 24.9 | 9.8 |
| SAME | 45.2 | 51.7 | 51.5 | 35.9 | 36.2 | 35.3 |
| BETTER | 34.0 | 34.4 | 37.8 | 29.5 | 38.9 | 54.9 |

Source: Conover, Feldman, and Knight (1987, 569).

the distribution of all predictions shifted slightly toward the accurate forecast. Such a distributional shift is also found in their aggregate data on unemployment forecasts. The unemployment result is even more impressive because the direction of the realized trend in unemployment changed during these three periods. Of course, these aggregate percentages may hide a great deal of idiosyncratic individual-level shifting from accurate to inaccurate predictions, but these net changes are consistent with a process of information diffusion.

Summary

The aggregate-level model outlined above has important statistical implications that can be used to test my theory and hypotheses. In order for the reader to understand the statistical consequences behind the *economic forecasting* and

presidential accountability models, I must discuss issues related to the estimation of these models.

1. In the literature from economics, the word "expectation" is used to refer to predictions, forecasts, or estimates of future economic conditions (Muth 1961). I use the word "expectation" to refer to a preferred state of affairs without regard to temporal direction, and I use the words "forecasts" or "predictions" to discuss estimates of future conditions. Unfortunately, in this chapter, as I discuss literature from the field of economics, I may sometimes be forced to refer to an economic forecast as an economic expectation. Readers should keep in mind the context in which this word is used.

2. According to Pesaran (1987, 11) decision making uncertainty can arise from asymmetric information or from unpredictable events or both. Uncertainty that can be reduced by obtaining additional information can be called endogenous or behavioral uncertainty (Pesaran 1987) because an individual can control its degree by his or her behavior. In contrast, the uncertainty associated with an uncontrollable or random event represents *exogenous uncertainty*. One way to clarify the difference between these two types of uncertainty is to think of the difference between ignorance and chance (or irreducible ignorance). Thinking of uncertainty in these terms, Pesaran argues that flipping a fair coin results in a situation characterized by exogenous uncertainty, while behavioral uncertainty arises in a situation like a game of chess where there is uncertainty about the opponent's moves. In the latter case, uncertainty is due to ignorance (or a lack of information), while in the former it is due to pure chance and cannot be reduced by obtaining additional information. In game-theoretic terms, Pesaran's exogenous uncertainty is analogous to the uncertainty caused by the moves of nature (e.g.; Rasmusen 1989, 22) whereas what Pesaran calls behavioral uncertainty is analogous to asymmetric information because players have private information about their own moves (e.g.; Rasmusen 1989, 53).

3. This model could potentially be operationalized and tested at the micro level using data from the University of Michigan's Surveys of Consumer Sentiment. However, data for political factors such as a respondent's partisanship are not generally gathered in these surveys. In my future research, I plan to test this model at the individual level. However, for the purposes of this dissertation, this model remains a heuristic device that is used to inform the specification of an aggregate-level model of economic forecasts.

4. I am admittedly ignoring any potential short-run biases due to influences other than changes in inflation and/or unemployment. I plan to focus on these short-run biases in future research, but first wish to investigate the long-run relationships between and among forecasts, inflation, and unemployment.

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HOMOGENEOUS PREFERENCES, HETEROGENEOUS INFORMATION,
AND THE DYNAMICS OF PRESIDENTIAL ACCOUNTABILITY

VOLUME II

By

Renée Marie Smith

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
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DOCTOR OF PHILOSOPHY

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1993

CHAPTER FIVE

COINTEGRATION AND ERROR CORRECTION

In Chapters Three and Four, I outlined a series of aggregate-level hypotheses about the process by which presidential approval and mass economic forecasts are generated. Table 5 summarizes these hypotheses, which are drawn from my theoretical arguments about the individual and joint behavior of citizens. Based on my theory and hypotheses, I then specified two macro-level models as follows:

(i) *the presidential accountability model*

$$\Delta a_t = \delta_0 + \sum_{k=1}^K \delta_k d_{kt} + \alpha (a_{t-1} - \sum_{j=1}^J \beta_j x_{jt-1}) + \epsilon_t \quad (5.1)$$

(ii) *the economic forecasting model*

$$\Delta O_{jt}^f = \gamma_0 + \sum_{k=1}^K \gamma_k b_{kt} + \lambda_j (O_{jt-p}^f - \beta_j O_{jt-1}) + v_{jt} \quad (5.2)$$

Note that in the *presidential accountability model*, a_t is the aggregate level of presidential approval; each x_{jt} is an indicator of the j th observed or forecasted valence outcome; each d_{kt} is an indicator of the k th dramatic political event; Δ is the differencing operator; and $-1 < \alpha < 0$. In addition, in the *economic forecasting model*, O_{jt-p}^f represents the aggregate mass forecast made in a previous period of the j th future economic outcome; O_{jt} is an indicator of the j th

Table 5 Theoretical Hypotheses**H_{3.1}: The Accountability Equilibrium Hypothesis**

Because citizens employ homogeneous standards of accountability and because their assignments of rewards or punishments for deviations from these standards are proportional to the size of the deviations, the aggregate level of presidential approval will, all else equal, be proportional to the levels of observed and forecasted valence outcomes. When this proportional relationship holds, an accountability equilibrium has been reached.

H_{3.2}: The Dynamic Information Adjustment Hypothesis I

Because individuals vary in the degree to which they are exposed to mass media information, information about contemporaneous prosperity, security, and integrity outcomes will be unevenly and incompletely distributed in a single period. This creates a delay or time lag (i.e.; disequilibrium) in the complete reward or punishment that the president receives for a particular time *t* valence outcome. But, all else equal, as this information penetrates the heterogeneous informational subgroups of citizens, individuals respond by changing their approval evaluations. At the aggregate level, these delayed responses result in dynamic partial adjustments or "corrections" to the aggregate levels of presidential approval eventually moving approval to a contextually-appropriate equilibrium state.

H_{3.3}: The Exogenous Shock Hypothesis

Dramatic political events will have immediate but transitory effects on approval evaluations. Aggregate disequilibrium caused by these events, results in error corrections to approval such that the level of presidential approval returns to its pre-event equilibrium state (assuming all other factors have remained constant).

H_{4.1}: The High-Information Convergence Hypothesis

Because all individuals prefer to form accurate economic forecasts, in the aggregate, economic forecasts will appear to be driven by the same forecasting mechanism used by those with high levels of information.

H_{4.2}: The Dynamic Information Adjustment Hypothesis II

Because individuals with low levels of information obtain media and interpersonal informational by-products at different points in time, the flow of information across these heterogeneous groups of citizens will be incomplete in a single period resulting in dynamic partial adjustments or error corrections in aggregate economic forecasts as information diffuses across subgroups of the citizenry.

realized economic condition associated with the forecast that was made in a previous period; and the b_{kt} represent factors such as partisanship, opinion about government economic performance, and uncertainty that operate as short-run biases.

Notice that each of the models above contains a term that represents a dynamic adjustment mechanism that eliminates deviations from equilibrium. The rates at which presidential approval and mass economic forecasts adjust and converge toward their equilibrium states are captured by the α and λ_j coefficients, respectively. Thus, my theoretical hypotheses about equilibrium, convergence, disequilibrium, and dynamic adjustments can be tested within the context of the two models above. But the hypotheses in Table 5 suggest that other statistical relationships ought to hold as well. The purpose of this chapter is to discuss the statistical implications of these hypotheses and to outline the appropriate methodology for conducting empirical tests of these hypotheses within the context of the two structural models above.

Error Correction and Equilibrium

To begin, consider the *accountability equilibrium hypothesis*, which implies that the time path for the aggregate level of presidential approval should exhibit movements toward an equilibrium that represents a state in which the president has been held fully accountable for the valence outcomes that occur under his or her tenure. Because citizens are hypothesized to punish and reward the president in proportion

to the degree to which favorable valence outcomes occur, I expect the level of presidential approval, all else equal, to be proportional to the levels of indicators of these valence outcomes. Full executive accountability (i.e.; equilibrium) occurs whenever the level of presidential approval "matches" existing conditions in this fashion.

However, as the *dynamic information adjustment hypothesis* suggests, full executive accountability is not instantaneous. Instead, the delayed responses of citizens with low levels of information generate aggregate-level disequilibrium between current conditions and the degree to which the president is rewarded or punished for them. Stating these ideas more formally, the *accountability equilibrium* relationship can be expressed as:

$$a_t - \sum_{j=1}^J \beta_j x_{jt} = 0 \quad (5.3)$$

where a_t is the aggregate level of presidential approval and where each x_{jt} is an indicator of the j th observed or forecasted valence outcome. Whenever this relationship holds, presidential approval is at an equilibrium level that is a function of existing valence conditions. As conditions (i.e.; the x_{jt}) change, disequilibrium occurs but is eventually eliminated over time as presidential approval undergoes dynamic adjustments toward a new equilibrium level. Intuitively, the relationship in Equation [5.3] is analogous to a center of gravity (Engle and Granger 1991) about which

aggregate presidential approval revolves. As observed and forecasted valence outcomes change, this "center of gravity" shifts. And over time, as citizens obtain information about evolving conditions, their probabilities of approving of the president, and hence their opinions, change. These underlying changes in citizens' opinions move the aggregate level of presidential approval toward a new equilibrium state.

Given this, I expect the trajectory of aggregate presidential approval to shift up and down in conjunction with movements in environmental conditions. A slightly more technical way to describe the way in which approval is expected to "move together" with indicators of valence outcomes is to characterize them as having the same trend.¹ From a technical viewpoint, when certain types of aggregate-level time series share a *common trend*, they are said to be bound together in a special statistical relationship called *cointegration*. Thus, one potential way to test the *accountability equilibrium hypothesis* is to determine whether presidential approval is cointegrated with observed and forecasted valence outcomes.

By the same token, the *high information convergence hypothesis* for economic forecasts suggests that aggregate-level measures of citizens' economic forecasts should be in an equilibrium relationship with the observed economic outcome(s) being predicted. Formally, this can be expressed as:

$$O_{jt-p}^f - \beta_j O_{jt} = 0 \quad (5.4)$$

where O_{jt}^f represents the aggregate level of the j th mass economic forecast and where O_{jt} represents the j th realized economic outcome. Clearly, if this equilibrium relationship is to hold, then the time paths of the economic forecast series and the observed economic outcome series must exhibit the same pattern; that is, if citizens' forecasts have any degree of accuracy, then the aggregate level of these mass forecasts should move up and down in conjunction with the realizations of the future outcomes they were meant to predict (e.g; Fischer 1989).

Since both the *accountability equilibrium* and *information convergence* hypotheses suggest common trends among certain subsets of variables, investigating whether these two time series are cointegrated with others can provide evidence in support of these two different equilibrium relationships. However, a second reason to examine whether presidential approval shares a common trend with indicators of valence outcomes and whether mass economic forecasts are cointegrated with future realizations of economic conditions is because there is a close association between statistical relationships of cointegration and the types of dynamic adjustments or "error corrections" that are suggested by my theory and that are specified in the structural models in Equations [5.1] and [5.2]. But to make the connection between cointegration and

error correction clear to the reader, let me turn to a more general discussion of these issues.

What is an Error Correction Model?

An error correction model (ECM) is a type of dynamic specification that can be used as a structural equation approximation for theoretical relationships that involve the re-equilibration of an endogenous variable toward an evolving equilibrium state. Formally, for an endogenous variable, y_t , and for an exogenous variable, x_t , a general structural ECM could take the following form:²

$$\Delta y_t = \delta_0 + \sum_{p=1}^P \zeta_p \Delta y_{t-p} + \sum_{p=0}^P \eta_p \Delta x_{t-p} - \alpha (y_{t-1} - \beta x_{t-1}) + v_t \quad (5.5)$$

where $-1 < \alpha < 0$ and where

$$y_t = \beta x_t \quad (5.6)$$

represents an equilibrium relationship toward which y_t has a tendency to move. As Equation [5.5] shows, in an ECM, the change or first difference of an endogenous variable is expressed as a function of last period's equilibrium error plus some additional factors such as the short-run dynamic effects of lagged changes of y_t and the contemporaneous and lagged effects of Δx_t . Depending upon the analyst's theory, Equation [5.5] also might contain other lagged or contemporaneous short-run exogenous variables.

Notice that the equilibrium condition in Equation [5.6] specifies a long-run relationship between the current levels

of each variable. As a result, the difference between the lagged levels of these variables, which enters the ECM through the term $(y_{t-1} - \beta x_{t-1})$, can be thought of as last period's equilibrium error. Hence, in an ECM, a portion -- equal to α -- of last period's disequilibrium generates current changes in y_t . As long as α lies in the interval $(-1,0)$, positive and negative equilibrium errors are, all else equal, reduced or "corrected" over time so that the trajectory of y_t evolves in conjunction with movements in x_t .

Because of the time path shared by these two series, the equilibrium associated with an ECM is not a static point, but is instead a proportional steady-state relationship between variables that are changing over time (Harvey 1991, 290). For instance, for the case of two variables, the points along the line $y_t - \beta x_t = 0$ each represent a place at which equilibrium can occur, and the line itself can be thought of as an attractor in the phase space (Granger and Hallman 1991b). Because equilibrium can occur at different points along this line, the equilibrium level of y_t will change from period to period. Although heuristically one might then describe y_t as dynamically re-equilibrating toward a moving target, the actual line of attraction does not move.

One of the advantages of the error correction specification is that it allows analysts to investigate the short-run behavior of a variable without assuming that these changes are independent of the long-run information contained

in the level of this or other variables (Sargan 1964; Davidson, Hendry, Srba, and Yeo 1978; Beck 1991). This can be fruitful from a conceptual viewpoint since specifying such a model forces an analyst to think theoretically about the factors that persistently influence changes in an endogenous variable versus those that cause only temporary shocks, and such theorizing may lead to important substantive advances.³ However, specifying an ECM also provides technical advantages. To show these to the reader, I begin by reviewing the properties of various types of time series.

TIME SERIES CHARACTERISTICS

In addition to the different behavioral hypotheses about the individual-level decision to approve of the president, the existing literature also contains assumptions about the time path of the aggregate approval series. For instance, the long-held "conventional wisdom" about the trajectory of aggregate presidential approval stems from Mueller's (1970) seminal work in which he posits "... a general downward trend in each president's popularity" that is linear and deterministic over the course of a term. This "inevitable decline" is due to the build up over time of a "coalition of minorities" disenchanted with executive decisions. To operationalize this pattern, Mueller includes a time trend among the explanatory variables in his model.

Mueller's theory and his decision to include a time trend in his approval function imply that the aggregate approval

series has certain statistical properties. Other theories and models of aggregate approval also contain assumptions that imply certain patterns for the time path of presidential approval. And because the statistical characteristics of a time series can have important consequences for statistical inference, it is important to recognize the assumptions that are being made. With this in mind, Table 6 provides information about the theories and models specified previously in the existing aggregate-level studies of presidential approval. Column (4) of this table summarizes the implicit or explicit assumption that each set of authors makes about the properties of the approval series.

As column (4) of Table 6 shows, most researchers analyzing the determinants of presidential approval assume that the level of approval is a stationary, mean-reverting process. Such processes can be expressed as:

$$y_t = \alpha + \rho y_{t-1} + \epsilon_t \quad (5.7)$$

where $|\rho| < 1$ and where ϵ_t is a stationary series with mean zero and variance σ^2 . As Equation [5.7] suggests, a stationary process can exhibit autoregressiveness; however, such series have both a finite mean and a finite variance that are constant and do not depend on time. Consequently, random shocks to these series have only a temporary effect, and the time path for y_t exhibits rapid fluctuations around a constant mean level.

Table 6 Studies of Aggregate Approval

| STUDY | FREQUENCY/
TIME PERIOD | MODEL
SPECIFICATION | ASSUMPTION
MADE FOR
INFERENCE |
|--|--|---|---|
| (1) | (2) | (3) | (4) |
| Mueller
(1970) | monthly:
1945-1969 | static linear
regression
model | approval
trend
stationary
around
linear time
trend |
| Brody and
Page (1975) | monthly:
June 1965-
April 1968,
January
1969-October
1971 | "error
correction"-
type regression
model | approval
difference
stationary
with a
stochastic
trend |
| Stimson
(1976) | monthly:
1945-1972 | static
regression
model (linear
in parameters) | approval
trend
stationary
around
nonlinear
time trend |
| Kernell
(1978) | monthly:
1945-1974 | partial
adjustment
model | approval
stationary |
| Hibbs,
Rivers, and
Vasilatos
(1982) | quarterly:
1961-1980 | distributed lag
model
(geometric) | approval
stationary |
| MacKuen
(1983) | 463 poll
readings:
1963-1980 | Box-Jenkins
transfer
function | approval
stationary |
| Norpoth and
Yantek (1983) | monthly:
1961-1980 | Box-Jenkins
transfer
function | approval
difference
stationary
with
stochastic
trend |
| Kiewiet and
Rivers (1985) | quarterly:
1961-1984 | distributed lag
model (Koyck
transformation) | approval
stationary |

Table 6 (cont'd).

| | | | |
|---|---|---|---|
| Chappell and
Keech (1985) | quarterly:
1957-1980 | distributed lag
model
(exponential) | approval
stationary |
| Ostrom and
Simon (1985) | monthly:
1953-1980 | simultaneous
equations | approval
stationary |
| Chrystal and
Peel (1986) | monthly: NA | Box-Jenkins;
vector
autoregression | approval
difference
stationary |
| Hibbs (1987) | quarterly:
January
1961-January
1984 | distributed lag
model
(geometric) | approval
stationary |
| Yantek (1988) | monthly:
January
1981-October
1985 | Box-Jenkins
transfer
function | approval
difference
stationary
with
stochastic
trend |
| MacKuen,
Erikson, and
Stimson
(1989) | quarterly:
1953-1987 | Box-Jenkins
transfer
function | approval
stationary |
| Ostrom and
Simon (1989) | days between
polls:
1981-1987 | static
nonlinear
regression
model | approval
stationary |
| Marra,
Ostrom, and
Simon (1990) | days between
polls:
1949-1984 | static
nonlinear
regression
model | approval
stationary |
| Williams
(1990) | quarterly:
1953-1984 | vector
autoregressive
system | approval
stationary |
| Beck (1991) | monthly:
April 1953-
October 1988 | error
correction
model (single
equation) and
other models | approval
stationary ^a |

Table 6 (cont'd).

| | | | |
|--------------|---|--------------------------------|------------------------|
| Beck (1992) | monthly and
quarterly:
April 1953-
June 1986 | partial
adjustment
model | approval
stationary |
| Brody (1991) | days between
polls: 1977-
1984 | partial
adjustment
model | approval
stationary |

*Using a Dickey-Fuller test, Beck concludes approval is stationary.

In contrast, a few authors assume that approval is one of two types of nonstationary processes. First, some assume that the presidential approval series can be decomposed into a deterministic trend and a sequence of random shocks that are stationary around this time trend (e.g. Mueller 1970; Stimson 1976). A time series whose short-run cyclical movements are stationary around a deterministic time trend is called a *trend stationary process* (Nelson and Plosser 1982, 141). In the linear case, such series can be expressed as:

$$y_t = \alpha + \beta t + \epsilon_t \quad (5.8)$$

where ϵ_t is a stationary series with mean zero and variance σ^2 . Notice that the conditional mean of y_t is $E(y_t|1,t) = \alpha + \beta t$, while its conditional variance is simply σ^2 . Thus a trend stationary (TS) process has a constant variance but a nonconstant, time-dependent mean. Taken together, these features imply that shocks to y_t cause only transitory deviations from the deterministic trend in the series. Hence, the time of path of y_t would be characterized by temporary fluctuations around a nonconstant, deterministically changing mean level.

Second, other authors (e.g.; Brody and Page 1975; Norpoth and Yantek 1983; Chrystal and Peel 1986; Yantek 1988) assume that approval is a *difference stationary* (DS) process, having a nonstationary level, but first differences that are stationary. A difference stationary series could be generated by:

$$y_t = \beta + \rho y_{t-1} + \epsilon_t \quad (5.9)$$

where $\rho = 1$ and where ϵ_t is a stationary series with mean zero and variance σ^2 . In this process, past shocks to y_t are given the same unit weight as recent shocks, and so the series is said to have a *unit root* in its autoregressive representation. Note also that in Equation [5.9], the first difference of y_t (i.e.; $\Delta y_t = y_t - y_{t-1}$) is stationary with mean β .⁴ When $\beta=0$ and ϵ_t is independently and identically distributed (iid), the series, y_t , is called a random walk, whereas when ϵ_t is iid but $\beta \neq 0$, y_t is labelled a random walk with drift. In addition, when $\rho = 1$ but ϵ_t is not identically and independently distributed (i.e.; if y_t is an integrated process containing other autoregressive or moving average components), the series is simply said to be *integrated* (Stock and Watson 1988). In this latter case, the variance of ϵ_t would become a more general process that can be expressed as:

$$\omega^2 = E[\epsilon_t^2] + 2 \sum_{j=1}^{\infty} E[\epsilon_t \epsilon_{t-j}] \quad (5.10)$$

The expression in Equation [5.10] is called the "long-run" variance of ϵ_t and allows for the influence of past autocovariances on the current variance of y_t .

The reason random walks (with or without drift) and general ARIMA processes are called integrated is because they can be expressed as the sum or accumulation of all past shocks. For instance, if we start with a value of y_0 (this

can be zero without loss of generality) and integrate y_t , then Equation [5.9] becomes:

$$y_t = y_0 + \beta t + \sum_{i=1}^t \epsilon_i \quad (5.11)$$

where

$$\beta t = \beta_1 + \beta_2 + \dots + \beta_t \quad (5.12)$$

and where

$$\sum_{i=1}^t \epsilon_i = \epsilon_1 + \epsilon_2 + \dots + \epsilon_t \quad (5.13)$$

The quantity in Equation [5.13] represents the sum of the stochastic deviations from $\rho = 1$. Hence, y_t is an integrated process with a *stochastic trend*.⁵

The conditional mean of the process in Equation [5.11] is time dependent and given by $y_0 + \beta t$. Thus, when an integrated process has drift (i.e.; when $\beta \neq 0$), its conditional mean is similar in form to the conditional mean of a trend stationary process. In addition, assuming that $y_0 = \beta = 0$, the variance of the integrated process above is given by $t\sigma^2$. Because the variance of an integrated process is time dependent, shocks to this series have a permanent effect and hence, the series will not fluctuate around a constant level but will exhibit long swings either upward or downward. The key difference between a trend stationary process and an integrated process is that only the conditional mean is a function of time in a trend stationary process, whereas an integrated process always has

a time dependent variance and will also have a time dependent mean when the process contains drift.

Table 7 summarizes the main features of the three types of time series discussed above.⁶ Because TS and DS processes

Table 7. Time Series Characteristics

| Type of
Time Series | Conditional
Mean | Conditional
Variance | General
Features |
|--------------------------------|-----------------------------|---------------------------------|--|
| stationary | constant | constant | shocks have temporary effect; series fluctuates around a constant mean level |
| trend
stationary | time
dependent | constant | shocks have a temporary effect; series fluctuates around a mean level that changes deterministically |
| difference
stationary | can be time
dependent | time
dependent | shocks have a persistent effect; series fluctuates in long stochastic swings |

can both have time-dependent conditional means, it will often be difficult to distinguish empirically between a trend stationary process with a highly autoregressive disturbance and an integrated, difference stationary process with drift. However, as I will argue below, political scientists need to become more rigorous about developing theories that predict the trajectory or time path of the series in which they are interested. Certain theories may suggest that the time series of interest should have the features of either a stationary, trend stationary, or difference stationary series.

Plausibility of Nonstationarity Assumptions

As Table 7 shows, technical assumptions about the stationarity, trend stationarity, or difference stationarity of the approval series each imply different patterns for movements in the aggregate level of presidential approval over time as well as different responses to shocks. However, very few authors develop theories that explicitly specify the type of time path that approval should follow. For instance, although authors, such as Kernell (1978), Hibbs, Rivers, and Vasilatos (1982), and Hibbs (1987), develop theories that suggest that aggregate levels of presidential approval should be highly autoregressive, their theories do not specify just how "highly" persistent this series should be. Instead, they assume that approval is stationary with a fixed, finite mean. This is a potentially problematic assumption for Hibbs (1987) since his theory suggests that government evaluations are a function of comparisons that citizens make between the performance of the current administration to that of past administrations. For instance, Hibbs posits that "the time trajectory of a new government's support is determined by its performance relative to that achieved by earlier governments, although as time elapses, earlier performance outcomes are discounted or 'forgotten' by the electorate" Although this statement does not suggest that the effect of a shock to presidential approval persists infinitely, it certainly leaves

open the possibility that the approval series will exhibit a severe degree of persistence.

Mueller (1970) and Stimson (1976) do offer theoretical explanations and predictions about the trajectory of presidential approval. Their theories suggest that approval is trend stationary with a nonconstant mean that declines deterministically as a function of time into the president's term. Deviations from this trend, such as those from rally 'round the flag-type events are expected to be stationary. But as I argued in Chapter Two, the hypothesis that aggregate approval inexorably declines by some fixed amount in each time period does not seem plausible to me.

In addition to the trend stationarity predictions of Mueller and of Stimson, the existing literature on presidential approval also contains a theoretical argument that explicitly suggests that approval will be an $I(1)$ process. According to Chrystal and Peel, a president's approval rating can be thought of as a proxy for the present value of citizen's expected future benefits. Assuming that citizens form expectations of the future rationally (i.e.; efficiently) by using all information available to them at time t , changes in presidential approval should not be forecastable from past information -- only unexpected "surprises" (i.e.; innovations) should cause changes in approval. Therefore, their theory predicts that approval

should be an $I(1)$ process with a first-order moving average error.

Although my theory assumes that citizens base their approval decisions on the most recent information they have available to them, it does not suggest that all citizens have up-to-date information about contemporaneous changes in observed valence outcomes nor that each citizen forms forecasts of the future rationally. And so there is little reason to suspect that aggregate changes in presidential approval will be completely unforecastable as the rational expectations hypothesis suggests. However, while rejecting the hypothesis that these changes are unpredictable can mean rejecting strong versions of the rational expectations hypothesis, it does not automatically mean that we need to reject the idea that presidential approval is an integrated process. There may be other theories that political scientists and economists have yet to think of that will suggest that approval is an integrated process. Limiting ourselves either to automatic assumptions of stationarity or to rational expectations arguments as the only justification for predictions of nonstationarity is not very creative.

At a minimum, my theory about an accountability equilibrium and the diffusion of information across citizens suggests that aggregate presidential approval will be highly autoregressive -- or synonymously that the influence of the past on current approval will be strong and persistent. But

according to my theory, the persistence or "memory" in the approval series is not due to all citizens homogeneously remembering and holding the president accountable for the past as Hibbs suggests, but is instead due to the effects of aggregation over heterogeneous responses from citizens. The theory outlined in Chapter Three posits that, at any point in time, only a portion of the citizenry responds to contemporaneous information about changing conditions. Therefore, the aggregation of these opinions is a function of citizens' "delayed" reactions to "new" information about changes in valence outcomes. These staggered and overlapping sets of information and opinion change generate autoregressiveness in the approval series. Thus, my arguments offer an explicit theoretical rationale for Kernell's idea that aggregate presidential approval appears to contain "built-in inertia."

In a very different context, Taylor (1980) formally shows that the patterns of persistence observed in the U.S. unemployment series can be generated by staggered but overlapping wage contracts in conjunction with the diffusion of information about wage rates set by other firms. Interestingly, he also shows that under certain conditions this persistence lasts beyond the length of time that it takes for information to reach all decision makers. My hypotheses about the diffusion of information and staggered evaluations of valence outcomes to some extent parallel Taylor's.

However, if this were the only component of my argument, then my theory would still not yield predictions about the *degree* of persistence to expect in the approval series. But my theory also suggests that the level of presidential approval will evolve in such a way that, over the long-run, its trajectory will mimic the growth or decline in indicators of valence outcomes. Implicit in my argument is an assumption that one or more of the valence outcomes upon which citizens focus their attention is itself growing or declining so that its mean is not fixed. In other words, I assume that citizens punish or reward the president in response to one or more "moving targets."

From a technical viewpoint, this assumption about growth or decline in the exogenous factors that influence approval's long-run trajectory implies that I expect one or more of these valence outcomes to be a nonstationary, integrated process. For instance, one economic valence outcome for which the president is generally thought to be accountable is the inflation rate (i.e.; the rate of change in the Consumer Price Index). Many economists argue that there have been shocks to inflation, such as from the Arab oil embargo or from major wars, whose effects persist today. Phillips (1988b) argues that these types of shocks or innovations are precisely the type that will generate stochastic drift in a series. As he (1988b, 348) notes:

In time series what this means is that the superposition of new shocks to the system inevitably leads to a

stochastic drift away from the given model. This stochastic drift induces a unit root in the system The very fact that constant term adjustments or structural shifts are needed to eliminate this statistical evidence is itself support for the [unit root] hypothesis because such adjustments themselves attach unit weight and hence persistence to certain innovations.

Given the fundamental impact of the oil crisis and other shocks to inflation, it seems at least as plausible to suspect that inflation will be a nonstationary and integrated process as it does to think otherwise.

