Public Choice
DOI 10.1007/s11127-010-9635-4

The consequences of midnight regulations and other surges in regulatory activity

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Received: 5 January 2009 / Accepted: 11 March 2010

Abstract Is the midnight regulations phenomenon real and what are its consequences? This paper finds that when an administration's time is almost up, submissions of economically significant regulations nearly double. Such surges in regulatory activity decrease the duration of regulatory review at the Office of Information and Regulatory Affairs (OIRA), likely because of political pressure to quickly approve new rules. Specifically, one additional economically significant regulation submitted to OIRA decreases the mean review time for all regulations by about two thirds of a day. If OIRA review improves regulation quality, then regulatory surges that decrease review time could hinder such improvement.

Keywords Regulation · Midnight regulations · Regulatory review · OIRA · Election cycles · Regulation quality · Federal regulations · Federal Register · Rulemaking · Cinderella constraint · Executive Order 12866 · Economically significant regulations · Lame-duck administration

JEL Classification H0 · H1 · H11 · K2

1 Introduction

Midnight regulations are federal regulations published during an outgoing president's term between Election Day and the inauguration of the next president. The term "midnight regulations" was coined after the regulatory outburst at the end of the Carter administration set a record for the number of pages added to the *Federal Register* (in which all federal regulatory activity is published) during an outgoing president's lame-duck period, with 24,531 pages

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Published online: 08 April 2010

(Dudley 2001; Davies and de Rugy 2008; Brito and de Rugy 2008a). Since then, outgoing presidents have added pages to the *Federal Register* at higher rates during the midnight period than at other times in their presidencies.

Although the term "midnight regulations" has been around for decades and the phenomenon has received attention by researchers and media alike, there is no straightforward, empirical test for whether there actually is a spike in regulatory activity during the midnight period. Optimally, researchers would track the total number of regulations created by federal agencies during midnight and non-midnight periods, but such data are not tracked or available. Instead, researchers have relied on the number of pages added to the *Federal Register* as a proxy for regulatory output in a given time period. Cochran (2001), Davies and de Rugy (2008), and Brito and de Rugy (2008a) all have shown that the average number of regulations created during the midnight period greatly exceeds the number created during non-midnight periods. Both Cochran (2001) and Davies and de Rugy (2008) empirically verified the midnight regulations phenomenon, defined here as a statistically significant increase in the number of regulations created during midnight periods relative to non-midnight periods, by examining the number of pages added to the *Federal Register*. Although the monthly rate of pages published in the *Federal Register* seems likely to increase as more regulations are created in a given month, other factors, such as lengthier individual regulations, might also increase the number of pages published without actually increasing the number of regulations issued. While the *Federal Register* offers researchers a long, continuous time series to use as a proxy for regulatory activity, the proxy's validity as a measure of regulations issued has not been verified. Additionally, the robustness of the results of other researchers who have used the *Federal Register* as a proxy can be further tested by implementing alternative metrics or proxies of regulatory activity.

This paper's primary contribution is to identify and test for a potential consequence of surges in regulatory activity like midnight periods: rushing the regulatory review process. This paper also adds to the existing literature on federal regulations by using new proxies and metrics to test for increased rulemaking during midnight periods.

Rather than rely on *Federal Register* pages as a proxy for regulatory output, this paper examines the relationship between midnight periods and economically significant regulations, which are defined as regulations that will impact the economy by more than $100 million.[1] Various executive orders have obligated the Office of Information and Regulatory Affairs (OIRA; 2008) to review all economically significant regulations produced by executive branch agencies.[2] If overall rulemaking dramatically increases during the midnight period, the number of economically significant rules reviewed by OIRA should increase during the midnight period. The results presented in this paper are consistent with the midnight regulations phenomenon pointed out by previous researchers.

Midnight regulations are often criticized for several reasons. Primary among these reasons is a lack of accountability (Brito and de Rugy 2008a). Lame-duck administrations, which need not worry about pleasing the electorate or gaining Congress's cooperation, can

[1] Reagan's Executive Order 12291 established OIRA's role as administrative reviewer of federal regulations. It required regulatory impact analyses to be prepared for "major rules", but left some flexibility in the definition of "major rule" (see Brito and de Rugy 2008a). Executive Order 12866, September 30, 1993, clearly established the definition of "major rule" as a regulation that might "have an annual effect on the economy of $100 million or more". Additionally, according to one anonymous referee, OIRA has the ability to classify rules with an annual effect of less than but near $100 million (e.g., $90 million) as economically significant, in response to agencies' apparent propensity to intentionally underestimate the effects of rules in order to avoid such a classification.

[2] For example, see Executive Order 12866, http://www.whitehouse.gov/omb/inforeg/eo12866.pdf.

pursue regulatory policies that, in other circumstances, might have invited retaliation (Morrow 2001). Similarly, because midnight regulations occur after an election, any regulatory actions taken by the lame-duck administration may defy the will of the electorate as voiced through the election process. As such, midnight regulations are sometimes viewed as "undemocratic" (Brito and de Rugy 2008a).

Another documented criticism is that outgoing presidents can use midnight regulations to "tie the hands of their successors, occasionally forcing them to choose between accepting objectionable policies as law or paying a steep political price for trying to change them" (Howell and Mayer 2005). In fact, once created, it appears that midnight regulations are not often repealed by the following president. Loring and Roth (2005) examined the midnight regulations created at the end of George H.W. Bush's term and at the end of Bill Clinton's presidency. The authors found that Clinton repealed only 9% of George H.W. Bush's midnight regulations, and that George W. Bush repealed only 3% of Clinton's midnight regulations (Loring and Roth 2005). Because an incoming president may alter or amend a midnight regulation rather than repeal it altogether, Loring and Roth also examined how many midnight regulations were amended by the incoming administration. They found that 43% of George H.W. Bush's and 82% of Clinton's midnight regulations were not amended (Loring and Roth 2005).

