

Protecting the Weak: Why (and When) States Adopt an Administrative Procedure Act

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ABSTRACT

One of the most important recent developments in theories of American bureaucracy has been the recognition that the organizational procedures enacted by public officials have a significant impact on the nature of both bureaucratic *control* and *performance*. This development has been accompanied, however, by only limited empirical investigation. We attempt to address this gap in the literature by examining the conditions under which generic Administrative Procedure Acts (APAs) are adopted by the states. In particular, we test five hypotheses derived from the existing literature on when an APA will be adopted. In general, we find two conditions increase the likelihood that an APA will be adopted: first, when there are Democratic legislative supermajorities facing a Republican governor; and second, when there is Democratic control that is perceived to be temporary. These results indicate that existing theories which emphasize agency and dynamic effects are empirically valid, albeit with an important qualification: there is a distinctive partisan bias in the usefulness of administrative procedures for these purposes.

1. Introduction

The creation of the Interstate Commerce Commission in 1887 started a process of delegation of policy-making authority to executive branch agencies. The New Deal

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accelerated this process at both the federal and state levels of government. With this greater delegation of authority, observers increasingly became aware of the risk of bureaucratic arbitrariness (Bonfield, 1986; Heady, 1952; Nathanson, 1948). This perception motivated the development, in the late 1930s, of instruments that would protect against bureaucratic drift while maintaining the benefits of bureaucratic expertise.

An expansive literature has developed examining the problems that arise when elected officials delegate authority to agencies and the instruments used to address these issues. Although this literature has examined a range of mechanisms,¹ one of the most important control mechanisms to receive scholarly attention has been the organization of agencies, embodied in the procedural and structural choices politicians make to condition agency behavior. According to this literature, there are a variety of reasons that such mechanisms can affect the problem of bureaucratic drift. Legal scholars, for example, have argued that administrative procedures ensure that public bureaus will follow due process and limit bias in the creation of rules (Aranson, Gellhorn and Robinson 1982; Mashaw 1985; Gellhorn 1986; Gellhorn and Davis 1986). More recently, rational choice scholars have advanced a number of potential reasons as to why procedural mechanisms might be employed. Perhaps the most important among these is the argument made by McCubbins, Noll and Weingast (1987, 1989). They argue that administrative procedures have been used as a means of constraining an agency's policy-making discretion. By introducing strict limits on this discretion, the procedures can act to ensure that outcomes will be closer to an elected officials' ideal than if the agency had an unlimited range of options. More recently, Epstein and O'Halloran (1994, 1996, 1999) and Huber and Shipan (2001, see also Huber, Shipan and Pfahler 2001) have complemented this argument by arguing that administrative procedures are used as a means of constraining executive-directed agencies when the elected official occupying the executive—

¹ Broadly speaking, the literature examines three classes of mechanisms designed to relax the tension between capturing bureaucratic expertise and limiting bureaucratic drift (see Chang, de Figueiredo and Weingast 2000). First, public officials employ *ex post* punishments and rewards, including overturning decisions via statute (see, e.g., Spulber and Besanko, 1992; Weingast and Moran, 1983), ongoing oversight by the legislature (see, e.g., Weingast and Moran 1983; McCubbins and Schwartz 1984; Bawn 1995) and the courts (see, e.g., Spiller 1992; McCubbins, Noll and Weingast, 1994), and manipulation of budgets, to provide appropriate incentives for behavior (see, e.g. Niskanen 1971; Banks 1989; Banks and Weingast 1992; Weingast and Moran 1983). Second, officials can manipulate *appointments* as a means of ensuring that bureaucrats' objectives will be aligned with their political principals (see, e.g., Hammond and Hill 1993; Spiller and Urbiztondo 1994). Finally, as we discuss here, officials can utilize *ex ante* control mechanisms, such as administrative procedures and other organizational design instruments as a means to ensure that poor decisions, from the officials' perspective, will not be taken.

presidents and governors—differs from those who are enacting legislation in the congress. Others, however, have emphasized other aspects of the role administrative procedures. A number of scholars (Epstein and O'Halloran 1994, 1999; Lupia and McCubbins 1994; de Figueiredo, Spiller and Urbiztondo 1999), for example, have argued that administrative procedures act primarily as a means of balancing informational asymmetries between public officials and agencies, and not as a means to create distributive rents. A final argument (Moe 1989, 1990; McCubbins, Noll and Weingast 1987, 1989; de Figueiredo 2001a; Vanden Bergh, 2000) contends that the role administrative procedures play must be understood in a dynamic context. According to this argument, these procedures create a “lock in” effect—constraining both future politicians and their agents—and therefore act as a mechanism whereby current majorities can ensure, at a cost, that future majorities will not upset their policy intentions.

Although this literature has provided a great deal of insight into the organization of government agencies, as the previous discussion emphasizes, it has also created a myriad of both complementary and potentially competing arguments about the role of administrative procedures. Unfortunately, these theoretical moves have not been supplemented by empirical analysis. In particular, because the scholarly debate has focused primarily on the passage of federal-level administrative procedures it has been nearly impossible to do broad analysis in a variety of political and institutional contexts. This has limited the ability to assess the validity and relative importance of the different explanations in the literature. Further, the opportunity to conduct historical counterfactuals is also constrained by the existence of what might be considered a single time series.

As an example, McCubbins, Noll and Weingast (1999) (hereafter McNollgast) provide a detailed empirical analysis of the adoption of the federal Administrative Procedure Act of 1946. According to their argument, multiple aspects of the explanations alluded to above accounted for the adoption of the federal APA. They argue that the federal APA was adopted by a Democratic Congress, with the support of a Democratic President Truman, in a situation in which those in power were fearful that they would lose both the presidency and the legislature in the upcoming elections. Since the coalition made the APA politically feasible and as a way of locking in the policies that they had enacted under the New Deal for the previous fourteen years, Democrats passed a number of procedural policies as a means of enfranchising certain interests and further privileging the status quo. In McNollgast's terms,

one of the critical political motivations for placing administrative procedural requirements on agency decision making is to cement the status quo, and to that end, the New Deal Democrats were able to use procedures as a method of preventing potential future Republican lawmakers from reversing what had taken place in the previous decade. Importantly, however, McNollgast's theory and case discussion both point to a non-partisan characterization of procedures: even though the act was passed by a particular party, if the Republicans had been faced with a similar set of circumstances *and* capabilities, then they, too, presumably would have attempted to use such a status quo-favoring organizational solution to future threats. Moe (1989, 1990) makes a similar argument about specific agency procedures; he points to the fact that officials (of either party) can use organization structure as a means to prevent an agency's mandate from being co-opted or circumvented in the future. Notably, in all of the examples used to motivate and illustrate these theories—McNollgast's analysis of the adoption of the federal APA on the one hand, and Moe's analysis of the creation of the Environmental Protection Agency and Consumer Product Safety Commission, on the other—the analysis focuses on the actions of Democratic legislatures. This leaves both a theoretical and empirical puzzle: Would Republicans be able to avail themselves of such a move if they also had an incentive to do so? Is the nature of these mechanisms equally available to both? Or would the difficulty in excluding groups from procedural due process mean that Republicans would have to look elsewhere in order to create such lock in? As with much of the literature that focuses on the federal level adoption of organizational mechanisms for the management of the bureaucracy, however, these questions are difficult, if not impossible, to test within a single institutional context much less with a single time series of data.

