The Dynamics of Divided Government*

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March 18, 2003

Abstract

What are the implications of divided government on the legislative productivity of Congress? This question is a central part of debates about the outcomes of divided government. It has been argued that the combination of partisan and institutional factors may reduce legislative productivity under divided government. This paper reviews a simple dynamic spatial model of the implications of divided government. This model illustrates that as the amount of policy space that becomes gridlocked changes, there should be policy changes to either bring policies in line with the gridlock interval between Congress and the president or to reverse previous policies. Based on the dynamics of this model, I hypothesize that as the policy gridlock changes — measured by a pivotal politics gridlock interval — legislative productivity may increase. This effect is enhanced by the liberalism of the gridlock policy space. I also find that not all legislation is gridlocked to the same degree — in fact, much legislation is not subject to gridlock. Thus, the lawmaking process is productive, even in the face of divided government. Finally, a counterfactual analysis demonstrates that in the 1990s, significant gridlock lowered the legislative productivity of Congress and the President because it created few opportunities to change the supply of major legislation.

*The author would like to thank Jim Battista, John Freeman, Liz Oldmixon, and Michael Greig for useful discussions on this paper. Work on this paper has been supported by a Faculty Research Initiation Grant, University of North Texas. The data and code used in this paper can be obtained from the author.
1 Introduction

What are the implications of divided government for the output of congressional-executive policymaking? Mayhew’s (1991) finding that divided government does not reduce the amount of major legislation passed by Congress has generated a decade of debate and reanalysis around this question. Recent work by Edwards, Barrett and Peake (1997), Krehbiel (1998), Krehbiel (1996), Binder (1999), Coleman (1999), and Howell, Adler, Cameron and Riemann (2000) has used new data and methods to show under what circumstances divided government affects the passage of legislation. These studies have debunked the finding of Mayhew and show that divided government does affect the amount of major legislation passed by Congress.

The revisions to the initial work of Mayhew have included the incorporation of more institutional details about congressional-executive relations (Krehbiel 1996, Krehbiel 1998, Binder 1999, Coleman 1999). These revisions include such factors as bicameralism and the supermajoritarian characteristics of Congress. In addition, Binder (1999) and Coleman (1999) have demonstrated that intraparty and interchamber preference diversity in Congress has a significant impact on congressional legislation. These sources of partisan polarization can increase the ideological divide within Congress and between Congress and the president, exacerbating the impacts of divided government. Krehbiel’s (1996) formal model of congressional-executive bargaining demonstrates how these factors interact both within and across congresses. Finally, Edwards, Barrett and Peake (1997) demonstrate the impact of divided government on the likelihood that major legislation fails to be enacted.

These studies of the impacts of divided government have identified several crucial factors — preferences, institutions, and parties — that can be used as the basis for a model of legislative productivity. The next section outlines a formal model, which can be used to generate hypotheses about the nature of divided government. These include predictions
about how the partisan and ideological composition of Congress, and the dynamic interaction of changes in legislative majorities, presidential preferences, and the changes in each of these variables affect the legislative productivity of Congress. Section three of the paper discusses how using multiple measures of legislative productivity (those of Mayhew (1991), Edwards, Barrett and Peake (1997), and Howell et al. (2000)) and the insights of the model we can evaluate the partisan and ideological impacts of divided government. Section four presents the results of the analysis, using a Poisson autoregressive model. Section five concludes.

2 Pivotal Politics, Parties, and the Dynamics of Legislation

To understand the changing nature of legislation and congressional activities, spatial voting models have been proposed to illustrate the impacts of different rules and preferences. Krehbiel (1996) presents a basic spatial model of congressional-executive relations that illustrates the basic insights of policy gridlock. In his model, a unicameral legislature with both veto override and filibuster rules passes legislation. This legislation can then be either signed or vetoed by a president. Vetoes may then be overridden.

The results of this model depend on the location of the initial status quo position and the preference configurations of the president and the legislature (see Krehbiel (1996)). The model also produces the prediction that so long as the president’s ideal point is extreme relative to the legislature (his ideal point is not within the interval defined by the pivotal veto override and filibuster voters) that the resulting policies will lie in an interval between the veto override and filibuster pivotal voters.

This model is static and unicameral – points that are clearly admitted by Krehbiel (1998, Chapter 9). Yet the model can be used to generate clear empirical predictions about the dynamic changes in legislation passed by Congress, and therefore the amount of policy change that we would expect to see as new majorities are elected to Congress and new presidents
win election to the White House. Thus, as we see changes in the nature of congressional majorities and in the occupants of the White House we can gauge the changes in legislative productivity and congressional-executive relations.

As other scholars have noted, Krehbiel’s (1996) model of lawmaking is unicameral (Binder 1999, Coleman 1999). Clearly, to incorporate the empirical findings in the literature, we should consider a new model that has the following characteristics:

- Bicameralism.
- Diversity of preferences.
- Dynamic implications about the equilibrium laws enacted.

A revised basic spatial model based on Krehbiel (1996) can be specified as follows. Let $P$ be the ideal point of the president, $H_M$ and $S_M$ be the median legislators in the House and Senate respectively, $S_F$ be the filibuster pivotal voter in the Senate, and $H_V$ and $S_V$ be the pivotal veto override voters in the House and Senate, respectively. We assume that there is a unidimensional policy space and that that the relative ordering of the ideal points is $P < H_V < S_V < S_M < H_M < S_F$.\(^1\) All actors are assumed to have single peaked preferences over choices in a unidimensional, compact policy space.