Midnight regulations, and spikes in regulatory activity in general, pose another potential problem: they could overwhelm the institutional review process (Brito and McLaughlin 2008; Brito and de Rugy 2008a). The regulatory review process as performed by OIRA could be hampered during periods of high volume rulemaking, either because OIRA is pressured to quickly finish reviews or because OIRA becomes overloaded with rules to review during midnight periods (Brito and McLaughlin 2008; Brito and de Rugy 2008a).

This paper tests whether OIRA spends less time reviewing economically significant regulations submitted during midnight periods than during non-midnight periods. It also tests whether an increase in regulatory activity decreases average review time at OIRA. These tests yield three important findings: first, that the volume of economically significant rules submitted to OIRA increases during midnight periods; second, that the ratio of economically significant rules to all significant rules submitted to OIRA increases markedly during midnight periods; and third, that OIRA's average review time decreases during midnight periods and other periods of high regulatory activity. Specifically, one additional, economically significant regulation submitted to OIRA decreases the mean review time for all regulations reviewed by OIRA by about two thirds of a day. The increase in the number of regulations submitted to OIRA during midnight periods accounts for part of this finding.

2 Background

The most basic test of the midnight regulations phenomenon is whether there is an actual increase in new regulations published during midnight periods as compared with non-midnight periods. Previous studies have relied on the number of pages added to the *Federal Register* in a given time period as a proxy for the number of regulations created in that period. Both Cochran (2001) and Davies and de Rugy (2008) found that the rate of adding pages to the *Federal Register* increases on average by 17% during the midnight period compared to the average of the rest of the year.

Until now, the rate of page publication in the *Federal Register* was the only variable researchers used as a proxy for the actual number of regulations created in a given time period. Because this rate could increase if individual regulations included more pages per

regulation, giving the appearance of a growth in regulatory activity when in fact there was none, this paper presents alternative metrics of regulatory activity. These new metrics are the total number of economically significant regulations submitted for review to OIRA in a given time period and the ratio of economically significant regulations to the total number of regulations submitted for review to OIRA in a given time period.

These metrics allow further testing for the existence of the midnight regulations phenomenon. Data on the number of economically significant rules submitted to OIRA in a given time period allow a direct test of a variant on the midnight regulations phenomenon: that more economically significant rules are created during midnight periods than during other periods. Additionally, the number of economically significant rules submitted to OIRA in a given period may serve as a proxy for the total number of rules created in a given period. The other metric—the ratio of economically significant regulations to all regulations submitted to OIRA in a given time period—captures two separate, possible consequences of spikes in regulatory activity. The first is that during spikes in rulemaking, the number of economically significant rules submitted to OIRA will likely increase; if this increase occurs, the ratio's numerator would increase. The second is that during spikes in rulemaking, OIRA might choose to classify fewer rules as "significant",[3] freeing up reviewers to examine economically significant rules, rather than significant rules. If this occurs, the ratio's denominator would decrease. Both actions would indicate an overwhelming of OIRA's capabilities and are captured in this ratio.

Additionally, it is possible that the time OIRA spends reviewing rules decreases during the midnight period compared to other periods. OIRA has a fairly constant operating budget and staff despite marked fluctuations in the number of rules it must review (Brito and de Rugy 2008b), although OIRA can add temporary detailees from other agencies to help with review. Thus, it seems possible that during periods of high rulemaking volume, OIRA spends less time reviewing each rule because it is overwhelmed by the workload. Alternatively, an administration may pressure OIRA to quickly conclude reviews, particularly during its midnight period when faced with the Cinderella constraint—the impending end of an administration's term. This paper tests whether average rule review time decreases during the midnight period, as well as whether rule review time decreases when the number of significant rules created in a given period increases. None of these tests necessarily demonstrates any relationship between OIRA review time and rule quality, however quality may be defined.

3 Data

Since 1981, the Office of Information and Regulatory Affairs (OIRA), a part of the Office of Management and Budget, has reviewed the regulations created by executive branch agencies. Between February 1981 and December 1993, OIRA reviewed an average of 203.5 regulations per month. From January 1994 to January 2009, the mean number of regulations reviewed per month fell to about 50.3. This decrease is likely due to Executive Order 12866 (EO 12866).

Under EO 12866, all new regulations must be submitted to OIRA, but OIRA may review only "significant regulations".[4] A regulation can be deemed significant by either the submit-

[3]OIRA has at least some flexibility in classifying a regulation as "significant." See EO 12866, Sect. 3(f), which is also addressed in Sect. 3 of this paper.

[4]The The White House (1993). Executive Order 12866, Sect. 6(a)(3)(A), http://www.whitehouse.gov/omb/inforeg/eo12866.pdf.

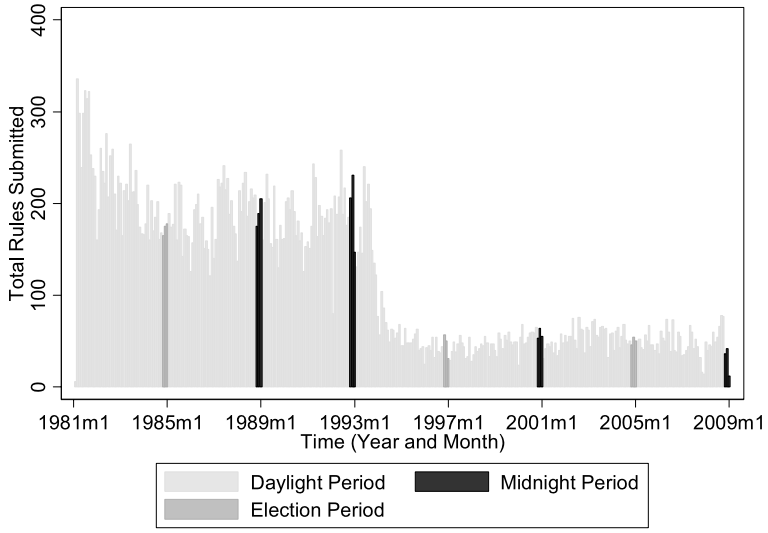

Fig. 1 Total rules submitted each month. Note: "Election periods" denote election periods wherein the incumbent was re-elected. "Midnight periods" denote election periods wherein the incumbent either lost or was not eligible for re-election. "Daylight periods" denote all other periods

ting agency or by OIRA. A regulation is categorized as significant if it is likely to do any of the following:

(1) Have an annual effect on the economy of $100 million or more [a special category called "economically significant"] or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in [EO 12866].[5]

Figure 1 shows that after 1993, when EO 12866 was created, the pattern of agencies' regulation submissions to OIRA changed drastically: the total number of rules submitted plummeted from an annual average of 1,955 to 617. As such, it seems appropriate to examine data from years after EO 12866 was implemented (i.e., January 1994–January 2009) separately from prior data. Data from the post-EO 12866 period and from the entire period (February 1981–January 2009) are described in this section, and, for robustness, some results using both data poolings are given in Sect. 4.

[5]EO 12866, Sect. 3(f). As noted in footnote 2, according to an anonymous referee, although EO 12866 defines "economically significant" as having an annual effect of $100 million or more on the economy, OIRA may sometimes categorize a rule as economically significant despite a prior estimate of an annual effect of less than $100 million. Also, because the nominal threshold defining economic significance of regulations—$100 million—has not changed since 1993, the threshold in inflation-adjusted dollars has gradually decreased over time.

Table 1 Summary statistics by year and by period

Year	Total rules reviewed[6]	Economically significant rules reviewed	Other rules reviewed	Economically significant-to-all ratio	Mean review time (days)
1981	2,857	65	2,792	0.028	9.627
1982	2,675	79	2,596	0.033	12.919
1983	2,491	64	2,427	0.031	18.452
1984	2,153	67	2,086	0.038	26.604
1985	2,185	54	2,131	0.030	26.282
1986	2,025	71	1,954	0.042	24.494
1987	2,383	79	2,304	0.039	28.559
1988	2,381	88	2,293	0.046	31.412
1989	2,158	71	2,087	0.041	23.300
1990	2,120	86	2,034	0.046	26.369
1991	2,224	135	2,089	0.079	33.723
1992	2,338	135	2,203	0.075	43.546
1993	2,009	99	1,910	0.068	32.448
1994	810	138	672	0.186	30.60
1995	597	62	535	0.121	36.760
1996	520	76	444	0.160	43.683
1997	499	76	423	0.168	49.236
1998	510	82	428	0.171	54.125
1999	586	88	498	0.179	56.681
2000	655	112	543	0.201	62.029
2001	533	87	446	0.209	49.321
2002	686	97	589	0.155	46.774
2003	709	100	609	0.157	48.647
2004	639	85	554	0.142	55.521
2005	589	76	513	0.150	57.976
2006	639	76	563	0.136	58.718
2007	480	76	404	0.169	53.250
2008	581	133	448	0.209	51.705
2009	12	4	8	0.333	10.83

Note: Year 1981 does not include data from January. Year 2009 includes only January 1–January 20, 2009.

Data on regulatory activity and OIRA review time were taken from OIRA's website, which contains information on which rules it has reviewed, when it received those rules from regulatory agencies, when it finished reviewing those rules, and when the rules were published in the *Federal Register*.[7] The website also denotes which submitted rules were classified as economically significant, ex ante. Table 1 gives the numbers of economically

[6]The sharp decline in total rules reviewed in 1994 relative to previous years is the result of Executive Order 12866. This decline is not necessarily reflective of a decrease in the number of rules submitted to OIRA or in the number of rules issued yearly, but rather a decline in the number of rules reviewed by OIRA.

[7]http://www.reginfo.gov/public/do/eoHistoricReport.

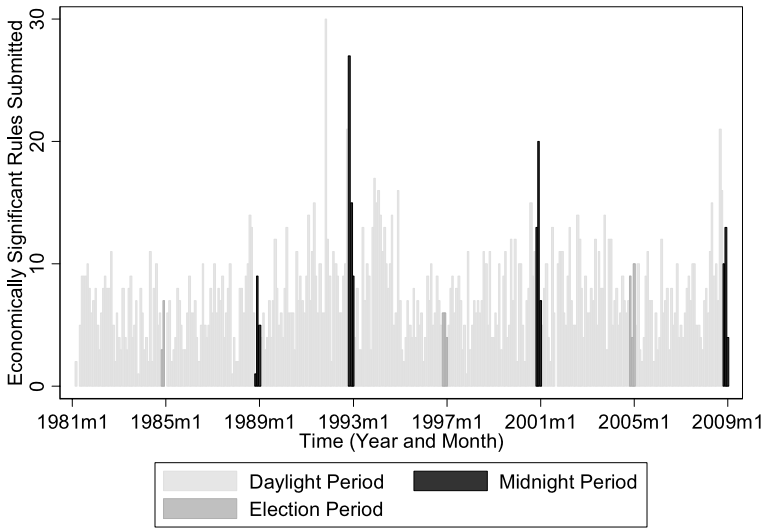

Fig. 2 Economically significant rules submitted each month. Note: "Election periods" denote election periods wherein the incumbent was re-elected. "Midnight periods" denote election periods wherein the incumbent either lost or was not eligible for re-election. "Daylight periods" denote all other periods

significant and significant rules submitted each year to OIRA as well as the mean review time in days. Figure 1 graphically depicts the total number of rules submitted to OIRA for review each month, and Fig. 2 shows the number of economically significant rules submitted to OIRA for review each month. In these figures, election periods and midnight periods are marked. Both election periods and midnight periods refer to the time between Election Day and Inauguration Day. An election period, however, is defined as the time between Election Day and Inauguration Day when the incumbent has won the election, whereas a midnight period is defined as the time between Election Day and Inauguration Day after a new president has been elected. The midnight periods, therefore, occurred between the Reagan and George H.W. Bush administrations, the George H.W. Bush and Clinton administrations, the Clinton and George W. Bush administrations, and the George W. Bush and Obama administrations.