Furthermore, if presidential approval is in an equilibrium relationship with a "moving target," then it should exhibit changes in its mean that are proportional, in the long run, to the evolution of the exogenous forces that act on it. In other words, if one believes the arguments in favor of an *accountability equilibrium*, and if the exogenous re-equilibrating forces that influence approval have nonconstant means due to shocks and periods of growth or decline, then presidential approval should itself share those characteristics and be a nonstationary, integrated process in levels.

Note that my argument here is very different from others in political science because I am not automatically assuming that the exogenous factors that influence approval have fixed means and variances. I want to emphasize this point generally as well as with respect to the system of presidential accountability under analysis here. In most time series analyses, researchers tend to assume that the "inputs" to the

structural system are well-behaved in the sense that they fluctuate around a fixed mean (i.e.; are stationary). Perhaps this tendency is due to a conceptual or normative bias toward viewing the political world as stable. And yet, the *accountability equilibrium hypothesis* suggests that, in the long run, the system of executive accountability is stable despite the integrated, stochastic trends in the phenomena under investigation. Or more precisely, my hypotheses suggest that the system of presidential accountability is stable because the factors being studied share a common, stochastic trend.

The theoretically-predicted stability of the system of executive rewards and punishments is mathematically represented in the *approval equilibrium model*, which is a difference equation with an autonomous response that converges to zero. In such systems, the time path of the endogenous "output" follows the trajectory of the exogenous "inputs" (e.g.; Cortes, Przeworski, and Sprague 1974), so that they share the same long-run trend. Hence, if the exogenous forces that influence presidential approval are integrated processes, then the presidential approval series also should be.

But there is a second reason to suspect presidential approval to have a stochastic trend. As discussed in Chapter Three, information about dramatic political events is expected to generate only short-run changes in citizens' opinions of the president because such events do not tap fundamental

citizen attitudes. However, shocks associated with valence outcomes, such as those from wars or scandals, are expected to stimulate more deeply-held citizen attitudes and lead to permanent or long-run effects on aggregate approval over time. Taken together, this implies that aggregate approval is potentially an $I(1)$ process.

But is it plausible to expect presidential approval, which is measured in percentages and hence is bounded in the interval $[0,100]$, to be an integrated process with a nonconstant mean, a unit root, and a time-dependent variance? Consider, for instance, the comments of Cortes, Przeworski, and Sprague (1974, 165) in their discussion of determining whether the properties of a difference equation are theoretically reasonable:

When formulating a theory, one normally knows whether certain variables can reach some particular values. For example, if one studies an output that is a proportion (of votes, crimes, people, expenditures, etc.) it is obvious that this output cannot be divergent. Proportions are defined only between 0 and 1, and this definition immediately imposes the condition that the output that is a proportion must stay within these bounds for all t .

I agree. However, agreeing with this statement does not rule out the possibility that presidential approval, measured as the percentage of respondents who say they approve of the president's handling of his or her job, will not have some of the problematic properties of an integrated, nonstationary process, especially in a finite sample. Let me now provide a theoretical justification for how this might occur.

Recall my earlier theoretical argument, based on discussions in Kernell and Hibbs (1981), Hibbs (1987), and Ostrom and Simon (1988), that citizens respond to questions about how the president is handling his or her job by placing themselves along a latent scale -- call it y^* -- that ranges from $-\infty$ to $+\infty$. The position of a single individual, y_i^* , along this unobserved index represents that citizen's underlying propensity to approve of the president's performance. Now define y_t^* as the time series that results from summing the individual scores along this unobserved scale at each time point. Notice that this aggregate series will wander around above the zero axis when the number of people placing themselves on the positive side of the continuum is greater than the number of people placing themselves on the negative side, and vice versa.

In my view, it is entirely plausible that this *unobserved* aggregate time series will exhibit long stochastic swings between crossings of the zero axis. The nonstationary, unit root properties of this unobserved series would arise from the fundamental shocks that have occurred along the economy, security, and integrity dimensions. For instance, consider the shock from the Watergate scandal. Because shocks are superimposed one on top of the other, it is difficult to show empirically that the effects of this scandal persist today; however, I do think that it makes sense to say that, with respect to the issue of executive integrity, the system of

presidential accountability will never quite be the same again. For instance, when the Iran-contra affair was revealed, the specter of Watergate loomed in the minds of many people, which suggests that this previous historical "innovation" potentially influenced their current evaluations of President Reagan's job performance.

In a similar fashion, shocks to the economy that affected the mean level of economic factors like inflation and unemployment also likely influenced the mean level of the unobserved aggregate approval series in such a way that today when inflation rises, citizens recall the oil crisis and periods of stagflation from the 1970s. The same argument also applies to the valence issue of security. Certainly, citizens' evaluations of George Bush's handling of the events leading up to the Gulf War were influenced by their knowledge of past U.S. involvement in major wars. In a similar way, I suspect that committing troops to a particular region of the world will be viewed differently in the future in light of the "shock" from the U.S. winning the Gulf War. This is not to suggest that citizens' expectations of the president have changed in any way; they still prefer security, a strong economy, and no scandals to the alternatives. But as they evaluate the performance of the incumbent president, the force of certain historical events persists either due to the actual physical memories of citizens or because of institutions such

as the mass media whose job it is to remember and to remind citizens of these things.

Although these arguments provide plausible reasons for why one might expect the unobserved y_t^* approval series to exhibit unit-root-type behavior, there remains the question of how the observed presidential approval series when measured as a percentage could have an infinite variance. Clearly, as t approaches infinity, the variance of the observed, bounded approval series cannot be infinite. This does not mean, however, that in a finite sample, the approval series cannot contain a stochastic trend within the range of values over which it varies (i.e.; the range of values over which its density is concentrated). For instance, Granger and Hallman (1991a, 212) show, via a series of simulations, that a bounded series that results from a nonlinear transformation of an $I(1)$ variable can share the same finite-sample characteristics as the unobserved original series; that is, if $y_t^* \sim I(1)$ and if $y_t = f(y_t^*)$, then the observed y_t will itself often be "integrated" even if the transformation is such that it places bounds on the series.⁷ Hence, it is not technically implausible for the bounded approval time series to possess a unit root and thus a stochastic trend. Furthermore, my theory provides a theoretical basis for suggesting that it will.

Tests for Stationarity and Nonstationarity

Because alternative theories will predict different time paths and features for the aggregate presidential approval

series (or for other time series generally), empirically testing whether a univariate series is stationary, trend stationary, or difference stationary can provide an initial test of these rival hypotheses. For many years, the conventional approach to distinguishing a stationary time series from one that is integrated was to examine the autocorrelation function (ACF) of a series. The autocorrelation function tells an analyst how strongly correlated or dependent one observation in a time series is with neighboring points in the series where ρ is the correlation between y_t and y_{t-1} ; ρ^2 is the correlation between y_t and y_{t-2} ; ρ^3 is the correlation between y_t and y_{t-3} ; and so forth. Hence, the estimated ACF for an integrated time series should yield an estimate of ρ that is "close" to 1.0, with all other autocorrelations declining exponentially to zero.⁸

Unfortunately, relying on the estimated ACF to judge whether $\rho = 1$ is somewhat subjective. And so, beginning in the late 1970s, a number of "unit root" tests were developed, including the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests and the semi-parametric Phillips-Perron tests. These statistical tests are tests of the null hypothesis that a time series has a unit root versus the alternative that it is stationary. Using variations of these tests, an analyst also can test the null hypothesis that a series contains a deterministic trend versus the alternative that it is stationary. The primary differences between these tests are

the way in which serial correlation is treated. I discuss the implementation of the DF and ADF tests in Appendix A.

The DF and ADF tests have been criticized because they do not powerfully discriminate between time series with a unit root and those that have a root that is close, but not exactly equal, to unity. Because these tests involve testing the null hypothesis that a series has a unit root, they place greater probability on this hypothesis, which makes it unlikely that an analyst will fail to find a unit root in a series unless there is very strong evidence against it. In response to these criticisms, Kwiatkowski, Phillips, Schmidt, and Shin (1992) have developed a test in which the null hypothesis that a series is stationary is compared to either an alternative that it has a unit root or an alternative that it contains a deterministic time trend. Their test uses the semi-parametric corrections for serial correlation developed in Phillips and Perron (1988). Kwiatkowski et al. suggest that the KPSS test be used to supplement, rather than supplant, the DF and ADF unit-root tests. In those cases where these tests yield the same conclusions, an analyst has very strong evidence that his or her conclusion is supported since the null hypothesis has been tested from both sides. I discuss the KPSS test in Appendix A as well.⁹

STATISTICAL INFERENCE WITH INTEGRATED REGRESSORS

In addition to the fact that alternative theories may predict different trajectories for a time series, the

stationarity, trend stationarity, or difference stationarity of a particular series has important consequences for statistical inference. This is especially true for the case of integrated regressors. For instance, Granger and Newbold (1974) point out that the OLS regression of one independent $I(1)$ process on another typically generates a high R^2 but a very low Durbin-Watson statistic -- the latter of which indicates strongly autocorrelated residuals. As their Monte Carlo simulations show, this nonstationarity biases downward the standard error of the estimated coefficient, which results in inflated t-ratios that give analysts a false impression of statistical significance. In such instances, conventional hypothesis tests are biased toward rejection of the null and false "acceptance" of a relationship between the two time series. Granger and Newbold (1974) label this the "spurious regression" problem.

Although they alerted analysts to some of the problems of inference associated with OLS regressions using integrated time series, only recently have the Granger and Newbold simulation results been given a firm analytic footing. As Phillips (1986) shows, the spurious regression problem arises because the coefficient from the regression of one $I(1)$ variable on another converges to a random variable rather than to a constant at the limit. Furthermore, the distributions of the t-ratios and the F-statistics in these regressions diverge asymptotically so that "there are no asymptotically correct

critical values for these conventional significance tests" (Phillips 1986, 318). Importantly, Phillips (1986, 321) also proves that the behavior identified by Granger and Newbold for regressions involving two independent $I(1)$ processes "continues to hold irrespective of whether y_t and x_t are independent." Hence, with only one exception to be discussed below, the spurious regression problem arises whenever one $I(1)$ process is regressed on one or more other integrated time series.

To avoid the problem of spurious regressions, analysts have conventionally followed one of two practices. First, many apply corrections for $AR(1)$ error processes to regressions with autocorrelated residuals to adjust the standard errors of the coefficients. Second, others difference their data and analyze the stationary first differences. Neither of these two approaches is entirely satisfying, because each is often employed mechanically without regard to theory, and therefore can create additional problems of inference. For instance, those using mechanical $AR(1)$ corrections for serial correlation ignore the fact that the coefficient estimates are not generally consistent when the regressors are integrated processes. Furthermore, although automatically differencing each time series is readily accepted by some analysts, doing so can create additional problems of inference when a univariate time series contains a stochastic trend that is common to the other

variables being analyzed. In such cases, differencing throws away important long-run information about the way in which these series "move together" or covary. This creates a second problem of spuriousness in that the analysis will be biased toward falsely concluding there is no relationship between two series.

Given the bias of OLS toward falsely suggesting statistically significant relationships among integrated regressors as well as the potential for incorrectly concluding two differenced time series with the same stochastic trend are unrelated, how should an analyst proceed when dealing with integrated regressors? One potential solution to these technical problems occurs when these integrated regressors are cointegrated. Then the relationship between and among integrated regressors can be specified using the functional form of an error correction model. Because in an ECM the changes in a series are expressed in terms of both short- and long-run factors, such a model retains important long-run information about the covariance of the integrated series. Furthermore, this information is incorporated into the ECM in a way that renders each term of the model stationary, and can thus circumvent Granger and Newbold's spurious regression problem. Hence, I now turn to a discussion of the concept of cointegration.

What is Cointegration?

As originally defined by Engle and Granger (1987), cointegration occurs when two or more integrated time series form a linear combination that is stationary.¹⁰ The existence of these stationary linear combinations is interesting because the algebra of $I(0)$ and $I(1)$ processes (e.g.; Engle and Granger 1987) suggests that the sum of two $I(1)$ processes also will be $I(1)$; that is, the resulting series will have a variance that matches the higher order of its constituent parts. However, under certain circumstances, a linear combination of these $I(1)$ processes will be $I(0)$, where a reduction in the order of integration occurs because each process shares a common stochastic trend. For instance, suppose y_t and x_t , are both $I(1)$ and a linear combination:

$$z_t = y_t - \beta x_t \quad (5.16)$$

is a mean zero, stationary process. Under these conditions, y_t and x_t are cointegrated. In this case, β is called the cointegrating parameter and $(1, -\beta)'$ represents the cointegrating vector. The existence of cointegration implies that y_t and x_t each have an important long-run component (associated with the unit root in each series), but that these shared trends, on average, annihilate each other so that the proportional difference between the two series is stationary. The common factor that causes these trends to cancel is assumed to be unobserved.¹¹

Cointegrating Versus Spurious Regressions

To obtain an estimate of the cointegrating vector, analysts can estimate one or more *cointegrating regressions*. For instance, in the bivariate case, the system of cointegrating regressions is:

$$y_t = \psi_{10} + \beta x_t + e_{1t} \quad (5.17a)$$

$$x_t = \psi_{20} + \lambda y_t + e_{2t} \quad (5.17b)$$

where $\lambda = 1/\beta$. Now consider Equation [5.17b] (with the intercept suppressed for purposes of exposition), and notice that $e_{1t} = y_t - \beta x_t = z_t$ as in Equation [5.16]. Thus, if two integrated time series are cointegrated, the residuals from a cointegrating regression should be stationary.¹² Determining whether these series are cointegrated can be accomplished by using a variation of the Dickey-Fuller test as discussed in Appendix A. Since the residuals from a cointegrating regression represent deviations from equilibrium, the stationarity of the residual series implies that equilibrium errors will be eliminated over time as this time series converges to its mean.

The difference between a cointegrating and a spurious regression lies in the degree of correlation between the two I(1) processes. In the case when these two series are asymptotically collinear (i.e.; cointegrated), the residual process from a cointegrating regression has a lower order of integration than do the regressors. This differs from a

spurious regression in which the residual series is integrated of the same degree as the regressors (Phillips 1986). In a spurious regression, $\hat{\beta}$ cannot be consistently estimated by OLS because the signal given by the x_t regressor has a variance that is of the same order as the residual noise (Phillips 1989). Since this noise wanders around stochastically, $\hat{\beta}$ never converges -- even asymptotically -- to a constant. However, in the case of cointegrated time series, β can be consistently estimated because the signal from x_t has a variance that is of a higher order of magnitude than the regressor-disturbance correlation (Phillips 1989).

Now consider Equation [5.17a] as a single cointegrating regression. Although $\hat{\beta}$ can be consistently estimated by OLS assuming only that $E(e_{1t})=0$, its asymptotic distribution under this weak assumption is nonstandard because it is confounded by nuisance parameters. The presence of nuisance parameters in the limiting distribution are due to two types of bias: (a) the dependence between the stochastic trends in y_t and x_t and (b) the correlation between x_t and e_{1t} that occurs when e_{2t} is not iid but contains AR or MA components. When will these conditions arise? The first will occur whenever the latent factor linking the two series affects each simultaneously so that they must be considered jointly endogenous. The second condition is likely to arise frequently when cointegrating regressions are estimated because such regressions control only for the long-run relationship between x_t and y_t so that

the short-run dynamics of the process fall into the error term and create serial correlation. Hence, e_{1t} and x_t are potentially correlated via interdependencies in the error vector whenever e_{2t} (and thus x_t) is an ARIMA process rather than a pure random walk. These interdependencies generate nuisance parameters that bias the asymptotic distribution of the OLS estimator of β .

To see this more clearly, focus on Equation [5.17a] and assume that y_t and x_t are stationary and that e_{1t} is iid. Under these conditions, $\hat{\beta}$ can be estimated consistently via OLS if we assume that $E[y_t|x_t] = 0$. Using the law of iterated expectations, this implies both that $E[e_{1t}] = 0$ (mean zero disturbances) and $E[x_t e_{1t}] = 0$ (regressor uncorrelated contemporaneously with the disturbance). Given these assumptions, we could prove the consistency of the OLS estimator of β by examining:

$$plim \hat{\beta} = \beta + plim \left[\frac{1}{T} \sum_{t=1}^T (x_t - \bar{x})^2 \right]^{-1} plim \frac{1}{T} \sum_{t=1}^T (x_t - \bar{x}) e_{1t} \quad (5.18)$$

If we assume that the variance of x_t satisfies regularity conditions so that $plim \sum_{t=1}^T (x_t - \bar{x})^2 / T$ is finite then this quantity converges to a constant, $Var(x)$, by the weak law of large numbers. Assuming continuity and using Slutsky's theorem, its inverse converges in probability to $[Var(x)]^{-1}$. And furthermore, under the assumption that the regressor is uncorrelated with the disturbances, $plim [\sum_{t=1}^T (x_t - \bar{x}) e_{2t}] / T$

converges in probability to zero, and therefore, $\text{plim } \hat{\beta} = \beta$ so that $\hat{\beta}_{\text{OLS}}$ is a consistent estimator of β .

In the stationary case, the consistency of the OLS estimator of β revolves around assumptions of mean zero disturbances and regressors uncorrelated with the disturbances. In addition, its consistency is a function of the fact that $\text{plim } \sum_{t=1}^T (x_t - \bar{x})^2 / T$ converges weakly to its probability limit at rate T , which means that the standardization that leads to convergence in distribution (i.e.; makes the asymptotic distribution of $\hat{\beta}$ non-degenerate) is $\sqrt{T}$. This is why, in the stationary case, we say that the OLS estimator of β is "root T consistent."

But when two $I(1)$ processes are cointegrated (i.e.; asymptotically collinear), they form a linear combination $e_{1t} = y_t - \psi_{10} - \beta x_t$ that is stationary. The stationarity of e_{1t} occurs because the stochastic trends in each series annihilate or nullify each other. In the cointegrated case, $\hat{\beta}$ can be estimated consistently via OLS under "weaker" assumptions than those assumed for the stationary case. To see this, first note that although one may only be interested in estimation of $\hat{\beta}$ in Equation [5.17a], when x_t is $I(1)$, like it or not, an analyst is, at a minimum, dealing with the following data-generating process:

$$y_t = \psi_{10} + \beta x_t + e_{1t} \quad (5.19a)$$

$$x_t = x_{t-1} + \xi_t \quad (5.19b)$$

where ξ_t and e_{1t} are stationary, but are potentially mutually and serially correlated. And so the question becomes: Under what conditions can β be consistently estimated via OLS and under what conditions will its distribution be asymptotically normal?

Although this might seem just like the stationary case, it is not. Recall that if we integrate the process in Equation [5.19a], we get: $x_t = x_0 + \sum_{i=1}^t \xi_i$. Notice too, that β -- the parameter of interest -- is the coefficient on x_t , the integrated process, and therefore, the accumulated effects of shocks to x_t will play an important role in the estimation of $\hat{\beta}$ and its variance. Because it is a function of past innovations, x_t will be correlated with e_{1t} , and the nature of this correlation will depend upon the serial correlation properties of ξ_t . If one allows for the possibility of serial correlation in either ξ_t or e_{1t} , the variance-covariance matrix of the disturbance vector for the system becomes:

$$\Omega = \begin{bmatrix} \omega_{11} & \omega_{12} \\ \omega_{21} & \omega_{22} \end{bmatrix} \quad (5.20)$$

where unless ξ_t and e_{1t} are iid, these variances and covariances are:

$$\begin{aligned}
\omega_{22} &= E(\xi_t^2) + 2 \sum_{j=1}^{\infty} E(\xi_t \xi_{t-j}) \\
\omega_{11} &= E(e_{1t}^2) + 2 \sum_{j=1}^{\infty} E(e_{1t} e_{1t-j}) \\
\omega_{21} &= E(\xi_t e_{1t}) + \sum_{j=1}^{\infty} [E(\xi_{t-j} e_{1t}) + E(\xi_{t+j} e_{1t})]
\end{aligned} \tag{5.21}$$

Now suppose that we are again interested in investigating the consistency of $\hat{\beta}$ and determining its asymptotic distribution given these integrated and cointegrated regressors. Park and Phillips (1988) do the necessary expansions and prove that:

$$T^{-2} \sum_{t=1}^T (x_t - \bar{x})^2 \rightarrow^d \int_0^1 B_2 B_2 \tag{5.22}$$

$$T^{-1} \sum_{t=1}^T (x_t - \bar{x}) e_{1t} \rightarrow^d \int_0^1 B_2 dB_1 + \omega_{21} \tag{5.23}$$

where B_1 and B_2 are demeaned Brownian motion processes (continuous time random walks defined on the $[0,1]$ interval) and where ω_{21} represents a nuisance parameter that does not disappear asymptotically and that will vary from one estimation problem to another.

Despite the presence of this nuisance parameter, the OLS estimator of β is actually consistent. Unlike the stationary case, the contemporaneous correlation of the regressor with e_{1t} does not affect the consistency of β . This is true because as shown in expressions [5.22] and [5.23], the magnitude of the sequence of the sum of squares is $O(T^2)$ and is larger than the

$O(T)$ magnitude of the regressor-disturbance correlation. Since these two sequences converge at different rates, the signal from the variance of x_t swamps out the sample correlation between x_t and e_{1t} . In fact, with integrated and cointegrated regressors the standardization that results in convergence for the ratio of the numerator and the denominator is T rather than $T^{1/2}$, so that the OLS estimator of β is "super consistent."

But although contemporaneous correlation and serial dependencies do not affect the consistency of the OLS estimator of β , they do bias its asymptotic variance. Unlike the stationary case, serial correlation in the error vector results in more than a loss of efficiency. Instead, serial correlation alone or in conjunction with contemporaneous regressor-disturbance correlation creates a second-order asymptotic bias that leads to a nonnormal asymptotic distribution for the OLS estimator of β . But when $\omega_{21} = 0$, this nuisance parameter disappears. Under these conditions, the Brownian motion terms in the expression $\int_0^1 B_2 dB_1$ become independent. Consequently, the asymptotic distribution of the OLS estimator of β is a mixture of independent normally distributed components, so that $\hat{\beta}$ has an asymptotically normal distribution.

Notice that ω_{21} will equal zero when Ω is diagonal. Of course, Ω will be diagonal under an assumption that $\lambda=0$ and that ξ_t and e_{1t} are identically and independently distributed.

In addition, Ω is diagonal if x_t is uncorrelated with all contemporaneous, future, and past values of e_{1t} ; that is, if x_t is strictly exogenous and the model is completely specified. When strict exogeneity holds, the OLS estimate of $\hat{\beta}$ in Equation [5.17a] has an asymptotically normal distribution so that its t-ratio, as well as the F-statistic for the regression, has the usual interpretation.

The Error Correction Representation

Engle and Granger (1987) show that there is an association between the concept of cointegration and the specification and estimation of error correction models. In fact, the Granger Representation Theorem (Engle and Granger 1987) states that if two or more $I(1)$ variables have an autoregressive error correction representation, then they are cointegrated, and if two or more $I(1)$ series are cointegrated, then they have an autoregressive error correction representation. This error correction representation consists of a system of reduced form error correction models. For instance, in the bivariate case, the error correction representation has the form:

$$\Delta x_t = \delta_{10} + \sum_{p=1}^P \zeta_{1p} \Delta y_{t-p} + \sum_{p=1}^P \eta_{1p} \Delta x_{t-p} - \alpha_1 (y_{t-1} - \beta_{11} x_{t-1}) + u_{1t} \quad (5.24a)$$

$$\Delta y_t = \delta_{20} + \sum_{p=1}^P \zeta_{2p} \Delta y_{t-p} + \sum_{p=1}^P \eta_{2p} \Delta x_{t-p} - \alpha_2 (y_{t-1} - \beta_{21} x_{t-1}) + u_{2t} \quad (5.24b)$$

where $-1 < \alpha_1$, $\alpha_2 < 0$ and $\beta_{11} = \beta_{21} = \beta$ and where y_t and x_t are

jointly endogenous.¹³ Notice the common cointegrating parameter, β , in these two equations. Jointly cointegrated time series imply a cross-equation restriction on the system of error correction equations. Furthermore, note that the interpretation of the equilibrium behavior in this error correction system is that both changes in x_t and changes in y_t are attracted to the same equilibrium state represented by $y_t - \beta x_t = 0$, but that the rates of attraction, denoted by α_1 and α_2 , vary so that each process oscillates around this equilibrium state in a different fashion.

Given the existence of cointegration between two $I(1)$ time series, each term in Equations [5.24a] and [5.24b] is stationary. For instance, the variables expressed in changes are stationary because they have been differenced, and the quantities $(y_{t-1} - \beta_{11}x_{t-1})$ and $(y_{t-1} - \beta_{21}x_{t-1})$ are also stationary because the common factor represented by the cointegrating parameter, β , causes the long-run stochastic trends in each series to nullify each other. Since the components of these models are stationary, the spurious regression problem identified by Granger and Newbold is avoided without undertaking atheoretical corrections. In addition, long-run information is incorporated into each of these equations via the error correction terms containing the lagged levels of x_t and y_t .

Cointegrated Systems

Since each equation in the system above contains only lagged variables, one way to interpret Equations [5.24a] and [5.24b] is as a reduced form error correction system. Under this interpretation, a researcher might estimate the complete reduced form system and investigate the broad implications of the system's properties rather than to draw inferences from specific parameter estimates. For instance, Baillie and Bollerslev (1989) estimate a seven-equation autoregressive error correction system for international exchange rates and find that these seven rates share a single stochastic trend and hence are tied together in one long-run relationship. These analysts place no structural interpretation on the coefficients for the lagged short-run factors nor do they attempt to disentangle the direction of causality between these rates. They instead accept the idea that the series are jointly endogenous.

To see how the dynamic properties of a reduced form error correction system can be analyzed, rewrite the system in Equations [5.24a] and [5.24b] in matrix form as follows:

$$\begin{aligned} \begin{bmatrix} \Delta x_t \\ \Delta y_t \end{bmatrix} &= \begin{bmatrix} \delta_{10} \\ \delta_{20} \end{bmatrix} + \begin{bmatrix} \zeta_{11} \cdots \cdots \zeta_{1p} \\ \zeta_{21} \cdots \cdots \zeta_{2p} \end{bmatrix} \begin{bmatrix} \Delta y_{t-1} \\ \vdots \\ \Delta y_{t-p} \end{bmatrix} + \begin{bmatrix} \eta_{11} \cdots \cdots \eta_{1p} \\ \eta_{21} \cdots \cdots \eta_{2p} \end{bmatrix} \begin{bmatrix} \Delta x_{t-1} \\ \vdots \\ \Delta x_{t-p} \end{bmatrix} \\ &\quad - \begin{bmatrix} \alpha_1 & -\alpha_1 \beta_{11} \\ \alpha_2 & -\alpha_2 \beta_{21} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ x_{t-1} \end{bmatrix} + \begin{bmatrix} u_{1t} \\ u_{2t} \end{bmatrix} \end{aligned} \quad (5.25)$$

Now consider the 2 by 2 coefficient matrix:

$$-\Gamma = \begin{bmatrix} \alpha_1 & -\alpha_1\beta_{11} \\ \alpha_2 & -\alpha_2\beta_{21} \end{bmatrix} \quad (5.26)$$

The determinant of Γ is calculated as:

$$|\Gamma| = (-\alpha_1\alpha_2\beta_{21}) - (-\alpha_2\alpha_1\beta_{11}) \quad (5.27)$$

This determinant is zero whenever $\beta_{11} = \beta_{21}$; that is, $-\Gamma$ is singular with less than full rank when these two time series are cointegrated.

The matrix $-\Gamma$ contains the coefficients that represent the instantaneous effects of the equilibrium error on current changes in either Δx_t or Δy_t . For instance, the immediate effect on Δx_t of an equilibrium error caused by a one-unit increase in x_t is given by $\alpha_1\beta_{11}$. Political scientists familiar with dynamic models will recognize $-\Gamma$ as the matrix of long-run impact multipliers. Cointegration among two or more $I(1)$ processes implies that this multiplier matrix for the system has a reduced rank. In the bivariate case where the number of regressors, k , equals two, the existence of a common, long-run factor means that the cointegrating rank of Γ equals one. However, in multivariate settings, the cointegrating rank of Γ will be equal to r , the number of cointegrating vectors or stationary linear combinations ($r < k$) in the system. Thus, the long-run dynamic properties of this system can be investigated by determining the rank of Γ .¹⁴ For instance, notice that if the rank of Γ equals zero, then Γ is a null matrix, which implies that the long-run has

no effect on short-run changes in x_t or y_t and that a researcher would be justified in analyzing only the first differences of each series. In addition, when $\beta_{11} \neq \beta_{21}$, then these time series are not cointegrated and Γ has full rank. The full rank of Γ implies that each series in the vector process is stationary, and consequently, one could specify the system as a vector autoregressive system in *stationary* levels.¹⁵

EXOGENEITY AND SINGLE-EQUATION MODELS

A second way to think of an error correction system is as a set of simultaneous equations some of whose coefficients we might restrict to zero on the basis of a *a priori* theory. These zero restrictions tell us which factors to treat as exogenous and imply various causal orderings among the variables in the system. In some cases, the restrictions imply that only a single error correction equation rather than the complete system needs to be estimated. For instance, consider the following bivariate error correction system:

$$\Delta x_t = \delta_{10} + \sum_{p=0}^P \zeta_{1p} \Delta y_{t-p} + \sum_{p=1}^P \eta_{1p} \Delta x_{t-p} - \alpha_1 (y_{t-1} - \beta_{11} x_{t-1}) + v_{1t} \quad (5.28a)$$

$$\Delta y_t = \delta_{20} + \sum_{p=1}^P \zeta_{2p} \Delta y_{t-p} + \sum_{p=0}^P \eta_{2p} \Delta x_{t-p} - \alpha_2 (y_{t-1} - \beta_{21} x_{t-1}) + v_{2t} \quad (5.28b)$$

where $-1 < \alpha_1, \alpha_2 < 0$ and where $\beta_{11} = \beta_{21} = \beta$. In the technical sense, these equations represent a structural rather than a reduced form error correction system because the

contemporaneous effects of Δx_t and Δy_t are allowed to influence each other. Following Phillips (1989, 1991), my discussion allows for the possibility of these contemporaneous influences. However, regardless of whether these factors enter the model, I will use the word "structural" to refer to error correction models that are specified on the basis of a researcher's theory in order to draw inferences about specific parameters associated with both short- and long-run factors.