To this end, therefore, we propose to move to a different but comparable institutional domain as a way of parsing the explanations of the effects and incentives created by administrative procedures: *the states*. As with the federal APA, the state-level administrative procedure acts (SLAPAs) embody in statute major principles that are applicable to administrative agencies (Bonfield, 1986; Davis, 1978). The statutes apply to all agencies and can be thought to establish a base level of procedural structure. Although there are some

differences among the state level acts, in general they establish a number of features of the agency decisionmaking process, including rulemaking, adjudication and judicial review.²

Table 1. Adoption Dates of Administrative Procedure Acts

<i>State</i>	<i>Year</i>	<i>State</i>	<i>Year</i>
Alabama	1981	Montana	1971
Alaska	1959	Nebraska	1945
Arizona	1952	Nevada	1965
Arkansas	1967	New Hampshire	1973
California	1947	New Jersey	1968
Colorado	1959	New Mexico	1969
Connecticut	1945	New York	1975
Delaware	1960	North Carolina	1973
Florida	1961	North Dakota	1941
Georgia	1964	Ohio	1943
Hawaii	1961	Oklahoma	1963
Idaho	1965	Oregon	1957
Illinois	1975	Pennsylvania	1945
Indiana	1945	Rhode Island	1956
Iowa	1951	South Carolina	1977
Kansas	1984	South Dakota	1966
Kentucky	1984	Tennessee	1974
Louisiana	1966	Texas	1975
Maine	1961	Utah	1973
Maryland	1957	Vermont	1967
Massachusetts	1954	Virginia	1975
Michigan	1943	Washington	1959
Minnesota	1946	West Virginia	1964
Mississippi	1976	Wisconsin	1943
Missouri	1945	Wyoming	1957

² It is important to note that while our analysis exclusively concerns generic administrative procedure acts, our findings might need to be qualified when considering procedures adopted for specific agencies. In this sense, to preview our findings, our results concerning partisan bias are particular to the generic procedures. In order to extrapolate these findings to specific agencies, it would be useful in future research to test conditions for procedural adoption on policies specifically enacted by each party.

⁴ Some have argued that states *should not* enact such acts as general procedures cannot address specific policy issues adequately (Benjamin, 1942).

The vast majority of legal analysts have argued that general administrative procedure statutes are an effective and efficient way to solve the agency problems created by legislative delegation (Bonfield, 1986; Cooper, 1965; Davis, 1978; Heady, 1952; Kleps, 1947; McCubbins and Schwartz, 1984; Nathanson, 1948; Stason, 1948; Tunks, 1948).⁴ Despite this overarching opinion and support, and although all fifty states eventually adopted a SLAPA, state governments did not rush to implement these structures. From the time North Dakota implemented the first state-level administrative procedures act in 1941, over forty years passed before Kansas and Kentucky became the last two states to implement an act in 1984.⁵ Following an initial wave of eleven states that passed administrative procedure acts before 1950, the diffusion of the policy throughout the states has taken place in no obvious pattern (see Table 1).⁶

The variation in the *timing* of the adoption of administrative procedure acts creates a fertile testing ground for assessing what Moe (1990) calls the “politics of structural choice.” We therefore proceed to provide an empirical assessment of the existing theories of administrative procedures by conducting an analysis of the timing of adoption of APAs at the state level.

In the next section, we begin by taking the existing theories of administrative procedures and teasing out the implication of each one for our dependent variable: when a state will adopt such procedures. Broadly speaking, the hypotheses are formed from the combination of theories in two dimensions. First, we distinguish *partisan* and *non-partisan* theories. The latter posits that both parties can use administrative procedures equally effectively; whereas the former contends that the APA was specifically favorable to only one of the parties, making it a functional instrument only for that party. Second, we distinguish *static* from *dynamic* arguments. Much of the existing literature focuses the discussion of administrative procedures primarily on conditions that exist between *current* institutional actors. Some explain, however, that an APA can be used as an instrument for locking in benefits when existing regimes fear future loss of power. Based on these two dimensions, then, we develop five hypotheses that can be tested with our data. In Section 3, we lay out the

⁵ See *N.D. Sess. Laws of 1941*, Chap. 240. Kansas L. 1984, Ch. 313 ss. 1 - ss. 36; Ch. 338 ss1 to ss 27. Kentucky Enact. Acts 1984 Ch. 417 ss. 1 to ss. 35.

⁶ See the Appendix for citations to each state-level administrative procedure act.

sources, structure and measures for our data. Here we describe the cross-sectional panel data set we collected which includes observations for all fifty US states over the period from 1930 to 1984 and measures of political, institutional, and environmental variables. In Section 4, we lay out the procedure we use to test the hypotheses outlined in Section 2. In Section 5, we offer results. We find that two factors have the greatest impact on the adoption of SLAPAs. First, Democratic legislatures will adopt them when they have a veto-proof majority and face a Republican governor. Second, Democratic legislative supermajorities *or* unified Democratic governments will adopt SLAPAs when they fear the future loss of power. Together, these results provide important empirical evidence about the nature of procedures. Consistent with both Epstein and O'Halloran (1999) and Huber and Shipan (2001), the former result indicates the importance of procedures as a mechanism for controlling potentially obstructionist executives. Second, the latter result provides confirmation of more general theories about the nature of "bureaucratic insulation" as a device to lock in benefits by groups (or in this case parties) that fear the future loss of power (see, e.g., de Figueiredo 2001a; Vanden Bergh, 2000; Moe 1989). Finally, both results provide an important caveat to existing theory that in large part views administrative procedures as an unbiased instrument. In fact, our results indicate the opposite: that despite a dual set of conditions under which they might be adopted, they seem to have a markedly Democratic bias. One rationale for this can be seen in the discussion of the role of interest groups in the existing literature. In the final section, we provide a concluding discussion about potential explanations for this result, what they mean for our understanding of the role and effect of administrative procedures, and directions for further research.

2. The Effects of Administrative Procedure Acts and the Implications for Adoption

Prior to any explanation of *why* an administrative procedure act is adopted, it is necessary to consider what the actual or perceived *effects* of such procedures are. Over the last fifteen years, there has been a considerable development of theory concerning the implications of such acts. Despite this development, however, there is still disagreement on exactly how

such acts might be used. Therefore, in this section we consider the implications of each of the theories on the incentives to adopt a SLAPA as a means for *identifying* hypotheses.⁷

Broadly speaking, the hypotheses developed here have two dimensions. On the one hand, there are *partisan* versus *non-partisan* explanations for the adoption of such acts. On the other hand there are *static* versus *dynamic* explanations for the adoption of procedures. Each of these, when combined together, generates different implications for the adoption of APAs.