For this model, we would predict that the depending on the location of the status quo that the final location of policy would be in the interval that will win legislative majorities, be spared a filibuster, and either avoids a veto or sustains an override attempt. This means that at a minimum policy converges to the region between $H_V$ and $S_F$ — policies that be be sustained by a veto override in the more extreme legislative chamber and that are not filibustered by the pivotal veto override senator. The proof of this argument can be found in Krehbiel (1996) and Brandt (2001).\(^2\) This interval, which Krehbiel (1996) calls the “gridlock

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\(^1\)Assuming the president is extreme relative to Congress is not without loss of generality. However, it is consistent with the Poole and Rosenthal measures of legislative ideal points.

\(^2\)Considering bicameralism hardly changes the basic predictions of the original Krehbiel model – it mainly makes it more complicated. However, the basic insight that the policy gridlock interval and the policies in equilibrium converge in the region noted holds. This is why there is no loss of generality in considering the
“interval” is the region of policies that can be blocked by either chamber of Congress or the president if a proposal is made to change them. It defines the set of potential equilibrium alternatives we would expect to see in a stable partisan system (Krehbiel 1998).

As Krehbiel (1996) notes, this model can be viewed dynamically by replaying the basic game over multiple congresses. A simple version of this process is shown in Figure 1, which shows the gridlock interval for several different congresses. In “Congress 1”, the president is liberal relative to both chambers of congress. The gridlock interval is relatively liberal, with the veto pivot in the House being the closer veto pivot to the president.

The second congress has a more right-leaning or conservative gridlock interval. There are two sets of policies that are now in equilibrium (in the “Congress 2” gridlock interval) that were not in the first gridlock interval. These policies are those to the right of \( S_F \) from the first gridlock interval and also to the left of \( S_V \) in the second gridlock interval. Congress and the new, more conservative president will be able to pass policies in the new, conservative region of the gridlock interval. Also, policies that were previously at the left of the first gridlock interval, those between \( H_V \) in the first gridlock interval and those to the left of \( S_F \) in the second interval are no longer in equilibrium in the new gridlock interval. Therefore, congressional majorities and the president will want to pass legislation to move policies previously in this region into the new gridlock interval.

In the third Congress, a new liberal president has been elected and Congress has moved leftward.\(^3\) Here the gridlock interval shrinks, but does not shift far to the left because the location of the pivotal congressional voters does not change the interval that much (the unicameral model. However, for empirical analysis, given the importance attached to bicameralism in the work of Binder (1999) and Coleman (1999), we need to modify the model.

\(^3\)Obviously, there could not be three presidents in three successive Congresses, but the stylized fact still holds if we think of the configuration of the preferences in the second congress holding for longer than a two year congressional term.
Senate veto pivot from Congress 2 is close to the veto override pivot in Congress 3. Here we see a set of previously conservative policies moving to the left. Note that little policy space is opened at the left to pass new liberal policies. The main impact of the changes in congressional-executive relations from Congress 2 to Congress 3 is the repeal of conservative policies from Congress 2.

Thus, as new congressional majorities come to power, the distribution of congressional preferences changes and presidents are elected (or reelected) we see shifts in policies at the extremes of the gridlock intervals. This is exactly the form of the dynamic change in policy outcomes noted by Krehbiel (1996, 22-27). Krehbiel (1996) argues that as the policies converge into the gridlock interval (from some arbitrary starting status quo) we see weak convergence into the intersection of the gridlock interval from the different time periods. In fact, all that the pivotal politics model requires is that in for equilibrium in Congress $t$, that all policies will lie somewhere in the gridlock interval for Congress $t$. It does not require the policy convergence to be as strict as Krehbiel argues — only that policies from year to year are within the gridlock interval.

We see three sources of policy change in this model. First, as gridlock intervals increase or decrease in size, they open new policy opportunities in regions that were previously not covered by the gridlock intervals. Second, as the intervals change in size, policies that were previously in equilibrium (within the gridlock interval at $t - 1$) are no longer in the new gridlock interval (at time $t$). These policies must be changed or moved into the gridlock interval to remain in equilibrium. For the example in Figure 1 this requires moving liberal policies into the gridlock interval from Congress 1 to Congress 2, and shifting some more moderate policies, potentially, to the right. Both are sources of new legislation.

Third, regardless of the change in the size of the gridlock interval, there can be a change in its location, or central tendency that produces one or both of the first two sources of policy change. In this case, the ideal points of the pivotal members of the House and Senate
are shifting with or without a change in the size of the interval. This means that the interval can become more or less ideologically polarized without changing in size.

In general, these three possible sources of policy interval changes are all about the location and variance of the equilibrium policies in the legislative policy space. We expect to see more legislation when the policy space changes significantly from one congress to the next (opening or closing opportunities for policy innovation or retrenchment). These changes will alter the win-set of admissible policies that could be passed in Congress. Thus, we have one set of policy changes and one impact on lawmaking that corresponds to changes in the size or dispersion of the gridlock interval.

Second, we expect policy to change in response to the shifts in liberalism and conservatism of the congressional-executive gridlock interval. As this interval’s central tendency becomes more liberal, we expect there to be shifts in the policy activism of Congress – more new legislation is passed that reflects judicial activism. Conventional wisdom holds that when the gridlock interval shifts to the right we would see an initial surge in policymaking by Congress (as previous liberal policies are repealed), but then a decline in the amount of new legislation, given conservative proclivities for smaller government..

Thus, we have two key predictions that can be offered by this model about the dynamics of legislation and legislative productivity under different changes in the gridlock interval defined by the model:

**Changes in the Size of the Gridlock Interval** Increases in the size of the gridlock interval should lead to more legislation. Decreases in the size of the gridlock interval should lead to less legislation.