For instance, suppose a theory implies that $y_t = \beta x_t$ represents a long-run structural equilibrium relationship between two I(1) processes. In this case, the equilibrium relationship and deviations from it could be specified as:

$$y_t = \delta_{20} + \beta x_t + e_{2t} \quad (5.29)$$

where $\beta = \beta_{11} = \beta_{21}$ as above. In this case, the theory suggests that x_t is "exogenous" to y_t . Given the assumed "exogeneity" of x_t to y_t , an analyst might specify a single structural error correction equation to model the process by which disequilibrium is generated and corrected. A typical example would be:

$$\Delta y_t = \delta_{20} + \sum_{p=1}^P \zeta_{2p} \Delta y_{t-p} + \sum_{p=0}^P \eta_{2p} \Delta x_{t-p} - \alpha_2 (y_{t-1} - \beta x_{t-1}) + v_{2t} \quad (5.30)$$

where $-1 < \alpha_2 < 0$ and where $\beta = \beta_{21} = \beta_{11}$ as above. Notice that by restricting all the coefficients in Equation [5.28a] to zero, this analyst would implicitly be assuming that the data-generating process for the I(1) x_t series is:

$$x_t = x_{t-1} + \xi_t \quad (5.31)$$

where ξ_t is stationary but not necessarily randomly distributed.¹⁶

Given the structural ECM in Equation [5.30] and its equilibrium condition in Equation [5.29], now assume that an analyst wants to draw inferences about β , the cointegrating parameter; α_2 , the rate of error correction; and ζ_{2p} and η_{2p} for all p . This means that the structural parameters of interest are both the short- and long-run coefficients. The question then arises as to whether and how the parameters of the single structural ECM can be estimated and whether ignoring the data-generating process $x_t = x_{t-1} + \xi_t$ has any effect on the validity of the inferences drawn from the model's parameter estimates.

In specifying the single ECM in Equation [5.30], one of the restrictions placed on the error correction system in Equations [5.28a] and [5.28b] is $\alpha_1 = 0$. From a theoretical point of view, this restriction represents an assumption that although y_t and x_t move together in the long run, the causal ordering is unidirectional and asymmetric so that y_t responds to movements in x_t by re-equilibrating toward the equilibrium state, but x_t is not influenced by equilibrium errors. Political science theories may often suggest such causal orderings. From a technical perspective, the restriction that $\alpha_1 = 0$ is an assumption about the *weak exogeneity* of x_t with respect to the cointegrating parameter β .

Recall that weak exogeneity implies the absence of cross-equation restrictions between the model for the process generating x_t and the structural model for Δy_t so that their likelihood functions are independent. Engle, Hendry, and Richard (1983) argue that when weak exogeneity holds no information is lost if the data-generating process for x_t is ignored when β is estimated. Weak exogeneity is closely associated with the concept of predeterminedness since, under certain circumstances, both would imply that the variable x_t is independent of contemporaneous and future values of the error process v_{2t} in the structural ECM for Δy_t . However, weak exogeneity is always defined relative to a particular parameter or set of parameters, and these may or may not be equivalent to all the parameters of the model (Urbain 1992). Hence, the assumption that $\alpha_1 = 0$ is best described as an assumption about the *long-run* weak exogeneity of x_t to β only (Dolado 1992).

The assumption that x_t is weakly exogenous to the cointegrating parameter β is, however, important for drawing valid inferences from a single equation ECM. Note that this weak exogeneity assumption implies that:

$$-\Gamma = \begin{bmatrix} 0 & -(0)\beta_{11} \\ \alpha_2 & -\alpha_2\beta_{21} \end{bmatrix} \quad (5.32)$$

This matrix is clearly singular and of reduced rank; however, its cointegrating rank has not changed. There is still one common factor linking y_t and x_t , but the long-run relationship

between the two series is now asymmetric so that disequilibrium generates changes in y_t only. Hence by imposing the restriction that $\alpha_1 = 0$, x_t is no longer jointly endogenous with y_t . Therefore, one part of the two problems that generates a nonstandard distribution for the OLS estimate of β has been eliminated.

However, the problem that has not been circumvented is the one of the long-run correlation of x_t with *past* deviations from equilibrium and hence the contemporaneous correlation of ξ_t with v_{2t} . Unlike the case for stationary regressors, the weak exogeneity of x_t with respect to β is not enough to ensure valid inference about the long-run effects of x_t on y_t . This is quite important to think about. Engle, Hendry, and Richard (1983) argue that weak exogeneity is the only prerequisite for inference. Yet Phillips (1991) shows that when regressors are cointegrated, ensuring valid inference about the long-run relationship between x_t and y_t requires additional assumptions such as (a) that ξ_t and v_{2t} are independently and identically distributed or (b) that x_t is strongly exogenous to y_t .¹⁷ Recall that x_t is defined as strongly exogenous if it is both weakly exogenous and is not "Granger caused"¹⁸ by y_t (Engle, Hendry, and Richard 1983). Strong exogeneity is equivalent to what the Cowles Commission called strict exogeneity (Cooley and LeRoy 1985); that is, both imply that x_t is independent of the contemporaneous, future, and past values of v_{2t} .

The assumption that ξ_t and v_{2t} are iid rules out both the autoregressive structure for ξ_t that leads to Engle and Granger's autoregressive ECM as well as MA forms of serial correlation. Hence, this assumption rules out ξ_t being a stationary ARMA process, which in turn implies that x_t is purely $I(1)$ but is not an ARIMA process. Given the types of time series that political scientists analyze, the assumption that the system's error vector is iid will sometimes be too strong. But relaxing this assumption slightly to one of strict exogeneity allows some of these processes to exist without confounding the distribution of β . For instance, Phillips (1988b) shows that if ξ_t is a stationary $AR(1)$ process and x_t is strictly exogenous, then β will have an asymptotically normal distribution and its t -ratio can be used for inference in the usual way provided that the ECM being estimated contains enough contemporaneous and lagged Δx_t terms to purge v_{2t} of its correlation with ξ_t . In this case, standard inference is ensured by strict exogeneity and a complete dynamic specification.

But in a second example in which strict exogeneity does not hold and ξ_t and v_{2t} each follow an $MA(1)$ process, Phillips (1988b) proves that the distribution of the OLS estimator of β from a single-equation ECM is nonstandard and confounded by the effects of the information that is lost by not estimating the ECM jointly with the model for the data-generating process of x_t . To explain the intuition behind this, Phillips (1988b,

357) notes that β is the coefficient on x_t in the cointegrating regression. But because over time $x_t = x_0 + \sum_{i=1}^t \xi_i$, the series x_t is dominated by the accumulated errors. In the same way, any information about the content of ξ_t that is ignored during estimation of β accumulates as T approaches infinity, thereby confounding the limiting distribution of β and making it nonstandard. This problem is eliminated, however, when strict exogeneity holds.

By definition, strict exogeneity requires that x_t is weakly exogenous with respect to β , and so the assumption that $\alpha_1 = 0$ is a necessary condition to ensure standard inference from a single ECM. Notice that when $\alpha_1 = 0$, the error correction system in Equations [5.28a] and [5.28b] becomes triangular (Phillips 1988b, 1991). But as Phillips shows, the asymptotic normality of β is not guaranteed when a single-equation from a triangular ECM is estimated. What is instead sufficient for optimal inference is that the system be recursive -- triangular with a diagonal variance-covariance matrix. Of course, strict exogeneity implies that Ω is diagonal. Hence, as Phillips (1991) notes, the condition of strict exogeneity or a lack thereof provides analysts with some guidance about how to proceed in empirical work and still obtain an estimator of β that has an asymptotically normal distribution. Phillips (1991, 302) summarizes these guidelines as follows:

Full system estimation by maximum likelihood or asymptotically equivalent subsystem techniques that

incorporate all prior knowledge about the presence of unit roots are most desirable Single equation estimation of an ECM is generally not sufficient unless the variables in the regressor set are strongly exogenous for the cointegrating parameters. In stationary time series regression single equation estimation usually leads to a loss of statistical efficiency but in cointegrated systems, the use of single equation techniques imports bias, nuisance parameter dependencies, and loses optimality.

Therefore, Phillips (1991, 302) concludes that "the arguments for the use of systems methods in cointegrated systems seem more compelling than they are in the classical regression context."

Estimation, Inference, and Strict Exogeneity

Interestingly, when strict exogeneity holds, an analyst has a number of system, subsystem, and single-equation estimators from which to choose. The reason for this is that under strict exogeneity the system becomes recursive, and consequently, full information maximum likelihood and subsystem limited information estimators of $\hat{\beta}$ all reduce to ordinary least squares just as they do in the stationary case (Phillips 1991, 293). In this section, I want to discuss some of these estimators, assuming that strict exogeneity holds. As the discussion proceeds, I hope to show how these estimators parallel those that political scientists commonly use in other contexts. In addition, I will introduce political scientists to some recent results that show how to "force" the strict exogeneity assumption to hold so that

analysts can obtain the correct, asymptotically normal t -ratios for the long-run parameters of interest.

Consider again the structural cointegrating regression and error correction model of Equations [5.29] and [5.30], which I repeat here as:

$$y_t = \delta_{20} + \beta x_t + e_{2t} \quad (5.33)$$

$$\Delta y_t = \delta_{20} + \sum_{p=1}^P \zeta_{2p} \Delta y_{t-p} + \sum_{p=0}^P \eta_{2p} \Delta x_{t-p} - \alpha_2 (y_{t-1} - \beta x_{t-1}) + v_{2t} \quad (5.34)$$

where $-1 < \alpha_2 < 0$ and where the structural parameters of interest are: α_2 , β , and ζ_{2p} and η_{2p} for $\{p = 1, \dots, P\}$.

Notice that the ECM in Equation [5.34] is actually nonlinear in the parameters since the error correction term could be expressed as:

$$-\alpha_2 y_{t-1} + \alpha_2 \beta x_{t-1} \quad (5.35)$$

Because of this nonlinearity, Stock (1987) proposes that single-equation ECMs be estimated using nonlinear least squares.¹⁹ When NLS is used to estimate the ECM, distinct point estimates of $\hat{\alpha}_2$, the rate of error correction, and $\hat{\beta}$, the long-run effect of x_t on y_t are obtained. Furthermore, the NLS estimate of β will, in theory, be equal to the estimate of β that would be obtained by applying OLS to the cointegrating regression in Equation [5.33].

The ECM also could be estimated by applying OLS directly to Equation [5.34] in a single step. However, when OLS is

used to estimate the ECM directly, the error correction term that is actually being estimated is:

$$-\alpha_2 y_{t-1} - \theta x_{t-1} \quad (5.36)$$

where $\theta = -\alpha_2 \beta$. In this case, $\theta \neq \beta$, and thus, it does not equal the estimate of the long-run structural relationship that would, in theory, be obtained by applying OLS to the cointegrating regression. In fact, NLS applied to Equation [5.34] yields a distinct estimate of β , the *total multiplier* (i.e.; the sum of all the lag coefficients across the j periods that it takes the system to re-equilibrate after a shock). In contrast, OLS applied in a single step to the ECM produces an estimate of the *impact multiplier*, $-\theta = -\alpha_2 \beta$. Since the structural parameter of interest is β , the total multiplier or long-run effect of a unit increase in x_t on y_t , those estimating the ECM using OLS in a single step have to "back out" this coefficient by calculating $\beta = -\theta / -\alpha_2$.

Given that the structural parameter has to be calculated from the estimates, the single-step OLS estimator of a single-equation ECM is analogous to an indirect least squares estimator in which the structural parameters are computed as nonlinear functions of the reduced form parameters.²⁰ Although political scientists who prefer this single-step OLS estimator (e.g.; Beck 1987, 1991; Durr 1993) seem to recognize that estimates of $\hat{\beta}$ have to be computed, what they fail to observe is that the estimate they obtain for the standard error of θ is NOT the standard error of β . Hence, any

comparison of the t-ratios for β from a cointegrating regression and the t-ratios for θ from the ECM amounts to a comparison of apples and oranges. Thus, analysts who incorrectly rely on the t-ratios from single-step OLS estimation of an ECM to draw inferences about the long-run effect of x_t on y_t may incorrectly fail to reject the null and may conclude that these variables are unrelated in the long-run.²¹ This may account for Durr's (1993) Monte Carlo evidence that ECMs estimated by OLS in a single-step are more likely to detect a lack of statistical significance when a randomly generated $I(1)$ variable is included in the error correction term of an ECM than if the ECM were estimated using a two-step procedure. Since Durr did not compute the correct standard errors and t-ratios for the single-step OLS estimator, his criteria for failure to detect spuriousness may not be equivalent across the two estimators.

In addition to NLS and single-step OLS, Engle and Granger (1987) propose a two-step estimator. Analysts employing this estimator proceed by first applying OLS to the cointegrating regression in Equation [5.33] to obtain an estimate of the cointegrating vector $(1, -\hat{\beta})'$ associated with the stationary linear combination $\hat{z}_t = y_t - \hat{\beta}x_t$.²² (Recall that this cointegrating vector captures the common, latent factor that links y_t to movements in x_t and that causes their long-run stochastic trends, associated with the unit roots in each series, to cancel or annihilate each other.) Once this

estimate of z_t is obtained (and tested for stationarity), it is then lagged and used as a proxy for $(y_{t-1} - \beta x_{t-1})$ in the ECM so that the error correction term for Equation [5.34] becomes:

$$-\alpha_2 \hat{z}_{t-1} \quad (5.36)$$

where $\hat{z}_{t-1} = y_{t-1} - \hat{\beta}x_{t-1}$. The resulting ECM with the estimated $\hat{z}_{t-1}$ included as a regressor is then estimated via OLS in a second step.

The Engle-Granger two-step estimator is a type of limited information estimator. Because, under strict exogeneity, limited information estimators are asymptotically equivalent to the OLS single-equation estimator, the EG two-step estimator can be used in a single-equation context. However, it was initially developed within the context of a bivariate error correction system.²³ The rationale for the use of the E-G two-step estimator is the same as that underlying other two-step estimators such as Heckman's (1979) solution to the problem of sample selection bias or the estimators developed in the 1940s and 1950s to deal with serial correlation.²⁴ For instance, think of the Cochrane-Orcutt technique in which one obtains an estimate of ρ , the autocorrelation coefficient, and taking it as a known parameter, uses it to transform the data in such a way that the coefficients of interest can be estimated consistently (and also efficiently provided strict exogeneity holds). The purpose of such two-step estimators is to isolate, in the first step, estimates of nuisance parameters that confound inference. These estimates are then

used, in a second step, as if they were equal to their population values.

Within the context of cointegrated time series, the E-G two-step estimator isolates the nuisance parameters caused by unit roots and drift in the first-step cointegrating regression. Consequently, the second-step estimates of the parameters in an ECM are consistent and have standard distributions. But notice that the EG two-step estimator does not produce an estimate of $\hat{\beta}$ in the second step. Furthermore, the estimate of $\hat{\beta}$ obtained in the first step does not have a standard distribution unless x_t is independent of e_{2t} contemporaneously and at all leads and lags (i.e.; is strictly exogenous). This fact has always been viewed as a weakness of the EG two-step estimator.

Inference When Strict Exogeneity Fails

But interestingly, even when x_t is not strictly exogenous, Saikkonen (1991), Phillips (1991), and Wooldridge (1992) show that analysts can exploit the consistency properties of the OLS estimator of β to obtain from a cointegrating regression standard errors and t-ratios that can be used in the usual way.²⁵ For instance, re-consider the cointegrating regression:

$$y_t = \delta_{20} + \beta x_t + e_{2t} \quad (5.37)$$

Now compare Equation [5.37] to the cointegrating regression that results when an additional stationary regressor, q_t , is included:

$$y_t = \delta_{20} + \beta x_t + \gamma q_t + w_{2t} \quad (5.38)$$

An important point to note about these two cointegrating regressions is that the inclusion or omission of the stationary q_t series has no effect on the consistency of $\hat{\beta}$, which is estimated consistently provided the expected value of the disturbances is zero. This condition is met in *both* cointegrating regressions above provided that y_t and x_t are cointegrated and an intercept is included in each. Since the inclusion or omission of a stationary variable has no bearing on the stationarity of the residuals from a cointegrating regression, the $I(1)$ signal from x_t still overwhelms the $I(0)$ residual noise so that $\hat{\beta}$ is consistently estimated.

But notice that when the stationary q_t is included, the residual processes in these two regressions are not the same (i.e.; $e_{2t} \neq w_{2t}$). Intuitively, the process w_{2t} has more "subtracted" from it than does the series e_{2t} . Thus, the inclusion of q_t might be interpreted as "adjusting" the conditional mean of e_{2t} (Phillips 1991, 225). Given this interpretation it becomes easier to see that, by appropriately choosing q_t , the standard errors and t-ratios from a cointegrating regression could be "adjusted" so that inference

could proceed as usual. But just what adjustments are needed? Precisely those that are equivalent to strict exogeneity since this condition ensures that $\hat{\beta}$ has an asymptotically normal distribution. Recognizing this, Saikkonen (1991), Phillips (1991), and Wooldridge (1992) suggest that analysts include leads, lags, and contemporaneous values of the stationary Δx_t in the cointegrating regression. Including these stationary regressors produces a new estimate of the standard error of the cointegrating regression that has been adjusted for the contemporaneous correlation and serial covariance properties between ξ_t and e_{2t} . Basically, by including these stationary regressors, analysts "have forced the strict exogeneity assumption to be true" (Wooldridge 1992, 40) so that $\hat{\beta}$ has a standard distribution.²⁶

Although Saikkonen (1991) argues that inference about $\hat{\beta}$ can proceed as usual from such an *augmented* cointegrating regression, Wooldridge (1992) suggests that analysts take the additional step of making the standard errors and t-ratios robust to general forms of serial correlation by obtaining both the adjusted $\hat{\sigma}_w^2$ and a consistent estimate of $\hat{\omega}_w^2$, the long-run variance of w_{2t} .²⁷ Given consistent estimates of $\hat{\sigma}_w^2$ and $\hat{\omega}_w^2$, robust t-ratios can be computed by multiplying the t-ratios for the coefficients of each I(1) variable in the augmented cointegrating regression by the ratio $\hat{\sigma}_w/\hat{\omega}_w$.²⁸ A valid F-statistic arises from multiplying the F-statistic from this regression by the ratio, $\hat{\sigma}_w^2/\hat{\omega}_w^2$.

Finally, the full information maximum likelihood Johansen estimator (Johansen 1989, 1991; Johansen and Juselius 1990) always can be used to obtain estimates of $\hat{\beta}$ with asymptotically normal distributions. In the Johansen estimator, OLS is used to estimate a multivariate, reduced form autoregressive error correction system such as that shown in Equations [5.24a] and [5.24b]. Assuming a closed system, a complete dynamic specification, and Gaussian errors, this coincides with maximum likelihood because each equation contains the same regressors. Unfortunately, when a researcher is interested in short-run structural relationships or when the long-run structural relationships differ across equations, the Johansen estimator is less useful and may be inefficiently overparameterized.²⁹

Recall that to obtain an estimator with an asymptotically normal distribution when regressors are $I(1)$ and cointegrated, information about the contemporaneous and past effects of unit roots must be used during estimation (Phillips 1991). The Johansen estimator achieves this by correcting the correlations between the series in levels and the series in differences for the effects of lagged first differences. In addition, it involves joint estimation of the entire system, thereby incorporating information about the common unit roots and contemporaneous correlations between the levels of each series. This is the sense in which this is a full information estimator, and this is why it achieves asymptotically

efficient estimation of $\hat{\beta}$. Basically, the Johansen estimator estimates a restricted vector autoregression, where the restrictions implied by common unit roots are placed on Γ , the matrix of long-run impact multipliers. This estimator then yields estimates of the coefficients of the cointegrating vector(s) and the rate(s) of error correction by solving an eigenvalue problem and decomposing the Γ matrix with respect to its characteristic roots.

Tests for Weak and Strict Exogeneity

Because strict exogeneity is a sufficient condition for the asymptotic normality of $\hat{\beta}$ when time series are cointegrated, researchers using integrated regressors to test hypotheses must rigorously push their theories to address questions of exogeneity and causal order. Although political science theories may suggest causal orderings and zero restrictions among variables in a long-run equilibrium relationship, they are not always well enough developed to rule out subtle interdependencies in the error vector nor do they always adequately tell us how to specify the short-run dynamics in an ECM. Therefore, although I urge analysts to bring theory to bear on these issues, I also think that tests of exogeneity and lag length can be important guides to model misspecification and can help analysts avoid problems of inference.

Tests for both weak and strong (or strict) exogeneity within cointegrated systems are currently under development

(Urbain 1992; Toda and Phillips 1991; Johansen 1991). One of the issues involved here is that a variable can be weakly exogenous to some of the model's parameters without being weakly exogenous to others (Urbain 1992; Dolado 1992). In addition, long-run weak exogeneity can be easily violated when the model's short-run dynamics are misspecified (Phillips 1989; Urbain 1992). And furthermore, Granger causality tests, which can be used to test for strict exogeneity once weak exogeneity has been confirmed, can have nonstandard distributions when applied to integrated regressors in levels (Toda and Phillips 1991). But while econometricians iron out these issues, some initial tests of exogeneity suggested by Engle and Granger (1987) can be implemented.

For instance, re-consider Equations [5.28a] and [5.28b]. Engle and Granger (1987) argue that a failure to reject the null hypothesis that $\alpha_1 = 0$ indicates that x_t is weakly exogenous with respect to the long-run parameter β .³⁰ Once evidence of long-run weak exogeneity is found, a bloc F test then can be used to determine whether lagged changes in y_t Granger cause Δx_t . Evidence of long-run weak exogeneity (i.e.; $\alpha_1 = 0$) and Granger non-causality from Δy_{t-p} to Δx_t then suggests that x_t is orthogonal to the error term in the equation for Δy_t . In addition, although the leads and lags test is just entering the literature, Phillips (1991, 295) implies that another test for strict exogeneity is to perform tests of statistical significance on the coefficients of the

leads, lags, and contemporaneous values in the augmented cointegrating regression. Because these regressors are stationary, inference is standard. If the coefficients for the augmenting variables are jointly zero, then strict exogeneity is supported.

Summary

The theoretical hypotheses derived in Chapters 3 and 4 and summarized in Table 5 have statistical implications that can be empirically tested within the context of the aggregate-level *presidential accountability* and *economic forecasting* models. These hypotheses imply that relationships of cointegration should exist among certain sets of factors and that changes in the aggregate levels of both presidential approval and mass economic forecasts should be generated by dynamic adjustments toward their respective equilibrium states. The methodological tools for ascertaining the presence of cointegration and the degree of error correction are outlined above. What remains is to operationalize these two models so that these statistical tests can be used to test empirically the aggregate-level theoretical hypotheses outlined in Table 5. The task of operationalizing these models is taken up in the next chapter.

1. I use the word *trend* as follows: Nonstationary time series exhibit long swings because they tend to depart from a specific value as time goes on. When these long swings are primarily either up or down, the series has a trend (Maddala 1988, 213).

2. I will define the term exogenous more precisely below. At this point, I merely wish to draw a distinction between a dependent and an independent variable as suggested by some theory.

3. Or using terminology from the engineering literature, I could say that distinguishing the set of factors that influence the fundamental signal from those that create temporary noise can lead to theoretical advances.

4. As Equation [5.11] below shows, the nonstationarity of an integrated process arises through the integration or addition of shocks. Thus, such time series can be made stationary by differencing them, and are therefore called difference stationary processes. Time series that are stationary after differencing them are also said to be integrated of order d , expressed as $I(d)$, where d refers to the number of times the series must be differenced to achieve stationarity. For example, a stationary process is denoted by $I(0)$ and a process integrated of order one is denoted by $I(1)$.

5. More specifically, a variable has a *stochastic* trend if it increases or decreases for long periods of time, on average, by a fixed amount, but deviates from this average by an unpredictable random amount at any particular point in time (Stock and Watson 1988, 151). Alternatively, a trend stationary time series has a *deterministic* trend in its mean, which implies that it increases or decreases for long periods by the same fixed amount in every period.

6. I have not discussed the case of an explosive time series, which would be generated whenever $|\rho| > 1$ in Equation [5.10]. I do not think the theoretical constructs or the data that political scientists are interested in generally have these characteristics, although a theory that predicted an ever-spiraling arms race might be one example of a potentially explosive political phenomenon.

7. Furthermore, as Phillips (1988) proves, there exists a class of *near-integrated* time series that share the characteristics of purely integrated processes. The effects of shocks to these near-integrated series are so persistent that, for all intents and purposes, they should be treated as if they were integrated. This category of near-integrated time series -- those with a root close, but not equal to, unity -- consists of stationary time series with a highly autoregressive component and nonstationary time series with a mildly explosive root as well as general ARIMA processes (Phillips 1988, 1022).

8. Note that I am talking about the case where ρ equals +1.0, which is the most likely case for the data that political scientists and economists analyze.

9. Because I will use quarterly data for part of my empirical analyses, it also will be important to test for seasonal unit roots. The DF, ADF, and KPSS tests are appropriate for testing for the presence of a single unit root at zero frequency; however, as Hylleberg, Engle, Granger, and Yoo (1990) show, seasonality in the data can sometimes generate such zero frequency unit roots. Hence, I also discuss the HEGY tests for seasonal unit roots in Appendix A.

10. Cointegration in its purest form occurs between and among $I(1)$ variables. However, Phillips (1988a) shows that near-integrated time series also will be cointegrated with integrated regressors.

11. Hence, as Engle and Granger (1991, 6) note: "For a pair of actual economic series that are cointegrated, it is an interesting question to ask what is the common factor?"

12. Although the residuals from either or both regressions can be tested for stationarity and cointegration, in the structural model setting, an analyst would normalize the cointegrating regression on the endogenous variable. As Wooldridge (1992) points out in his discussion of *generalized cointegration*, this normalization forces the endogenous variable to be among any $I(0)$ linear combination because it sets its coefficient to unity. In the bivariate case, this normalization is of little consequence because if x_t is $I(1)$, then when $\beta \neq 0$, y_t must be $I(1)$. However, in a multivariate setting, if x_{1t} and x_{2t} are two $I(1)$ regressors that are cointegrated with each other, then y_t can be either $I(0)$ or $I(1)$. In either case, y_t will be cointegrated with x_{1t} and x_{2t} -- either purely because it is also an $I(1)$ process or in the generalized sense because its coefficient has been forced to be unity (Wooldridge 1992).

13. However, note that for pedagogic purposes, I have normalized the error correction term on y_t in both equations.

14. This is typically accomplished using a full information maximum likelihood procedure developed by Johansen (1988, 1991).

15. In fact, Engle and Granger's derivation of the reduced form error correction representation shows that it is simply a re-parameterized vector autoregression with nonlinear restrictions across the equations. These restrictions on the long-run impact multiplier matrix reduce the number of unit roots in the system. In the stationary case, there are no unit roots in the system so these restrictions need not be imposed. However, in a VAR with integrated and cointegrated regressors in levels, these restrictions need to be imposed but are not, and so the unit roots

in the system are implicitly estimated. Consequently, the OLS coefficient estimates from an unrestricted VAR on integrated and cointegrated levels have nonstandard distributions for precisely the same reasons as do coefficient estimates from a cointegrating regression (Sims, Stock, and Watson 1990; Engle and Yoo 1991).

16. Although most analysts give the issue little thought, the fact that the first differences of x_t enter the structural model autoregressively implies that ξ_t is not iid, but is potentially a stationary ARMA process. There is no theorem that says that an ECM must or must not contain contemporaneous or lagged first difference terms as regressors. Lagged first differences appear in the Engle-Granger ECM representation because these authors assume a parametric form for serial correlation in ξ_t .

17. Note that (a) implies (b).

18. A variable, y_t , "Granger causes" another variable x_t if by incorporating the past history of y_t , one can improve a prediction of x_t based only on the history of x_t (Granger 1969; Freeman 1983, 327).