4 Model and results

Two aspects of regulatory activity during midnight periods may be empirically testable. The first is whether more regulations are created during midnight periods than during non-midnight periods. The second is the possibility that regulations created during periods of high regulatory activity, such as midnight periods, might receive less scrutiny from OIRA.

The first hypothesis tested in this paper is whether there is a statistically significant increase in the number of regulations submitted to OIRA during midnight periods as compared with non-midnight periods. In (1),

$$R_t = f(A_t, E_t, \sigma_t) \tag{1}$$

let R equal the total number of regulations submitted to OIRA in time period t. R is a function of the administration, A, the election cycle, E, and some normally distributed stochastic

element, σ. The administration term captures presidents' inclination to regulate. The election cycle term, in this context, simply refers to whether an administration is in a midnight period.

Regulatory activity, and perhaps political activity in general, might systematically change according to the incentives produced by the election cycle. A broader model of actions and incentives created by election cycles might include such activities as directing government capital investment, exceeding budgetary limits, or legislative voting. This paper, however, focuses primarily on producing empirical tests of whether regulatory activity increases in midnight periods and whether midnight regulations receive less scrutiny from OIRA.

4.1 Metrics of new regulations

I propose two measures of regulatory activity: the number of economically significant regulations submitted to OIRA each month and the ratio of economically significant regulations to all regulations submitted to OIRA each month. Regardless of whether they are meaningful proxies for the total number of regulations created in a given month, these measures allow testing of the following two hypotheses:

Hypothesis 1 There are more economically significant regulations submitted during midnight periods than non-midnight periods (i.e., the midnight regulations phenomenon is real).

Hypothesis 2 An increase in the number of economically significant regulations sent to OIRA in a given month decreases OIRA's average review time for each rule.

Cochran (2001), Davies and de Rugy (2008), and Brito and de Rugy (2008a) all have concluded that regulatory activity increases in midnight periods; each used the number of pages published in the *Federal Register* to measure regulatory activity. Pages published in the *Federal Register* might be a good proxy for regulatory activity as well as for actual regulations created. The proxy could suffer an upward bias in measuring the number of new regulations created, however, as longer individual regulations or other (non-regulatory) bureaucratic affairs published in the *Federal Register* would conflate into the same proxy.[8] As alternative measures, I use the number of economically significant rules reviewed and the ratio of economically significant rules reviewed to all rules reviewed.

Since late 1993, OIRA has reviewed all economically significant proposed rules under EO 12866. Thus, since the end of 1993 at least, OIRA should have reviewed a constant percentage—100%—of economically significant rules. Also, since 1993, OIRA's budget and number of employees have remained fairly constant in nominal terms (Brito and de Rugy 2008b), although OIRA has some ability to add temporary detailees from other agencies. It may therefore be reasonable to assume that the total number of rules that OIRA can review with the same degree of scrutiny in any given period has remained constant, if the average time required to review an economically significant rule and to review a significant rule has also remained relatively constant across time periods.

[8] It is possible that the pages dedicated to non-regulatory affairs in the *Federal Register* appear as white noise in the proxy—that is, that such pages occur randomly regardless of the rate of regulatory activity. However, a casual glance at the *Federal Register* will show that many such pages contain notices of public hearings that are related to the creation of new regulations, meaning that more pages of non-regulatory affairs likely are published during times of higher regulatory activity.

If the average review times of economically significant and significant rules across time are not constant or are indeterminable, however, then total economically significant rules submitted by period might not serve well as a proxy for total new rules created in a period. Fortunately, the ratio of economically significant rules submitted to all rules submitted might not suffer from any bias due to changes in average rule review times, because systematic changes in average rule review time should occur for both economically significant and significant rules.

The ratio of economically significant rules submitted to all rules submitted captures two margins in the OIRA review process that spikes in regulatory activity might change. The first—increased regulatory review burden caused by the submission of additional economically significant rules to OIRA—increases the numerator of the ratio. The other margin of change is in the number of non-economically significant rules OIRA reviews. While OIRA must review economically significant rules, whether other rules are significant and must be reviewed by OIRA is, to at least some degree, decided by OIRA.[9] This flexibility may allow OIRA to choose to review fewer significant rules during times when its review burden is not particularly high and vice versa. Thus, if there are periods where OIRA is operating at its maximum review capacity and it receives additional economically significant rules, OIRA may pursue three different options: spend less time reviewing each rule in order to get more rules reviewed, review fewer significant rules by simply not classifying as many rules as significant, or bring in temporary detailees and work harder and longer. The ratio would capture the first two of these possible OIRA actions, but probably not the third.

4.2 Results: confirming the midnight regulations phenomenon

Each of these measures, total economically significant rules submitted and the ratio of economically significant to all rules submitted, tests whether more regulations are created during midnight months than other months.[10] The first specification (2) is

$$ECON\_SIGN_t = \beta_0 + \beta_1 MIDNIGHT_t + \beta_2 EO12866_t + \beta_x ADMIN_x + \varepsilon_t, \qquad (2)$$

where *ECON_SIGN* is the number of economically significant regulations submitted in month t, *MIDNIGHT* is a dummy variable indicating whether month t is a midnight month, *EO12866* is a dummy variable indicating Executive Order 12866 was in effect during month t, and $ADMIN_x$ is a dummy variable for each presidential term ($ADMIN_1$ = Reagan, 1981–1984; $ADMIN_2$ = Reagan, 1985–1988; $ADMIN_3$ = George H. W. Bush, 1989–1992; $ADMIN_4$ = Clinton, 1993–1996; $ADMIN_5$ = Clinton, 1997–2000; $ADMIN_6$ = George W. Bush, 2001–2004; $ADMIN_7$ = George W. Bush, 2005–2008).[11]

[9] See Sect. 3 of this paper for details taken from EO 12866 on when a rule is classified as economically significant or significant.

[10] Additionally, the author performed regressions using an additional specification with all significant regulations reviewed as the dependent variable and using both data poolings (1981–2009 and 1994–2009). The results of these regressions were statistically inconclusive—the coefficient estimate on *MIDNIGHT* was variably positive and negative, and never statistically significant. These results are available from the author upon request.