This hypothesis is based on the idea that the changes in amount of the policy space that are considered part of the equilibrium set of policies for a configuration of congressional and presidential preferences will depend on the the changes from the past gridlock interval. As the interval grows or shrinks, we would expect to see a change in the amount of new legislation.
A second hypothesis can be found based on the location of the interval. As the interval becomes more liberal / conservative we should see changes in congressional-executive lawmaking. Thus,

**Changes in the Location of the Gridlock Interval** As the gridlock interval becomes more liberal we should see more legislative productivity. As the interval becomes more conservative, we should see initially see more lawmaking, but the effect should die off.

These two hypotheses, one about the change in the size or dispersion of the interval and the other about the location of the interval are dynamic predictions about the amount of lawmaking we should see between the Congress and the president. The next section discusses how the variables in these hypotheses are measured.

### 3 Measuring the Gridlock Interval and Major Legislation

There are two main sets of variables in the hypotheses of the last section. The dependent variable is the number of enactments based on several measures of the legislative productivity of Congress and the president. In this paper, I use both the Mayhew measures of major legislation, the four measures of Howell et al. (2000) and the failed legislation measure of Edwards, Barrett and Peake (1997). This allows an assessment of both the dynamic properties of major legislation and legislative productivity identified by Howell et al. (2000) and the measurement issues they raise. All measures are biennial from 1957-1993.

Mayhew (1991) proposed an initial counting scheme for such major or landmark legislation. Howell et al. (2000) develop several new measures based on the entire universe of congressional legislation passed into law in the postwar period based on *Congressional*

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4While these studies have worked to reconceptualize the measures of the legislative output of Congress, they have both started with a base of legislation that has been produced and passed or failed in Congress to define the universe of important legislation that is affected by divided government. Binder (1999) creates a new set of data based on coding *New York Times* editorials based on their content and discussion of matters before Congress. Using this data, she finds that important gridlocked legislation (as defined by *Times* editorials) is less likely to pass under divided government, controlling for the ideological and partisan polarization of Congress. This measure is not currently available from Binder.
Quarterly, New York Times, and other sources to develop the measure based on contemporary observers evaluations of the significance of legislation. Krehbiel (1998) uses the same data as that reported in Howell et al. (2000) to assess the effects of “gridlock” on legislative productivity.

Finally, I also use the measure of failed major legislation developed by Edwards, Barrett and Peake (1997) as a check on whether the amount of legislation that fails to pass is a function of the gridlock interval measures. They present another scheme to count major failed legislation — major legislation that fails to pass Congress or fails to become law. Edwards, Barrett and Peake (1997) reconceptualize the debate and analyze the number of laws that failed to pass under unified and divided government. They find that under divided government, the number of major laws that fail to pass increases.

Coleman (1999) presents a critique of the existing literature on divided government and legislative productivity. He argues that while the conventional wisdom that divided government reduces congressional productivity is correct, it ignores the contribution of party scholars who have argued that party responsiveness is the key aspect of party government in Congress. Using the data from Mayhew and others, he finds support for model of legislative productivity that measures party responsiveness through interactions of party control and unified government measures, intraparty factionalism, and the size of Senate supermajorities. While his argument is dynamic, the data analysis is not dynamic. It does posit and analyze factors that evolve over time to explain legislative productivity in the postwar era.

The second set of variables in the two hypotheses are those for the independent variables, based on the gridlock interval. Previous analyses (e.g., Edwards, Barrett and Peake (1997), Mayhew (1991), Howell et al. (2000)) have typically used a simple set of dummy variables to assess the impacts of unified/divided government on legislative productivity. The general finding is that this variable has an impact on the amount of major legislation passed by Congress (with Mayhew (1991) as the notable exception).
Krehbiel (1998) use a measure of the interelection swing to assess the size of the gridlock interval. Binder (1999) uses a variety of measures, but focuses most on the bicameral distance between the House and Senate, and ideological diversity measures based on Poole-Rosenthal W-Nominate scores. Her measure uses the Poole-Rosenthal scores to measure the percentage of moderates in each Congress. She includes a variable for divided government, but does not directly measure the president’s preferences with similar scores. Finally, Coleman (1999), uses measures based on Poole-Rosenthal DW-Nominate scores to assess the impacts of partisan divisions on legislative productivity.\(^5\)

Simply using a party control dummy variable measure to assess unified government misses the changing nature of partisan majorities in Congress and the White House. It effectively treats all Democratic or Republican congressional majorities the same. In addition, the measure is difficult to interpret, since as some scholars such as Coleman (1999) and Binder (1999) note, the impacts of divided government may be asymmetric.

What is needed are measures of the ideal points of the pivotal members of Congress and the president that are time invariant and comparable across chambers. Poole (1998) presents a set of “common space” scores for members of both chambers of Congress and the president that can be used for this purpose. Based on these ideology scores for each member of Congress we can empirically determine the gridlock interval for each Congress. This measure is superior to the other ideology scores of Poole because it is comparable across chamber of Congress and over time. Both of these comparisons are essential for creating and comparing gridlock intervals.

To find the gridlock interval, for each Congress we line up the locations of the ideal points $P$, $S_V$, $H_V$, and $S_F$.\(^6\) We can then use the basic spatial model of the last section to determine

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\(^5\)There is a question about whether either of these measures — the W-Nominate or the DW-Nominate — are appropriate in these cases where we need a time- and chamber- comparable measure of preferences as measures. The only scores produced by Poole that are comparable across chambers and time are the common space scores. See Poole’s website, http://voteview.uh.edu/page2a.htm for a discussion.

\(^6\)Prior to 1975, the Senate filibuster required 67 votes. For these years, I use 67 votes as the basis for the Senate veto pivot; after 1975, I use 60 vote, the present-day cloture requirement.
the location of the gridlock interval: generally, the interval from the veto pivot closest to the
president to the Senate filibuster pivot. Using the common space scores first dimension, the
ideal points for each pivotal member are located in a -1 to 1 interval. The gridlock intervals
are presented in Figure 2. The midpoint of the interval and the House and Senate medians
are also labeled on this figure for comparison.