With regard to the former, the partisan view holds that political liberals advance their interests by creating strict administrative procedures that must be followed by all agencies. There are two reasons why the adoption of a SLAPA might be in the interest of political liberals. The first reason is that, according to the legal literature in particular (see, e.g., Aranson, Gellhorn and Robinson 1982; Mashaw 1985), the adoption of formal rules of administrative procedure provides an increase in the basic rights of due process and representation in the rule-making and administration of public policy. To the extent that the pursuit of civil and legal rights was the agenda of the Democrats in the post-War period, this conclusion suggests that Democrats were more likely to support their adoption. In addition to the simple ideology of the extension of rights, the adoption of procedures also might be supported for their impact on policy outcomes. The reason has to do with which groups gained relatively greater access to the policy making process through the adoption of the specific rules of SLAPAs. In the latter part of the nineteenth century and the first half of the twentieth century, many scholars observed that government agencies were largely affected by asymmetric interest group organization (see, e.g. Bernstein 1952; Stigler 1971; Peltzman 1976; Rothenberg 1994). One of the main effects of the adoption of the specific elements of the APA at the national level, and similarly at the state level, was to enfranchise groups that had been previously excluded from the administrative policy-making and enforcement process through the inclusion of elements such as rules of standing, requirements for public hearings, and subsidies to groups for developing standards.⁸ To this effect, and in simple terms,

⁷ We want to reemphasize that a SLAPA is strictly a state-level act while we use the acronym APA in our discussion of the federal level statute.

⁸ As de Figueiredo, Spiller and Urbiztondo (1999: 285) point out, “One of the central properties of administrative procedures is to enable participation in the regulatory process of interest groups that previously were, for technical or incentive reasons, unable to participate...[They] aid the participation of a number of previously excluded groups.” Indeed, an examination of specific state APAs reveals that these procedures, in general, rarely *excluded* any groups, and instead simply facilitate the participation of previously shot out groups.

SLAPAs make it easier for groups typically represented by Democrats—consumers and environmentalists, for example—to participate in a process that had largely been dominated by the regular constituency of Republicans—in particular, organized business. And in enhancing their participation, a SLAPA, according to this argument, improves the likelihood that constituent interests of Democrats would obtain favorable policy outcomes. For these two reasons, therefore, this subset of the literature suggests the first *static (ideological) partisan hypothesis* which state that Democrats, when given the opportunity to adopt a SLAPA, will do so.⁹

Hypothesis 1 (H1): Undivided control by Democrats or supermajority control of the legislature by Democrats will, on average, increase the probability that a SLAPA will be adopted.

Another static hypothesis focuses on the importance of *separation of powers*. This literature argues that administrative procedures act as a constraint on the executive, thereby favoring the legislature. According to both Epstein and O’Halloran (1994, 1999) and Huber and Shipan (2001), when there is a significant divergence of policy preferences between the legislature and the executive, agency discretion will be severely constrained through the use of highly specific and restrictive procedures. According to this argument, when the legislature and executive are *preference aligned*, proxied for by the unification of control of both sets of institutions by one party, a legislature can allow government agencies a high degree of discretion, thus taking advantage of the policy expertise housed in those agencies. When control is divided, however, the legislature must be more wary of how the agency will use broad grants of discretion, and therefore, all else equal, the agency will be constrained more severely through very specific procedures which the agency must follow. Thus, the passage of

Section 3 of the Massachusetts code on administrative procedure, for example, ensures that “prior to the adoption, amendment, or repeal of any regulation...the agency shall give notice and afford interested persons and opportunity to present data, views, or arguments...” (*General Laws of Massachusetts*, Chapter 30A §3). Similarly, the South Carolina code provides that before promulgating any rule, an agency must notify all parties and provide appropriate information to them regarding the impact of the rule (*South Carolina Code of Laws*, Title 1, Chapter 23 §1-23-110 and §1-23-111).

⁹ It might be argued that the reverse is true: that an APA has a particularly Republican flavor, by making regulation more difficult to pass. While this argument has not received much attention in the literature, we will test it given the nature of the model specification outlined in Section 4.

administrative procedure acts, as well as the adoption of administrative procedures in specific policy legislation, will occur under conditions in which control is divided. This formulation, of course, depends in part on whether there is an inherent bias in the procedures. If procedures have an inherent partisan bias, then we have the second *static (delegatory) partisan hypothesis*

Hypothesis 2 (H2): Supermajority legislative control by the Democrats when there is a Republican governor will, on average, increase the probability that a SLAPA will be adopted.

Notably, however, there is a substantial literature that eschews the partisan flavor of the first two hypotheses. This second set of literature does not suggest that administrative procedures only benefited liberal interest groups. Instead, this literature argues that administrative procedures can benefit both parties. If, as Epstein and O'Halloran and Huber and Shipan both posit, there are no partisan biases in the use of procedures, then both parties will be equally likely to adopt such procedures when there is divided government. Thus we have the *static (delegatory) non-partisan hypothesis* that under divided government adoption of administrative procedures, and by inference, a SLAPA, will be more likely.

Hypothesis 3 (H3): Divided government will, on average, increase the probability that a SLAPA will be adopted.

Hypotheses 1 through 3 reflect the fact that adoption of administrative procedures is generally viewed by many to reflect concerns about the immediate future. Indeed, this might be the case in areas where there is little policy durability. In fact, however, a SLAPA is more durable than normal legislation. This in turn implies that its proponents at the time of adoption might not only be concerned with the current political circumstances but also future ones. De Figueiredo (2001a) in particular outlines a theory as to when “insulating” mechanisms will be adopted (see also Vanden Bergh 2000). According to this theory, insulation will be adopted, in general, by groups that find themselves in control over public authority but that those groups also feel that such a hold will be temporary.

For this result to hold, an insulating mechanism must exhibit one of three characteristics. First, it must be *costly* to those in power. If the mechanism is costless, then

there will be no variation in adoption; it will be a dominant strategy for groups to adopt these measures. Second, the institution must *increase benefits to future political minorities*. This condition provides an incentive for the group to pay the costs when in power in exchange for gaining benefits when out of power. Finally, the mechanism must be (politically) *durable*; in other words, adoption itself must change the political landscape to make repeal less likely than adoption itself. Otherwise, even if weak groups institute such mechanisms when they gain a temporary moment of control, their action will be reversed when they lose power.