19. Stock (1987) shows that the NLS estimate of $\hat{\beta}$ is also super consistent. But Phillips (1991) shows that the strict exogeneity of x_t to e_{2t} and v_{2t} is required for standard inference about $\hat{\beta}$. In the absence of strict exogeneity, $\hat{\beta}$ will have an asymptotically normal distribution only if information about the data-generating process for x_t is used during system estimation. For Stock's NLS estimator, this means using seemingly unrelated systems NLS (Phillips 1991, 297). When strict exogeneity holds, the simulation evidence of Phillips and Loretan (1991) suggests that the NLS estimator may have better small-sample properties than does the OLS estimator.

20. Under this interpretation, the lagged value, x_{t-1} , is implicitly being used as an instrument for the potentially endogenous x_t in Equation [5.29] (e.g.; Phillips 1989, 201).

21. To avoid this problem, analysts need, in effect, to "back out" the correct standard errors and t-ratios as well as to compute $\hat{\beta}$. My reading of Phillips (1991, 286-287) suggests that an approximation to the appropriate standard errors and t-ratios could be obtained by setting $\alpha_2 = -1$ and re-estimating the ECM via OLS. The restriction that $\alpha_2 = -1$ implies that the long-run effect occurs instantly, in which case, $\theta = -\alpha_2\beta = \beta$, and the resulting standard errors and t-ratios are approximately those for β . These are only approximate, however, because the degrees of freedom would be different.

22. The Engle-Granger estimator is generally only appropriate for cases where there is a single cointegrating vector. If multiple cointegrating relationships exist, OLS produces an estimate of the

cointegrating vector that minimizes the sum of squared deviations from equilibrium. Unless this minimum residual variance series is orthogonal to all other stationary linear combinations, OLS will not produce a unique estimate of any specific cointegrating vector (Wooldridge 1992).

23. The motivation for the two-step estimator can be seen by re-considering the bivariate, reduced form error correction system in Equations [5.24a] and [5.24b]. Because $\hat{\beta}$ can be estimated consistently by OLS when time series are cointegrated, regressing y_t on x_t produces a very good estimate of $\hat{\beta}$. Furthermore, because this estimate is used in each equation of the error correction system as if it were known, the cross-equation restriction, $\beta_{11} = \beta_{21} = \beta$, generated by the common unit root, is imposed in the second step so that Γ in Equation [5.26] is of reduced rank as it should be when time series are cointegrated.

24. Pagan (1984) provides an interesting discussion of a unified framework for thinking about two-step estimators. My discussion is influenced by his.

25. The following discussion draws primarily from Wooldridge (1992).

26. Saikkonen (1991) argues that the advantages of the leads and lags procedure are that no parametric assumptions are made and the model can be estimated via OLS in the time domain. Previously suggested approaches were either semi-parametric (Phillips and Hansen 1989) or relied on spectral regression (Phillips 1991b).

27. Wooldridge (1992) points to the Berk (1974) estimator as one simple alternative for obtaining an estimate of $\hat{\omega}_w^2$. The Berk estimator is computed as:

$$\hat{\omega}_w^2 = \hat{e}_w^2 / (1 - \hat{a}_1 - \dots - \hat{a}_p)^2$$

where the estimates for a_1 through a_p are from the OLS regression of w_{2t} on P lags of itself and where $\hat{e}_w^2$ is the square of the standard error from this regression.

28. Any coefficient on a stationary variable in a non-augmented cointegrating regression has a standard distribution (Sims, Stock, and Watson 1990), so its standard error and t-ratio do not need to be adjusted. However, if stationary regressors other than the leads and lags are included in a augmented cointegrating regression, the standard errors and t-ratios for these coefficients should come from the original non-augmented cointegrating regression (Wooldridge 1992).

29. Note that system estimation may be necessary in my particular two-equation system since presidential approval and citizens' economic forecasts could plausibly be endogenous. In that case,

the Johansen estimator could be used to obtain consistent and asymptotically efficient first-step estimates of the cointegrating vector(s), which could then be used in second-step estimation of the two error correction models.

30. The estimate of $\hat{\alpha}_1$ has a standard distribution because it is the coefficient on the stationary error correction term. Thus, its t-ratio can be used in the typical way.

CHAPTER SIX

MEASUREMENT AND MODEL OPERATIONALIZATION

The theoretical hypotheses outlined in Chapter Three and Chapter Four have a number of implications that can be tested using the methods and estimators discussed in Chapter Five along with a number of auxiliary tests. For instance, within the context of presidential approval, the *accountability equilibrium* and *dynamic information adjustment (I)* hypotheses suggest that approval can be modeled as an error correction process. Similar implications follow from the *high-information convergence* and *dynamic information adjustment (II)* hypotheses as applied to economic forecasts. In addition, these hypotheses also imply that certain subsets of variables will share a common pattern of dynamic equilibration that is influenced by the diffusion of information across citizens over time. To test these theoretical implications, I will perform three types of empirical tests that attempt to answer the following questions:

- (a) Do operationalized versions of the *presidential accountability* and *economic forecasting* models adequately fit the data?
- (b) Is there evidence of one or more common latent dynamic equilibrium relationships linking the levels of either presidential approval or economic forecasts to appropriate subsets of exogenous variables?
- (c) Is there evidence that the dynamics of presidential approval and/or economic forecasts change in response to variation in information over time?

The answers to these questions will shed considerable light on my theoretical hypotheses.

THE PRESIDENTIAL ACCOUNTABILITY MODEL

To address these questions, I must operationalize the aggregate-level models discussed in chapters three and four. To begin, recall the general version of the *presidential accountability model*:

$$\Delta a_t = \delta_0 + \sum_{k=1}^K \delta_k d_{kt} + \alpha (a_{t-1} - \sum_{j=1}^J \beta_j x_{jt-1}) + \epsilon_t \quad (6.1)$$

with $-1 < \alpha < 0$ and where Δ represents the first difference operator; a_t is the aggregate level of presidential approval; each x_{jt} is an indicator of the j th observed or forecasted valence outcome; and each d_{kt} is an indicator of the k th dramatic political event.

The Dependent Variable: Approval Changes

I begin the process of operationalizing this model with a discussion of the dependent variable of interest -- the period-to-period change in presidential approval. Although most of the existing literature on the determinants of presidential approval deals with the relationship between the level of aggregate approval and the levels of other explanatory factors, the *presidential accountability model* takes the first differences or changes in approval as the endogenous variable. From a conceptual point of view, the decision to model the first differences of aggregate presidential approval results from my interest in linking micro-level opinion change to net changes in aggregate

approval. And my interest in *net change* follows from my belief that shifts in aggregate approval have important political consequences. In my view, both the magnitude (i.e.; the level) as well as the direction of change in public approval of the president's job performance influence presidential decisions to use the bargaining, command, or going public power strategies. Furthermore, the media's "horse-race" coverage of presidential approval, which focuses on the sources of the most recent changes in public opinion, likely reinforces the real and presidentially-perceived impact of those changes on political outcomes. Some empirical evidence of the political relevance of both is provided by Marra and Ostrom (1989) who find that both the change in and the level of presidential approval have a statistically significant impact on the number of seats a party wins or loses in elections for the U.S. House of Representatives.

Although I will use changes in presidential approval as the dependent variable, the *presidential accountability model* also provides considerable insight into movements in the level of presidential approval over time. By subtracting a_{t-1} from both sides of Equation [6.1], the model can be interpreted in terms of the influence of dramatic political events and valence outcomes on the *level* of presidential approval. In fact, Davidson, Hendry, Srba, and Yeo (1978) argue that an error correction model is simply "a reformulated levels equation." One advantage of this ECM specification for my

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purposes is that it links changes in and the levels of presidential approval by specifying approval changes as a function of last period's equilibrium error between the levels of the equilibrium variables.

Given this, I operationalize the dependent variable as the period-to-period change in the percentage of respondents who indicate they approve of the president's job performance when asked to respond to Gallup's question: *"Do you approve or disapprove of the way _____ is handling his job as president?"* Because of data availability, my empirical analyses will be confined to the 1953-1988 period covering the Eisenhower through Reagan administrations. Some of my analysis will use quarterly data because one of my explanatory variables is available on only a quarterly basis before 1978. When possible, I will analyze monthly data because I think that a monthly period is closer to the natural frequency that political leaders and citizens use when they think of the president's performance.¹ To give the reader a feel for the magnitudes of the levels and the changes in monthly presidential approval over time, Tables 8 and 9 present the means and standard deviations of both for presidents Truman through Bush (1949-1992).²

Gallup polls that include the presidential approval question are often taken more frequently than once a month; they are not, however, taken at regular intervals, nor are they even always taken at least once a month. To aggregate

Table 8. Monthly Levels of Approval, 1949-1992

| | MEAN | STANDARD
DEVIATION | MINIMUM | MAXIMUM | N |
|-------------|-------------|-------------------------------|----------------|----------------|----------|
| Truman (II) | 38.03 | 11.74 | 23.00 | 69.00 | 48 |
| Eisenhower | 65.23 | 6.97 | 49.00 | 79.00 | 96 |
| I | 69.90 | 4.79 | 57.00 | 79.00 | 48 |
| II | 60.55 | 5.54 | 49.00 | 73.00 | 48 |
| Kennedy | 70.33 | 7.20 | 56.00 | 80.50 | 35 |
| Johnson | 55.56 | 13.40 | 35.00 | 80.00 | 61 |
| Nixon | 50.84 | 12.06 | 24.00 | 67.00 | 67 |
| I | 56.42 | 5.13 | 48.00 | 67.00 | 48 |
| II | 36.74 | 13.11 | 24.00 | 65.00 | 19 |
| Ford | 47.47 | 6.45 | 38.00 | 71.00 | 29 |
| Carter | 46.28 | 12.38 | 27.00 | 72.30 | 48 |
| Reagan | 52.86 | 7.62 | 36.30 | 68.00 | 96 |
| I | 50.14 | 7.50 | 36.30 | 68.00 | 48 |
| II | 55.58 | 6.79 | 40.00 | 68.00 | 48 |
| Bush | 60.56 | 14.34 | 30.50 | 85.60 | 48 |
| All years | 54.77 | 13.58 | 23.00 | 85.60 | 528 |

Table 9. Monthly Changes in Approval, 1949-1992

| | MEAN | STANDARD
DEVIATION | MINIMUM | MAXIMUM | N |
|-------------|-------------|-------------------------------|----------------|----------------|----------|
| Truman (II) | -0.81 | 3.05 | -10.00 | 8.00 | 47 |
| Eisenhower | -0.09 | 3.48 | -9.00 | 11.00 | 95 |
| I | 0.23 | 3.76 | -9.00 | 11.00 | 47 |
| II | -0.42 | 3.18 | -6.00 | 7.50 | 48 |
| Kennedy | -0.22 | 3.75 | -6.00 | 12.00 | 34 |
| Johnson | -0.58 | 3.06 | -7.50 | 7.00 | 60 |
| Nixon | -0.53 | 3.70 | -8.50 | 10.50 | 66 |
| I | 0.00 | 3.65 | -8.00 | 10.50 | 47 |
| II | -1.84 | 3.56 | -8.50 | 6.00 | 19 |
| Ford | -0.64 | 3.81 | -13.00 | 6.00 | 28 |
| Carter | -0.68 | 5.05 | -14.00 | 15.70 | 47 |
| Reagan | 0.13 | 3.21 | -9.30 | 7.00 | 95 |
| I | 0.20 | 3.09 | -9.30 | 7.00 | 95 |
| II | 0.00 | 3.36 | -8.00 | 6.00 | 47 |
| Bush | -0.29 | 6.35 | -15.25 | 14.33 | 47 |

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the available Gallup approval data into monthly values, I followed some of the decision rules outlined in Ostrom and Simon (1985). For instance, in months where Gallup asked the approval question more than once, I used the average of all approval percentages for that month.³ When the interviewing period for a particular poll overlapped two different months, the approval percentage from that poll was used in both months. These rules can be contrasted with a coding plan used in other analyses (e.g.; Beck (1987, 1992) among others) in which the approval percentage from the last Gallup poll taken in a particular month is used as that month's value. There are tradeoffs associated with either practice since both potentially result in a loss of information. For instance, suppose a dramatic political event occurs at the beginning of a month. Taking the approval rating from the last poll in the month could completely miss the initial magnitude of the effect of this event. Averaging across all the polls in a given month retains part of these effects, although it admittedly smooths them into the other approval changes that occur in that month.

One of the more problematic issues associated with the measurement of approval for this study is that Gallup sometimes suspends general polling in order to concentrate its resources on polls for election trial heats. As a result, the approval question has not always been asked during the months preceding a presidential election. For instance, Gallup did

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not ask the approval question in September and October 1956, October 1968, July through October 1972, August through November 1976, October 1980, and August 1984. The fact that these data are missing is unfortunate -- especially with respect to tests of some of the arguments made in this dissertation. Information about the president's performance is likely to be more highly concentrated and hence inescapable for all citizens during these pre-election periods. And it would be valuable to know precisely how approval changes during these times in order to perform a stronger test of my hypotheses. Therefore, inferences drawn from my model about the rate of error correction will likely be more applicable to non-election periods and the estimated effects may understate those that occur during campaign periods.

Interestingly, few analysts really consider this data problem and few report the way in which they interpolate these missing values. Ostrom and Simon (1985) report that they replace missing values with the average of the approval ratings from the most recent polls before and after the gap. However, when more than one month is missing, their practice results in no change in approval during the interpolated months. To avoid this, I interpolate these missing values using the average change in approval from the closest before and after polls. I then parcel this average change in equal increments over the months of missing data. Although both practices generate a constant *change* in approval over the

months in which data are missing, under my approach, the interpolated approval levels are not constant because the changes are not zero.

Explanatory Variables: Transitory Influences

I rely heavily on the existing approval literature for guidance in operationalizing the d_{kt} dramatic political events. There are two important issues associated with these events: (a) their identification and selection and (b) the manner in which their duration is accounted for within the context of a statistical model. The important issue with respect to the selection of dramatic political events is to define the concept of a dramatic political event *a priori* so that they are identified in a systematic and theoretical, rather than *ad hoc*, manner. Mueller's (1970) definition of a "rally 'round the flag" event provides a useful point of departure. According to Mueller (1970, 21), international rally points:

must be associated with an event which 1) is international and 2) involves the United States and particularly the president directly; and it must be 3) specific, dramatic, and sharply focused.

Mueller's list of international rally points includes 34 events for the 1945-1968 period (he includes the start of each president's term within this category). And after identifying these events, Mueller operationalizes a single rally 'round the flag variable as the length of time in years since the last rally point. By doing so, the effects of these events are restricted to decay monotonically over time.

MacKuen (1983) relies on Mueller's definition of a rally point, but expands the idea to include both domestic and international events. He ultimately selects (from the *World Almanac*, *Information Please Almanac*, and a list of televised presidential speeches from the *New York Times Index*) a set of 73 events "that had a dramatic quality and in which the president played a significant role." MacKuen then uses a transfer function methodology that allows him to estimate parameters for the initial impact, duration, and cumulative effects of each separate event on presidential approval.

Ostrom and Simon's (1985, 1989) contribution to the identification of these events is to suggest that the set of dramatic, sharply focused events should be honed to include only those that receive front-page coverage in the *New York Times*. They also make important suggestions about four categories (approval-enhancing events, approval-diminishing events, foreign travel, and presidential speeches) and three domains (international, domestic, and personal) into which presidentially-relevant dramatic events can be classified. Ostrom and Simon (1985) identify a set of 85 such events for the Eisenhower through Carter administrations, while Ostrom and Simon (1989) select another 31 such events for the Reagan years. In their earlier analysis, these authors constrain the effects of these events to decline exponentially over a four-month period, while in their later model, the rate of

exponential decay is left as an unknown parameter to be estimated from the data.

I will use the two lists of dramatic political events compiled by Ostrom and Simon (1985, 1989). This choice is motivated by my theory, which suggests that the reason dramatic political events cause transitory boom and busts in aggregate presidential approval is because they represent happenings about which the entire public receives a highly concentrated dose of information. Thus, it seems logical to me to separate those events that receive front-page *NYT* coverage from those that do not. My argument is not that I think every person reads the *New York Times*, but instead that front-page *NYT* coverage of a dramatic event is correlated with media coverage in general and with topics of citizens' interpersonal discussions.

From these lists, I will create a series of dramatic political event variables that will be operationalized as a 1 in the period in which an event within a certain category occurs and a zero otherwise. These "pulse" variables are used to capture the immediate but visceral effects that these dramatic events are hypothesized to evoke from the citizenry. With respect to the direction of the effects of these variables, I expect approval-enhancing events and foreign travel to increase approval while approval-diminishing events should create decreases in approval. The existing evidence on the effects of presidential speeches is mixed. Ragsdale (1984)

argues that speeches should lead to increases in presidential approval. I have no *a priori* expectation about the direction of the effects of presidential speeches on approval.

Within the context of the *presidential accountability model*, the duration of the effects of these short-term forces can be calculated from the estimate of the parameter α , which represents the rate at which any deviation from equilibrium is exponentially corrected over time. Although in this model a single parameter performs "double duty" with respect to the duration of long-run and short-run factors, the fact that the d_{kt} dramatic political events are not specified as part of the equilibrium relationship means that these events have direct effects on the level of approval, but do not affect the other factors involved in the equilibrium relationship. As a result, dramatic political events can only shift the level of approval temporarily away from equilibrium. In contrast, the long-run x_{jt} factors drive approval up and down toward new equilibrium values. In other words, dramatic political events create *exogenous shocks* to approval but do not cause fundamental equilibrium shifts.

Explanatory Variables: Fundamental Forces

The factors capable of causing fundamental *equilibrium shifts* to presidential approval are those associated with citizens' institution-based expectations of the job performance of the ideal president. Citizens are expected to reward and punish presidents in proportion to the size of

deviations of observed and forecasted outcomes from the ideal. Because these expectations are homogeneous and fixed, the aggregate equilibrium relationship can be specified without observing these expectations by assuming that the greater the distance of observed and forecasted valence outcomes from the ideal, the greater will be the punishment levied on the president in the form of revocations of approval. Thus, the aggregate-level *approval equilibrium* relationship can be expressed as:

$$a_t = \beta_0 + \sum_{j=1}^J \beta_j x_{jt} + u_{1t} \quad (6.2)$$

where the x_{jt} denote observed and forecasted valence outcomes associated with economic prosperity, security, and executive integrity. This equilibrium relationship lies behind the error correction process in the *presidential accountability model* since it is this equilibrium state toward which the level of approval moves as citizens' opinions change. To operationalize this equilibrium relationship, I need to find indicators for the x_{jt} valence outcomes.

Indicators of Economic Prosperity: Realized Outcomes. As shown in Table 3, the economic problems of unemployment and the cost of living dominate citizens' opinions about the nation's most important problem. In addition, the existing literature on presidential approval provides empirical evidence that suggests that unemployment and inflation (an indicator of the cost of living) are related to aggregate

levels of presidential approval. Therefore, I will use monthly and quarterly measures of inflation and unemployment to represent the observed economic outcomes for which citizens hold the president responsible. With respect to these indicators, I operationalize unemployment as the monthly rate of civilian unemployment. In quarterly analyses, I will use the average of the monthly unemployment rates across the three months in a particular quarter. In addition, I will operationalize the level of inflation (for both months and quarters) as the annualized percentage rate of change in the Consumer Price Index.⁴ As either unemployment or inflation increase, presidential approval should decline.

These measures of unemployment and inflation are chosen to reflect the type of information that is available to citizens from the media. For instance, both print and electronic media report government announcements of the unemployment rate by discussing whether the change in the unemployment rate is up or down and what the current unemployment rate is. With respect to inflation, media reports about the Consumer Price Index rarely focus on its absolute level. Instead, the media generally provide information about the direction of the period-to-period rate of change in the CPI, and the implications of these changes tend to be discussed in terms of an annualized rate. This probably encourages citizens to think of the annualized percentage rate of change in the CPI as the level of

inflation.⁵ For example, Conover, Feldman, and Knight (1987) find that individuals who have information about inflation report it to researchers in terms of an annualized rate.

Indicators of Economic Prosperity: Forecasted Outcomes.

The measures of unemployment and inflation discussed above are indicators of observed or realized economic conditions. However, as the arguments in Chapter Three suggest, I also expect citizens to hold the president accountable for the extent to which their forecasts of future economic conditions fail to match those expected from the ideal president. Therefore, the x_{jt} explanatory variables also must contain a measure of citizens' predictions of the economic future. The measure of economic forecasts that I will use is based on responses to the question: *"Now turning to business conditions in the country as a whole -- do you think that during the next 12 months we'll have good times financially, or bad times, or what?"* Respondents are allowed to place themselves in one of five categories in response to this question. The measure of economic forecasts that I will use is the percentage of people replying either an unequivocal or a qualified "bad times" to this question. The percentage of those responding negatively is an indicator of concern and discontent with the future economic climate the incumbent president is perceived to have provided. As the percentage of negative forecasts increases, aggregate approval should decline.

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This survey question about future business conditions is one of the five questions that comprise the University of Michigan's Index of Consumer Sentiment (ICS). The other four questions are:

- (a) We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?
- (b) Now looking ahead -- do you think that a year from now you (and your family living there) will be better off financially or worse off, or just about the same as now?
- (c) Looking ahead, which would you say is more likely -- that in the country as a whole we'll have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression or what?
- (d) About the big things people buy for their homes -- such as furniture, a refrigerator, stove, television, and things like that. Generally speaking do you think that now is a good or a bad time for people to buy major household items?

MacKuen, Erikson, and Stimson (1992) factor analyze the mean responses to the five ICS questions and find that responses to the question about durable goods are not strongly connected to the responses to other ICS questions. However, with respect to the remaining four questions, MacKuen et al. find that the mean responses to prospective economic evaluation questions are a function of and subsume the mean responses to the questions capturing retrospective evaluations. In addition, they find that the mean responses to the business conditions questions are a function of the mean responses to those questions dealing with personal family finances. Thus, they conclude that the most politically relevant items from the ICS

are the questions that ask citizens about their forecasts of future national or business conditions.⁶

Of the five questions that comprise the Index of Consumer Sentiment, two ask respondents about future business or national conditions. The measure that I will use asks respondents to predict future business conditions over the next year, while the other (given in (c) above) asks for a prediction about conditions over a five-year period. MacKuen, Erikson, and Stimson provide the following rationale for their use of the question with the five-year rather than one-year forecasting horizon:

The two measures of business expectations are too highly correlated (.95) to include both. When the two are in the same regression equation, the long-term measure always dominates short-term expectations. Accordingly, we drop the latter and keep the former.

Clearly, their decision is based upon empirical criteria alone with no thought to sorting out theoretical distinctions between the two measures. Unfortunately, my theory does not predict whether I should expect people to hold the president accountable for their less than ideal forecasts of the national economic climate over the next year or over the next five years. However, given that a president is guaranteed only four years in office, I think citizens will primarily hold a president responsible for less than ideal forecasts of the upcoming year rather than holding him or her accountable for anticipated events that may not even take place during his or her tenure in office. That is, I think citizens are more

likely to judge a president's performance in terms of the immediate future rather than with respect to his or her longer-run legacy. As a result, I think it more appropriate to use the responses to the year-ahead business conditions forecasting question rather than the five-year question.

My second reason for choosing the one-year business conditions question is one of data availability. Responses to the five ICS questions have been collected with varying frequencies since the late 1940s as part of the annual Surveys of Consumer Finances (1949-1971), the "quarterly" Surveys of Consumer Attitudes and Behavior (1953-1977), and the monthly Surveys of Consumer Attitudes and Behavior (1978 to the present). These surveys were initiated by behavioral economist George Katona initially under the auspices of the Federal Reserve and later in conjunction with the University of Michigan's Survey Research Center, and I obtained the bulk of my post-1960 data on consumer sentiment from the Inter-University Consortium for Political and Social Research.⁷ However, ICPSR did not have all of the pre-1966 surveys and had very little pre-1960 data in its archive. As a result, I turned to publications by Katona and his colleagues in the *Federal Reserve Bulletin* (November 1948, June 1950, March 1955, and March 1959), *Consumer Expectations 1953-56*, and various volumes of the *Survey of Consumer Finances* and *Surveys of Consumers*. These published sources more frequently reported the responses to the one-year ahead business

conditions question than they did to the five-year ahead question.

But even using these additional publications, I was unable to obtain data for 14 quarters. The quarters for which data are missing are: the first, and second quarters of 1953, the third quarter for all years from 1953 through 1961, the third and fourth quarters of 1964, and the second quarter of 1965. Apparently, third quarter data from the years 1953 through at least 1959 (7 of the 14 missing data points) simply do not exist because during that period the "quarterly" surveys were taken only three times a year. Richard Curtin (who now directs the surveys) confirms this in a 1982 *Public Opinion Quarterly* article in which he reports: "Many of the questionnaire items used in the Surveys of Consumer Sentiment date back to the mid-1940s, and were regularly measured three times a year in the 1950s, quarterly from 1960 through 1977, and on a monthly basis since 1978." To deal with these missing data, I will drop the first three quarters of the Eisenhower administration from my analysis. I also will interpolate the data for the remaining 11 missing quarters (6 of which do not exist) just as I did for the missing approval data.⁸ And so because of data availability constraints, my quarterly analyses begin in the fourth quarter of 1953 and my monthly analyses begin in 1978. All quarterly and monthly analyses will extend through 1988.⁹

Indicators of Executive Integrity. As discussed in Chapter Three, citizens' beliefs about the job performance of the ideal president also consist of their preference for executive integrity. And so the x_{jt} explanatory variables associated with the long-run *accountability equilibrium* also must contain a measure to capture outcomes along this dimension. To operationalize an executive integrity variable, I make a distinction between those scandals and improprieties that involve the president indirectly via his or her association with subordinates accused of illegal or unethical acts and those scandals that are perceived by the public to involve the president directly. By direct presidential involvement, I mean situations in which either the president is alleged to have engaged in the illegal or unethical activity or to have been directly involved by authorizing or allowing the scandal to be covered up.

I think this distinction is important because the evidence in Table 2 about citizens' institution-based expectations shows that citizens believe an ideal president should not "use the office of the president for *personal gain*" (emphasis added) and should not "hide things from the public." Both of these beliefs revolve around the direct involvement of the president, and in citizens' minds, the institution of the presidency itself, in some illegal or unethical activity. But although most modern presidents have been faced with disclosures about the unethical or illegal behavior of aides

and confidants, few have faced allegations of unethical or illegal *presidential* behavior. By distinguishing between direct and indirect presidential involvement in a scandal, I hope to separate those scandals that call into question a president's personal judgment about his or her advisors versus those scandals in which the public perceives the powers associated with the institution of the presidency to have been abused.

For instance, consider the events surrounding the resignation of Eisenhower's chief of staff, Sherman Adams. During investigations by the House Subcommittee on Legislative Oversight, Adams testified that he had accepted gifts of an oriental rug and material for a vicuna coat from a wealthy Bostonian who was being investigated by two federal agencies. Apparently, Adams also had been in communication with those federal agencies regarding his friend's case, and Adams was alleged to have tried to influence the decisions of these agencies. Although these events may have led to temporary shifts in Eisenhower's approval from citizens who questioned Eisenhower's association with Adams, these events did not fundamentally alter the equilibrium level of Eisenhower's approval because there was no attempt by Eisenhower to cover this scandal up nor was Eisenhower alleged to be directly involved in the questionable behavior of Adams. Thus, Adams' behavior did not indicate that the president had abused the powers of the institution of the presidency in any way.

However, the Watergate (Nixon) and Iran-contra (Reagan) scandals are two scandals in which the powers associated with the institution of the presidency were alleged to have been abused either because the president directly authorized the illegal or unethical activity or because the chief executive failed to make a full disclosure about the events. The two scandals likely generated deviations from citizens' fundamental institution-based expectations of the president. To capture the effects of these *institutional scandals* on presidential approval, I will operationalize a scandal variable that takes the value of 1 from March 1973 through August 1974 (i.e.; from the release of McCord's letter to Judge Sirica through Nixon's resignation) and from November 1986 to December 1988 (i.e.; from the time of the initial revelations of an arms-for-hostages deal through the end of Reagan's term) and is a zero otherwise.¹⁰ I also will alternatively use separate dummy variables for each of these scandals to investigate whether their effects on approval differ. The decision to use a dummy variable to operationalize these institutional scandals is based on the idea that these events cause fundamental (i.e.; structural) shifts in citizens' opinions of the president's job performance. I expect approval to decline in the wake of an institutional scandal.