[Figure 2 about here.]

Note that the model presented earlier makes predictions about both the changes in the
central location and spread or dispersion of the gridlock interval. It predicts that as the
location of the interval becomes more liberal we should see more major legislation. In what
follows, I use the location of the midpoint of the gridlock interval to measure the central
tendency of the interval. In the analysis that follows, to assess the changes in the size of the
interval, I use a measure of the change in the size of the interval from a Congress $t - 1$ to $t$.
This is a first difference in the interval.

Note that these two variables — the change in the location and change in the size of
the interval — measure three possible ways that the interval can change over time. First,
the interval could expand in size, but be centered in the same location. This is just an
expansion that gridlocks more policies as the ideological distribution of preferences in the
House and Senate becomes more extreme. The second source of the changes in the gridlock
interval occur as the size stays the same, but the central location of the interval (say its
midpoint) becomes more liberal or conservative. Thus, as the interval changes in this way,
the gridlock policies change – shifting to more liberal or more conservative policies in the
gridlock interval. Finally, both the size and location of the interval can change, combining
both of these previous cases.

The only exception to this in the post-war period is in the Eisenhower Administration, when Eisenhower
is actually less conservative than his veto override pivot. In this case, we use Eisenhower’s ideal point as the
measure of the lower end of the gridlock interval.
What is the consequence of these shifts in the gridlock intervals? First, as the party in control of Congress and / or the White House changes, the interval typically changes. We expect to see new parties coming to power and bringing with them new policy agendas, such as Reagan in 1981 with his focus on tax cuts and the Republican takeover of Congress in 1994, with its focus on the *Contract with America*. This is clearly evident in Figure 2.

Is this change in the gridlock interval an empirically valid measure for assessing changes in congressional majorities and the shifts in congressional preferences and the president’s preferences? To answer this, consider the location of the gridlock interval from 1955 to 1999. As we would expect, periods of time that have been viewed as historically “gridlocked” have the largest gridlock intervals. The largest gridlock interval occurs in 1997 at 0.56 – when Clinton faced the GOP 104th Congress. The largest five gridlock intervals occur in the Nixon (1969, 1973) and Clinton Administrations (1995-1999). These periods are all known for their partisan divisions. The smallest gridlock interval is in 1977 when Carter faced a Democratic Congress. The smaller gridlock intervals occurs in the Carter Administration and the first two years of the Clinton Administration. The average gridlock interval size under unified government is 0.335, and 0.406 under divided government. This difference is statistically significant (t-test = 2.19).

However, the gridlock interval size and divided government measures are only correlated at 0.43 ($p = 0.04$). Clearly there is something different in the gridlock interval versus measuring partisan control. The difference that the measure captures is both the institutional and partisan bases of lawmaking. In contrast to this correlation, the midpoint of the gridlock interval is correlated with divided government at 0.75 ($p < 0.001$). Thus, while divided government is highly correlated with the central tendency of the gridlock interval, there is clearly some other information in the size of the interval that is neglected by using only a partisan dummy variable to capture the effects of divided government. In effect, this measure captures the partisan / ideological diversity measures used by Binder (1999) and
Coleman (1999) while at the same time accounting for the institutional factors such as the veto override pivots and the filibuster pivots.

The next section outlines a dynamic event count regression model that is used to determine the impacts of the gridlock interval measures on the amount of legislation passed by Congress.

4 Empirical Model and Analysis

4.1 Past empirical regression models

Given the previous discussion, we expect to see dynamics in congressional productivity and outputs. This fact has been recognized in most of the recent analyses of legislative productivity and the impacts of divided government. However, the treatment of the dynamic patterns in these data has used one of three main approaches:

- Dynamics are ignored.
- Dynamics are a nuisance and must be corrected.
- Dynamics are accounted for with deterministic components.
- Other *ad hoc* corrections and models.

None of these approaches account for the dynamic effects of divided government and the effects of changing gridlock interval since the effects of changes in the exogenous regressors affect both today’s legislative productivity and tomorrow’s legislative productivity through lagged values if there is a dynamic pattern. Further, the results are more complicated because all the dependent variable measures of legislative productivity are event counts — they are counts of the number of pieces of legislation that pass a given biennial Congress and are enacted into law (or not, for the failed legislation measure). As noted in Brandt, Williams, Fordham and Pollins (2000) and Brandt and Williams (2001) failing to adequately model the dynamics of count data leads to biased estimates and inefficiency.
Ignoring the dynamics can have serious consequences. Ignoring the dynamics leads to biased and inefficient estimates of the effects of divided government, gridlock, and other explanatory variables. Thus, we may understate (or overstate) the effects of divided government, with the nature of the bias determined by the serial correlation. This problem plagues the original analysis of Mayhew (1991) (as we will see). The Generalized Event Count (GEC) model used in Coleman (1999), can be viewed as a partial correction for this problem. However, as shown in Brandt et al. (2000), for dynamic event counts, this method leads to biased estimates and is inefficient.

Modeling the dynamics of the number of bills passed by Congress as nuisance is another approach. Edwards, Barrett and Peake’s (1997) analysis of the failed major legislation in Congress from 1947-1994 uses this approach. Such a model treats the dynamics of the number of bills that fail to pass Congress as a noise process, rather than something of substantive interest. Rather than take this approach, we should be asking what the dynamic multiplier effects of divided government are. This treats the effects of a change in unified to divided government as a factor that may have a dynamic regression effect rather than just a temporary effect, as implied in the noise-based dynamics of the first order serial correlation residual model.