[11] In fact, these administrations begin and end on January 20, meaning that simple dummy variables created based on year alone would incorrectly attribute some observations. These dummy variables have accordingly been constructed to include the 20 days of January in the appropriate administration. For example, reviews completed anytime from January 1 through January 20 of 2009 are included in the dataset and are attributed to the George W. Bush administration.

Table 2 Effects of midnight periods on the number of economically significant rules submitted for review, February 1981–January 2009

	(1) *ECON_SIGN*	(2) *ECON_SIGN*	(3) *ECON_SIGN*
MIDNIGHT	3.898	3.919	3.800
	(3.43)**	(3.45)**	(3.38)**
p12866		0.528	–0.614
		(1.25)	(0.47)
ADMIN2 (Reagan, '85–'88)			0.221
			(0.29)
ADMIN3 (Bush I, '89–'92)			3.012
			(3.89)**
ADMIN4 (Clinton, '93–'96)			2.453
			(1.94)
ADMIN5 (Clinton, '97–'00)			2.168
			(1.44)
ADMIN6 (Bush II, '01–'04)			2.635
			(1.75)
ADMIN7 (Bush II, '05–'08)			2.043
			(1.35)
Constant	7.185	6.900	5.729
	(33.48)**	(22.04)**	(10.51)**
Observations	336	336	336
R-squared	0.03	0.04	0.10

Absolute value of t statistics in parentheses

* Significant at 5%; ** significant at 1%

Because Executive Order 12866 was created in 1993, the set of regressions that use only data from 1994 onward does not include the variable *EO12866* or the pre-1994 administration dummy variables.

The econometric specification of the model using the second metric is similar (3), except that the dependent variable, *SIGN_RATIO*, is the ratio of economically significant rules submitted in period t to the total number of rules (economically significant and significant) reviewed in period t:

$$SIGN\_RATIO_t = \beta_0 + \beta_1 MIDNIGHT_t + \beta_2 EO12866_t + \beta_x ADMIN_x + \varepsilon_t. \quad (3)$$

The results of OLS regressions of (2) and (3) are presented in Tables 2, 3, 4, and 5.[12] In these regressions, an observation is the monthly mean of *ECON_SIGN* in Tables 2 and 3 or *SIGN_RATIO* in Tables 4 and 5. Thus, there are 336 observations for the 1981–2009 period (February 1981–January 2009), and there are 181 observations after EO 12866 (January 1994–January 2009).

[12] Although Davies and de Rugy (2008) found that the rate of page publication in the *Federal Register* follows a unit root process, Dickey–Fuller tests rejected unit root processes for all the dependent variables used in this paper. OLS is appropriate.

Table 3 Effects of midnight periods on the number of economically significant rules submitted for review, January 1994–January 2009

	(1) *ECON_SIGN*	(2) *ECON_SIGN*
MIDNIGHT	3.732	3.956
	(2.52)*	(2.62)**
ADMIN5 (Clinton, '97–'00)		–0.294
		(0.37)
ADMIN6 (Bush II, '01–'04)		0.182
		(0.23)
ADMIN7 (Bush II, '05–'08)		–0.419
		(0.53)
Constant	7.434	7.568
	(27.59)**	(12.84)**
Observations	181	181
R-squared	0.03	0.04

Absolute value of *t* statistics in parentheses

* Significant at 5%; ** significant at 1%

All results indicate a statistically significant increase in the total number of economically significant regulations submitted to OIRA during midnight periods relative to non-midnight periods. Columns 1–3 of Table 2 show various specifications of (2). The coefficient estimate on *MIDNIGHT* across all three specifications remains positive and statistically significant. The coefficient estimate is very consistent, ranging from 3.800 to 3.919.

Interpretation is relatively straightforward: during midnight periods between February 1981 and January 2009, the monthly average quantity of economically significant regulations submitted to OIRA increased by about six regulations. The mean monthly quantity of economically significant regulations submitted to OIRA over this period was about 7.4, so during midnight periods economically significant rules submitted to OIRA increased by just over 50%. These increases are probably not attributable to political party or to other individual presidential characteristics, because including administration dummy variables, as in column 3 of Table 2, does not change the estimate. Also, controlling for the creation of EO 12866 barely changes the estimate on the midnight regulations term.

Table 3 also details estimates of (2). The data used for Table 3, however, contain only observations made from January 1994 to January 2009 (i.e., only observations made after EO 12866 was in effect), whereas those in Table 2 include observations from February 1981 to January 2009. The coefficient estimates on the midnight periods variable are 3.732 without any administration dummies and 3.956 with administration dummies, and both are significant at the 1% level. As in Table 2, these estimates correspond to an increase of about 50% in the number of economically significant regulations submitted to OIRA during midnight periods, as the mean number of economically significant regulations submitted in a month over this period was 7.55.

Table 4 presents regressions similar to those of Table 2, except that the dependent variable is *SIGN_RATIO*, or the monthly ratio of economically significant regulations to all regulations submitted for review, as shown in (3). These estimates are consistent with those of Tables 2 and 3. The estimates presented in Table 4 show that during midnight periods, the ratio of economically significant regulations to significant regulations increases. The coefficient estimates on *MIDNIGHT* are 0.066 when not including administration dummies, as shown in column 1, and 0.067 with them, as shown in column 3, and both estimates are statistically significant at the 1% level. Including the EO 12866 dummy variable does not meaningfully alter the results, as shown in column 2. The ratio could increase if ei-

Table 4 Effects of midnight periods on the ratio of economically significant rules to all rules submitted for review, February 1981–January 2009