In fact, administrative procedure acts exhibit all three. First, passing an administrative procedure act imposes costs on the enacting coalition. On the one hand, there is a fixed cost for the coalition to pass an act incurred for the time and political capital required to generate passage. More importantly, an administrative procedure act also constrains the action of an existing legislature. As existing theory posits (see, e.g., de Figueiredo, Spiller and Urbiztondo 1999; Lupia and McCubbins 1994; McNollgast 1987, 1989, 1999) such procedures can *bias* outcomes in favor of certain groups by constraining the discretion that policymakers, both legislatures and governors, have to set policy. Just as the existing policymakers are constrained, therefore, this effect in turn favors minority groups. A legislature would be willing to bear these costs, if they felt they were going to be out of power in the future. Most importantly, this incentive will exist only if such procedures are durable. In fact, unlike perhaps other more substantive legislation, SLAPAs are in fact durable, as evidenced by the fact that no act has been repealed after its adoption. In other words, the political conditions for repeal *ex post* are not the same as those for repeal *ex ante*. The most important reason for this durability is that SLAPAs enable the organization of previously unrepresented, perhaps even unorganized, groups. As noted earlier, the SLAPA reduces the fixed costs of organizing, and after such organization, it is easier for previously excluded groups to participate. This means that the groups that benefit from a SLAPA have a greater incentive and capability to fight against repeal than they did for adoption, making repeal more difficult than adoption. In other words, the passage of the SLAPA changes the political group structure that limits the possibility of repeal.

The critical question in operationalizing these dynamic hypotheses then is which groups will gain such benefits? The answer depends on the effect of the administrative procedure act itself. As we outlined earlier, theory on this question is divided: some view it as

a device particularly beneficial to Democrats; others view it as a mechanism which helps *all* minorities at the expense of sitting majorities. In the case of the former, we would expect that when Democrats are in power, but anticipate losing power, adoption will be most likely. Thus we have the *dynamic partisan hypothesis*

Hypothesis 4 (H4): Adoption of a SLAPA will be more likely when Democrats are in power and they perceive their future electoral prospects to be weak.

As we argued above, however, others theorize that the SLAPA creates benefits for both Republican and Democratic minorities. If this is the case, then *any* government which has control in the current period but perceives it will lose its control in the future will have an incentive to adopt such an act. In fact, this is precisely the argument made by McNollgast (1999) concerning adoption of the federal Administrative Procedure Act of 1946. They argue that the passage of the act in 1946 was no accident. One of the key features of their argument captures the central intuition behind the dynamic hypothesis. They argue that the Democrats, who feared losing control of the White House in 1948, passed the act as a way of cementing the policies they had enacted under the New Deal. The Act, by empowering their constituents, would ensure that in such an event the Republicans would not as easily be able to roll back the gains the Democrats had made in economic regulation. Up to this point, the McNollgast argument is consistent with the dynamic partisan hypothesis. But in their view the APA works in favor of minorities of either party (McCubbins, Noll and Weingast 1987, 1989, 1999). This implies the counterfactual that the Republicans, if faced with similar political conditions of temporary control, would have acted the same way. Of course, this counterfactual is untestable with only a single observation, but is amenable to testing with multiple adoptions at the state level. This then allows us to posit the *dynamic non-partisan hypothesis*

Hypothesis 5 (H5): Adoption of a SLAPA will be more likely when either party is in power and perceives its future electoral prospects to be weak.

3. Data and Measurement

Data. To test the hypotheses developed above, we use three types of data. First we have gathered the date of enactment of generic administrative procedure acts in the states (see Table 1). We gathered current statute citations from the *Administrative Law and Regulatory Reform Bibliographic Database* created by Florida State University.¹⁰ From these citations, we were able to track the legislative history for each act by referring to the statutory code for each law (See Appendix 1 for list of citations to statutes). We also verified these classifications using law review articles that tracked developments of state-level administrative law.¹¹

The second type of data measures the political factors that are expected to affect the adoption of generic administrative procedure acts. This information is gathered for the time period 1930 to 1984 to coincide with the policy innovation date (1941) and the date of the last state to enact the act (Kansas and Kentucky respectively). We gather data on two main political factors. First, we gathered data on the partisan make up of both houses of the legislature and the governor for each year. The data was originally gathered from the Inter-University Consortium for Political and Social Research (ICPSR) data entitled, *Partisan Divisions Among the States*.¹² Second, we add the supermajority veto override rules for each state from *The Book of the States*.¹³ Finally, we obtain data on state government expenditures from the data set in de Figueiredo (2001b).

Measurement. To test the hypotheses developed, we construct several measures. A complete summary of the variables used appears in Table 2. First, we use the above dates in Table 1 to construct a dummy variable for whether a SLAPA was passed in a particular year. We call this variable y_i . Thus,

$$y_{it} = \begin{cases} 1 & \text{if } APA \text{ passed in year } t \\ 0 & \text{otherwise} \end{cases}$$

Note that i indexes a particular state and t indexes a particular year. For each state, y_i equals one in the year the SLAPA was adopted and zero in every other year.

¹⁰ See the following World Wide Web site: <http://www.law.fsu.edu/library/admin/admin3.html>

¹¹ For example, see Bonfield (1986); Cooper (1965); Heady (1952); Nathanson (1948).

¹² These data have been corrected following de Figueiredo (2001b) based on information from *The Book of the States*.

Next we construct the independent variables. First, we construct a dummy variable which indicates whether the Democrats have full control over policy making. Notably, this means that the Democrats either have unified control over both houses of the legislature and the governorship *or* there is a Republican governor but the Democrats have sufficient *supermajority* control over both houses to override a veto. For each state, let p_h $h \in \{L, H\}$ be the proportion of Democrats in each house, x_1 be a dummy variable for Democratic control of the governorship, and m_i be the veto-override requirement. Thus, we construct a dummy variable for Democratic control

$$x_{2it} = \begin{cases} 1 & \text{(if } p_{hit} > 0.5 \forall h \text{ and } x_1 = 1) \text{ or } (p_{hit} > m_i \forall h) \\ 0 & \text{otherwise} \end{cases}$$

Similarly, we define x_3 in a similar fashion to indicate Republican party control.

Next, we define the measures of future party strength. We do this in two ways, based on retrospective and prospective measures. To define the measure for the Democrats retrospectively, we calculate the probability in the previous ten years (inclusive) that the Democrats had control of political institutions. That is, we define

$$x_{4it} = 1 - \frac{1}{10} \sum_{j=0}^9 x_{2i(t-j)}$$

Similarly, x_5 is defined analogously in terms of x_3 to measure historical Republican weakness.¹⁴ Implicitly, these measures of historical weakness imply that elected officials base their subjective estimates of winning future elections on previous results. An alternative is that elected officials are prospective, that their subjective assessment of their electoral prospects is based on a rational expectation of the future. One example of such a process would be if after a change in the partisan composition of the legislature, officials assumed that the change

¹³ See Council of State Governments, 1938-1984).