The third approach to the dynamics of congressional legislative productivity is to account for the dynamics with deterministic components. Howell et al. (2000) model their measures of congressional legislative productivity using a Poisson regression model with linear and quadratic deterministic exponential trend terms. There are two reasons why this is a failed

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8They employ a Cochrane-Orcutt model to correct for serial correlation in the residuals for their regression of the number of failed bills on a measure of divided government and the same control variables as used by Mayhew. This means that under the assumption that there is first order serial correlation error process, their estimates of the effects of divided government are unbiased.

9Brandt et al. (2000) and Brandt and Williams (2001) show via Monte Carlo studies that the a first order serial correlation error process (such as the Cochrane-Orcutt type correction) does not adequate account for dynamics in event count data. It produces biased estimates of the effects of exogenous variables.

10They justify these exponential trend terms using augmented Dickey-Fuller tests for unit roots. Based on their tests they fail to reject the null of a unit root with a deterministic trend. They therefore include trend terms in their Poisson regression models.
approach for modeling dynamics in event count data. The first is that the data in question is not non-stationary. Howell et al. (2000) base their specification of the dynamics on the first differences of the data series rather than the raw stationary series. These differenced series display more dynamics than the actual raw series, although these are “false” dynamics induced by the incorrect use of an augmented Dickey-Fuller test.\footnote{When an augmented Dickey-Fuller test is employed on the raw counts in these series it assumes 1) the data are not heteroscedastic, 2) the critical values of the test statistic can be computed based on a normal simulation from an unit root process (this is the basis for tabulated ADF critical values), and 3) the residual serial correlation will be removed by augmentation. Each of these assumptions is incorrect, and therefore invalidates the use of the ADF test and their finding of a unit root. First, the heteroscedasticity in the raw event count series violates the assumption of uniform variance that underlies the specification of the ADF test. Second, the tabulated critical values for the ADF distribution are based on assumptions of Gaussian innovation processes in a unit root model. While not necessary for the computation of the distribution, this implicit distributional assumption is not valid for count data models with small means (see the discussion in (Brandt et al. 2000)). Finally, when a time series is stationary, differencing that series will induce false serial correlation making it nearly impossible to reject the null hypothesis that the series is a unit root when in fact it is stationary. Simulations (not shown here) confirm these basic results and show that tabulated ADF critical values are too large for use with count data time series models because they ignore the heterogeneity in the event count data.}

Krehbiel (1998) constructs a measure of the “gridlock” interval based on congressional election data. Krehbiel computes this measure as the change in the percentage of seats held by the Democrats, with the sign determined by the party of the president. Thus, the measure is very close to the interelection swing. Since this variable is then measured as a difference in seats held from one Congress to the next, Krehbiel hypothesizes that it should affect the difference in the number of major enactments, which he measures using the landmark (Group A) and minor (Group B) laws enactments Howell et al. (2000). While a defensible approach, there is no reason to difference the counts of major or landmark enactments in Krehbiel’s gridlock model. Since the dependent variable measure Krehbiel uses is stationary, there is no reason to difference it to make it stationary. The only rational is based on having differenced the key independent variable. This however is incorrect, since the differencing of the major enactments measures induces false serial correlation in the regression model. This misspecification means that Krehbiel’s estimates of the impacts of the gridlock interval (based on the interelection swing) are standard errors that are too small. This means the
results are overconfident and potentially overstate the impacts of the changes in the gridlock interval he measures on the changes in the amount of major legislation passed by Congress.

How then should we model measures of legislative productivity? First, we must account for the dynamics of the legislative productivity measures. Second, we must account for the possible dynamic relationships between divided government and the changes we observe in the level of legislative output. The next section proposes a general model that allows for both of these possibilities.

4.2 A Dynamic Model of Legislative Productivity

Several measures of legislative productivity are employed in testing the hypotheses. The first dependent variable used is Mayhew’s Sweep 1 series (major legislation derived from *Congressional Quarterly*, the *New York Times* and the *Washington Post*). In addition, I also employ the four measures proposed by Howell et al. (2000). These are what they refer to as Groups A-D legislation. Group A are “landmark enactments,” similar to Mayhew’s Sweep 1 data. Group B are “major enactments” that are mentioned in either the *New York Times* or *Washington Post* end of session review, or receive six or more pages of coverage in the *CQ Almanac*. Group C are the “ordinary enactments” which are public laws mentioned in the *CQ Almanac* summary. Group D are all “minor enactments” or other legislation not in the other categories. All data series run from 1957-1994.

The key independent variables in the time series regression model are based on the gridlock interval defined in the last section. I include measures of the changes in the size of the gridlock interval ($\Delta Gridlock$) and the changes in the midpoint of the gridlock interval ($\Delta Midpoint$). An additional variable to control for the party of the president is also included.

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12 I omit the data / legislation in what Mayhew calls his Sweep 2 which is based on experts accounts after the fact of which legislation is important. These are omitted because as Howell et al. (2000) show, they are plagued by measurement error and serial correlation and provide no real addition to the original measure based on the news sources.