Indicators of Security. With respect to international security, the evidence in Table 2 shows that citizens

simultaneously expect a president to develop good relations with other countries, to keep the U.S. out of unnecessary wars, and to stand up for the U.S. in foreign affairs. Given these multiple preferences, I will use both an indicator of war and an indicator of international tension short of war to capture these two types of preferences. To operationalize concerns about war, I will use the number of soldiers killed per quarter during the Vietnam War. These data were collected from weekly reports of battle casualties in the *New York Times*.¹¹

Most aggregate-level models of approval use a measure of battle casualties to control statistically for the effects of the Vietnam War on Johnson's and Nixon's approval ratings. However, the theoretical rationale for the inclusion of this variable in my model arises from my arguments about the way in which outcomes associated with citizens' institution-based expectations of the president tap fundamental beliefs and attitudes that citizens hold about their welfare and self interest. That battle casualties might be related to a citizen's self interest is reflected in the following remarks by Neustadt (1980, 72):

One should never underestimate the public's power to ignore, to acquiesce, and to forget, especially when the proceedings seem incalculable or remote from private life. Unless the shooting starts, a Lebanon may be remote, a Berlin seems incalculable, sputniks overhead become routine. But paychecks, grocery bills, children's schooling, sons at war are quite distinctly matters of real life.

Thus, battle deaths would seem to be a useful indicator of a security outcome for which citizens hold the president accountable. Presidential approval should fall as the number of battle deaths increases.

The second variable that I will use is a measure of international tension between the U.S. and the now-defunct Soviet Union. As Table 2 shows, citizens expect the president to establish good relations with other nations, and since the USSR was the most important "other nation" during the 1953-1988 period, citizens' evaluations of the president along the security dimension were likely influenced by the degree of U.S.-Soviet tension. To measure the level of tension, I will use data from Goldstein and Freeman (1990) on net U.S.-Soviet cooperation, where net cooperation is a weighted sum of all cooperative acts by the U.S. directed at the Soviet Union minus the weighted sum of all hostile U.S. acts. As net cooperation increases, international tension should ease, and presidential approval should rise.

The Operationalized Model

Given the indicators discussed above, the operationalized version of the *presidential accountability model* can be expressed as:

$$\Delta x_{1t} = \delta_0 + \sum_{k=1}^K \delta_k d_{kt} + \alpha (x_{1t-1} - \sum_{j=2}^6 \beta_j x_{jt-1}) + \epsilon_{1t} \quad (6.3)$$

where x_{1t} is the level of presidential approval, x_{2t} is the unemployment rate, x_{3t} is inflation, x_{4t} captures economic forecasts, x_{5t} is U.S.-Soviet tension, x_{6t} is battle deaths, x_{7t} represents institutional scandals, and d_{kt} is the k th dramatic political event. As noted above, I expect to find $\beta_1, \beta_2, \beta_3, \beta_5$, and $\beta_6 < 0$ and $\beta_4 > 0$.¹²

Tests of $H_{3.1}$, the *accountability equilibrium hypothesis*, will receive confirmation if evidence of a common latent equilibrium relationship between the level of presidential approval and the levels of the fundamental forces (the x_{jt}) is found. For instance, this hypothesis will receive support if the following statistical relationship holds:

$$\hat{z}_{1t} \sim I(0) \text{ provided } x_{jt} \sim I(1) \text{ for some } j > 1$$

where $\hat{z}_{1t} = x_{1t} - \sum_{j=2}^6 \hat{\beta}_j x_{jt}$. This statistical statement implies that presidential approval will be cointegrated with at least one of the x_{jt} explanatory variables after controlling for the others.¹³

Partial and indirect tests of $H_{3.2}$, the *dynamic information adjustment hypothesis (I)*, also can be accomplished within the context of the model in Equation [6.3]. This hypothesis implies that changes in presidential approval should be a function of an error correction process; that is, in order for movements toward equilibrium to occur, disequilibrium between the levels of approval and the level of

valence outcomes must dissipate over time. Thus, this hypothesis implies that the following statistical relationship will hold:

$$-1 < \alpha < 0$$

Values of α in the $(-1, 0)$ interval ensure that the effects of disequilibrium decay over time so that the level of presidential approval converges toward its accountability equilibrium state. Although this test can provide support for the idea that changes in approval are a partial, rather than complete and instantaneous, response to deviations from the hypothesized equilibrium state, it does not provide a direct test of my argument that citizens' changing responses to information are responsible for these dynamic adjustments. Hence, I will specify direct tests of my information diffusion arguments below.

Finally, with respect to tests of $H_{3.3}$, the *exogenous shock hypothesis*, standard hypothesis tests of the significance of the individual coefficients for each of the dramatic event variables in the *presidential accountability model* will allow me to determine which events generate changes in presidential approval. But such tests do not allow me to determine whether my theoretical classification of these events as short-run factors rather than long-run, equilibrium forces is empirically supported. One way to test this distinction is to regress a constant term on all of the x_{jt} equilibrium variables. If I have adequately accounted for the

equilibrium relationship, then the residuals from this regression should be randomly distributed around the constant. If this test indicates there is a systematic long-run variable missing from the equilibrium relationship, then the first place to begin to look is among the variables that I have classified as short-run forces. Although this is a diagnostic rather than a statistical test, it can supplement the evidence obtained via estimation of the presidential accountability model.

THE ECONOMIC FORECASTING MODEL

To test my hypotheses about the determinants of mass economic forecasts, I must operationalize the *economic forecasting model*. Recall that the general version of this model for the j th economic outcome is given by:

$$\Delta O_{jt}^f = \gamma_0 + \lambda (O_{jt-p}^f - \eta_j O_{jt-1}) + v_{jt} \quad (6.4)$$

where $-1 < \lambda_j < 0$ and where O_{jt}^f is an aggregate average forecast for the j th economic outcome and O_{jt} is the realized outcome.

Although an analyst might potentially operationalize separate models for citizens' point estimates of future inflation and unemployment, I do not think that most citizens' forecasts are that precise. Instead, those with low levels of awareness, exposure, and thus information focus on forming forecasts of the trajectory of future conditions (i.e.; better, same, worse). For this reason, I will use the period-

to-period change in x_{4t} , the previously-defined measure of economic forecasts, as the dependent variable for the *economic forecasting model*. Recall that x_{4t} is defined as the percentage of people who predict that future business conditions one year hence will be worse than present conditions. Since this variable represents a more global type of forecast, the model cannot be specified specifically with respect to the j th realized outcome. Instead, these forecasts likely represent a summary forecast of a number of realized conditions.

The Explanatory Variables

Given the previously-discussed evidence that inflation and unemployment have long been important economic concerns for citizens, it is likely that citizens are thinking of future values of these outcomes as they form their summary forecasts of future business conditions. Hence, the equilibrium relationship representing the aggregate degree of accuracy or inaccuracy of mass economic forecasts can be specified as follows:

$$x_{4t-p} - (\eta_1 x_{2t} + \eta_2 x_{3t}) = z_{2t} \quad (6.5)$$

where each variable is as defined in Equation [6.3] and where $p=4$ for quarterly data or $p=12$ for monthly data. In other words, citizens' forecasts of future conditions made one year ago will be proportional to a linear combination made up of the current inflation and unemployment rates. Deviations from

equilibrium occur when the percentage of people who made negative economic forecasts does not correspond with the realized outcomes they were meant to predict.

The Operationalized Model

Given the indicators discussed above and the equilibrium relationship specified in Equation [6.5], the *economic forecasting model* can be operationalized as:

$$\Delta x_{4t} = \gamma_0 + \lambda (x_{4t-p-1} + \eta_1 x_{2t-1} + \eta_2 x_{3t-1}) + v_{2t} \quad (6.6)$$

where all variables are as defined for Equation [6.5] and where the term in parentheses has the particular lag structure shown because it represents last period's aggregate equilibrium error. I expect to find η_1 and $\eta_2 > 0$.

Tests of $H_{4.1}$, the *high information convergence hypothesis*, will receive confirmation if evidence of a common latent equilibrium relationship between the level of mass economic forecasts and the levels of inflation and unemployment is found. For instance, this hypothesis will receive support if the following statistical relationship holds:

$$\hat{z}_{2t} \sim I(0) \text{ provided } x_{jt} \sim \text{for } j=2 \text{ and/or } j=3$$

where $\hat{z}_{2t}$ is defined as in Equation [6.5]. This statistical statement implies that economic forecasts made previously will be cointegrated with the current unemployment or inflation rates that these summary forecasts were meant to predict.

Just as in the model for presidential approval, partial and indirect tests of $H_{4.2}$, the *dynamic information adjustment hypothesis (II)*, can be undertaken within the context of the model in Equation [6.6]. This hypothesis implies that changes in economic forecasts should be a function of an error correction process; that is, in order for the level of previous forecasts to coincide with the mix of observed outcomes, forecasting errors must be corrected and dissipate over time. Thus, this dynamic adjustment hypothesis implies that the following statistical relationship will hold:

$$-1 < \lambda < 0$$

Values of λ in the $(-1,0)$ interval ensure that the effects of disequilibrium decay over time so that forecasting errors are reduced to zero. Evidence that this relationship holds supports the idea that a dynamic "error correction" process generates changes in forecasts, but it does not provide direct evidence that those adjustments are the result of the diffusion of information. I will outline direct tests of this idea below.

AUXILIARY TESTS

Provided that strict exogeneity holds, the *presidential accountability* and *economic forecasting* models can be estimated separately using one of the estimators discussed in Chapter Five. If these models generally fit the data, then this too provides evidence to support my theoretical claims. To assess the overall goodness of fit of these models and to

determine whether strict exogeneity holds, I will perform a number of diagnostic tests, the relevant details of which I will explain when the results of these are presented in Chapter Seven. But before turning to the empirical results, let me outline some additional tests for information diffusion and dynamic equilibration.

Investigating Latent Effects

The idea that aggregate levels of presidential approval should be in an equilibrium state with observed and/or forecasted valence outcomes suggests that the approval time series should move in tandem with indicators of these economic factors; that is, approval should share a common pattern of dynamic re-equilibration with one or more of these outcomes. Similarly, previous economic forecasts are expected to be in an equilibrium relationship with current inflation and unemployment. The source of these common dynamics is hypothesized to be the latent diffusion of information across subgroups of citizens. To investigate whether these common equilibrium relationships occur, I will use the Johansen FIML system approach to estimate a multi-equation system of conditional error correction models using quarterly data from the fourth quarter of 1953 through the fourth quarter of 1988. The $k=4$ variables that I will include in the system are the levels of approval, unemployment, inflation, and mass economic forecasts.¹⁴ The system I will estimate can be expressed as:

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$$\Delta X_t = \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-p} + \Gamma_p X_{t-p} + \epsilon_t \quad (6.7)$$

where $\Gamma_i = -(I - \sum_{j=1}^p A_j)$ for $\{i=1, \dots, p\}$, X_t is a k -dimensional vector, and where p is the order of the vector's autoregressive polynomial (i.e.; $A(L) = A_0 + A_1L + \dots + A_pL^p$). Under the null hypothesis that some of these series are cointegrated, Γ_p has a reduced rank of r , the number of cointegrating vectors. In addition, under the null, $\Gamma_p = A(1) = \alpha\beta'$ where α and β are each $k \times r$ matrices.

Determining whether any of these variables are cointegrated and whether any share a common dynamic pattern involves examining the rank of Γ_p , the matrix of long-run dynamic impact multipliers. When the $\text{rank}(\Gamma_p) = 0$, no long-run linear combinations are stationary and thus no subsets of integrated variables are cointegrated. When $\text{rank}(\Gamma_p) < k$ where k is the number of univariate unit root processes in the vector, then some linear combinations are stationary while others are unit root combinations. Evidence of the reduced dimensionality of this matrix suggests that the dynamics of one or more series in the vector are so similar that their associated characteristic roots cancel each other. Finally, when $\text{rank}(\Gamma_p) = k$, then the matrix has full rank, which indicates that the vector process is stationary because all linear combinations are stationary.

Using the Johansen estimator, the eigenvalues of Γ_p are estimated as the squares of the canonical correlations between

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the vector of residuals from the regression of first differences of each variables on the lagged first differences and the vector of residuals from a regression of the lagged level of each series on the lagged first differences. In other words, the squared canonical correlations between two subsets -- the variables in first differences and the variables in levels -- corrected for the effects of lagged first differences are estimates of the eigenvalues of Γ_p . The rank or dimensionality of the impact multiplier matrix is then determined by a series of sequential likelihood ratio tests of r , the number of stationary linear combinations (i.e.; equilibrium relationships) within the multiplier matrix. This likelihood ration test is given by: $-2\ln L = N^{-1}\sum_{i=1}^k \ln(1 - \lambda_i^2)$ where λ_i^2 is the i th eigenvalue. The eigenvectors, β , associated with these eigenvalues represent estimates of the parameters in the cointegrating vectors.

Presidential Approval and Information

My hypotheses suggest both that certain equilibrium relationships should exist among the x_{jt} explanatory variables and that the force that causes these common dynamic patterns is the diffusion of information across citizens. Within the context of the *presidential accountability model*, I will use two tests to determine the effects of information on the dynamics of presidential approval. The basic intuition behind each test is that if dynamic adjustments to approval are some function of the diffusion of information across citizens over

time, then including controls for over time variation in information should change the dynamic implications of the original *presidential accountability model*.

Information Test I. The first test that I will use to investigate the effects of information on the dynamics of presidential approval is drawn from the work of Stoker (1986). Stoker proposes a test to determine whether a model's dynamics arise from aggregation bias. So that readers can see why this approach might be relevant to tests of the *dynamic information adjustment hypothesis (I)*, I must briefly discuss some issues of aggregation.

My previous arguments suggest that the marginal impact of a change in information on an individual's decision to approve of the president is eventually the same for all citizens, but that some groups of citizens have a "delayed reaction" because they are not all exposed to information instantly and therefore they do not all have up-to-date information. However, others (Zaller 1992; MacKuen 1984) argue that citizens differ not only exposure to information, but also in their rates of acceptance of information, so that the marginal impact of a change in information on citizens' evaluation of the president's job performance differs for subsets of individuals.

When the marginal effects of a variable differ across subgroups of individuals, the micro-level behavioral relationships are necessarily nonlinear. Coefficient

estimates obtained from aggregate-level models that are specified in any way other than in the functional form that would arise from exact aggregation over these nonlinear relations are potentially biased. The source of this bias is related to the variances and other moments of the distributions of the model's explanatory variables. To see this, consider the example used in Stoker (1986) and Granger (1987) in which each individual-level relationship is exactly the same as every other and is specified as:

$$y_{it} = F(x) = \alpha + \beta_1 x_{it} + \beta_2 x_{it}^2 \quad (6.8)$$

In this case, the correctly specified aggregate-level regression is given by:

$$E_t(y) = \alpha + \beta_1 E_t(x) + \beta_2 (E(x))^2 + \beta_2 \text{Var}_t(x) \quad (6.9)$$

where the substitution $E_t(x^2) = \text{Var}_t(x) + (E(x))^2$ is implicit. Even an analyst who used the squared mean of x as a regressor will omit the variance term. As a result, OLS estimates of the model's parameters will be biased and inconsistent (unless Σx_{it} is an uncorrelated sequence). As Equation [6.9] implies, when one set of individuals in society makes decisions in a fundamentally different way than others, then the aggregate-level relationship may depend on the percentages of people in the relevant subgroups and on the way in which these percentages vary over time (Stoker 1986). If the composition (or distribution) of the electorate is ignored, these omitted distributional effects, "can be mistakenly interpreted as

evidence of dynamic effects in empirical studies of aggregate data" (Stoker 1986, 766).

If the underlying micro-relations are nonlinear, my arguments about mass reliance on elite cues and media information provide strong theoretical reasons to expect the effects of these nonlinearities to persist at the aggregate level because the type of public information disseminated by the media is a *common factor* within each citizen's decision rule. For instance, Granger (1987, 218) provides some examples of such public information:

A possible list of observable common factors, which are variables publicly available and may be expected to enter the decision-making mechanisms of most microunits, would include interest rates, tax rates (personal, corporation), previous values of macrovariables, and publicly announced forecasts of variables such as the index of leading indicators.

Formally, we might differentiate a common factor from an individual factor as follows:

$$x_{it} = \mu_t + x'_{it} \quad (6.10)$$

In this equation, each individual's explanatory variable, x_{it} , is linked by a common factor, μ_t . To put some concreteness to this, suppose x_{it} is an individual's forecast of future business conditions and consider the common factor to be media information about these forecasts. In addition, x_{it} is a function of *independent* individual factors, x'_{it} , which represent the difference between the individual's personal information about future conditions and the common media information. Assume that $E(x'_{it}) = 0$.

From a technical viewpoint, the presence of a common factor in citizens' forecasts creates systematic cross-sectional dependencies across individual forecasts that not only do not disappear at the aggregate level, but dominate the uncorrelated, private information upon which some citizens base their forecasts. To see this, notice that aggregating over the relationship shown in Equation [6.10] yields:

$$\sum_{i=1}^N x_{it} = N\mu_t + \sum_{i=1}^N x'_{it} \quad (6.11)$$

Assuming that the sample is large enough so that central limit theorem arguments can reasonably be said to apply, the variance of the first term will be of a higher order than the variance of the second sequence. Hence, the variance of the first sequence will dominate the sum, so that this sum will be well approximated by $N\mu_t$ alone. Thus, the aggregate effects of the individual dispersions, x'_{it} , around the common central tendency, μ_t , will not enter the macro-level equation. Furthermore, Granger (1987) proves that aggregating over nonlinear individual relationships when the explanatory variables include a common factor will necessarily yield aggregate relationships that are a function of the individual-level behavioral nonlinearity.¹⁵

Interestingly, both Stoker (1986) and Buse (1992) identify instances in which once controls for distributional effects are included in an aggregate-level model, the multiplier coefficients on the model's lagged exogenous

variables become statistically insignificant. In fact, Stoker finds that a static macro-level model that controls for individual heterogeneity is statistically equivalent to a simple dynamic model with first-order autocorrelation. Using Stoker's approach in a different context, Buse (1992) reaches a similar conclusion:

In three of the four cases we have examined, the dynamics are not statistically significant once the distribution effects are in the model. This suggests to us that we may have drawn the wrong conclusion from the literature. Rather than inferring the presence of dynamic [micro-level] behavior, we should perhaps have been concluding that the underlying behavioral equations are of a different functional form.

Thus, the issues of aggregation, common factors, and behavioral nonlinearities are relevant to tests of the information diffusion hypothesis and to the interpretation of the dynamic process specified in the presidential accountability model.

To determine whether a model's dynamics arise from aggregating over nonlinear individual-level relationships, Stoker (1986) suggests that analysts control for variation over time in the distribution of an exogenous variable by using cell proportions as regressors. For instance, since changes in approval have been shown to be a function of citizens' economic forecasts, then by controlling for the variation over time in the proportions of people with media information about these forecasts, I can capture any distributional effects that result from shifts in the distribution of information. (More precisely, these will

capture shifts in the distribution of information about forecasts that are independent of shifts in the mean of the forecast measure.) And so to implement this test, I need measures of the proportions of people with different levels of awareness and information who predicted future conditions would be worse.

To classify individuals into awareness subgroups, I will use education as a proxy for level of awareness. The assumption underlying this approach is that those with higher levels of education are more likely to be highly aware. I recognize that education is a coarse measure of awareness; however, other potential variables that might capture awareness are measured so infrequently that no continuous time series exists. In addition, on the basis of his tests of four different measures of political awareness, Zaller (1990b) concludes:

As expected, information outperformed the other measures of awareness in the sense that it produced larger high-low differences in response variability than did any other measure. Education was, however, a very close second, producing an average reduction in error variance of 46 percent to 49 percent for information.

Although education may be a "second best" indicator, it is nonetheless associated with awareness and hence with levels of information.

To obtain the necessary proportions of people with different levels of information about economic forecasts, I will disaggregate my measure of economic forecasts by education.¹⁶ I will then create a time series that measures

the proportion of those who said future conditions would be worse who had less than a high school education, the proportion of people who said future conditions would be worse who had a high school diploma, the proportion of people who said future conditions would be worse who had attended college but did not receive a degree, and the proportion of people who said future conditions would be worse and who had a college degree or more. Thus, there will be four of these cell proportions.

Stoker's test is based on the idea that any nonlinear relationship can be decomposed into a linear relationship and a remainder. To implement the test, two of the cell proportions should not be included in the model and the omitted cell proportions should be those associated with the linear portion of the nonlinear relationship. The cell proportions included in the aggregate model represent deviations from linearity, and if they are statistically significant then this indicates that the underlying distribution or composition of the citizenry is an important determinant of aggregate changes in the dependent variable.

Information Test II. My second test of whether the dynamics of presidential approval are influenced by an information diffusion process will be to include controls for variation over time in citizens' reception of information in the presidential accountability model. To obtain an aggregate measure of information reception, I will use data from two

questions from the University of Michigan's Surveys of Attitudes and Behavior.¹⁷ The first of these questions is: "During the last few months, have you heard of any favorable or unfavorable changes in business conditions?" People who answer this first question affirmatively are then asked: "What did you hear?" and the respondent's first and second answers to this latter question are coded separately as either favorable or unfavorable in the subcategories of government/defense, employment and purchasing power, prices, and miscellaneous. Each of these subcategories is further divided into 10 specific types of information that a respondent might mention, and within these more specific categories are codes for whether a respondent said that he or she had heard about increases or decreases in inflation or unemployment.

To obtain an aggregate measure of variation over time in information reception, I will first calculate the monthly change in the macroeconomic indicators of inflation and unemployment discussed earlier. I will then determine whether this change was positive or negative. Following this, I will take the responses to the questions above and coded them into the percentage of people in each period who had accurate information about the most recent change in inflation, the percentage of people who had accurate information about unemployment, and the total of these two percentages.¹⁸ The idea behind this measure is that since the question asks

respondents whether they have heard of changes in business conditions, those who indicate that they have heard of a change represent people who have been exposed to new information. Furthermore, if they can accurately identify the direction of the change that they heard about, then it is likely that they have received (i.e.; have both been exposed to and have comprehended) this information.¹⁹

Economic Forecasts and Information

I also will perform two tests for the effects of information on mass economic forecasts. In the first of these, I will include the above-mentioned unemployment information and inflation information reception variables in the model for economic forecasts to see whether their inclusion has any effect on the dynamic implications of the model.

My second test of the effects of information on mass economic forecasts will involve using Granger causality tests to determine whether the economic forecasts of experts help to predict mass economic forecasts and vice versa.²⁰ To do so, I will use data from Livingston's survey of experts' forecasts of future inflation and investigate whether these inflation forecasts "Granger cause" mass economic forecasts.²¹ Since the forecasts of experts and expert opinion are often reported in the media, this test will provide indirect evidence about whether the process of information diffusion is elite driven, mass driven, or reciprocal.

Summary

In this chapter, I discussed the data and measures that will be used to operationalize the aggregate-level *presidential accountability* and *economic forecasting* models derived from my theory. In addition, I outlined tests of the effects of information on aggregate-level presidential approval and mass forecasts of future business conditions. In the next chapter, I implement these empirical tests and interpret the evidence.

1. Granger (1990) argues that relationships of cointegration are unaffected by temporal aggregation; that is, by summing or averaging a single series over time. Thus, tests for integration and cointegration using quarterly or monthly data should in theory produce similar results.
2. Gallup began asking the approval question in 1938, but because of their sampling techniques, the pre-1949 data are not completely reliable.
3. The quarterly approval rating is the average of these monthly values.
4. For instance, my measure of the quarterly level of inflation will be computed as $[\ln(x_{jt}/x_{jt-4})]*100$.
5. From a statistical point of view, the annualized percentage rate of change in the CPI represents a time series that has already been differenced. Hence, when this series is taken as the level of inflation, analysts are in effect looking for a second unit root.
6. The MacKuen et al. conclusions are based on using the mean response to these particular survey questions. The two measures produce qualitatively similar empirical results during the Reagan years. I think my measure captures the more politically relevant response.
7. They bear no responsibility for my analyses or interpretation.
8. This means all quarterly analyses will be based on 141 observations -- 7.8 percent of which had to be interpolated.
9. Although approval data are readily available for the Bush years, a complete set of data for the components of the Index of Consumer Sentiment are not. I plan to extend my analyses through the Bush years as soon as these ICS data become available.
10. All other non-institutional scandals will be included in the variable capturing the transitory effects of personal approval-diminishing events.
11. Battle deaths during the Korean War are of no consequence to my analysis because the Korean War ended with an armistice on July 27, 1953.
12. Because deviations from the equilibrium state enter the model with a one-period lag, the "accountability errors" from the last period of one president's tenure will influence changes in the next president's first approval rating. To prevent this, I will include a separate dummy variable for each time a change in administration occurs. These dummy variables, which take the value of 1 in the

first period of a new president's administration and are otherwise zero, effectively delete these observations from the analysis.

13. I am assuming that at least one of the explanatory variables is an I(1) process. This assumption will be tested empirically.

14. The reason I can include only contemporaneous values of the economic forecast series in this system is because if two variables, say x_{3t} and x_{4t} , are contemporaneously cointegrated, then x_{3t} also will be cointegrated with all leads and lags of x_{4t} .

15. Granger's proof applies to stationary regressors and all continuous, nonlinear functions. Lippi's (1988) proofs suggest that very general dynamic models (including ECMs) result from aggregating over heterogeneous micro-level relationships when regressors are integrated. He concludes:

In the case of ECMs, ... aggregation turns out to be a source of dynamics for the macroequations. Independently of the dynamic shape of the corresponding microequations, we have shown that the dependent lagged variable, as well as the independent lagged variable, are likely to occur in the macroequations Simple static or almost static microbehaviors have been seen to be a possible microbackground for dynamically complex macroequations.

16. The best test for information diffusion requires as fine a time interval as possible. Thus, I will move to monthly data to perform these tests. Because of data availability, I am limited to implementing these tests only during the Reagan years.

17. For this test, I will use monthly data from 1978 through 1988.

18. More specifically, I will use the responses associated with the following categories:

- 23 = employment has risen/is rising; more overtime; plenty of jobs or work around; unemployment declining
- 29 = unemployment has risen/will rise (and that's good or necessary for the economy)
- 31 = lower or stable prices; prices won't rise; lower prices; less inflation; price rebates
- 32 = higher prices; inflation; prices will rise (including specific prices) (and that's good)
- 63 = drop in employment (except plant closings); high or higher unemployment; layoffs; less overtime; short hours; automation
- 71 = prices are falling/will fall/are too low; deflation
- 72 = prices are high/are rising; inflation; wages lag behind prices.

19. A disadvantage of this measure is that the question asks respondents about whether they have heard of any favorable or unfavorable changes in the last *few months*, and so it is hard to

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determine just when citizens may have heard the information to which they refer. This means that although I use a one-month period to define accurate responses, I cannot be sure that this is the time period that citizens are thinking of as they respond to the question. However, it seems likely that because this question asks about changes in conditions and because changes in unemployment, inflation, and other economic conditions are announced in the media on a monthly basis, citizens will think of the most recent retrospective or prospective information that they have heard. Admittedly, my choice of a one-month time frame to define accuracy is arbitrary, but it seems less arbitrary than a decision to use any time frame longer than one month. A second disadvantage of this measure is that there are numerous other responses that citizens might give so that there may be some times when this measure underestimates the percentage of people with accurate information about inflation or unemployment. For instance, a person who mentions that he or she has heard favorable or unfavorable information about interest rates may also have heard about inflation or unemployment.

20. Of course, I will be careful to check the time series properties of these data since unit roots can bias the distribution of the usual block F tests for "Granger causality."

21. The Livingston surveys are taken only twice a year, so I will create a quarterly time series by entering the same value in each of the two quarters within a six-month period.

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CHAPTER SEVEN

EMPIRICAL RESULTS

In this chapter, I will present and interpret the empirical results obtained from implementing the hypothesis tests outlined in Chapter Six. Recall that these tests were proposed to answer three basic questions: Do the models for presidential approval and economic forecasts adequately fit the data? Is there evidence of one or more common equilibrium relationships involving approval or economic forecasts? And, is there evidence that the dynamics of presidential approval and/or economic forecasts change in response to variation in information over time? Let me begin to address these questions by first presenting some empirical evidence about the univariate properties of the four key time series used in this analysis -- presidential approval, unemployment, inflation, and economic forecasts.

To investigate the properties of the basic time series of interest, I used the methods outlined in Appendix A along with visual inspections of the autocorrelation functions. The purpose of these tests is to determine whether the time series representing presidential approval, unemployment, inflation, and economic forecasts appear to be stationary, trend stationary, or integrated. The results of these tests, along with details about their interpretation, are presented in Appendix B.

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The empirical evidence in Appendix B leads me to four general conclusions: (a) none of the quarterly series have seasonal unit roots nor do any have more than one unit root; (b) the inflation and economic forecast series are each $I(1)$, difference stationary processes with stochastic rather than deterministic trends; (c) the unemployment series is not an $I(1)$ process but is either stationary or trend stationary; and (d) the presidential approval series is highly persistent and is likely a near-integrated process with a root close, but not equal, to 1.0. Although these results neither confirm nor disconfirm the theoretical hypotheses outlined in Chapters Three and Four, this initial evidence that some of these series are integrated and near-integrated leaves open the possibility that some of them will be cointegrated. That is, this evidence suggests that it will be important to investigate whether some of these variables move together in the type of equilibrium relationships discussed earlier. In short, these results provide part of the statistical and empirical backdrop for the subsequent empirical evidence.