¹⁴ Note that we subtract the summation of control from one in order to scale the variable as a measure of “weakness”.

represented a realignment. Thus, we construct alternative measures of subjective assessments of electoral prospects based on prospective measures. For the Democrats, this is simply

$$x_{6it} = 1 - \frac{1}{10} \sum_{j=0}^9 x_{2i(t+j)}$$

We define the variable x_7 analogously in terms of x_3 to construct a prospective measure of Republican weakness. Based on this construction, the variables x_2 through x_7 provide a sufficient set of measures to test the hypotheses outlined in the previous section.

In addition to these measures, we also construct a number of control variables. First, as we note elsewhere (see Vanden Bergh 2000), one of the issues which might affect the adoption of administrative procedures is the budget status of the state at the time of adoption. On the one hand, large budgets might increase the probability that a set of administrative procedures designed to reign in the bureaucracy might be adopted. Additionally, an important interpretation of this variable is that it also proxies for the incentive to lock in benefits: if the size of government is increasing, it might indicate who stands to gain the most by locking in those policies—the Democrats. On the other hand, as McNollgast (1999) note, the APA also potentially increases the cost of policy administration, since a detailed and complicated set of procedures makes outputs more costly to provide. This further would imply that under stricter budget constraints, states will be less likely to adopt an APA. To examine which of these two effects dominates, and to control for their impact, we construct a measure x_8 which measures the year-on-year growth in per capita government expenditures. Second, to control for the effects of both temporal and spatial *diffusion* (see, e.g. Walker 1969; de Figueiredo 2001b), we also construct two additional sets of controls. For temporal effects we construct a measure of *duration* x_9 which is simply the year normalized to 1941, the year the first APA was adopted (by North Dakota). For regional effects, we construct a vector \mathbf{x}_{10} of nine dummy variables to indicate the region the state is in.¹⁵

¹⁵ We follow the ICPSR regional categories, with a few exception, in constructing these dummy variables. Specifically, the regions consist of: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut; New York, New Jersey, and Pennsylvania; Ohio, Indiana, Illinois, Michigan, and Wisconsin; Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida; Kentucky, Tennessee, Alabama,

Mississippi and Louisiana; Arkansas, Oklahoma, and Texas; Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada; Washington, Oregon, California, Alaska and Hawaii.

Table 2. Summary of Measures

<i>Variable</i>	<i>Indicator</i>	<i>Measures</i>
y_1	dummy for adoption of APA	adoption of a SLAPA
x_1	dummy for Democratic governor	Democratic governor
x_2	dummy for Democratic control	Democratic control
x_3	dummy for Republican control	Republican control
x_4	% times in 10 previous years there has been Democratic control	Democratic weakness in the future
x_5	% times in 10 previous years there has been Republican control	Republican weakness in the future
x_6	% times in 10 following years there has been Democratic control	Democratic weakness in the future
x_7	% times in 10 following years there has been Republican control	Republican weakness in the future
x_8	change in per capita expenditures	governmental budget constraints
x_9	year - 1941	duration dependence
\mathbf{x}_{10}	(vector of) regional dummies	regional adoption patterns

4. Model Specification and Hypothesis Tests

Our method of testing the hypotheses concerning SLAPAs is a one-way transition, discrete hazard analysis.¹⁶ We make a number of assumptions about the process of adoption.

¹⁶ The choice between a continuous-time and discrete-time formulation is not entirely transparent (Allison, 1982; Petersen, 1991). As Box-Steffensmeier and Jones discuss, however, explicit knowledge about the *exact timing* is not important for this project. The legislature could adopt the statute at any time during the year, and we could theoretically measure (from recorded votes) the exact date within the year. Our primary empirical question is not *when during the legislative session* did the statute get enacted. Instead, the question is *when (and why) relative to other states* was the law passed (Box-Steffensmeier and

First, we assume the transition is *one-way*. In other words, once a provision is adopted it will remain. While this is clearly not institutionally necessary, states can reverse the adoption of a SLAPA, a few facts make this a reasonable simplification. First, as we argue above, it is extremely difficult to reverse the adoption of a SLAPA in most cases. Second, no state has ever repealed a SLAPA.¹⁸ This means that we eliminate all observations that occur *after* the line-item veto has been adopted. Our second assumption is that the *hazard function* can be represented by a standard normal cumulative distribution function.

These two assumptions mean we can represent the event history model as a standard probit in which we condition on the event not yet having occurred.¹⁹ Putting all of these assumptions together, we can construct a formal representation of this model. For a vector of covariates \mathbf{x} , we have

$$P(y_{lit} = 1 \mid \mathbf{x}_{it}, y_{lis} = 0 \text{ for } s < t) = \Phi(\mathbf{b}' \mathbf{x}_{it})$$

which can be estimated by the usual maximum likelihood methods for a probit model. To test the five hypotheses, therefore, the fully specified retrospective model is:

$$\begin{aligned} P(y_{lit} = 1 \mid \mathbf{x}_{it}, y_{lis} = 0 \text{ for } s < t) = \\ \Phi(\mathbf{a} + \mathbf{b}_1 x_1 + \mathbf{b}_2 x_2 + \mathbf{b}_3 x_3 + \mathbf{b}_4 x_2(1 - x_1) + \mathbf{b}_5 x_3 x_1 + \mathbf{b}_6 x_4 + \mathbf{b}_7 x_5 + \mathbf{b}_8 x_8 \\ + \mathbf{b}_9 x_9 + \mathbf{b}_{10} \mathbf{x}_{10} + \mathbf{b}_{11} x_2 x_4 + \mathbf{b}_{12} x_3 x_5 \end{aligned} \quad (1)$$

A few points are worth noting about the implementation of this model. First, the panel nature of the data means that there exists the possibility that there is both heteroscedasticity and autocorrelation. Although these problems will not affect the estimates of the coefficients,

Jones, 1997). Additionally, since the time units are large (one year), there are certain years when enactment of a generic administrative procedure act takes place in multiple states. As Blossfeld, Hamerle, and Mayer (1989) state, "...strictly speaking, continuous time techniques are inappropriate" when the number of ties is high. As such, a discrete-time formulation is an appropriate representation of the process.

¹⁸ We can further think about this as a test of first time adoption of this policy. While no state has repealed a SLAPA, some states have amended their SLAPA over time. We leave the study of the timing of amendments for future research.

¹⁹ Note that this probit model can be interpreted as a traditional hazard model. For an explicit derivation of the associated functions see de Figueiredo 2001b (See also Yamaguchi 1991; Blossfeld, Hamerle, and Mayer 1989; Kiefer 1988).

they will lead, if present, to inconsistent estimates of the standard errors. Therefore, to eliminate this potential problem, we recalculate the standard errors of the estimates using an adaptation of the method suggested by Newey and West. The details of this procedure are outlined in Appendix 2.²⁰ Second, two states—Alaska and Hawaii—were excluded because they passed a SLAPA within the first 9 years of statehood. Third, because of their nonpartisan state politics, we also excluded Nebraska and Minnesota. Finally, the specification of (1) includes a number of variables that do not reflect either the hypotheses of interest or controls. Since we are interested in testing hypotheses about interactions, however, this is the appropriate approach. Excluding the main effects would inappropriately bias the results in favor of finding significant coefficients on the interaction terms.