13 The dependent variables data series actually all start in 1947, but the common space scores used for the independent variables only begin in 1957.
This variable is coded 1 for Democratic presidents and -1 for Republican presidents.\textsuperscript{14}

To deal with the dynamic specification of a regression model for the event counts of major legislation in each Congress, I use employ a Poisson Autoregressive or PAR(p) model. This model, presented in Brandt and Williams (2001) is a time series regression model for event counts based on the following specification:

\begin{equation}
Pr(y_t = Y|m_t) = \frac{e^{-m_t} m_t^Y}{y_t!}
\end{equation}

\begin{equation}
m_t = \sum_{i=1}^{p} y_{t-i} \rho_i + \left(1 - \sum_{i=1}^{p} \rho_i \right) \exp(X_t \beta)
\end{equation}

\begin{equation}
X_t = \begin{pmatrix}
\Delta \text{Midpoint}_t \\
\Delta \text{Gridlock}_t \\
\text{President}_t
\end{pmatrix}
\end{equation}

where \(y_t\) is the legislative productivity measure, \(\rho_i\) are coefficients on the lagged values of the legislative productivity measure, \(X_t\) is a 1 \(\times\) \(k\) vector of regressors at time \(t\) and \(\beta\) is a \(k\ \times\ 1\) vector of regression coefficients. Equation 1 is a Poisson density that describes realization of the counts based on the mean at time \(t\), \(m_t\). The second equation is a generalized autoregressive process that describes the evolution of the mean \(m_t\) are a realization of past values of the counts in \(y_{t-1}, \ldots, y_{t-p}\). For the covariate matrix \(X_t\), \(\Delta \text{Gridlock}_t\) is the change in the gridlock interval from time \(t - 1\) to \(t\), and \(\Delta \text{Midpoint}\) is the change in the midpoint of the gridlock interval from times \(t - 1\) to \(t\). The variable \(\text{President}_t\) measures the party of the president.

This PAR(p) regression model can be estimated using the procedure and code described in Brandt and Williams (2001).\textsuperscript{15}

\textsuperscript{14}The variable is coded to capture the sign of the shifts in the partisan direction of the gridlock interval. In a partial regression effect interpretation of this parameter, it captures the directional impact of changing a president’s ideology when the party that controls the presidency changes. It also provides a control for the direction of the president’s ideology in the changes to the gridlock interval and midpoint.

\textsuperscript{15}The code, for both R and Gauss, can be obtained from the author.
4.3 Results

Here I report the “best” PAR(p) model based on likelihood ratio tests and Akaike Information Criteria to select the lag length.\textsuperscript{16} Table 1 shows the results of the regression model for each of the dependent variables for legislative productivity outlined in the previous section. Here we present the models for each of the measures of the different kinds of legislation. The first thing to note is that for all the regression models, the dynamic effects are present. The PAR(1) coefficients in each model are significant, indicating that there is some dynamic multiplier effect that extends over multiple Congresses for the impacts of changes in the gridlock intervals and their locations. Second, we see that the impacts of the changes in the gridlock interval and its midpoint vary across different kinds of legislation.

[Table 1 about here.]

For the most important legislation or major legislation (Howell et al.’s Group A and Mayhew’s Sweep 1 legislation), we see that that increases in the size of the gridlock interval are associated with more major legislation. For Howell et al.’s (2000) landmark enactments (Group A), the z-score is 1.55, which has a p-value of 0.06, under the null hypothesis that the coefficient is greater than zero. For Mayhew’s data, the z-score is 1.27, which has a p-value of 0.1, under the same one-sided null hypothesis.

Changing the size of the gridlock interval does not have a statistically significant effect on either the “major enactments” (Group B) or the “ordinary enactments” (Group C). For minor enactments, changes in the gridlock interval size do have a strong positive effect, with a z-score of 4.67. Finally, Edwards, Barrett and Peake’s (1997) failed legislation measure does not respond to changes in the size of the gridlock interval. Thus, we see that changes in the gridlock interval have their largest impacts on the most important legislation and

\textsuperscript{16} Each series was fit with a PAR(1) to a PAR(4) model. The best model for the series was chosen based on likelihood ratio tests and Akaike Information Criteria tests. Details of these results may be obtained from the author.
minimal impacts on the less “average” categories of legislation.

What happens as the gridlock intervals become more or less liberal? The $\Delta Midpoint$ variable assesses this effect. We expect that the coefficient for this variable will be negative, since more liberal (negative) gridlock interval midpoints are more likely to produce more activist congresses that are potentially more productive, *ceteris paribus*. The reality however, is that only for the minor enactments (Group D) and failed legislation does the liberalism of the gridlock interval have the expected effect on the legislative productivity. For the minor enactments (Group D) the z-score is -4.97 and for the failed legislation it is -2.07. For the landmark enactments (Group A) the p-value for the change in the midpoint variable is 0.16. For the “major enactments” (Group B) and “ordinary enactments” (Group C) legislation, which are less important, we see that changes in the gridlock interval and its midpoint location do not impact the legislative productivity.

To assess the impacts of changes in the midpoints and size of the gridlock interval, Figures 3 and 4 present summaries of the impacts multipliers for changes in the gridlock interval and the midpoint of the interval, respectively. For each of these figures, a one standard deviation change in the size of the gridlock interval or a (positive) one standard deviation increase in the midpoint of the interval is assumed and the total impact of the change is computed (see Brandt and Williams (2001) for details on how to compute the multipliers). This process is repeated 5000 times to generate a simulated set of long run or total impacts for the change in the independent variable.\footnote{This procedure accounts for both the uncertainty around the regression coefficients and the forecasted impact. First, a draw is taken from the (normal) distribution of the estimated parameters in Table 1 and their estimated covariance. Second, for this set of parameters the multipliers are then computed.}

[Figure 3 about here.]

[Figure 4 about here.]
Figure 3 shows the estimated densities for the total impact on the dependent variable for a one standard deviation change (0.061) in the gridlock interval. This change is about equal to the change in the gridlock interval from the Carter to the Reagan Administrations. Here we see more clearly the effects of the gridlock interval change documented in Table 1. For the landmark legislation measures (Mayhew, and Howell et al.’s (2000) Group A), there are weak increases in the number of new laws passed. Thus, the expansion of the gridlock interval by one standard deviation has a median impact of approximately two new landmark laws for this one standard deviation change in the gridlock interval. In contrast, as reported earlier, the changes in the major enactments (Group B), ordinary enactments (Group C) and the amount of failed legislation (Edwards et al.) is zero. For the minor enactments (Group D) we see a large increase in the amount of new legislation. Thus, changing the gridlock interval this modest amount has a disproportionate impact on the landmark enactments and the most minor enactments. “Run-of-the-mill” legislation is not much affected. If the changes in the partisan and ideological control are therefore mainly merely changes in the gridlock interval, then there is little impact on the ordinary activity of Congress.