THE PRESIDENTIAL ACCOUNTABILITY MODEL

To test whether changes in aggregate levels of presidential approval are driven by a dynamic error correction process, I estimated Equation [6.3], the operationalized version of the *presidential accountability model*, using quarterly data from the fourth quarter of 1953 through the

Table 10. Presidential Accountability Model Estimates

| | Endogenous Variable | |
|---|--------------------------------|--------------------------|
| | (1)
Δ approval | (2)
Δ approval |
| constant | 15.296
(4.223) ^a | 15.965
(3.631) |
| approval _{t-1} | -.239
(.051) | -.233
(.051) |
| economic forecasts _{t-1} | -.319
(.208) | -.465
(.092) |
| institutional scandals _{t-1} | -26.339
(9.104) | -30.437
(9.226) |
| battle deaths _{t-1} | -.003
(.002) | -.004
(.002) |
| U.S.-Soviet tension _{t-1} | -.025
(.105) | |
| inflation _{t-1} | -.893
(1.063) | |
| unemployment _{t-1} | .441
(1.415) | |
| international approval-
enhancing events | 2.264
(.915) | 2.496
(.901) |
| personal approval-
enhancing events | 1.699
(1.478) | 1.510
(1.472) |
| domestic approval-
diminishing events | -1.006
(1.127) | -.990
(1.126) |
| personal approval-
diminishing events | -1.673
(1.590) | -1.641
(1.563) |
| major presidential
speeches | -.217
(.440) | -.241
(.435) |
| foreign travel | -.327
(.672) | -.360
(.665) |
| <hr/> | | |
| R ² (changes) | .59 | .57 |
| Adjusted R ² (changes) | .52 | .52 |
| R ² (levels) | .89 | .89 |
| Adjusted R ² (levels) | .88 | .88 |
| log-likelihood | -386.93 | -389.14 |
| SE | 4.15 | 4.16 |
| DW | 1.74 | 1.75 |
| Box-Pierce Q: $\chi^2(20)$ | 13.92 | 12.95 |
| ARCH: F(4,140) | 2.34 | 2.21 |
| Normality: $\chi^2(2)$ | .56 | .38 |
| bloc F tests: leads | | .51 |
| lags | | .83 |

^aQuantities in parentheses are the standard errors of these coefficients.

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fourth quarter of 1988. In the first column of Table 10, I report the nonlinear least squares estimates of the model's coefficients with their associated standard errors reported in parentheses.¹ These estimates show that neither the lagged level of unemployment nor the lagged level of inflation is statistically different from zero. In addition, the lagged level of economic forecasts approaches, but does not quite reach statistical significance at traditional levels ($p < .06$). Interestingly, these results are similar to those of MacKuen, Erikson, and Stimson (1992), who find that inflation and unemployment have no statistically significant effects on presidential approval once controls for mass economic forecasts are included in the approval function.

Given these results, I re-estimated the model after excluding the inflation and unemployment variables as well as the incorrectly signed and statistically insignificant U.S.-Soviet tension variable. As shown in column two of Table 10, this revised model has an adjusted R^2 of .57 when the model is expressed in terms of quarterly approval changes and an adjusted R^2 of .88 when the model is translated into approval levels. The standard error of the regression is 4.16 approval percentage points. Furthermore, there is no indication that the residuals from this model deviate from normality or are autocorrelated. The model also appears robust to the effect of autoregressive conditional heteroskedasticity for lags one through eight although as reported at the bottom of Table 10,

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there is some slight evidence of ARCH effects using four lagged squared residual terms. Generally, the revised model appears to fit the data well. Using a log-likelihood ratio test shows that dropping the inflation, unemployment, and tension variables makes no statistically significant difference ($-2*LLR = 4.42$).

Exogeneity Issues

In light of my earlier discussion about single-equation ECM estimation when variables are integrated and cointegrated (evidence of cointegration will be presented below), I also investigated the robustness of my implicit exogeneity assumptions. First, since a lack of weak exogeneity often evidences itself in terms of nonconstant parameter estimates, I examined a plot of the model's recursively estimated residuals as well as plots of the recursive estimates of the model's coefficients. Nothing unusual turned up in these plots although they indicated that using a dummy variable to capture the effects of the two scandals may not be fully adequate. A similar conclusion was reached by examining the plot of the cumulative sum of the residuals, which shows that this sum stays within the confidence bounds throughout the sample period. Taken together, these results indicate that the parameters of this model are free of joint variation with the parameters of the model for economic forecasts.

However, I also estimated the model with the leads, lags, and contemporaneous first differences of economic forecasts

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included to investigate whether my implicit assumption of strict exogeneity is supported. As the bloc F tests at the bottom of column two of Table 10 show, these leads and lags are not statistically significant.² Although these tests for exogeneity do not provide unambiguous support for the claim that economic forecasts are strictly exogenous to presidential approval, they are consistent with such an assumption.

Hypothesis Tests

Given the favorable overall goodness of fit of the *presidential accountability model*, I will now use the model's estimates to perform some initial tests of my theoretical hypotheses. Looking again at the estimates in column two of Table 10, one can see that, as hypothesized, institutional scandals and battle deaths during war have negative and statistically significant effects on changes in presidential approval. Mass economic forecasts also have a statistically significant effect on approval changes such that as the percentage of people predicting future business conditions will be worse rises, presidential approval declines.

The effects of the observed and forecasted valence outcomes are not, however, complete in a single period as indicated by the statistically significant coefficient for the lagged level of presidential approval. This coefficient estimate, which represents the rate at which the level of presidential approval adjusts toward its contextually-appropriate equilibrium level, falls in the $(-1,0)$ interval as

hypothesized and implies that 23.3 percent of any equilibrium error is eliminated in each quarter. This estimated rate of adjustment means that, all else equal, approximately 15 percent of a sustained shock to one of the long-run prosperity, security, or integrity outcomes will remain after eight quarters.

For instance, suppose there is a sustained five percentage point increase in the percentage of people predicting that future business conditions will be worse. Because of this rise in negative forecasts, the level of approval at time t will no longer be proportional to the level of economic forecasts, but will be 2.33 percentage points too high given prevailing conditions. However, beginning in the next quarter ($t+1$), this disequilibrium will generate changes in approval that, over time and all else equal, will move presidential approval to a new and lower equilibrium level in which the president's approval rating "matches" the level of negative economic forecasts. Specifically, for the case of the 5 percentage point change in forecasts, approval will be only one percentage point above its new equilibrium level in period ($t+3$). Figure 1 provides a plot of movements in the level of presidential approval in response to this hypothetical 5 percentage point change in economic forecasts.

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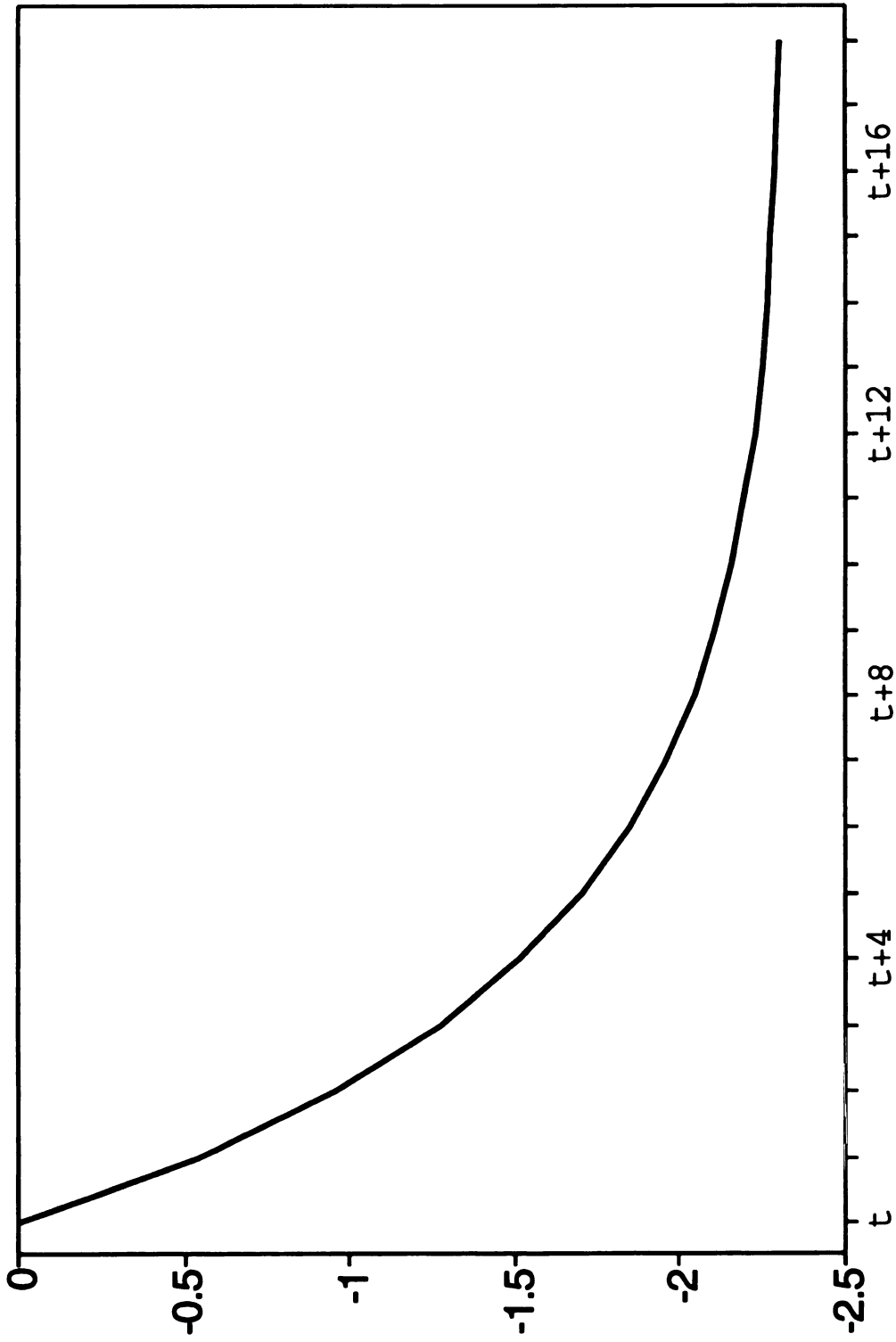


Figure 1. Response of Approval to Forecast Change

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Turning to the effects of dramatic political events on changes in presidential approval, the estimates in column two of Table 10 show that these variables as a group have very little effect. The only variable in this group that has a statistically significant effect is the variable measuring international approval-enhancing events (i.e.; rally 'round the flag events). As these estimates show, a "rally" event leads to a 2.26 percentage point increase in presidential approval.

Figure 2 shows the dynamic response of presidential approval to a 10 percentage point increase at time t in the percentage of people predicting future conditions will be worse along with the occurrence of an approval-enhancing international event at $(t+2)$. As seen in Figure 2, the increase in negative forecasts causes approval to move to a new equilibrium level. However, movements toward equilibrium are temporarily disrupted by the small positive influence of the dramatic international crisis. Clearly, the timing of a rally event can be important since the ability of such an event to offset a decline in approval depends on the magnitude of the changes that are taking place in the long-run factors. Although an international dramatic approval-enhancing event can postpone the descent of presidential approval to its new equilibrium level, it can not permanently override the countervailing force of long-run factors such as scandals, war, or economic forecasts.

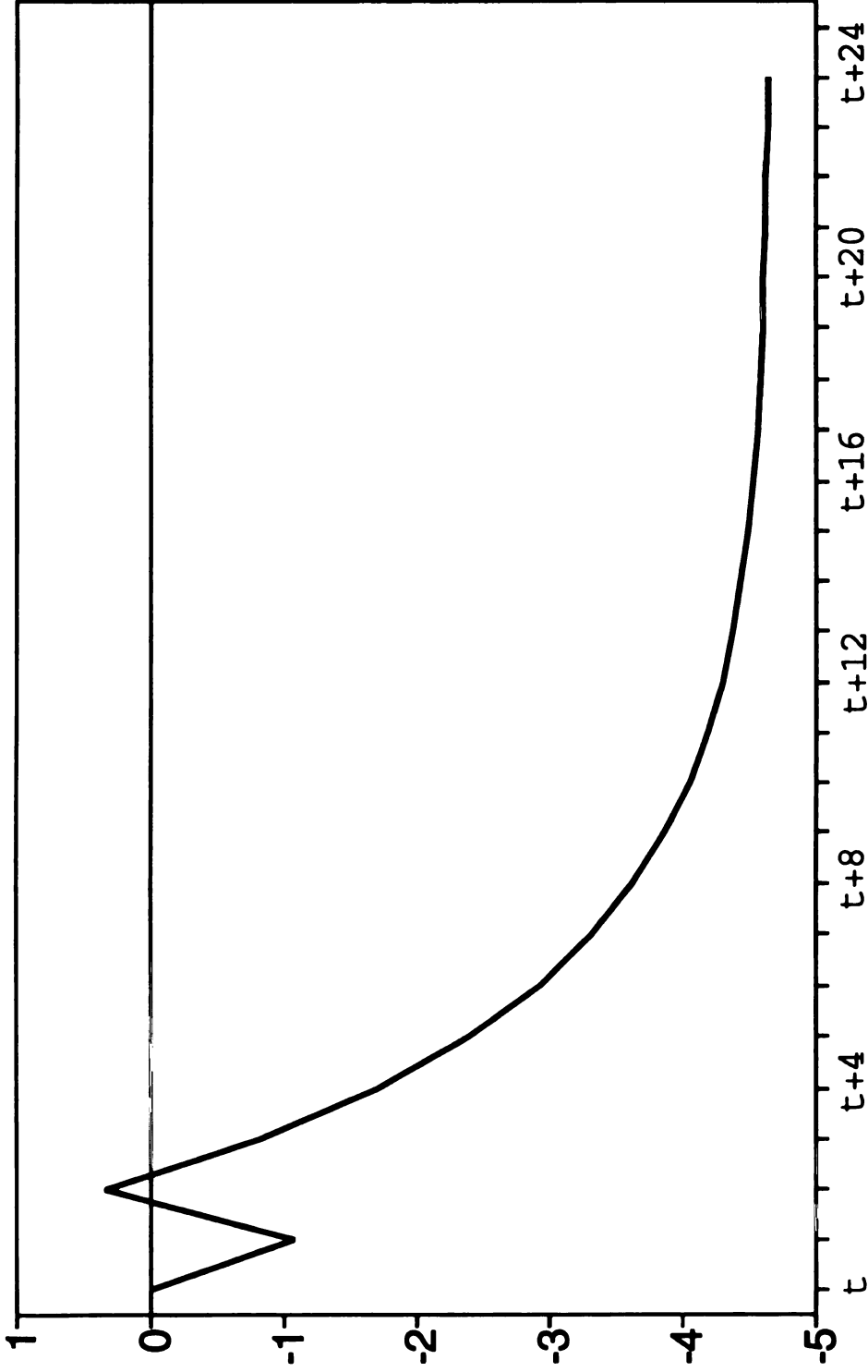


Figure 2. Response of Approval to Rally and Forecast Change

Discussion

The empirical evidence obtained from estimating the *presidential accountability model* shows that support exists for the broader contours of my previous arguments although some of the specific details of my argument did not receive support. For example, my distinction between the short-run influences of exogenous shocks from dramatic political events and the long-run effects of prosperity, security, and integrity outcomes on changes in presidential approval receives support since an error correction model in which these two types of effects are separated fits the data adequately. However, a number of the hypothesized short- and long-run relationships were not found to be supported.

For instance, only rally 'round the flag events were seen to have a statistically significant short-run effect. I think the primary reason many of these dramatic political event variables are statistically insignificant is because the data are measured at quarterly intervals. Data measured at monthly intervals are probably better for determining the effects of these short-run forces. In addition, the long-run relationships between presidential approval and prosperity, security, and integrity outcomes do not appear to involve international U.S.-Soviet tension or inflation or unemployment. The lack of evidence of a long-run relationship between presidential approval and inflation and unemployment is surprising to me given my previous theoretical arguments

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that not all citizens actively seek information and are instead exposed to media information at different times. If the effects of prospective economic forecasts dominate the effects of current inflation and unemployment as these results indicate, then this may imply (a) that citizens' institution-based expectations of the president are truly prospective and forward-looking or (b) that the media information to which citizens are exposed is prospectively rather than retrospectively oriented. This latter idea is something I plan to explore in future research using content analyses of media reports.

THE ECONOMIC FORECASTING MODEL

To test some of my hypotheses about economic forecasts, I estimated Equation [6.6], the operationalized version of the *economic forecasting model*, using quarterly data from the fourth quarter of 1953 through the fourth quarter of 1988. Recall from my discussion in Chapter Six that my primary aim is to determine if and how inflation and unemployment are related to mass economic forecasts. Thus, the results in this section may have a somewhat exploratory flavor to them.

In the first column of Table 11, I report the nonlinear least squares estimates of the model's coefficients. There are two interesting things to notice in these results. First, the lagged level of unemployment has no statistically significant effect on changes in economic forecasts while the lagged level of inflation does. As the coefficient for

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inflation shows, increases in the level of inflation lead to upward changes in the percentage of those predicting future conditions to be worse. Second, notice that changes in economic forecasts do appear to be a function of a dynamic, but incomplete response, to last period's aggregate "forecasting errors" in the sense that deviations from a proportional relationship between lagged aggregate levels of forecasts made previously and last period's observed level of inflation are "corrected" over time at a rate of 11 percent per quarter. However, these long-run dynamic adjustments do not account for an overwhelming proportion of the variance in changes in economic forecasts as indicated by the model's adjusted R^2 of .09.

Because unemployment does not appear to be part of a *long-run* relationship with the level of economic forecasts and because the long-run relationship between the level of inflation and the level of economic forecasts does not completely account for the variance in changes in economic forecasts, I re-estimated the model with lags of the short-run changes in unemployment, inflation, and economic forecasts included. The results appear in the second column of Table 11. The model in column 2 of Table 11 fits the data better than the original model. This revised model has an adjusted R^2 of .22 when the model is expressed in terms of quarterly changes and an adjusted R^2 of .90 when the model is translated into levels. The model's residuals also show no signs of

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Table 11. Economic Forecasting Model Estimates

| | Endogenous Variable | |
|--------------------------------------|----------------------------|---------------------------|
| | (1)
Δ forecasts | (2)
Δ forecasts |
| constant | 4.415
(2.540)* | 15.965
(3.631) |
| economic forecasts _{t-5} | -.109
(.060) | -.183
(.047) |
| inflation _{t-1} | 4.753
(1.971) | 5.172
(.942) |
| unemployment _{t-1} | -5.372
(7.483) | |
| Δ forecasts _{t-1} | | -.205
(.083) |
| Δ inflation _{t-1} | | 1.418
(1.468) |
| Δ unemployment _{t-1} | | -4.918
(1.465) |
| <hr/> | | |
| R ² (changes) | .11 | .25 |
| Adjusted R ² (changes) | .09 | .22 |
| R ² (levels) | .88 | .90 |
| Adjusted R ² (levels) | .88 | .90 |
| log-likelihood | -442.61 | -430.91 |
| SE | 6.36 | 5.85 |
| DW | 2.34 | 2.07 |
| Box-Pierce Q: $\chi^2(20)$ | | 13.32 |

*Quantities in parentheses are the standard errors of these coefficients.

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autocorrelation or of ARCH (for lags one through eight). This is an adequate performance although it would be nice to be able to account for a larger portion of the variance in the changes in economic forecasts.³

Exogeneity Issues

I also investigated the assumption of weak exogeneity using parameter constancy tests. Plots of the recursive residuals and the recursively estimated coefficients for this model show no statistically significant evidence of structural breaks or parameter instability. Similarly, plots of the cumulative sum of residuals and cumulative sum of squared residuals always remain within their confidence intervals. These tests do not give any reason to suspect that weak exogeneity is violated.

In addition to this evidence of parameter constancy, I implemented tests for strict exogeneity in two ways. First, I included leads, lags, and contemporaneous values of inflation in the model because this is the one variable that appears to influence changes in economic forecasts in the long run. Using bloc F tests showed that neither the lagged and current first differences of inflation ($F=1.46$) nor the leads ($F=.75$) have a statistically significant effect. In addition, I investigated the issue of possible simultaneity between presidential approval and economic forecasts by first including leads, lags, and the current value of approval in the *economic forecasting model*. I found that neither the

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leads ($F=2.51$) nor the bloc of lags and the current change in approval ($F=1.72$) have a statistically significant effect.

Finally, I also estimated an unrestricted, diagnostic VAR (Engle and Granger 1987) in which I regressed changes in economic forecasts and changes in presidential approval on the lagged levels of each of the equilibrium variables.⁴ In the equation for changes in economic forecasts, the lagged level of presidential approval had no statistically significant effect (t ratio = $-.53$). Taken together, the evidence that neither the level of presidential approval nor blocs of leads and lagged changes in approval have a statistically significant effect on changes in economic forecasts is consistent with an assumption of strict exogeneity. Thus, the *economic forecasting model* can be estimated separately.

Hypothesis Tests

The estimates in column two of Table 11 show that dynamic adjustments in response to deviations from an equilibrium relationship between the levels of previous forecasts and the level of current observed inflation occur at a rate of 18.3 percent per quarter. This provides support for the *dynamic information adjustment hypothesis*. I also estimated this model using last period's level of economic forecasts rather than that from one year earlier and found that it made little difference in the estimates.

These estimates in column two of Table 11 also show that changes in unemployment influence changes in economic

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forecasts although the sign of this coefficient is unexpectedly negative. This negative coefficient on the lagged change in unemployment is robust to lag length and other specification changes. I think this result may occur because inflation and unemployment may be linked via short-run Phillips curve tradeoffs. However, rather than investigating the macroeconomic aspects of this result, I will instead pursue and test for informational effects. It may be that placing controls for information about inflation and unemployment into this model can provide insight into this result.

Additional analyses not reported here show that neither institutional scandals nor battle deaths have a statistically significant effect on changes in economic forecasts. These results stand in contrast to the anecdotal conclusions of Strumpel et al. (1975), who argue that a lack of confidence in political institutions caused by the Watergate scandal and the Vietnam War translated into losses in consumer confidence. At least with respect to forecasts of future business conditions, this does not appear to be the case. I also included dummy variables for the first quarter of each new presidential administration in the model and found that these variables, as a group, have no statistically significant effect on forecasts of future business conditions. Individually, the only coefficient that came close to being statistically significant was for Kennedy's first quarter in office ($p < .07$). It would

be interesting to see whether this result holds up for other components of the Index of Consumer Sentiment.

Discussion

The empirical evidence obtained from estimating the *economic forecasting model* suggests that changes in economic forecasts are a function of dynamic adjustments that are incomplete in a single period. However, these data show few differences between a model in which forecasts of conditions one year ahead are juxtaposed with the realized outcomes they were meant to predict and a model in which the forecasts and observed outcomes are entered in the same period. Hence, the question of whether the aggregate-level forecasting function represents a response to "forecasting errors" or a more extrapolative mechanism remains an open question. Haller and Norpoth (1993) have recently made some interesting suggestions about how to address this issue. However, using multiple approaches, they ultimately conclude that aggregate forecasts are some mixture of "rational" and "adaptive" forecasting mechanisms. I plan to pursue this issue further in future research.

More importantly, these empirical results indicate that the level of inflation has long-run effects on mass economic forecasts while changes in unemployment have only short-run effects. Variables that represent the effects of "political" factors have no statistically significant influence. Since presidential approval is a function of these economic

forecasts, it is reassuring to see that they are, in turn, a function of realized economic outcomes. Thus, rather than calling into question the link between the observed economy and presidential approval, these results (and those of MacKuen, Erikson, and Stimson 1992) simply suggest that the arguments must be recast to include economic forecasts.

INVESTIGATING LATENT EFFECTS

Although the *presidential accountability* and *economic forecasting* models appear to fit the theory and data adequately, they do not provide complete and direct evidence about whether subsets of these variables are associated with each other via a dynamic latent equilibrium relationship as suggested in Chapters Three and Four. For instance, recall that the *accountability equilibrium hypothesis* implies that aggregate levels of presidential approval should be in an equilibrium state with observed and forecasted valence outcomes; that is, this hypothesis suggests that the approval time series should move in tandem with indicators of these factors and should share a common pattern of dynamic re-equilibration. In addition, the *high-information convergence hypothesis* suggests that economic forecasts will be linked to observed economic outcomes in a similar fashion. The source of these common equilibrium dynamics is hypothesized to be the latent diffusion of information across subgroups of citizens.

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The Johansen Test

To determine whether the dynamics of presidential approval and economic forecasts are shared or common with other variables, I used the Johansen estimator discussed in Chapter Six to estimate a multi-equation system of error correction models using quarterly data from the fourth quarter of 1953 through the fourth quarter of 1988. Because taking first differences of a dummy variable turns it into a pulse, I used only the continuously-measured inflation, unemployment, approval, and economic forecast measures in this system. The likelihood ratio statistics obtained from applying the Johansen estimator to this four variable system are reported in Table 12 along with the estimated eigenvalues and eigenvectors.⁵

Table 12. Johansen Test of Rank of Multiplier Matrix

| Null Hypothesis | Test Statistic | Critical Value |
|-----------------|----------------|----------------|
| $r \leq 3$ | 5.47 | 9.10 |
| $r \leq 2$ | 21.09 | 20.20 |
| $r \leq 1$ | 48.40 | 35.10 |
| $r = 0$ | 79.74 | 53.30 |

| Eigenvalues | Eigenvectors |
|-------------|--|
| .2016 | $a_t = 69.06 - .02x_{1t} - 2.58x_{2t} - .07x_{3t}$ |
| .1783 | $x_{1t} = -64.69 - .25a_t + 8.24x_{2t} + 2.20x_{3t}$ |
| .1060 | |
| .0373 | |

These results indicate that the null hypothesis that Γ_p has a rank of zero, one, or two can not be rejected, while the null hypothesis that this multiplier matrix has a rank of three can be rejected. Hence, the rank of Γ_p in this four-variable system is two (i.e.; reduced rank) rather than four (i.e.; stationary, full rank vector process). On the basis of these results, I conclude that there are two equilibrium relationships within this vector of variables; that is, there are two common dynamic patterns (i.e.; two cointegrating vectors) among these variables.

Regression-Based Tests

Because any two equilibrium relationships of this sort will themselves be cointegrated, identifying and interpreting the estimates of these multiple factors is difficult without making some exogeneity assumptions. However, my previous theoretical arguments and empirical evidence suggest that neither unemployment nor presidential approval enters into the equilibrium relationship between economic forecasts and inflation and that neither unemployment nor inflation is part of the cointegrating relationship between presidential approval and economic forecasts. Hence, my results suggest that one of the equilibrium relationships is between presidential approval and negative economic forecasts alone while the other is between inflation and negative economic forecasts.

Additional evidence to support this conclusion comes from single-equation, regression-based tests for cointegration among subsets of these variables. (See Appendix A for details about implementation of these tests.) For instance, when the residuals from the regression of economic forecasts on presidential approval are tested for cointegration, the cointegrating Dickey-Fuller statistic is -3.90, which is larger than the $\alpha = .05$ critical value of -3.38. Thus, the null hypothesis of no cointegration can be rejected. In addition, the regression of inflation on economic forecasts and unemployment yields a cointegration Dickey-Fuller statistic of -4.56, which is larger than the $\alpha = .05$ critical value of -3.80.⁶ Taken together, the results in Table 12 provide support for the hypothesis that there is an unobserved common dynamic that links movements in the level of presidential approval to the level of forecasts of future business conditions and similarly that economic forecasts and inflation share a common dynamic pattern of re-equilibration.

THE EFFECTS OF INFORMATION

According to my theoretical hypotheses in Chapters Three and Four, the latent force underlying these equilibrium relationships is the diffusion of information across citizens over time. Thus, I need to test whether controlling for information effects changes the dynamic implications of either the *presidential accountability* or *economic forecasting* models. I will begin by addressing this question within the

context of the model for presidential approval and then move to an assessment of this issue with respect to mass economic forecasts.