Given the above specification, we can return to the hypotheses developed in Section 2 to determine what would constitute evidence for each. Table 3 provides a summary of the formal hypothesis tests. For evidence of H1, we would expect $b_2 > 0$. This would mean that Democrats, when given the opportunity are more likely to pass a SLAPA. H2 states that when the Democratic legislatures face Republican governors, they will be more likely to pass an APA. For this hypothesis to hold, we would expect that $b_4 > 0$. H3 states that *both* Republican and Democratic legislatures will be more likely to pass APAs when they face a governor of the opposite party. Thus, for evidence of H3, we test whether $b_4 = b_5 > 0$. For H4, the dynamic partisan hypothesis, we would expect that when both the Democrats are in power and perceive weak electoral prospects the likelihood of adoption will increase; in other words, under H4, we would expect to see $b_{11} > 0$. Finally, H5 states that *either party* would be equally likely to adopt an APA when they are in power but foresee their opponents in power in the future. Thus, if $b_{11} = b_{12} > 0$, we would have evidence for the dynamic non-partisan hypothesis.

²⁰ Greene 1993, Chapters 13-15 and 21; White 1980; White and Domowitz 1984; Newey and West 1987; de Figueiredo 2001b.

Table 3. Summary of Hypothesis Tests

<i>Hypothesis</i>	<i>Intuition</i>	<i>Statistical Test</i>
<i>H1: Static (Ideological) Partisan</i>	Democrats adopt APAs when given the opportunity	$\mathbf{b}_2 > 0$
<i>H2: Static (Delagatory) Partisan</i>	APAs are more likely to be adopted when there is a Democratic supermajority and Republican governor	$\mathbf{b}_4 > 0$
<i>H3: Static (Delagatory) Non- Partisan</i>	Both parties are (equally) likely to adopt an APA when they have a supermajority in the legislature and there is divided government	$\mathbf{b}_4 = \mathbf{b}_5 > 0$
<i>H4: Dynamic Partisan</i>	Democrats adopt APAs when they are in control and perceive future prospects as weak	$\mathbf{b}_{11} > 0$
<i>H5: Dynamic Non- Partisan</i>	Both parties are (equally) likely to adopt an APA when they are in control and perceive their future prospects as weak	$\mathbf{b}_{11} = \mathbf{b}_{12} > 0$

5. Results

We estimate seven models which allow us to test each of the hypotheses above, and to determine the robustness of the findings. All of the models are estimated using the probit specification with the corrected standard errors presented in the previous section. Model 1 includes only the dummy variables for control by either the Democrats or Republicans. Model 2 adds the main effects and interactions to test for the effect of divided government. Model 3 includes variables for all five hypotheses listed above. Model 4 is the same as Model 3, but also includes the control variables for expenditure growth and duration. Finally, Model 5 provides the full set of variables as specified in equation (1) above, including the dummy

variables for each region. Model 6 is the same as Model 4 with the constraint imposed that the coefficients of the interactions between a party's control and future weakness are equivalent. Finally, Model 7 reproduces Model 4, but uses *prospective* measures to operationalize future expectations of electoral prospects. Notably, in this model, the sample is reduced in size since using prospective measures means we must cut off the right hand side of the data in order to generate the variables for these expectations.

We now turn to an assessment of the results which are provided in Table 4. A summary of the implications of the estimates from each model for each hypothesis is provided in Table 5. H1 states that Democrats will be more likely to pass an APA when they have an opportunity, either from undivided control or veto-proof majorities in the legislature. In general, this hypothesis does not hold. In Model 1, which does not include any other controls, the coefficient on Democratic control is not significant. In the other models, this coefficient is either insignificant, or negative, indicating that when Democrats have control, they are *not* more likely to pass an APA, unless other conditions hold as well.

H2 draws on two literatures, positing that the passage of an APA is more likely when there is Democratic supermajority control of the legislature and divided government. To evaluate this hypothesis we examine the coefficient of $(1 - x_1)x_2$, which is b_4 . In this case, In every model, this coefficient is positive and significant, indicating *strong support* for the partisan distributive hypothesis. Notably, this result is robust to every specification of the model.

The non-partisan delegatory hypothesis H3 states that *both* Democratic and Republican legislative supermajorities will pass APAs when facing a governor of the opposite party. Here, we test whether the coefficients $(1 - x_1)x_2$ of x_3x_5 are equally positive and significant. By inspection, it is possible to reject this hypothesis, since while as noted previously the coefficient of $(1 - x_1)x_2$ has the right sign and is significant in every specification of the model, the coefficient b_5 on x_3x_5 is never positive and never significant.²¹

The final two hypotheses address dynamic processes. Hypothesis 4 (H4) states that when Democrats are in power, either through undivided control of both the legislature and the executive, or through supermajority control of the legislature, then an APA will be passed

when they perceive their future prospects as being weak. Recall here we test the hypothesis that the *interaction* between Democratic control and party weakness should be positive. In this case, in Model 3, we find there to be support for this hypothesis, as the coefficient is indeed positive and significant. Further, this result is robust to a number of other specifications. When controls for expenditures and duration are included in Model 5, and when controls for regional effects are added in Model 6, the result becomes even stronger. Model 7 provides another robustness check for the result. In all of the other models, we use retrospective measures of expectations of future control. In Model 7, we use prospective measures. Here, again, H4 is borne out, as the coefficient on Democratic control and party weakness is positive and significant.²²

The second dynamic hypothesis H5 posits that *both* parties will pass APAs when they gain complete but temporary control. Model 4 provides some evidence against this hypothesis as the coefficient on Republican control and future weakness is not significant. To further test this hypothesis, in Model 6, we constrain the coefficients b_{11} or b_{12} to be equal. Here we do obtain the result that the coefficient on the variable that measures party control combined with a party's assessment that such control will not hold in the future is positive and significant. Comparing this result to Model 4, however, we notice that this result is likely driven completely by the coefficient on the Democratic conditions and not the Republican ones, the latter which are not significant in Model 4. If a likelihood ratio test comparing the fit of Models 4 and 6 rejects the hypothesis that the explanatory power of Model 4 and 6 are equivalent, then we would reject H5 in favor of H4. Here the likelihood ratio statistic is 7.48 which is significant,²³ indicating that the H5 should be rejected in favor of H4.

In this set of tests, the pattern is stark: regardless of the specification, two conditions account best for the adoption of an APA at the state level. First, when Democrats have a supermajority in the legislature, they adopt an APA when facing a Republican governor. Second, when Democrats are in control, either through a supermajority in the legislature *or*

²¹ As a formal test of this hypothesis, one can test whether $b_4 = b_5$. This is rejected for every model.