In contrast, changing the central tendency of the gridlock interval — its midpoint — has a very different effect on the amount of legislation that is enacted. A negative one standard deviation change in the changes in the gridlock interval midpoint (0.07) is approximately equivalent to the change from 1991 to 1993, when the change in the Democratic Congress under President George H.W. Bush to Democratic Congress of President Clinton.\footnote{Here I employ a negative one standard deviation change because it is comparable to history. Employing a positive change would be consistent with the model, but does not have the same historical analog. For example, the change in the gridlock interval midpoint from 1979 to 1981 is 0.23.} Here we see that more liberal gridlock intervals lead to more landmark legislation. For the Group A and Mayhew measures there are 1.42 and 3.16 median increases, respectively. For the minor enactments (Group D) we see that there is a more than 40 law increase as the gridlock interval becomes more liberal. In contrast, for the failed legislation, we see that more liberal
gridlock intervals lead to nearly 2.5 more failed laws. This makes sense, since as the gridlock midpoint and therefore the gridlock interval become more liberal, it shifts the veto pivot points on average further from average Republican president in the post-war period. This increases the amount of conflict between the president and Congress and therefore increases the amount of legislation that is subject to failing to pass.

In general, these results are at odds with those in the literature (except for the treatment of the dynamics in the dependent variables). Howell et al. (2000) find that unified government has a statistically significant effect on the landmark and minor legislation. Edwards, Barrett and Peake (1997) find that divided government increases the amount of failed major legislation enacted. Binder (1999) and Coleman (1999) find that institutional factors such as Senate supermajorities and larger ideological intraparty divisions reduce the amount of legislative productivity.

In the present analysis, we see that larger gridlock intervals are the result of both the institutional and partisan divisions within and across the branches. As the gridlock intervals change, we see that there are new opportunities to pass legislation, and thus a pressure to demand policies that differ from those of the previous Congresses. This is similar to Binder’s (1999, 526) idea that the longer a party is out of the congressional majority, the more pressure there is to avoid policy gridlock and pass a new agenda. Here we see direct evidence of this effect in that the marginal changes in the gridlock interval itself lead to more legislation as new congressional majorities, in concert with the president, are able to pass new legislation as the gridlock interval changes. Thus, we see that this demand side factor for legislation has an important impact on the productivity of the lawmaking process.

Because of the non-linearity of the PAR(1) model, we must compute impact and long run multipliers to examine the magnitude of the changes in the independent variables. However, computing the multipliers is complicated by the fact that we really would like to see the impacts of relative changes in the independent variables, not long run effects on the mean.
Therefore, I present a series of counterfactual scenarios that illustrate the impacts of the changes in the locations of the midpoints and the size of the gridlock interval.

The first of these asks the following question: what if there had been a continual period of unified Democratic government following the Reagan-Bush years? In other words, what if President Clinton had faced a Democratic Congress after 1994? To analyze this “Democratic Scenario,” I use the results from the previous estimations and estimate conditional forecasts of the number of pieces of new legislation that would have been passed for the landmark legislation measures (Group A and Mayhew). I then compare these measures to a forecast using the data from the GOP Congresses first elected in 1994, the “Republican Scenario.” For the Mayhew measure we can actually compare these conditional forecasts to the actual data, since Mayhew has updated his data series to the present. Figure 5 presents the forecasts for the scenarios.

[Figure 5 about here.]

The Democratic Scenario assumes that the gridlock interval (and its location) from 103rd Congress with President Clinton followed the average path for Democratic presidents in the post-war period (pre-1994).\(^\text{19}\) The Republican Scenario assumes that Clinton faced the GOP controlled 104th to 106th Congresses. Thus, the actual 1994-1999 gridlock intervals are used for these forecasts. These forecasts are both out of sample, since the last observations used in the estimations in Table 1 are data on the 103rd Congress (1993-1994 term).

The results are rather striking. For Howell et al.’s (2000) landmark enactments measure (Group A) we see a considerable initial increase in the Republican Scenario over the Democratic Scenario. Had Clinton had average Democratic congresses for the final six years of his term, the mean legislative productivity of Congress would have been about 13-15 landmark enactments per Congress for 1995-1999. Thus, as would be expected for a Democratic president, Clinton would be losing ground with Congress as it drifted away from him over the course of his term.

\(^{19}\)This corresponds to positive changes of 0.022 in both the gridlock interval and the midpoint of the gridlock interval per Congress for 1995-1999. Thus, as would be expected for a Democratic president, Clinton would be losing ground with Congress as it drifted away from him over the course of his term.
enactments per congress using Howell et al.’s (2000) measure and 11-13 landmark enactments per congress for the Mayhew measure. Under the Republican Scenario we see even more landmark enactments: between 16 and 21 per Congress for Howell et al.’s (2000) measure and 13-15 for Mayhew’s (1991) measure. In contrast, we can see that for the Mayhew measure, the 104th Congress performed consistent with the model (1995) where the actual number of major enactments passed by Congress was 15. After the 104th Congress, we see a major leveling off or decline in landmark enactments, for both measures. In fact, the model predicts the decline in the number of landmark enactments after the 104th Congress. The actual Mayhew data however, show a sooner and more precipitous decline in the number of landmark enactments after 1995.