	(1) *SIGN_RATIO*	(2) *SIGN_RATIO*	(3) *SIGN_RATIO*
MIDNIGHT	0.066	0.070	0.067
	(3.05)**	(5.20)**	(4.90)**
p12866		0.114	0.091
		(22.68)**	(5.79)**
ADMIN2 (Reagan, '85–'88)			0.003
			(0.30)
ADMIN3 (Bush I, '89–'92)			0.019
			(1.99)*
ADMIN4 (Clinton, '93–'96)			0.024
			(1.60)
ADMIN5 (Clinton, '97–'00)			0.034
			(1.85)
ADMIN6 (Bush II, '01–'04)			0.028
			(1.55)
ADMIN7 (Bush II, '05–'08)			0.037
			(2.00)*
Constant	0.096	0.035	0.026
	(23.66)**	(9.29)**	(3.98)**
Observations	336	336	336
R-squared	0.03	0.62	0.63

Absolute value of *t* statistics in parentheses

* Significant at 5%; ** significant at 1%

ther the number of significant rules submitted to OIRA increased or the total number of rules submitted decreased. Figure 1 shows that the total number of rules submitted to OIRA does not seem to change during midnight periods, but, as Fig. 2 shows, there are tremendous increases in the number of economically significant rules submitted for review during at least two of the four midnight periods in the data.[13] Based on the evidence of Figs. 1 and 2, it seems likely that the positive effect of *MIDNIGHT* on *SIGN_RATIO* is caused by an increase in economically significant rules submitted rather than by a decrease in the total rules submitted. This evidence bolsters the case made by the results of Tables 2 and 3 that the number of economically significant regulations submitted to OIRA increases noticeably during midnight periods.

[13]The finding that the "total number of rules submitted to OIRA does not seem to change during midnight periods" is not meant to imply that there is not an increase in total regulatory activity during midnight periods. Figure 1 shows only that the number of rules submitted to and subsequently reviewed by OIRA seem relatively unaffected by midnight periods—there could be a vast proliferation of rules that are not reviewed by OIRA not shown in this figure. This finding partially motivated the examination of submission and review of economically significant and significant rules, as a way of squaring the likely increased overall regulatory activity observed in midnight periods (as shown in other research) with the relatively constant rate of rule submission to OIRA seen in midnight periods (shown in Fig. 1).

Table 5 Effects of midnight periods on the ratio of economically significant rules to all rules submitted for review, January 1994–January 2009

	(1) *SIGN_RATIO*	(2) *SIGN_RATIO*
MIDNIGHT	0.121	0.118
	(5.08)**	(4.86)**
ADMIN5 (Clinton, '97–'00)		0.006
		(0.49)
ADMIN6 (Bush II, '01–'04)		0.004
		(0.31)
ADMIN7 (Bush II, '05–'08)		0.009
		(0.71)
Constant	0.147	0.142
	(33.89)**	(14.95)**
Observations	181	181
R-squared	0.13	0.13

Absolute value of *t* statistics in parentheses

* Significant at 5%; ** significant at 1%

Table 5 also contains the regression results of (3), where *SIGN_RATIO* is the dependent variable. The data used for regressions in Table 5 are from January 1994 to January 2009 (i.e., after EO 12866 went into effect). The results are similar to those of Table 4. The coefficient estimates on *MIDNIGHT* are 0.121 when not including administration dummies and 0.118 with them, and both estimates are statistically significant at the 1% level.

Interpretation of the coefficient estimates of *MIDNIGHT* in Tables 4 and 5 depends on the evidence presented in Figs. 1 and 2; specifically, because the dependent variable, *SIGN_RATIO*, is the ratio of economically significant rules submitted to OIRA to all rules submitted to OIRA, the coefficient estimate on the independent variable *MIDNIGHT* indicates changes in the ratio, which could mean changes in either the numerator, the denominator, or both. Figures 1 and 2 show that any changes in that ratio that occur during midnight periods likely result from increases in the numerator rather than decreases in the denominator.

The mean of *SIGN_RATIO* between February 1981 and January 2009 is 0.098, and that figure increases to 0.151 during the post-EO 12866 period (January 1994–January 2009). The coefficient estimate on *MIDNIGHT* presented in Table 4, column 3 is 0.067, which means that during midnight periods from 1981 to 2009, the ratio of economically significant rules to all rules submitted to OIRA increased by about 68.4%. From Table 5, which uses data from 1994 to 2009, the interpretation of the coefficient on *MIDNIGHT* in column 2, 0.118, is that during midnight periods between 1994 and 2009, the ratio of economically significant rules to all rules submitted to OIRA increased by about 78.1%. All results in Tables 4 and 5 are consistent with a marked increase in submissions of economically significant rules to OIRA during midnight periods, especially when combined with the evidence shown in Figs. 1 and 2.

4.3 Results: the effects of regulatory activity on average rule review time

It is important to know whether increased submission of economically significant rules hinders OIRA. Presumably, a major goal of OIRA is to improve the quality of regulatory agencies' analyses. If OIRA review leads to higher quality analysis of regulations, then the amount of time OIRA spends reviewing proposed rules might serve as a proxy for regulatory analysis quality. Conversely, the amount of time OIRA spends reviewing a rule might be

completely unrelated to how much OIRA's review improves the rule's quality. In fact, there is no way of knowing whether a rule that was "under review" by OIRA for 20 days was actually being worked on for 20 days or sat on someone's desk for 19 days and was worked on for one day. Without making any assumptions about the relationship between rule review time and rule quality, this subsection attempts to discover any relationship between mean review time and the number of economically significant rules submitted to OIRA as well as between mean review time and the ratio of economically significant rules to all rules submitted to OIRA.

Increased rule submission could reduce review time, depending on OIRA's staffing and budgeting constraints. Brito and de Rugy (2008b) point out that OIRA's staffing level has remained relatively constant since 1993, so it may be reasonable to assume that OIRA's review capabilities have also remained constant. According to EO 12866, OIRA has 90 days to review submitted rules, which can be extended by 30 days at OIRA's request or indefinitely at the submitting agency's request (Office of Management and Budget 1993). Holding staff and maximum review time constant, if OIRA ever operates at maximum review capacity, then OIRA could only review any increase in economically significant rule submissions by reviewing at a faster rate—that is, by spending less time reviewing individual rules. Whether OIRA actually operates at maximum review capacity and thus must decrease the time spent reviewing rules when rule submission increases is an empirical question not addressed here. Nevertheless, results that show that mean review time decreases when rule submission increases would be consistent with the idea that OIRA can only review a larger number of rules in a given time period if it spends less time on each rule on average.