Information and Presidential Approval

My first test of the effects of information on the dynamics of presidential approval is to include measures of the over time variation in the distribution of information across citizens as suggested by Stoker (1986) and as discussed in Chapter Six. The results of implementing this test within the context of the *presidential accountability model* using monthly data for the Reagan years are reported in Table 13. As the evidence in column 1 of Table 13 shows, neither the cell proportions for those with the lowest levels of education nor the proportions for those with the highest levels of education are statistically significant. Interestingly, as shown in column 2 of Table 13, when these cell proportions are lagged an additional period, the proportions of those with the highest levels of education are statistically significant. However, by comparing the estimates in column two to the baseline estimates in column three, one can see that the inclusion of these variables changes the other coefficient estimates very little. Furthermore, a bloc F test shows that these two variables do not jointly contribute to the explanatory power of the model. These results call into question either theoretical arguments about the dependencies across individuals caused by the overwhelming effects of media

Table 13. Tests for Distributional Effects, 1981-1988

| | Endogenous Variable | | |
|------------------------------|-------------------------------|--------------------------|--------------------------|
| | (1)
Δ approval | (2)
Δ approval | (3)
Δ approval |
| constant | 8.335
(5.044) ^a | 15.707
(4.851) | 9.246
(2.701) |
| approval(-1) | -.118
(.045) | -.131
(.044) | -.121
(.042) |
| forecasts(-1) | -.067
(.024) | -.077
(.024) | -.068
(.023) |
| assassination
attempt | 8.945
(2.923) | 9.257
(2.864) | 9.023
(2.865) |
| Iran-contra scandal | -7.985
(2.078) | -8.085
(2.017) | -7.898
(2.000) |
| % with low
education(-1) | .0089
(.073) | | |
| % with high
education(-1) | .023
(.104) | | |
| % with low
education(-2) | | -.103
(.072) | |
| % with high
education(-2) | | -.139
(.100) | |
| <hr/> | | | |
| R ² | .28 | .31 | .28 |
| Adjusted R ² | .24 | .26 | .25 |
| SE | 2.81 | 2.77 | 2.78 |
| Box-Pierce Q: $\chi^2(20)$ | 13.70 | 16.04 | 13.55 |

^aQuantities in parentheses are the standard errors of these coefficients.

information on opinion (i.e.; the idea that media information is a common factor that creates dependencies across individuals in a cross section) or arguments of authors such as Zaller (1992) about the nonlinearity of the individual-level behavior.⁷

My second test of whether the common dynamic between presidential approval and aggregate economic forecasts is due to the diffusion of information across citizens over time is to control for variation in aggregate information reception among citizens. In Table 14, I report the estimates of the *presidential accountability model* (using monthly data for the period 1978:02-1988:12) with these information reception variables included. As shown in column 1 of Table 14, the variable measuring variation in total reception of inflation and unemployment information has a statistically significant effect on changes in presidential approval. Furthermore, as shown in column 2 of Table 14, the variables for reception of inflation information and reception of unemployment information are each statistically significant.

Note, however, that the inclusion of variables measuring aggregate information reception does not significantly change the dynamic effects of economic forecasts on presidential approval. (The estimates in column three of Table 14 are those for the baseline model.) Instead, these measures of information reception and of economic forecasts have

Table 14. Approval Model with Information Controls

| | Endogenous Variable | | |
|---|--------------------------------|--------------------------|--------------------------|
| | (1)
Δ approval | (2)
Δ approval | (3)
Δ approval |
| constant | 10.604
(2.873) ^a | 10.721
(2.894) | 9.836
(2.896) |
| approval _{t-1} | -.142
(.042) | -.144
(.042) | -.130
(.042) |
| forecasts _{t-1} | -.048
(.028) | -.047
(.028) | -.077
(.025) |
| assassination attempt | 3.646
(2.686) | 3.731
(2.701) | 4.411
(2.705) |
| Iran-contra scandal | -7.805
(2.614) | -7.800
(2.623) | -7.665
(2.654) |
| total information
reception _{t-1} | -.165
(.075) | | |
| inflation information
reception _{t-1} | | -.198
(.104) | |
| unemployment
information
reception _{t-1} | | -.153
(.079) | |
| <hr/> | | | |
| R ² | .28 | .29 | .26 |
| Adjusted R ² | .25 | .25 | .23 |
| SE | 3.64 | 3.65 | 3.69 |
| Box-Pierce Q ~ χ^2 (20
df) | 32.10 | 31.89 | 34.13 |

^aQuantities in parentheses are the standard errors of these coefficients.

independent effects on changes in presidential approval during the Carter and Reagan years. As these estimates show, the coefficients on these information reception variables are negative. The reason they are negative is because the percentage of information received rises as actual conditions get worse and falls as these conditions improve. Although this evidence does not provide support for my arguments linking information diffusion to the magnitude of dynamic adjustments in presidential approval, these results do indicate that variation over time in the reception of information about inflation and unemployment influences changes in approval.

Information and Economic Forecasts

To investigate whether information influences the dynamics of economic forecasts, I included in the *economic forecasting model* the same measures of information reception used above. The results appear in Table 15. Note that these estimates are based on using the previous period's level of forecasts rather than the level from one year earlier. When estimating the model using monthly data from 1978:02-1988:12, I found that the level of forecasts from a year earlier had no statistically significant effect on changes in economic forecasts but that last period's level of economic forecasts was highly statistically significant as shown in the baseline

Table 15. Forecast Model with Information Controls

| | Endogeneous Variable | | |
|--|-------------------------------|--------------------|------------------------|
| | Δ forecasts | Δ forecasts | Δ forecast
s |
| constant | 4.881
(1.452) ^a | 4.968
(1.455) | 4.740
(1.517) |
| forecasts _{t-1} | -.263
(.056) | -.255
(.057) | -.208
(.050) |
| inflation _{t-1} | .859
(.215) | .784
(.228) | .745
(.210) |
| Δ unemployment _{t-1} | 4.275
(2.327) | 4.755
(2.380) | 4.307
(2.376) |
| Δ forecasts _{t-1} | | | -.039
(.086) |
| total information
reception _{t-1} | .182
(.101) | | |
| inflation information
reception _{t-1} | | .270
(.136) | |
| unemployment
information reception _{t-1} | | .114
(.113) | |
| <hr/> | | | |
| R ² | .16 | .16 | .14 |
| Adjusted R ² | .13 | .13 | .12 |
| SE | 4.91 | 4.91 | 4.97 |
| Box-Pierce Q: $\chi^2(20)$ | 23.92 | 23.16 | 21.55 |

^aQuantities in parentheses are the standard errors of these coefficients.

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model in column three of Table 15. I will comment on the substantive implications of this result below.

The results in column one of this table show that the measure of total information reception is not statistically significant. And, as shown in column two of Table 15, the level of unemployment information reception also has no statistically significant effect on changes in economic forecasts. However, the level of inflation information reception is statistically significant and correctly signed.⁸

My second test of whether information about the economy affects mass economic forecasts involved investigating whether the inflation forecasts of economic experts help to predict mass economic forecasts. Granger causality tests using four lags of each variable showed that the forecasts of experts did "Granger cause" mass economic forecasts ($F = 4.96, p < .00$) while the reverse was not true ($F=1.97, p < .10$). Implementing these tests on the first differences of each variable shows that changes in expert forecasts do not help to predict changes in mass forecasts ($F=1.59, p < .18$) nor do changes in mass forecasts help to predict changes in experts' forecasts ($F=.97, p < .43$).

However, neither of these tests is the appropriate way to examine the question of "Granger causal" relationships between these two series because both the expert and mass forecast series contain a unit root and the two series are cointegrated. To appropriately investigate this question, I

Table 16. Estimates of Diagnostic VAR Model

| | Endogenous Variable | |
|--|-----------------------------|-------------------------|
| | Δ expert forecasts | Δ mass forecasts |
| constant | .007
(.106) ^a | 3.326
(1.023) |
| Δ expert forecasts _{t-1} | .014
(.093) | -1.768
(.897) |
| Δ expert forecasts _{t-2} | -.132
(.091) | .081
(.882) |
| Δ expert forecasts _{t-3} | -.014
(.088) | .148
(.853) |
| Δ expert forecasts _{t-4} | -.024
(.088) | -.739
(.848) |
| Δ mass forecasts _{t-1} | .004
(.009) | .150
(.090) |
| Δ mass forecasts _{t-2} | .008
(.009) | .236
(.088) |
| Δ mass forecasts _{t-3} | -.001
(.009) | .247
(.087) |
| Δ mass forecasts _{t-4} | .007
(.009) | .299
(.087) |
| expert forecasts _{t-1} | -.097
(.047) | 2.409
(.495) |
| mass forecasts _{t-1} | .011
(.008) | -.422
(.076) |
| bloc F tests: | | |
| Δ expert forecasts _{t-p} | .56 (p < .69) | 4.86 (p < .00) |
| Δ mass forecasts _{t-p} | .48 (p < .74) | 1.27 (p < 1.29) |
| R ² | .10 | .25 |
| adjusted R ² | .03 | .19 |
| SE | .62 | 6.02 |
| Box-Pierce Q: | 16.66 | 7.74 |
| $\chi^2(20)$ | | |

^aQuantities in parentheses are the standard errors of these coefficients.

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estimated a diagnostic, unrestricted VAR-type model (Engle and Granger 1987). The estimates are in Table 16. As the results in column one of this table show, changes in the inflation forecasts of experts are not "Granger caused" by changes in mass forecasts ($F=.48$) nor are they influenced by the level of mass economic forecasts ($t\text{-ratio} = 1.38$). However, as shown in column two, expert forecasts do "Granger cause" changes in mass economic forecasts as indicated by the evidence that the level of experts' forecasts have a statistically significant effect on changes in mass economic forecasts ($t\text{-ratio} = 4.87$).

DISCUSSION AND SUMMARY

The empirical evidence in this chapter includes a number of new and interesting results. For instance, presidential approval and mass forecasts of future business conditions are shown not only to be associated with each other at the aggregate level, but to be related to each other in such a way that the two series move together in a dynamic equilibrium relationship. Similarly, economic forecasts share a common long-run dynamic pattern with the observed inflation level. Thus, the relationship between presidential approval and the observed level of inflation is indirect with inflation affecting economic forecasts and economic forecasts in turn influencing presidential approval.

My theory suggests that the latent causal force underlying these dynamic patterns of equilibration is media information and the flow of media information across citizens

over time. Although controlling for the effects of information within the context of the *presidential accountability* and *economic forecasting* models does not wipe out the influence of economic forecasts on presidential approval or the influence of inflation on forecasts of future business conditions, measures of information reception do have independent effects on changes in approval and economic forecasts. These results about information are both important and interesting.

For instance, the evidence that last month's levels of accurate information about inflation and unemployment influence presidential approval calls into question the assertion of MacKuen, Erikson, and Stimson (1992, 597) that "the prospective component fully accounts for the approval time series." Since the survey question tapping information reception has a retrospective tone to it and since the *lagged* levels of the resulting aggregate measures of information reception influence presidential approval, my evidence seems to suggest that we should not be too quick to discard the idea that at least some citizens are assigning blame to the president for past economic conditions. On a related point, the evidence that these variables measuring information reception have independent effects on changes in presidential approval and the evidence that the lagged level of accurate information about inflation influences economic forecasts also suggests that these forecasts are not "rational expectations"

in the Muthian sense since they do not appear to encompass efficiently all previous information.

And so the question becomes one of what effect these information reception variables are capturing. Recall that in both the *presidential accountability* and *economic forecasting* models, the estimated coefficients for these variables have the same sign that one would expect the observed inflation or unemployment rates to have. The reason this is the case is because the percentage of people with accurate information about inflation and unemployment increases as observed conditions get worse. Thus, it is likely that these aggregate levels of information reception are correlated with the *salience* of inflation and unemployment as concerns in citizens' minds. Interestingly, this results lends support to Ostrom and Simon's (1985, 355) assertion that changes in presidential approval "depend upon the degree to which public concern is concentrated upon these fundamental expectations." It also lends support to my arguments about the differential rates of citizen exposure to economic information since the percentage of those exposed can plausibly be said to grow as information about these outcomes becomes more accessible or "cheap." In light of these results, I think we need to develop individual- and aggregate-level theories that include the salience of outcomes on public opinion as an explanatory concept.

In addition to this interesting evidence about information reception and the salience of economic outcomes, another important result in this chapter is the evidence that during the Reagan administration, variation over time in the distribution of information across citizens (as measured by cell proportions) has no statistically significant effect on presidential approval. As noted earlier, this result (with the caveat that the model contains a lagged dependent variable and thus makes the test more strenuous) implies that the dynamics of presidential approval are not caused by the persistence of micro-level nonlinearities at the aggregate level. Although this question needs to be investigated for other administrations, my analysis represents the first attempt within the approval literature to examine this issue. Finally, the empirical evidence that experts' forecasts of inflation are useful in predicting mass economic forecasts lends support to my arguments that information is flowing in a "top-down" manner from elites, whose opinions are promulgated in the media, to the general public.

Taken as a whole, the empirical evidence presented in this chapter allows me to answer the three questions posed earlier. First, the presidential accountability and economic forecasting models do fit the data well. Second, there is evidence that subsets of these variables are related via a dynamic equilibrium relationship. And third, although the effects of information do not dominate these relationships,

the *salience* of economic information is found to have important aggregate-level implications for changes in presidential approval and changes in economic forecasts.

1. I estimated each of these equations using nonlinear least squares in a single step, so that I could obtain estimates of the standard errors for both the cointegrating parameter and the rate of adjustment. The equation for changes in presidential approval also included dummy variables for the first quarter of each new presidential administration. As is standard practice (e.g.; Beck 1990; MacKuen, Erikson, and Stimson 1992), I do not report the coefficient estimates for the dummy variables because they have no substantive meaning.

2. The F test in the row labelled "lags" is the F test for the exclusion of the bloc of lagged first difference as well as the contemporaneous change in economic forecasts.

3. The variance of the first differences of economic forecasts is 1/7 that of the levels. Thus, it is much more difficult in general to account for the variance of these changes.

4. I also regressed changes in unemployment and changes in inflation on these lagged equilibrium variables. The resulting estimates generally supported the claim that unemployment and inflation are exogenous to presidential approval and economic forecasts although there was an anomalous result suggesting that the level of presidential approval perhaps has a feedback effect on the level of inflation.

5. These estimates were obtained by including two lags of the first differences of each variable as regressors. Two lags were found to provide the most parsimonious and efficient fit to the data. However, these results are fairly robust to alternative lag length specifications. For instance, checking lag lengths from 1 through 4 shows that the null hypothesis of at least one cointegrating vector cannot be rejected at the $\alpha = .05$ level. However, the null hypothesis that there are at least two cointegrating vectors is rejected only at approximately the $\alpha = .07$ level when the lag length is four quarters. Johansen and Juselius (1992) suggest analysts use $\alpha = .10$ as their confidence level.

6. The second equilibrium relationship is not between inflation and unemployment since the regression of inflation on unemployment produces a cointegration Dickey-Fuller statistic of -1.53, which is smaller than the $\alpha = .05$ critical value of -3.38. Thus, the null hypothesis of no cointegration cannot be rejected. Since the residuals from this regression are nonstationary, inflation and unemployment are not bound together in an equilibrium relationship.

7. One caveat with respect to these conclusions is that it can be much more difficult to detect the effects of micro-level nonlinearities in an aggregate-level model that includes a lagged endogenous variable than in a model that simply includes lagged explanatory variables (Stoker 1986, 783). A second caveat is that these results are only for the Reagan administration and are only for the distributional effects associated with my measure of forecasts of future business conditions.

8. Changes in levels of accurate inflation and unemployment information had no statistically significant effects on changes in economic forecasts.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS

The central theoretical argument in this work is that citizens' opinions of the president's job performance are a function of their beliefs about desired outcomes for which they think the president is accountable and the information they have about present and future outcomes. Because I assume that citizens have temporally stable, homogeneous preferences for ideal presidential performance, my arguments imply that citizens' expressions of presidential approval are driven by the varying amounts of information they receive. My empirical evidence, which shows that accurate information about inflation and unemployment in conjunction with unfavorable economic forecasts influence changes in aggregate presidential approval, is consistent with these arguments. Furthermore, since my results show that aggregate forecasts are affected by information about inflation, the importance of economic information within the aggregate-level system of presidential accountability is clearly established.

INTERPRETING A PRESIDENT'S APPROVAL RATING

My emphasis on information as the force behind opinion change draws attention to the context-dependent nature of public support for the president. And my theoretical arguments and empirical evidence provide insight into the important facets of the informational environment in which

citizens make their decisions to approve of the president. For instance, this informational environment consists of both short-run and long-run factors. In the short-run, the relevant context for the approval decision includes information about dramatic international crises, while over the long run, it consists of information about institutional scandals, the enduring effects of war, and the future course of the economy. In addition, my empirical results show that variation over time in the salience of information about economic outcomes exerts an independent effect on aggregate approval. This, in turn, implies that the salience of information is an important component of the informational atmosphere in which citizens evaluate the president's job performance.

Because the process by which presidents are held accountable by the public has changed from a discrete and indirect event at the founding to a more direct and "perpetual election," the context-dependent nature of a president's approval ratings implies that part of a president's informal power is conditional on the information environment as well. Thus, a chief executive's ability to achieve his or her goals when interacting with members of the president's governmental, partisan, international, or national constituencies depends upon the constellation of salient information about short-run events and long-run outcomes that citizens have. And since the salience of the information depends primarily upon the

events and outcomes that citizens observe and perceive, this information environment (and hence the degree of informal presidential power) ebbs and flows as events and outcomes change.

However, some modern presidents seem not to understand the context-dependent nature of approval and instead ignore Neustadt's (1980, 17) warning that a president's approval ratings provide only "a clue to what they [citizens] saw around them when they said it." As a result, presidents sometimes mistakenly assume that high approval ratings represent across-the-board support for a president's program and performance rather than support that is dominated by citizens' responses to *salient* information. Furthermore, some chief executives do not recognize the distinct short- and long-run effects of different events and outcomes on presidential approval. Consequently, presidents may incorrectly assume that the effects of a declining economy on their approval ratings can be permanently halted by using a "going public" strategy rather than by attempting to change economic policy.

In addition to the potential for a president to ignore the difference between the sources of transitory versus long-run booms and busts in approval, my arguments and evidence suggest two other reasons that presidents may fail to comprehend the current meaning underlying their approval ratings. First, presidents might misjudge the meaning behind

their levels of public support because changes in presidential approval are an incomplete response to current information about observed and forecasted outcomes. My theoretical arguments suggest that differences among citizens in terms of their levels of awareness of and exposure to information creates a delay before full executive punishments and rewards are levied by all citizens. The thrust of this claim is supported by my empirical evidence in which the total effects of observed and forecasted outcomes on presidential approval are not instantaneous, but occur over the long run. Because citizens are differentially exposed to information, some of them err in the amount of punishment they levy on the president given existing conditions. In a sense, these errors cause slippage in the citizen-to-leader message system such that a president may fail to anticipate the ultimate degree of citizen displeasure with observed and forecasted conditions and to take action to change the outcomes that are causing the displeasure.

Second, the misreading of public support is compounded for presidents who assume that they are being held accountable only for observed (i.e.; realized) outcomes. As my empirical results show, presidential approval is intertwined in a long-run equilibrium relationship with citizens' forecasts of future business conditions. Since at least some portion of the electorate is punishing or rewarding the president for *anticipated* conditions, a president who assumes otherwise also

will misunderstand the message underlying his or her approval ratings.

INFORMATION AND APPROVAL MAINTENANCE

Assuming that a president did understand (a) that his or her approval ratings are context-dependent, (b) that this context consists of both short- and long-run influences, (c) that citizens are concerned with past, current, and future outcomes, and (d) that full presidential accountability is a long-run, rather than an instantaneous, phenomenon, what are the possibilities and consequences for a president concerned with bolstering or maintaining his or her approval ratings and hence, degree of informal power? My arguments and evidence suggest that presidents have two obvious tools to use to bolster sagging approval ratings. First, presidents can sometimes deploy U.S. troops to international hot spots to gain short-run "rally 'round the flag" boosts in approval. Or second, presidents can attempt to change fiscal or monetary policy in such a way as to bring about changes in economic conditions.

Given that citizens' forecasts of the future are influenced by the level of inflation, changes in monetary policy may be more effective in changing approval levels in the long run. However, I am skeptical that a president's influence on monetary policy is more than marginal. In addition, since a president's ability to influence fiscal policy generally involves bargaining with members of the

governmental constituency, it is difficult for a president to generate quick changes in economic policy and economic conditions. Because of these difficulties, presidents may be tempted to get involved in an international crisis to boost or maintain their approval ratings. However, since full-scale wars have negative and long-run effects on approval, and since not all crisis interventions boost approval (Brody 1991), a president's ability to increase his or her approval ratings using this tactic is somewhat risky. Furthermore, even if international actions do create a "rally" effect, the resulting increase in approval will be transitory rather than permanent.

Notice that by attempting to influence economic outcomes or by taking actions in the international arena, presidents potentially can change *actual* outcomes. However, given the importance of information in general and of salient information more specifically to changes in presidential approval, a third way in which presidents might try to maintain or improve their levels of public support is by attempting to change the information environment without changing real-life outcomes. For instance, a president might use a "going public" strategy and engage in self-promotion in attempt to change the balance of media information. However, I found no empirical evidence to suggest that presidential speeches or foreign travel have an effect on a president's quarterly approval ratings. Thus, to the extent that these

activities have an influence (for instance, on monthly approval), the effects must be small and short-lived. Furthermore, as Page, Shapiro, and Dempsey (1987) show, media messages attributed to unpopular presidents have little effect on public opinion. Thus, this strategy is not likely to be useful for generating increases in support once approval has fallen.

The fundamental problem with all three of these tactics is that presidents tend to use them reactively rather than in a preventative fashion. But once events transpire, a president's ability to change his or her approval ratings is constrained by past events. This is also true for presidential attempts to manipulate the informational environment using pure public relations efforts. Thus, if these tactics are to be effective, a president must exercise them proactively, anticipating rather than following public reactions to events and outcomes.

Recognizing these constraints, Neustadt (1980, 133) suggests that presidents exercise prospective leadership (and approval management) by *teaching* citizens about hardships that may occur in the future and about the actions that they can trust the president to take. As Neustadt notes, this teaching must consist of a combination of words and actions (with the emphasis on presidential actions) that neither glosses over nor presents the truth in an analytic fashion that is detached from citizens' real-life experiences. According to Neustadt

(1980, 78), the task of teaching citizens "is not a scholar's job -- or Madison Avenue's." Instead, a president must teach citizens in a way that "gives real-life experiences a meaning that will foster tolerance for him" (Neustadt 1980, 77).

In light of the structural constraints that presidents face when trying to change the events and outcomes for which the public holds them accountable and given the demands and tension inherent in the paradox of modern presidential power, Neustadt's advice seems particularly appropriate: Look ahead. Recognize the plight of those you are leading. And establish a credible record of action on "real-life" problems so that when you ask citizens to suspend their assignments of blame during difficult times they will have some basis for determining whether you can be trusted to solve the impending hardships.

CONTRIBUTIONS AND FUTURE RESEARCH

Four primary contributions to the existing political science literature arise from this dissertation. First, my theoretical arguments about information diffusion and the way in which information interacts with citizens' normative standards of accountability provide a plausible microfoundation for the aggregate-level relationship between presidential approval and mass economic forecasts. Rather than ignoring individual-level behavior or assuming that the aggregate-level approval function represents the decision calculus of the "representative citizen," my arguments suggest

a link between heterogeneous individual behavior and the dynamics of presidential approval. Thus, my arguments provide a behavioral base that is missing from other studies of presidential approval (e.g.; Hibbs 1987; MacKuen, Erikson, and Stimson 1992).

Second, my theoretical discussion of the concept of information diffusion and its application to presidential approval also yields conceptual contributions. For example, my distinction between the causal forces behind the short-run effects of dramatic political events on presidential approval and the long-run influence of economic forecasts suggests that information about different types of outcomes penetrates the electorate at varying rates. And as my arguments imply, the rate at which information spreads is likely a function of the salience of the outcomes as indicated by media and elite attention to them (see also Zaller 1992). The importance of the concept of salience to the process of information diffusion and aggregate opinion change is reinforced by my empirical evidence that approval changes are influenced by the level of accurate inflation and unemployment information.

The third contribution of this dissertation is its explication of the theoretical and practical issues associated with time series estimators that are new to a majority of political scientists. Although error correction models are being estimated more frequently in political science, the theoretical issues associated with their estimation are less

well understood. In addition, this work provides a detailed discussion and application of univariate tests for stationarity and nonstationarity as well as univariate and multivariate tests for cointegration that should be useful to many applied researchers. More specifically, this dissertation is the first to introduce political scientists to tests for seasonal unit roots in quarterly data and to the KPSS test of the null hypothesis of stationarity.

The fourth contribution of this work arises from my attempt to take the problem of aggregation and the links between the micro and macro levels seriously. Although my micro-level decision calculi are primarily heuristic devices and I have not derived formally the connection between the individual and aggregate levels, my discussion and application of Stoker's (1986) test for aggregation bias and Granger's (1987, 1990) work on common factors provides a solid first step toward an answer to the question of the way in which the myriad individual approval decisions result in a president's approval rating within a particular cross section and over time. Because these aggregation issues permeate a wide range of studies, the work in this dissertation may be useful across all subfields of political science.

In addition to its contributions, this dissertation also raises a number of questions for future research. First, my empirical results suggest that the influence of the media on information in general and specifically on the salience of

information needs additional investigation. In light of my theoretical arguments and empirical results, my current plans are to create time series measures of the salience of economic outcomes and of the number of retrospective versus prospective interpretations of economic outcomes by coding the content of nationally televised news reports. I will then investigate the relationship of these measures to changes in presidential approval.

Second, I plan to test my arguments at the individual level and hope to obtain the panel data collected and used by Conover, Feldman, and Knight (1986, 1987). These data are rich with self-reports of the types and amounts of retrospective and prospective information that individuals have. Third, I also plan to extend my aggregate-level analyses through the Bush and Clinton administrations as data on mass economic forecasts become available.

APPENDICES

APPENDIX A

UNIT ROOTS TESTS: TECHNIQUES

When two or more $I(1)$ variables are cointegrated, they form a linear combination that is stationary. Consequently, testing hypotheses about the presence of cointegration is based on the idea that stationary time series can be distinguished from nonstationary ones. In this appendix, I introduce statistical tests that can be used to test whether a single series or a single linear combination of series is stationary.

Dickey-Fuller Unit Root Tests

The existing econometric literature outlines numerous statistical tests for determining whether a single time series is stationary (e.g.; Dickey and Fuller 1979; Dickey, Bell, and Miller 1987; Phillips and Perron 1988; Kwiatkowski, Phillips, Schmidt, and Shin 1992). Many of these tests for unit roots are variations of the original and most commonly-used test due to Dickey and Fuller (1979).

To motivate my discussion of the Dickey-Fuller or DF test, first consider the following $AR(p)$ process:

$$y_t = \phi_1 y_{t-1} + \phi_2 y_{t-2} + \dots + \phi_p y_{t-p} + \epsilon_t \quad (A1)$$

Now let L = the lag operator such that $Ly_t = y_{t-1}$, and let $\Delta = 1-L$ so that $\Delta y_t = (1-L)y_t = y_t - y_{t-1}$. The DF test makes use of the fact that any p th order AR process is identically equal to:

$$(1-L)y_t = \sum_{i=1}^{p-1} \phi_i (1-L)y_{t-i} + \phi_p y_{t-p} + \epsilon_t \quad (\text{A2})$$

The ϕ_p coefficients for this process form an AR(p) polynomial as follows:

$$\phi(L) = 1 - \phi_1 L^1 - \phi_2 L^2 - \dots - \phi_p L^p \quad (\text{A3})$$

The DF test is a test of whether $(1-L)$ is a factor of the characteristic equation of y_t . When $(1-L)$ can be factored from the AR(p) polynomial, then $(1-L) = 0$, which implies that $L=1$. In that case, the characteristic equation has a unit root, and the scalar process is nonstationary. Looking at Equation [A2], it is clear that $(1-L)$ will be a factor of the AR(p) polynomial if $\phi_p = 0$.

The test initially proposed by Dickey and Fuller (1979) was for an AR(1) process *without drift* as follows:

$$(1-L)y_t = \phi_1 y_{t-1} + \epsilon_t \quad (\text{A4})$$

where $\phi_1 = (\rho_1 - 1)$. In the Dickey-Fuller framework, the null hypothesis is $\phi_1 = 0$ versus the alternative that $\phi_1 \neq 0$. Consequently, estimating Equation [A4] and determining if $\phi_1 = 0$ (i.e., if $\rho_1 = 1$) serves as an empirical test of whether a time series has a unit root and is nonstationary. Note that if the quantity $(\rho_1 - 1)$ is negative and significantly different from zero, then y_t is stationary. The limiting distribution for ϕ_1 is nonstandard. Critical values are provided in Dickey and Fuller (1979).

DF tests in the presence of drift. Many time series show evidence of drift, and so a constant term should be included in the DF regression as follows:

$$(1-L)y_t = \alpha + \phi_1 y_{t-1} + \epsilon_t \quad (A5)$$

To test the null hypothesis that a series is integrated when drift is present, one can estimate Equation [A5] using ordinary least squares and then determine whether ϕ_1 (i.e.; the quantity $(\rho_1 - 1)$) is significantly different from zero by comparing the "t-statistic" for this coefficient to an appropriate critical value. However, the critical values in Dickey and Fuller (1979) are only correct when the series shows no evidence of drift (i.e.; when $\alpha = 0$).

When $\alpha \neq 0$ the asymptotic and finite-sample distributions of ϕ_1 depend on the magnitude of the drift. One way to free the distribution of ϕ_1 from the nuisance of drift is to include a time trend in the DF regression as follows:

$$(1-L)y_t = \alpha + \beta t + \phi_1 y_{t-1} + \epsilon_t \quad (A6)$$

Under the null that $\rho = 1$ and $\beta = 0$, the DF critical values calculated by MacKinnon (1991) can be used.

However, when $\beta = 0$, the time trend is an irrelevant regressor, and Schmidt (1990) argues that including it decreases the power of the test. Schmidt (1990) shows that if the true data-generating process is given by Equation [A5], then the limiting distribution of the coefficient ϕ_1 depends on both the sample size, T , and the standardized drift -- the ratio of drift to the standard error of the disturbance.