What are we to make of this simple counterfactual forecasting exercise? First, we see that the model has broad applicability and captures the basic insights of the institutional factors outlined by Binder (1999) and Coleman (1999). Changes in the gridlock interval which reflect both ideological and institutional divisions and rules are broadly predictive of the changes in the amount of policy legislation passed by or changed by Congress. Second, as we see in the counterfactual example above, partisan changes in Congress that correspond by nature with large changes in the gridlock interval size and location have both immediate and gradually decaying effects consistent with a dynamic model. As predicted by the model and seen in the actual data in Figure 5, there is an initial response to these changes and a larger cumulative effect that may be seen over subsequent Congresses. While the model fails to predict well the general level of the number of new landmark enactments for the period after the 103rd Congress, it does get the basic shape and response of the partisan and ideological change correct. The reason is probably so overpredicts the number of landmark enactments is that there are no changes in the gridlock interval that parallel the large gridlock interval of the 104th Congress. The largest gridlock intervals in the postwar period all occur after the 103rd Congress (1993-1995). Further, the gap between the gridlock interval and the
congressional chamber medians grows to one of its largest points in this period. Thus, the model performance in the counterfactual underscores rather than minimizes the impacts of the congressional-executive policy gridlock interval on legislative productivity. Lastly, this counterfactual scenario is a bit of a stretch for the estimator, since there is little if any basis for comparison of Clinton’s post-1993 scenario with earlier presidents in the sample. With this in mind, the model and the estimation appear to hold up rather well.

5 Conclusion

The initial question of this paper asked “What are the implications of divided government for legislative productivity?” The answer to this question depends on the nature of the legislation we use to assess productivity and the dynamic model we use. Using the PAR(p) model for event count time series, we see that there are dynamic patterns in the data. These dynamic patterns, coupled with the changes in the gridlock intervals support the hypothesized changes in the legislative productivity of Congress and the president. We see that as gridlock intervals expand, revealing more policies that need to be moved into equilibrium, there is more landmark legislation enacted. Further, we see more minor enactments as well. However, the changes in the size of the gridlock interval do not affect the amount of major legislation that fails to pass. At the same time, as the gridlock intervals become more liberal, we see marginally more landmark legislation and more minor legislation. The amount of legislation that fails to be enacted when the gridlock interval location becomes more liberal increases sharply as the interval becomes more ideologically distinct from the president’s preferences.

How substantial are these changes in the enactments of legislation? As can be seen in Figures 3 and 4 the changes in the gridlock interval have the largest effects on the two landmark enactments measures — Howell et al.’s (2000) Group A and Mayhew’s (1991) Sweep 1 — are around two laws. As Coleman (1999, 827) discusses, even such modest changes
can have serious consequences if they are sustained over longer periods of time. That said, the impacts shown in these figures are long-run total multipliers or the cumulative effects of the one standard deviation changes in the different independent variables. Thus, for larger changes in the gridlock interval — such as the GOP takeover of Congress we expect to see even larger impacts. Effectively, these figures serve as a baseline for the minimum observed impacts. Figure 5 demonstrates this point as well.

Using Krehbiel’s (1996) pivotal politics model of lawmaking, we see that that the institutional and partisan characteristics of Congress and the president work together to impact legislative productivity. However, the results of the present analysis are at odds with the received wisdom. We generally expect that changes in gridlock intervals are associated with more divided government and higher partisan fractionalization within and across the branches. The actual empirical result is that these changes in the gridlock interval change the location of the equilibrium policies and create opportunities for Congress to legislate and the president to make policy. The institutional rules of the lawmaking process (reflected in the model) set broad limits on the policies that can be made. The resulting changes in policy are at the margins — controversial major legislation and minor legislation. The vast majority of major and ordinary enactments are unaffected. Further, the changes in the gridlock interval alter the nature of legislation that can be blocked by the president or Congress, which leads to changes in the amount of legislation that fails to pass Congress.

So is divided government and the severe partisanship of recent years a problem? Based on the present analysis, I would argue that it is not. Congress and the president, broadly responsive to public sentiment (and pursuing reelection) are able to enact laws that bridge both the constitutional separation of powers and the partisan divides. The model shows that knowledgeable, opportunistic politicians can work to move policies into equilibrium that reflects the congressional majorities and institutional rules of lawmaking. Congress and the President are still productive — even in the face of divided government and large amounts
of gridlock. Thus, the presence of divided government does not reduce the responsiveness of the lawmaking process.
References


Figure 1: Gridlock Intervals for Different Congresses. Figure shows a progression of gridlock intervals over three successive congresses with different presidents.
Figure 2: Bicameral Gridlock Interval, biennial, 1955-1999. Computed using Poole’s (19980 common space scores for each Congress. Shaded region is the gridlock interval.
Figure 3: Density Plots of the Total Effect on the Number of New Laws for a One Standard Deviation Change in the Gridlock Interval. Data series is listed above each graph. The number inside each graph is the median total change in the number of new laws for each measure.
Figure 4: Density Plots of the Total Effect on the Number of New Laws for a One Standard Deviation Change in the Gridlock Midpoint. Data series is listed above each graph. The number inside each graph is the median total change in the number of new laws for each measure.
Figure 5: Counterfactual Forecasts For Democratic and Republican Congresses for President Clinton. Solid lines are the forecasts with dashed lines indicating 90% posterior confidence interval. Dashed line marked actual is the number of landmark enactments for the Mayhew landmark enactments (Sweep 1) measure. “Democratic Scenario” assumes the Clinton faces the same gridlock interval from 1993-1999. “Republican Scenario” assumes the gridlock interval for the 104th to 106th Congresses.
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Table 1: PAR(1) Regression Results for Legislative Productivity Measures, 1957-1993. Standard errors in parentheses. There are 19 observations for each regression. See text for discussion.