Alternatively, OIRA could decrease the time spent reviewing rules during high volume periods due to political pressure. Thus, even if staff and budget are not worked at maximum capacity, due to, for example, the availability of temporary detailees, OIRA review time may still decrease when an administration is faced with its own constraint such as the impending end of its term—the Cinderella constraint.

Table 6 shows the results of regressions of monthly mean review time on the total number of economically significant rules and significant rules submitted to OIRA, as well other covariates, including midnight period and administration dummies. Table 6 has been restricted to only the period from January 1994 to January 2009 because of the clear definition of OIRA's obligation under EO 12866. The results shown in Table 6 contain two important findings. The first is that mean review time decreases noticeably when the number of economically significant rules submitted to OIRA increases. The second is that the midnight periods that occurred in this timeframe also markedly decreased mean review time. Caution should be taken in attributing causation to the second finding because of the limited number of observations of midnight periods that occurred between 1994 and 2009.[14]

Column 1 shows the first result, that an increase in total economically significant rules submitted to OIRA negatively affects mean review time. The dependent variable is monthly mean review time in all regressions in Table 6. Column 1 shows that, holding the total number of significant rules submitted to OIRA constant and controlling for differences across administrations, the submission of one additional economically significant rule to OIRA decreases the mean review time of all rules by approximately 0.676 days, statistically significant at the 1% level. In other words, evaluated at the mean, when OIRA receives one more economically significant rule in a given month, the review time for all rules submitted

[14] One midnight period occurred at the end of 2000 and another at the end of 2008, yielding six observations of midnight period months (November, December, and January of 2000–2001 and November, December, and January of 2008–2009) out of the 181 total months of 1994–2009.

Table 6 Effects of rulemaking on monthly mean review times, January 1994–January 2009

	(1) *REV_TIME*	(2) *REV_TIME*	(3) *REV_TIME*	(4) *REV_TIME*
SIGN	0.207	0.121		
	(2.58)*	(1.60)		
ECON_SIGN	–0.676	–0.352		
	(2.72)**	(1.48)		
MIDNIGHT		–25.366		–23.284
		(5.46)**		(4.97)**
SIGN_RATIO			–61.192	–37.906
			(4.49)**	(2.78)**
ADMIN5 (Clinton, '97–'00)	17.773	18.902	17.500	18.638
	(7.01)**	(8.01)**	(7.18)**	(8.11)**
ADMIN6 (Bush II, '01–'04)	12.487	12.451	12.657	12.567
	(5.00)**	(5.38)**	(5.21)**	(5.51)**
ADMIN7 (Bush II, '05–'08)	15.870	17.117	16.036	17.110
	(6.29)**	(7.29)**	(6.57)**	(7.44)**
Constant	33.958	35.387	46.896	43.593
	(8.52)**	(9.56)**	(17.64)**	(16.88)**
Observations	181	181	181	181
R-squared	0.26	0.37	0.30	0.39

Absolute value of t statistics in parentheses

* Significant at 5%; ** significant at 1%

to OIRA that month decreases by about two thirds of a day on average. This decrease could occur because OIRA substitutes some reviewing capability from significant rules to the economically significant rule. Alternatively, OIRA could speed up review for some economically significant rules due to political pressure. Column 2 repeats the regression shown in column 1 while adding a dummy variable for the midnight period. The coefficient estimate on economically significant rules, *ECON_SIGN*, remains negative but loses its statistical significance. Instead, *MIDNIGHT* is the only statistically significant, negative determinant of review time, besides the administration dummy variables.

In column 2, the coefficient on *MIDNIGHT* is −25.366 and is significant at the 1% level. This result indicates that, when controlling for the number of economically significant and significant rules as well as differences across administrations, the mean review time decreased during the midnight period by an astonishing 25 days. That is a 50.1% decrease relative to the mean review time over the entire period.

Total economically significant rules submitted to OIRA might not affect review time if review time depends on both economically significant rules and significant rules. Under an assumption that OIRA operates at maximum review capacity, however, the ratio of economically significant rules to all rules submitted would capture the total reviewing burden placed upon OIRA in any particular month. This measure is used in columns 3 and 4. The coefficient estimates on *SIGN_RATIO* in columns 3 and 4 are −61.192 and −37.906, and both are statistically significant at the 1% level. These results indicate that an increase in the ratio decreases mean review time. The interpretation of these coefficients is that a 1% increase in *SIGN_RATIO* leads to a decrease in review time of about 0.38 to 0.61 days. The mean

review time between January 1994 and January 2009 was 49.9 days, so, in percentage terms, a 1% increase in *SIGN_RATIO* leads to a 0.76% to 1.2% decrease in mean review time.

As explained previously, OIRA may have some flexibility in determining whether to classify a rule as "significant" and therefore whether it must be reviewed. It is possible that OIRA would classify fewer rules as significant during periods of high volumes of rule submissions in order to reduce its workload and to allow reviewers to focus on economically significant rules. Such an action would show up in the data as a decrease in the ratio's denominator. Conversely, economically significant rules are defined as rules that have an impact of more than $100 million, and, once that figure is established by a submitting agency, it seems unlikely that OIRA will decline to review the rule.

Overall, the evidence appears consistent with the hypothesis that review time decreases due to increases in the ratio of economically significant rules submitted to all rules submitted. The coefficient estimates on *MIDNIGHT* presented in Table 6 should perhaps be taken with caution, because, as mentioned earlier, there are only two midnight periods yielding six monthly observations between January 1994 and January 2009. Still, as Fig. 2 shows, the number of economically significant rules submitted to OIRA did dramatically increase at the end of 2000 and again at the end of 2008—that is, during the midnight periods included in the timeframe. Therefore, even if midnight periods do not lead to decreases in review in and of themselves, the evidence shows that the associated increase in the number of significant regulations submitted to OIRA does decrease review time. Economically significant rules may merit more review time than other rules, if the possible consequences of the economically significant rules are substantially greater than those of non-significant rules. These results, however, indicate that review time decreases as the ratio increases.