²² As one additional test, which we do not report here, we also tested whether it matters if the form of weakness in the future is either an undivided Republican government or divided government. Here the results do not distinguish between these two forms: as long as the probability that there will be Democratic control decreases, Democrats are more likely to adopt an APA.

²³ The test statistic is distributed chi-square with 2 degrees of freedom which generates a p -value for the test of 0.023.

through undivided majority control of the legislature and control of the governorship, they will pass an APA when they anticipate losing control (consistently) in the future. In this sense, the APA can also be interpreted as an “insulation” mechanism in which a political group that sees its power as temporary passes durable, minority-favoring institutions when given the opportunity.²⁴ Indeed, the strong Democratic partisan flavor of comparative statics on adoption of APAs is robust to numerous possible specifications.

Table 5. Summary of Results of Hypothesis Tests for Each Model

<i>Hypothesis</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>
<i>H1: Static Partisan</i>	0	0	0	0	0	0	0
<i>H2: Static (Distributive) Partisan</i>		+	+	+	+	+	+
<i>H3: Static (Distributive) Non-Partisan</i>		0	0	0	0	0	0
<i>H4: Dynamic Partisan</i>			+	+	+		+
<i>H5: Dynamic Non-Partisan</i>						+	

Note: + indicates support for the hypothesis. 0 indicates rejection or no support for the hypothesis.

6. Discussion

As we noted earlier, the passage of the federal Administrative Procedure Act of 1946 was a signal event in the history of American administrative law. As a number of scholars have noted, the use of procedures as a means for enhancing interest group representation and

²⁴ Given that we show that two of the five hypotheses hold, one might ask what the relative impact of the two sets of conditions is on the adoption of APAs. One simple way to make such a comparison is to compare the point estimates of the coefficients. Here, the ratio of the effect (in Model 4) of Democratic supermajority control when there is divided government—notably taking account of the main effect as well, and the effect of Democratic control (either undivided government *or* supermajority control and the Democrats having been “shut out” for the previous nine periods) is 2.65, indicating that the effect of divided government is over two and a half times that of political dynamics.

informational requirements has had and will continue to have a major impact on the nature of policy outcomes. As our results above show, there are two conditions under which an APA is most likely to be passed: when Democratic supermajorities experience divided government and when Democratic governments (executive and legislative) are fearful of losing control over public authority in the future.

These twin results shed light not only on the nature of adoption but on the existing theoretical debate about the federal APA. The first result provides an important confirmation of one of the main theoretical contributions concerning administrative procedures: that governments are more likely to constrain the bureaucracy when there is a divergence in preferences between the legislature and the executive (Epstein and O'Halloran 1994, 1999; Huber and Shipan 2001; Huber, Shipan and Pfahler 2001; McCubbins, Noll and Weingast 1987, 1989, 1999). The second, dynamic result also speaks to the existing scholarly debate on the use of procedural controls. Most importantly, the finding that Democrats, when given a (waning) "moment in the sun", pass APAs indicates that under these conditions, when Democrats are in power, they will pass an APA as a means of locking in long term benefits. This result comports with the literature which indicates that when institutions are *ex post* durable and that they impose costs on current majorities, groups will seek to pass them, being willing to trade benefits in the current period for expected benefits in future periods (see de Figueiredo 2001a, b; Vanden Bergh 2000; Moe 1989, 1990). In this sense, the results provide empirical evidence which is consistent with recent theory on the relationship between electoral competition, political uncertainty and policy insulation.

But the findings also depart significantly from these two arguments in an important way. In particular, all of this previous scholarship takes the use of procedures to be unbiased by party: as a means of constraint, both Republicans and Democrats are equally likely to use such procedural restrictions. Our results show that this is not the case. In particular, we find that Democratic legislatures are much more likely to adopt when facing a Republican governor but not *vice versa*. Similarly, we find that "weak" Democratic regimes are likely to adopt an APA but not the reverse. These findings imply that the specific institutional instrument is not unbiased with respect to party, and points to the importance of examining both the partisan and the inter-institutional effects of APAs simultaneously. In other words, even if the Republicans would have liked to lock in benefits in these cases, either against

present or future threats to their authority, the structure of procedures does not allow them to do so. Returning, to McNollgast's argument about adoption of the federal Administrative Procedure Act of 1946, for example, they would expect that if the conditions experienced by the outgoing Democrats in 1946 had existed under a Republican regime, the Republicans would have taken a similar, insulating action. Our analysis allows us to test this counterfactual and provides evidence which rejects it by showing that only the Democrats, when faced with these incentives will adopt the such procedures. In sum, the analysis indicates that, at least for generic administrative procedure acts, there is a distinct partisan bias. This fact raises an important future research avenue to explore whether the procedures specifically enacted by Republicans have a different character.

Finally, one might ask, why do such procedures necessarily favor Democratic interests? Although we leave a more intensive examination of this question for future research, one possibility is hinted at in the theoretical work of de Figueiredo, Spiller and Urbiztondo (1999; see also Lupia and McCubbins 1994): because both the national and state-level APAs did not *exclude* groups from participating, but instead *enabled* additional participation by previously underrepresented groups, they primarily benefited the party whose supporting interest groups faced stiffer hurdles for acting collectively. In particular, the evidence indicates that while other effects—such as evening of informational rents—might benefit all political principals, because of their *balancing* effect on interest group competition, it is those groups who are most likely to be shut out of the political process, either because of their high barriers to overcoming collective action or limited access, who are most likely to benefit from their enactment.