Schmidt's solution to the problem of testing for unit roots in the presence of drift is to estimate DF regressions as in Equation [A5] but to calculate the degree of standardized drift. This standardized drift, denoted α/σ_ϵ^2 , is not observable, but can be estimated under the null by imposing the unit root and using OLS to estimate:

$$\Delta y_t = \alpha + u_t \quad (A7)$$

The standardized drift then can be computed using $\hat{\alpha} = \text{mean } \Delta y_t$ and $\hat{\sigma}_\epsilon^2 = \hat{\sigma}_u^2/(T-1)$. Schmidt provides the distribution of the DF statistic as a function of 10 different sample sizes and 24 values of standardized drift.

DF tests in the presence of a deterministic trend. Although the conventional wisdom suggests that one conclude a series contains a unit root any time the DF or ADF statistics fail to reject the null, Kwiatkowski et al. (1992) note that failure to reject the null also often occurs if a series has a deterministic trend. Thus, estimating DF regressions both with and without a time trend is useful for determining whether the nonstationarity of a series is due to a deterministic rather than a stochastic trend. For instance, a statistically significant coefficient for the time trend in conjunction with a non-significant ϕ_1 coefficient could indicate that the series is trend stationary rather than difference stationary. If both coefficients are statistically significant, this could indicate the series has both a stochastic and a deterministic trend. Note that when $\beta \neq 0$,

the coefficients obtained from estimating Equation [A6] have standard normal distributions both asymptotically and in finite samples larger than 50 or so (Dickey and Fuller 1979; Goerlich 1992). However, in small samples, analysts might continue to use the nonstandard Dickey-Fuller or MacKinnon critical values (Goerlich 1992).

DF tests in the presence of serial correlation. In addition to the issue of nonzero drift and time trends, analysts also need to control for serial correlation since the DF regressions in Equations [A4] through [A6] are based on the assumption that the ε_t are iid. But when these regressions are estimated for processes of an order higher than AR(1), the ε_t may be serially correlated. In that case, these regressions must be augmented with enough lagged first difference terms to make the residuals white noise. Such tests are referred to as Augmented Dickey-Fuller tests (ADF).

DF tests for a second unit root. If the DF or ADF tests for a series do not allow rejection of the null and if the series contains no deterministic trend, then it is important to determine whether the series has only a single unit root. This is accomplished by regressing the second difference of the series on one lag of the first differences (with no constant term) for the DF test or by regressing the second differences on one lag of the first differences augmented by lagged second differences terms to control for autocorrelation (an ADF test). The "t-statistic" for the coefficient associated with the lagged first difference term is again the

DF or ADF statistic. If the null of a unit root is rejected at this stage, then one can conclude that the series has only a single unit root. However, unit root tests must not be applied mechanically. For instance, if an analyst suspects that a series has more than one unit root, Dickey and Pantula (1987) show that a top-down testing sequence should be used in which one tests for the maximum number of unit roots first.

DF tests in the presence of seasonality. Although the discussion thus far has assumed the presence of a single unit root, a series potentially can have (a) no unit roots, (b) a root or roots at zero frequency or (c) a root or roots at non-zero frequencies. To encompass these alternatives, Engle, Granger, and Hallman (1987) propose a more general definition of seasonal integration than that used previously in the econometrics literature. According to these authors, a variable is seasonally integrated of orders d_0 and d_s , denoted $SI(d_0, d_s)$, if:

$$(1-L)^{d_0} S(L)^{d_s} y_t = \Delta^{d_0} S(L)^{d_s} y_t \quad (A8)$$

is stationary. Under this formulation, $S(L)$ is a seasonal filter. For instance, for quarterly data: $S(L) = 1 + L + L^2 + L^3$. Given this definition, an $I(1)$ process that is stationary after first differencing is denoted as an $SI(1,0)$ process.

The idea behind the Engle, Granger, and Hallman definition is that if y_t is seasonally integrated it will be stationary after both first differencing and seasonal differencing; that is, for quarterly data, if $\Delta \Delta_s y_t \sim I(0)$,

then y_t is seasonally integrated. Although this is the typical way to think of seasonal integration, Engle et al. go on to show that a zero frequency unit root can be caused by seasonality in the data. As they show, since $\Delta y_t = (1-L^4)y_t = (1-L)(1+L+L^2+L^3)y_t$, this implies:

$$\Delta \Delta y_t = (1-L)^2 S(L) y_t \quad (A9)$$

As the expression in [A9] indicates, with quarterly data, the potential exists for two unit roots at zero frequency (one of which results from decomposing the seasonality in the data) as well as seasonal roots at other frequencies.

Hylleberg, Engle, Granger, and Yoo (1990) develop a test for multiple zero frequency unit roots and seasonal roots in quarterly data. Their test is based on further decomposing [A9] as:

$$(1-L)(1+L^4)y_t = (1-L)(1-L)(1+L)(1+L^2)y_t \quad (A10)$$

The factors of this polynomial can be interpreted by recalling that $(1-L)y_t$ implies that $y_t = y_{t-1} + e_t$; $(1+L)y_t$ implies that $y_t = -y_{t-1} + e_t$; and $(1+L^2)y_t$ implies that $y_t = -y_{t-2} + e_t$. Thus, for quarterly data, the roots of Equation [A10] correspond to two zero frequency unit roots, one biannual unit root at a half cycle per quarter (two cycles per year), and two complex pairs at annual cycles (one fourth cycle per quarter).

Hylleberg, Engle, Granger, and Yoo (1990) show that testing for various patterns of seasonal integration can be accomplished by estimating the following regression:

$$\phi^*(L) \hat{y}_{4t} = \pi_1 \hat{y}_{1t-1} + \pi_2 \hat{y}_{2t-1} + \pi_3 \hat{y}_{3t-2} + \pi_4 \hat{y}_{3t-1} + v_t \quad (\text{A11})$$

where the $\hat{y}_{jt}$ terms are constructed as follows:

$$\begin{aligned} \hat{y}_{1t} &= (1+L+L^2+L^3) \left(y_t - \sum_{p=1}^p \hat{\theta}_p y_{t-p} \right) \\ \hat{y}_{2t} &= -(1-L+L^2-L^3) \left(y_t - \sum_{p=1}^p \hat{\theta}_p y_{t-p} \right) \\ \hat{y}_{3t} &= -(1-L^2) \left(y_t - \sum_{p=1}^p \hat{\theta}_p y_{t-p} \right) \\ \hat{y}_{4t} &= (1-L^4) y_t \end{aligned} \quad (\text{A12})$$

The $\hat{\theta}_p$ coefficients can be consistently estimated by regressing $\Delta_4 y_t$ on p lags of itself (Dickey, Hasza, and Fuller 1987, 366). Equation [A11] also may be augmented to include additional lags of $\Delta_4 x_t$, quarterly seasonal dummy variables, a time trend, and/or a constant term. The constructed variables from [A12] have the following interpretations: $\hat{y}_{1t}$ represents y_t with seasonal roots at nonzero frequencies filtered out, $\hat{y}_{2t}$ represents y_t with biennial cycles filtered out, $\hat{y}_{3t}$ represents y_t with annual cycles filtered out, and $\hat{y}_{4t}$ represents y_t differenced for all zero and nonzero frequency seasonal roots.

Given the way these variables are constructed, hypotheses about various combinations of seasonal roots and zero frequency unit roots are encompassed in Equation [A11]. For instance, determining whether the series has a root equal to +1 involves a test of the null hypothesis that $\pi_1 = 0$ versus the alternative that $\pi_1 < 0$. When $\phi^*(L) = 1$ and $\pi_2 = \pi_3 = \pi_4 = 0$, Equation [A11] implies that:

$$\hat{y}_{1t} = (1 + \pi_1) \hat{y}_{1t-1} + \epsilon_t \quad (\text{A13})$$

and testing $\pi_1 = 0$ is just the usual Dickey-Fuller test applied to the seasonally differenced y_t series; that is, it is a test for a unit root after filtering away zero and nonzero frequency roots due to seasonality. Investigating the presence of a root equal to -1 involves testing the null of $\pi_2 = 0$ (i.e.; $\phi(-1) = 0$) versus the alternative that $\pi_2 < 0$. When $\pi_1 = \pi_3 = \pi_4 = 0$ then Equation [A11] implies that:

$$\hat{y}_{2t} = -(1 + \pi_2) \hat{y}_{2t-1} + \epsilon_t \quad (\text{A14})$$

The distribution of π_2 is the mirror image of the Dickey-Fuller distribution and testing whether $\pi_2 = 0$ is a test of whether seasonality is causing a second unit root at zero frequency.

Testing π_3 and π_4 allows one to investigate biannual and annual nonstationarity caused by the complex seasonal roots. With respect to these complex roots, one wants to test the null that $|\phi(i)| = 0$. Here the alternative is that $|\phi(i)| > 0$, which is two-sided. Consequently, one can compute an F-statistic and test the joint null hypothesis of $\pi_3 = \pi_4 = 0$ versus the alternative that either $\pi_3 \neq 0$ or $\pi_4 \neq 0$. A second approach is to perform a two-sided test of the null hypothesis of $\pi_4 = 0$, and if accepted, then perform a one-sided test of the null hypothesis that $\pi_3 = 0$ versus the alternative that $\pi_3 < 0$.

Using this framework, when π_2 and either π_3 or π_4 are equal to zero, one can conclude that y_t has no seasonal unit

roots. A series is stationary (i.e. has no unit roots) if each of the π_i (except perhaps π_3 or π_4) are statistically different from zero. Hylleberg et al. provide appropriate critical values for each of these tests. Ilmakkunnas (1990) shows that the conclusion an analyst arrives at with respect to the order of seasonal integration depends upon the test and testing sequence used. When seasonal unit roots are suspected, he argues that it is better to start with the more general HEGY test rather than a DF or ADF test.

KPSS Test for Stationarity

The DF and ADF tests are not very powerful against series with a root near but not on the unit circle. Because, the null hypothesis is that the series has a unit root, this hypothesis is likely to be accepted unless there is very strong evidence against it. Therefore, Sims (1988) and Sims and Uhlig (1991) argue that Bayesian, rather than classical hypothesis testing methods, should be used to avoid this problem. But one solution to this problem within the classical hypothesis testing framework is to test the null hypothesis that the level of a series is stationary versus the alternative that it has a unit root. This is the motivation for the test developed by Kwiatkowski, Phillips, Schmidt, and Shin (1992).

Kwiatkowski et al. begin by assuming that a time series can be decomposed into the sum of a deterministic trend, a random walk, and a stationary error as follows:

$$y_t = \beta t + r_t + \epsilon_t \quad (\text{A15})$$

where

$$r_t = r_{t-1} + u_t \quad (\text{A16})$$

with the u_t iid with mean zero and variance σ^2 . When $\beta = 0$, so that y_t has no deterministic trend, the null hypothesis is that the series is stationary and the alternative is that the series is $I(1)$ with a unit root. (When $\beta_0 \neq 0$, the null hypothesis is that the series is trend stationary.)

By differencing the expression in Equation [A15], we obtain: $\Delta y_t = \beta + \Delta r_t + \Delta \epsilon_t$. And then substituting u_t in for Δr_t (as implied by [A16]) yields:

$$\Delta y_t = \beta + u_t + \Delta \epsilon_t \quad (\text{A17})$$

Kwiatkowski et al. define the error in Equation [A17] as $w_t = u_t + \Delta \epsilon_t$, and they argue that if u_t and ϵ_t are iid and mutually independent, then w_t can be expressed as an MA(1).

As long as this moving average representation for the error process exists, the KPSS model becomes equivalent to an ARIMA model of the following form:

$$y_t = \beta + \rho y_{t-1} + w_t \quad (\text{A18})$$

where $\rho = 1$ and where:

$$w_t = v_t + \theta v_{t-1} \quad (\text{A19})$$

If λ is defined as the ratio of the variance of u_t to the variance of ϵ_t , then Kwiatkowski et al. show that $\lambda = 0$ corresponds to $\theta = -1$ and stationarity, while $\lambda = \infty$

corresponds to $\theta = 0$ or a pure random walk. By examining Equations [A18] and [A19], we can see a connection between the KPSS test and the DF test. The DF test for a nonstationary level amounts to testing $\rho = 1$ assuming $\theta = 0$, so that θ is a nuisance parameter; whereas the KPSS test for stationarity is a test of $\theta = -1$ assuming that $\rho = 0$ so that ρ is a nuisance parameter.

The KPSS test for level stationarity is a Lagrange Multiplier test that can be expressed as:

$$LM = T^{-1/2} \sum_{t=1}^T S_t^2 / \hat{\sigma}_\epsilon^2 \quad (\text{A20})$$

where $\hat{\sigma}_\epsilon^2$ is the estimate of the disturbance variance from the regression of y_t on an intercept (the sum of squared residuals divided by T) and where S_t is a partial sum process of the residuals, $\hat{\epsilon}_t$, from the same regression as follows:

$$S_t = \sum_{i=1}^t \hat{\epsilon}_i \quad (\text{A21})$$

for $\{t=1,2,\dots,T\}$. Rather than augmenting the regression to control for serial correlation as is done in the ADF test, the LM statistic in Equation [A20] can be made robust to autocorrelation by obtaining a consistent estimate of the "long-run variance" of the disturbances. A consistent estimate, denoted $\hat{s}^2(\ell)$, of this long-run variance can be constructed from the residuals of the regression of y_t on a constant term as follows (see also Phillips and Perron 1988):

$$\hat{s}^2(l) = T^{-1} \sum_{t=1}^T \hat{\theta}_t^2 + 2T^{-1} \sum_{s=1}^l w(s, l) \sum_{t=s+1}^T \hat{\theta}_t \hat{\theta}_{t-s} \quad (\text{A22})$$

where $w(s, l)$ is an optional weighting function that guarantees the estimates of the variances will be positive. The most commonly used weighting function is $w(s, l) = 1 - [s/(l+1)]$ as suggested by Newey and West (1987).

A disadvantage of the test developed by Kwiatkowski et al. is that it is sensitive to the lag truncation parameter, l , and econometricians do not have a strong grasp on how best to determine the appropriate lag length. For consistency of the estimate of $\hat{s}^2(l)$, the lag truncation parameter must converge to infinity as T converges to infinity. Kwiatkowski et al. provide a series of power simulations that can assist analysts in determining the appropriate range for the lag truncation parameter given a finite sample size.

Testing for a Single Cointegrating Vector

Engle and Granger (1987) show that when the number of cointegrating relationships, r , is equal to 1, the single cointegrating vector can be estimated by:

$$\hat{z}_t = y_t - \alpha + \beta x_t \quad (\text{A23})$$

where $\hat{z}_t$ is the vector of residuals from the regression of y_t on x_t . Since two $I(1)$ variables that are cointegrated form a linear combination that is stationary, determining whether $\hat{z}_t \sim I(0)$ is a test for cointegration. The DF and ADF tests for unit roots can be used to test the null hypothesis of no

cointegration (i.e.; $\hat{z}_t \sim I(1)$) versus the alternative of cointegration. In this case, not only do the DF and ADF tests have a nonstandard distribution, but their distributions are affected by $k-1$, the number of explanatory variables (not including the intercept) in the cointegrating relationship. Appropriate critical values are provided in MacKinnon (1990).

APPENDIX B

UNIT ROOT TESTS: EMPIRICAL RESULTS

Because alternative theories will predict different trajectories for the aggregate approval series and because the type of time path that a series follows has important statistical implications, investigating whether a series is stationary, trend stationary, or difference stationary can provide evidence about the assumptions underlying rival hypotheses. In this appendix, I will use the DF, HEGY, and KPSS tests discussed in Appendix A to evaluate the properties of the monthly and quarterly time series measuring presidential approval, unemployment, inflation, and economic forecasts. Because claims about trends in a time series are better evaluated using longer rather than shorter samples, I will employ these tests on monthly data from 1949 through 1988 and on quarterly data from the fourth quarter of 1953 through the fourth quarter of 1988.

Dickey-Fuller Tests for Nonstationarity

The results of the DF tests of the null hypothesis that each series has a unit root are presented in Table B.1 for the monthly series and Table B.2 for the quarterly series. The evidence provided in Table B.1 shows that the null hypothesis that a series has a unit root can be rejected for monthly levels of presidential approval, but cannot be rejected for

Table B.1. DF Tests for Nonstationarity, Monthly*Test for unit root in level of each series*

| | DF | Box-Pierce
Q | ADF | Box-Pierce
Q |
|---------------------|-----------|-------------------------|------------|-------------------------|
| Approval | -4.00 | 8.41 | NA | NA |
| Unemployment | -1.67 | 146.15 | -2.81 | 26.09 |
| Inflation | -2.07 | 202.40 | -2.05 | 30.46 |
| Forecasts | -2.20 | 18.62 | NA | NA |

Test for unit root in first differences of each series

| | DF | Box-Pierce
Q | ADF | Box-Pierce
Q |
|--|-----------|-------------------------|------------|-------------------------|
| ΔApproval | -22.41 | 10.96 | NA | NA |
| ΔUnemployment | -19.64 | 102.14 | -8.18 | 27.57 |
| ΔInflation | -16.20 | 141.33 | -8.21 | 28.43 |
| ΔForecasts | -12.71 | 21.31 | NA | NA |

^aIn the ADF tests, enough lags of the dependent variable were included to make the residuals white noise and the $\alpha = .05$ level. The number of lags used were: level of unemployment, 3; level of inflation, 13; change in unemployment, 2; and change in inflation, 12.

^bCritical values: -2.58 for $\alpha=.10$; -2.88 for $\alpha=.05$; -3.48 for $\alpha=.01$.

the monthly levels of unemployment, inflation, and economic forecasts. The nonstationarity of the monthly levels of inflation and economic forecasts does not appear to be due to deterministic trends. However, the evidence about the source of the nonstationarity in the unemployment series is mixed: the coefficient for a time trend included in the ADF is statistically significant (t ratio = 2.12), but the joint null hypothesis that the unemployment series has a unit root ($\rho = 1$) and not a deterministic trend ($\beta = 0$) cannot be rejected (bloc $F = 6.21$, $\alpha = .05$ critical value = 6.30).

The results of applying the DF and ADF tests to quarterly data for the Eisenhower through Reagan years are reported in Table B.2 and show that the null hypothesis of a unit root can be rejected for both the quarterly levels of approval and unemployment, but cannot be rejected for the quarterly levels of inflation and economic forecasts. An investigation of deterministic trends shows that the unemployment series may be trend stationary since the coefficient for a time trend is statistically significant and the joint test of the null that $\rho = 1$ and $\beta = 0$ is rejected (bloc $F = 7.53$, critical value = 6.30 for the $\alpha = .05$ level). None of the other series appear to be a function of deterministic trends.

HEGY Tests for Seasonal Integration

Because a zero-frequency unit root can result from seasonality in the data, I also used the HEGY tests and a "top down" testing sequence (i.e.; testing for the maximum number

Table B.2. DF Tests for Nonstationarity, Quarterly*Test for unit root in level of each series*

| | DF | Box-Pierce
Q | ADF | Box-Pierce
Q |
|---------------------|-----------|-------------------------|------------|-------------------------|
| Approval | -3.29 | 23.90 | NA | NA |
| Unemployment | -2.20 | 83.93 | -3.26 | 22.14 |
| Inflation | -1.47 | 124.93 | -2.74 | 29.93 |
| Forecasts | -1.14 | 20.69 | NA | NA |

Test for unit root in first differences of each series

| | DF | Box-Pierce
Q | ADF | Box-Pierce
Q |
|--|-----------|-------------------------|------------|-------------------------|
| ΔApproval | -10.36 | 25.19 | NA | NA |
| ΔUnemployment | -5.96 | 25.96 | NA | NA |
| ΔInflation | -6.72 | 45.24 | -6.49 | 17.95 |
| ΔForecasts | -5.64 | 19.37 | NA | NA |

^aIn the ADF tests, enough lags of the dependent variable were included to make the residuals were: level of unemployment, 1; level of inflation, 5; and change in inflation, 7.

^bCritical values: -2.58 for $\alpha=.10$; -2.88 for $\alpha=.05$; -3.48 for $\alpha=.01$.

Table B.3. HEGY Tests for Seasonal Integration, Quarterly*Test for seasonal integration in first differences*

| Conclusion/Results | | | | |
|---------------------------|------------------------------------|--|-------------------------------------|-------------------------------------|
| | ΔApproval | ΔUnemployment | ΔInflation | ΔForecasts |
| H_0 : SI(2,1) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| H_A : SI(2,0) | | | | |
| π_2 | -4.22 | -5.52 | -5.51 | -3.96 |
| π_3 | -4.62 | -7.80 | -7.44 | -5.95 |
| π_4 | -0.54 | 0.96 | -0.38 | 1.08 |
| H_0 : (2,1) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| H_A : (1,1) | | | | |
| π_1 | -3.36 | -3.72 | -3.21 | -4.93 |
| H_0 : (2,1) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| H_A : (1,0) | | | | |
| π_1 | -4.63 | -5.67 | -4.83 | -5.04 |
| π_2 | -4.15 | -5.47 | -6.86 | -4.34 |
| π_3 | -5.49 | -9.58 | -8.95 | -6.39 |
| π_4 | -0.27 | 1.24 | 0.33 | 1.01 |
| H_0 : (2,0) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| H_A : (1,0) | | | | |
| π_1 | -4.63 | -5.67 | -4.83 | -5.04 |

Test for seasonal integration in level of each series

| | Approval | Unemployment | Inflation | Forecasts |
|---------------|-----------------|---------------------|------------------|------------------|
| H_0 : (1,1) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| H_A : (1,0) | | | | |
| π_2 | -4.51 | -6.36 | -7.29 | -5.12 |
| π_3 | -5.97 | -8.77 | -8.89 | -6.67 |
| π_4 | 0.01 | -0.50 | -1.10 | 0.16 |
| H_0 : (1,1) | fail to | fail to | fail to | fail to |
| H_A : (0,1) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| π_1 | -2.49 | -2.06 | -1.84 | -3.83 |
| H_0 : (1,1) | fail to | fail to | fail to | fail to |
| H_A : (0,0) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| π_1 | -2.71 | -2.26 | -2.05 | -2.62 |
| π_2 | -4.67 | -6.39 | -7.31 | -3.79 |
| π_3 | -6.08 | -8.80 | -8.91 | -4.76 |
| π_4 | 0.33 | -0.49 | -0.99 | 0.91 |
| H_0 : (1,0) | fail to | fail to | fail to | fail to |
| H_A : (0,0) | reject H_0 | reject H_0 | reject H_0 | reject H_0 |
| π_1 | -2.71 | -2.26 | -2.05 | -2.62 |

*Each HEGY test was augmented with enough lags of the dependent variable to make the residuals white noise at the $\alpha = .05$ level.

^bCritical values for tests of first differences with no intercept are for π_1 , π_2 , and π_3 : -1.59 for $\alpha = .10$; -1.93 for $\alpha = .05$; -2.62 for $\alpha = .01$, and for π_4 are: -1.31 for $\alpha = .10$; -1.68 for $\alpha = .05$; -2.62 for $\alpha = .01$.

^cCritical values for tests of levels with an intercept are for π_1 : -2.58 for $\alpha = .10$; -2.89 for $\alpha = .05$; -3.51 for $\alpha = .01$, and for π_2 and π_3 are: -1.58 for $\alpha = .10$; -1.91 for $\alpha = .05$; -2.60 for $\alpha = .01$, and for π_4 are: -1.31 for $\alpha = .10$; -1.68 for $\alpha = .05$; -2.36 for $\alpha = .01$.

of unit roots first) to investigate seasonal integration in the quarterly series. The results of these tests appear in Table B.3 and show that the none of the series have seasonal unit roots at non-zero frequencies nor do any of them have more than one zero-frequency unit root.¹ With respect to the usual null hypothesis that a series has a single unit root, the results in Table B.3 indicate that this null cannot be rejected for any of these series; that is, the quarterly levels of presidential approval, unemployment, inflation, and economic forecasts appear to be nonstationary. In addition, none of these series shows evidence of deterministic trends. Their nonstationarity seems to arise because the series are $I(1)$ processes. The contradictory evidence from the HEGY and DF and ADF tests may occur because these tests control for serial correlation differently.

KPSS Tests for Stationarity

Because in a Dickey-Fuller test the null hypothesis is that a series has a unit root, DF and ADF tests have low power against alternatives that have a root close, but not equal, to one. To alleviate problems of power, I also used the KPSS test to test the null hypothesis that the monthly approval and unemployment series are each stationary. The results of the KPSS tests are reported in Table B.4. I also report the results of this test for the inflation series as a point of reference for the performance of the test.

Table B.4. KPSS Tests for Stationarity, Monthly

| | Lag Truncation Parameter (l) | | | | |
|--------------|--|------|------|------|------|
| | 0 | 2 | 4 | 6 | 8 |
| Approval | 4.07 | 1.69 | 1.05 | .789 | .640 |
| Unemployment | 19.34 | 6.44 | 3.95 | 2.86 | 2.26 |
| Inflation | 16.89 | 5.70 | 3.46 | 2.51 | 1.99 |

| | Lag Truncation Parameter (l) | | | | |
|--------------|--|------|------|------|------|
| | 10 | 12 | 14 | 16 | 18 |
| Approval | .545 | .479 | .431 | .394 | .366 |
| Unemployment | 1.88 | 1.63 | 1.44 | 1.29 | 1.18 |
| Inflation | 1.65 | 1.43 | 1.26 | 1.13 | 1.03 |

^aCritical values: .739 for $\alpha = .01$, .463 for $\alpha = .05$, and .347 for $\alpha = .10$.

The evidence in Table B.4 supports the previous findings that inflation is an integrated process. This test also supports the conclusion that unemployment is not an I(1) process since the null hypothesis of stationarity cannot be rejected. In contrast to the results of the DF test, the null hypothesis that presidential approval is stationary is not rejected at the $\alpha = .05$ level for lag truncation parameters from 0 through 13 and also is not rejected at the $\alpha = .10$ level for lag truncation parameters from 14 through 18.²

Conclusions

Taken together, the evidence from the DF, ADF, HEGY, and KPSS tests leads me to conclude: (a) none of the quarterly

series have seasonal unit roots at nonzero frequencies nor do any have more than one zero frequency unit root; (b) the inflation and economic forecast series are each $I(1)$, difference stationary processes that contain stochastic rather than deterministic trends; (c) the unemployment series is not an $I(1)$ process but is either stationary or trend stationary; (d) the presidential approval series is not a function of a deterministic time trend.

On the basis of the evidence above, it is unclear whether approval is a stationary or an integrated process. I conclude that presidential approval is so highly persistent that it is a near integrated process with a root close, but not equal, to unity. My conclusion about the approval series is based on four additional considerations. First, I argued previously that the observed approval series could plausibly be a nonlinear transformation of an unobserved $I(1)$ process. If this is the case, then the DF and ADF tests for unit roots are biased toward incorrectly *rejecting* the null hypothesis of a unit root. Second, the estimate of ρ is .94 for the monthly approval series and .86 for the quarterly approval series. However, under the null that $\rho=1$, this estimate is biased *downward*. Thus, these series could potentially be integrated or near-integrated. Third, although there is no evidence about the robustness of the KPSS test for stationarity when used on nonlinear transformations of $I(1)$ series, these tests do allow me to reject the null hypothesis of stationarity.

Fourth, since the regression of an $I(1)$ process on any stationary variable should yield a residual series that is nonstationary, an informal test of whether presidential approval is at least near integrated is to regress the $I(1)$ economic forecast series on presidential approval and check the resulting residuals for stationarity. If the residuals are stationary, this would indicate that the series is cointegrated with presidential approval -- a theoretically unlikely result unless the approval series is at least near integrated. Investigating this reverse regression using quarterly data shows that the residuals from the regression of economic forecasts on presidential approval are stationary at the $\alpha = 05$ level (cointegrating $DF = -3.90$). This result would not be theoretically expected if the approval series is stationary. Hence, this implies that the approval series is more likely an integrated process.

1. The estimated θ_j coefficients for the tests on the first differences were: approval = $(1 - .19L^1 + .26L^2 + .60L^4 + .20L^6 + .47L^8)$; unemployment = $(1 - .63L + .15L^2 + .59L^4 - .19L^5 + .27L^8)$; inflation = $(1 - .42L^1 - .30L^3 + .85L^4 - .35L^5 - .16L^7 + .53L^8)$; forecasts = $(1 - .14L^2 - .13L^3 + .38L^4 + .16L^5)$. The estimated θ_j coefficients for the tests on the levels were: approval = $(1 - 1.01L^1 + .29L^2 + .43L^4 - .36L^5 + .40L^8 - .33L^9)$; unemployment = $(1 - 1.45L^1 + .68L^2)$; inflation = $(1 - 1.13L^1 + .45L^2 - .38L^3 + 1.14L^4 - 1.11L^5 + .34L^6 - .23L^7 + .67L^8 - .41L^9)$; forecasts = $(1 - .75L^1 - .15L^2 + .33L^3)$.

2. Power simulations in Kwiatkowski et al. (1992) suggest that for this sample size, a lag truncation parameter between 10 and 20 is appropriate.

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