Pressure put on OIRA by the administration to quickly review economically significant regulations is one possible explanation. Another is that during periods of high volume rulemaking, such as midnight periods, there are more rules of both sorts—economically significant and significant—submitted and reviewed by OIRA. Under this explanation, OIRA must review the economically significant rules and significant rules within a somewhat constrained timeframe, so, although OIRA may prefer a longer review for economically significant rules, the high volume of rules submitted limits the time spent on each rule. However, since OIRA can add temporary detailees to aid its review and can extend the amount of time it spends reviewing a rule beyond the 90-day period specified in EO 12866, it seems likely that at least part, if not all, of the decrease in review time is attributable to political pressure.

5 Conclusion

It has long been contended that changes in the presidency result in outbursts of regulations from executive branch agencies—the midnight regulation phenomenon. Previous researchers have found support for the midnight regulations phenomenon by examining the rate of page publication in the *Federal Register*. This paper has introduced two alternative measures for rulemaking: the number of economically significant rules submitted to OIRA for review each month and the ratio of economically significant rules to all rules submitted to OIRA each month. The results of statistical regressions using data from February 1981 to January 2009 and from January 1994 to January 2009 all support the existence of a real increase in economically significant rulemaking during midnight periods.

For at least two possible reasons, one might expect the amount of time OIRA spends reviewing rules to change during midnight or other high volume periods. First, because OIRA reviews all economically significant and significant regulations published by executive branch agencies, dramatic increases in the number of economically significant and

significant regulations sent to OIRA for review, such as the spikes in regulatory activity that occur during midnight periods, could overburden the reviewing agency. If OIRA operates near its maximum capacity for reviewing rules, then increases in the number of rules submitted to OIRA may result in two actions. OIRA may spend less time reviewing individual rules in order to review more rules in a given time period. Also, it is possible that OIRA classifies rules as "not significant" that would have qualified as "significant" during times of lower reviewing burdens. A second possible explanation for the decreased review time during periods of high regulatory activity is much simpler: the administration and submitting agencies pressure OIRA to quickly complete reviews. This study finds strong evidence that average review time does decrease during periods of high volume of economically significant rulemaking. Holding the number of significant rules submitted to OIRA constant, an additional economically significant rule submitted to OIRA decreases the average review time for all rules by about two thirds of a day. In light of OIRA's ability to add temporary detailees to help with regulatory review and OIRA's ability to extend rule review beyond the 90-day limit set forth in EO 12866, it appears that the more likely explanation for the decreases in review time found in this paper is that the administration and possibly submitting agencies pressure OIRA to quickly review submitted rules during politically sensitive periods such as midnight periods.

At least some of the decrease in review time caused by increased submissions of economically significant regulations was driven by the midnight regulations spikes at the ends of the Clinton and the George W. Bush administrations. Midnight periods themselves seem to decrease review time at OIRA—an effect that is separate from that of the increased number of economically significant regulations submitted to OIRA. Controlling for the number of economically significant and significant rules, average review times decreased by about 25 days during the midnight period that occurred between 1994 and 2009. This curious result could be driven by a number of factors. One possibility is that deciding whether a rule qualifies as significant requires OIRA reviewer time. If there are more rules overall created during midnight periods, and OIRA's decision on whether to review each rule is also a burden to possible reviewers, then those potential reviewers may spend less time reviewing each rule in order to gain time for deciding whether to review rules. Such an action would result in lower average review times during midnight periods. Another possibility, and one that seems more likely, is that there is pressure on OIRA to quickly approve submitted rules. Knowing that a new administration could replace the incumbent administration's appointees throughout the government with its own appointees, the incumbent administration and appointees at submitting agencies may pressure OIRA staffers, either explicitly or tacitly, to approve midnight regulations quickly. Otherwise, if the rules linger at OIRA into the next administration, the odds of the rules being rejected outright (i.e., returned to the agency) may increase.

This finding leaves an opening for future research. If there is political pressure on OIRA to approve rules quickly in order to avoid the next administration's scrutiny, it seems like that pressure would be greater when the incumbent president and the new president are of different political parties. If that is the case, then we might see differences in the effect of the midnight period on review time that depend on whether there was a change of parties in the White House.

Another possible line of future research involves examining the regulatory repercussions of midnight regulations. Especially in cases where political parties changed, newly elected presidents might spend their first few months on the job trying to get rid of the previous president's midnight regulations. For every outburst of regulations that occurs in a midnight period, there may be a corresponding outburst of regulatory activity by the next president.

Finally, another avenue of future research involves a very fundamental question: is the quality of regulations affected by midnight regulations and other election cycle phenomena? While this question seems important, it also seems unanswerable without a good definition and consistent measure of regulation quality. This paper sheds light on the issue, though. If more OIRA review time leads to higher quality regulations, then outbursts of regulatory activity such as those of midnight periods may lead to lower quality regulations. Of course, it is entirely possible that OIRA review time does not have any effect on regulation quality, but that does not eliminate the question. Also, even if OIRA review does improve regulation quality, the number of days a regulation is "under review" may not actually correlate to a more thorough review. Nevertheless, this paper emphasizes the need to determine whether election cycles, and specifically the midnight regulations phenomenon, affect regulation quality. It also offers the first empirical evidence that the regulatory review process may indeed suffer during spikes of regulatory activity.

Acknowledgements The author thanks Jerry Ellig, Jerry Brito, Bentley Coffey, Chris Hixon, Richard Williams, and two anonymous referees for helpful comments. Much of this research was performed while the author was a Research Fellow at the Mercatus Center at George Mason University, which the author thanks for its support of research in economics. All mistakes are solely the author's responsibility.

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