Appendix 1. Citations to Laws creating the SLAPA

State	Statutory Citation
Alabama	Acts 1981, No. 81-855, p. 1534 ss. 1 to ss. 27
Alaska	SLA 1959, ch. 143
Arizona	Laws 1952, Ch. 97 ss. 1-11
Arkansas	Acts 1967, No. 434, ss. 1 to ss. 15
California	Stats. 1947, c. 1175, 1425; Cal. Gov. Code ss. 11370-3, 11421-7, 11440, 11445
Colorado	Laws 1959 H.B. 212 ss. 1-8
Connecticut	Public Acts No. 67, 1945
Delaware	60 Del. Laws, C. 585, ss. 1
Florida	Laws 1961, c. 61-280, ss.1 to ss. 6; Laws 1961, c. 61-292
Georgia	Acts 1964, pp. 338-356
Hawaii	L. 1961, c. 103, ss. 1 to ss. 20
Idaho	1965, Ch. 274 ss. 1 to ss. 14
Illinois	P.A. 79-1083, Art. I, ss. 1 to ss. 21 (1975)
Indiana	Acts 1945, c. 120
Iowa	Acts 1951 (54 G.A.) ch. 51 ss 1 to ss 11
Kansas	L. 1984, Ch. 313 ss. 1 - ss. 36; Ch. 338 ss1 to ss 27
Kentucky	Enact. Acts 1984 Ch. 417 ss. 1 to ss. 35
Louisiana	Acts 1966, No. 382 ss. 1 to ss. 17
Maine	Laws 1961, c. 394 ss. 1
Maryland	An. Code 1957, art. 40, ss. 40A; art. 41, ss. 244 to ss. 256; art. 76A, ss. 8 to ss. 15
Massachusetts	St. 1954, c. 681, ss. 1
Michigan	P.A. 1943, No. 88
Minnesota	Minn. Stat. Ann. ss. 15.041-9 (1946)
Mississippi	Law, 1976, ch. 487, ss. 1 to ss. 10
Missouri	L. 1945 p. 1504, ss. 1 to ss. 14
Montana	Enacted Sec. 1 to Sec. 24, ch. 2, Extra Laws 1971
Nebraska	Laws 1945 c. 255, ss. 1 to ss. 6, p. 795
Nevada	1965, p. 962 - 965
New Hampshire	1973, 507:1-4
New Jersey	L. 1968 c. 410 ss. 1 to ss. 17
New Mexico	Laws 1969, ch. 252
New York	Laws 1975, c. 167, ss. 1
North Carolina	1973, c. 1331, ss. 1
North Dakota	S. Laws 1941, ch. 240 ss1 to ss22
Ohio	1943 Ohio Gen. Code Ann ss 154-61 to ss. 154-73
Oklahoma	Laws 1963, c. 371, ss1 to ss. 27
Oregon	1957, c. 717, ss. 1 to ss. 14
Pennsylvania	1945 Pamphlet Laws 1388, no. 442
Rhode Island	G.L. 1956, ss. 42-35-1 to ss. 42-35-18
South Carolina	1977 Act no 176, Art. I and Art. II
South Dakota	SL 1966, ch. 159
Tennessee	Acts 1974, ch. 725, ss1 to ss18
Texas	Act 1975, 64th Leg., p. 136, ch. 61; Vernon's Ann. Civ. St. art. 6252-13a
Utah	Laws 1973, ch. 172
Vermont	1967, No. 360 (Adj. Sess.), ss. 1 - ss. 18
Virginia	1975, c. 503
Washington	Laws 1959, ch. 234, ss. 1 to ss. 20
West Virginia	1964, C. 1
Wisconsin	St. 1943 ss. 227
Wyoming	W.S. 1957, ss. 9-276

Appendix 2. Heteroscedasticity and Autocorrelation Consistent Standard Errors²⁵

As noted, there is significant potential for autocorrelation in the error structure of the data. This is a possibility since there are possibly some temporally-dependent omitted variables in the model, and more generally, because of the panel structure of the data.

The effect of autocorrelation in linear and nonlinear models is well-understood. While the point estimates of the coefficients \mathbf{b} are consistent, the standard errors are not. Therefore, following the suggestions of White and Newey and West, we recalculate the standard errors in the following way.²⁶ Let $f(y_{it}|\mathbf{q})$ be the joint density of observation it given the parameters

\mathbf{q} , and L denote the likelihood function, so that $\log L(\mathbf{q}) = \sum_{i,t} \log f(y_{it}|\mathbf{q})$. Let

$s_{it} = \frac{\partial \log L_{it}(\mathbf{q})}{\partial \mathbf{q}}$ and $\mathbf{H} = \frac{\partial^2 \log L}{\partial \mathbf{q}^2}$. Finally, let \mathbf{W} be the actual covariance matrix of the error terms. Then a consistent estimator of the variance-covariance \mathbf{V} matrix of the maximum likelihood estimator $\hat{\mathbf{q}}$ is given by:

$$\bar{\mathbf{V}} = \mathbf{H}^{-1} \mathbf{W} \mathbf{H}^{-1}$$

As White argues, the requirement is for a consistent estimator of \mathbf{W} . Following Newey and West's suggestion, a consistent estimator is:

$$\bar{\mathbf{W}} = \mathbf{S}_0 + \sum_{j=1}^L \mathbf{S}_j$$

where

$$\mathbf{S}_0 = \sum_{i,t} s_{it} s_{it}' \quad (\text{A-1})$$

$$\mathbf{S}_j = \sum_{i=1}^N \sum_{t=1}^{T_i} w_j (s_{it} s_{i(t-j)}' + s_{i(t-j)} s_{it}') \quad (\text{A-2})$$

where

²⁵ This appendix draws heavily on the work in de Figueiredo (2001b).

$$w_j = 1 - \frac{j}{L+1}$$

Note that these estimators have been adapted for a panel structure in which we assume that there is no covariance *across* states. In other words, we assume $C(s_{it}, s_{jt}) = 0$ for $j \neq i$.

Using these results, we can derive the specific estimator for the variance-covariance matrix of the probit model we utilize in Section 3. The log-likelihood function for the probit model is

$$\ln L = \sum_{i,t} \{y_{it} \ln \Phi_{it} + (1 - y_{it}) \ln(1 - \Phi_{it})\}$$

where $\Phi_{it} = \Phi(\mathbf{b}'\mathbf{x}_{it})$ and Φ indicates the cumulative distribution function for a standard normal random variable. Taking the first derivative with respect to β , we have

$$s_{it} = (y_{it} - \Phi_{it}) \frac{\mathbf{f}_{it}}{\Phi_{it}(1 - \Phi_{it})} \mathbf{x}_{it} = \mathbf{I}_{it} \mathbf{x}_{it} \quad (\text{A-3})$$

where \mathbf{f}_{it} is a standard normal probability density function evaluated at $\mathbf{b}'\mathbf{x}_{it}$, and

$$\mathbf{I}_{it} = (y_{it} - \Phi_{it}) \frac{\mathbf{f}_{it}}{\Phi_{it}(1 - \Phi_{it})}.$$

Substituting (A4-3) into (A4-1) and (A4-2) I get

$$\bar{\mathbf{W}} = \sum_{i,t} \mathbf{I}_{it}^2 \mathbf{x}_{it} \mathbf{x}_{it}' + \sum_{j=1}^L \sum_{i=1}^N \sum_{t=j}^{T_i} \{w_j \mathbf{I}_{it} \mathbf{I}_{i(t-j)} (\mathbf{x}_{it} \mathbf{x}_{i(t-j)}' + \mathbf{x}_{i(t-j)} \mathbf{x}_{it}')\}$$

Further, since \mathbf{H}^{-1} is simply the estimated covariance matrix from the misspecified model, a consistent estimator for variance-covariance matrix of $\bar{\mathbf{b}}$ is

$$V(\bar{\mathbf{b}}) = \mathbf{H}^{-1} \bar{\mathbf{W}} \mathbf{H}^{-1}$$

Finally, as Greene notes, we must choose L based on an assumption about the data generating process. Here, we assume that the error structure follows a first order autoregressive process

²⁶ Greene (1993): 360-364, 391, 422-423; White (1980): 817-824; Newey and West (1987): 703-705.

(AR(1)) which occurs over ten years. Since the temporal unit of analysis is a legislative election cycle, or two years, we use $L = 5$.

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