
REGULATORY IMPACT ANALYSIS AND LITIGATION RISK

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ABSTRACT

This paper explores the role that the regulatory impact analyses (RIAs) that agencies are required to prepare for important proposed rules play in decisions by courts about whether these rules should be upheld when they are challenged after promulgation. Conventional wisdom among economists and other senior regulatory officials in federal agencies suggests that high-quality economic analysis can help a regulation survive such challenges, particularly when the agency explains how the analysis affected decisions. However, highlighting the economic analysis may also increase litigation risk by inviting court scrutiny of the RIA. Using a dataset of economically significant, prescriptive regulations proposed between 2008 and 2013, we put these conjectures to the test, studying the relationships between the quality of the RIA accompanying each rule, the agency's claimed use of it in rulemaking decisions, and the likelihood the rule survives legal challenges. The regression results suggest that better RIAs are associated with lower likelihoods that the associated rules are later invalidated by courts, provided that the associated agency explains how it used the RIA in its decision-making. When the agency does not describe how the RIA was utilized, there is no correlation between the quality of analysis and the likelihood the regulation will be invalidated. An explanation of the RIA's role in the agency's decision also appears to increase the likelihood that the regulation will be invalidated by inviting an increased level of court scrutiny, and as a result, the quality of the RIA must be sufficiently high to offset this effect.

Keywords: regulation; regulatory impact analysis; judicial review; litigation risk

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THE GEORGE WASHINGTON UNIVERSITY REGULATORY STUDIES CENTER

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I. Introduction

In *Michigan v. EPA* (576 US ___, 2015), both the majority as well as the dissenters on the U.S. Supreme Court agreed that federal regulatory agencies should normally be expected to consider regulatory costs if the regulation's authorizing statute permits them to do so. Perhaps at least partly because of this case, legal scholars predict that courts will increasingly check to see that agencies have considered relevant economic factors, such as benefits and costs (Masur and Posner 2018, Sunstein 2017). This increased emphasis on economic factors should also lead to more extensive court scrutiny of the regulatory impact analyses (RIA) or equivalent economic analyses that agencies produce to inform regulatory decisions.¹ In interviews conducted in 2019, economists and other high-ranking officials at regulatory agencies cited *Michigan v. EPA* as a reason courts can be expected to pay greater attention to agency economic analysis in the future (Ellig 2019, 41).

Some commentators argue that RIAs have evolved into little more than litigation support documents, written primarily with an eye toward supporting a regulation in court rather than informing decisions while the regulation is being developed as the requirement was originally intended (Carrigan and Shapiro 2017; Katzen 2011, 126; Wagner 2009, 57). Yet whether RIAs are effective as litigation support documents remains an open question. In fact, we know of no study that examines whether the quality of agency economic analysis is systematically related to the likelihood that a regulation will be upheld in court. This study helps fill that gap, using a unique data set that tracks evaluations of the quality of agency RIAs, identifies whether the agency explained how the RIA influenced regulatory decisions, and follows judicial outcomes when the associated rules are challenged in court.

Employing a sample of 126 economically significant, prescriptive federal regulations proposed between 2008 and 2013 and eventually finalized,² we build on previously published research that both assigned scores to each regulation based on the quality of the accompanying RIA and identified whether the agency explained how the analysis was used in the regulatory decision (Ellig 2016, Ellig and McLaughlin 2012). We use those data to assess whether the quality of the analysis and the agencies' claimed use of it are correlated with the likelihood that at least

¹ President Bill Clinton's Executive Order 12866 requires executive branch agencies to prepare a regulatory impact analysis for significant regulations. A regulatory impact analysis assesses the significance and cause of the problem the regulation seeks to solve, identifies alternative solutions, and measures the benefits and costs of each alternative. The term "regulatory impact analysis" does not appear in this executive order, but it was used to refer to the same analysis in President Ronald Reagan's Executive Order 12911, which Executive Order 12866 superseded. Independent agencies often call equivalent analyses they prepare "cost-benefit analysis" or just "economic analysis."

² "Economically significant" regulations are those that have costs or other economic effects exceeding \$100 million annually or that meet other criteria specified in section 3f1 of Executive Order 12866. "Prescriptive" regulations mandate or prohibit activities.

part of the regulation is overturned in court, measured by examining whether any section of the Code of Federal Regulations (CFR) altered by the rule was subsequently challenged successfully in court. The regression analysis controls for numerous factors specific to each regulation and specific to the agency issuing the regulation.

We find that higher-quality RIAs reduce the likelihood that the associated regulations will be overturned in court, but only if the agency explains whether or how the RIA specifically affected decisions about the rule. Offering an explanation increases litigation risk, presumably by making it more likely that the court will examine the RIA and find shortcomings. Therefore, to increase the odds that the regulation will survive court challenge, the RIA must be of sufficient quality to offset the increased risk the agency assumes when it says it relied on the RIA.

In addition to contributing to the small body of academic research analyzing the determinants of judicial review outcomes using large sample quantitative approaches (see, e.g., Carrigan and Mills 2019), the findings highlighted in this paper also have potentially important implications for understanding the effects of administrative procedural constraints on agency rulemaking more generally. Much of the debate around how the procedures imposed on regulatory agencies – including those that require agencies to accept comments on proposed rules, subject their rules to executive oversight, prepare analysis to support them, and face scrutiny through the courts following promulgation – has revolved around how these constraints serve to alter the pace and quality of the resulting rules. Inspired by an influential legal literature claiming that rulemaking has been “ossified” by the procedural constraints imposed on agencies seeking to promulgate rules (McGarity 1992; Seidenfeld 1997), a significant portion of the associated quantitative research has focused on whether these procedures actually do slow the pace at which rules are promulgated or alter their content (e.g., Balla and Wright 2005; Shapiro 2002; Yackee and Yackee 2010; 2012).

The research highlighted in this paper adds a new element to this body of research by recognizing that the effects of procedures are not uniform. Moreover, they can operate to reinforce or impede one another. In fact, although it is certainly true that preparing a high quality RIA to accompany a rulemaking is a time consuming process, the act of doing so can also serve to save time later if it improves the rule’s chances of surviving judicial review. Thus, rather than lengthening the timeframe or discouraging agencies from engaging in rulemaking altogether, the effects of procedural constraints may be better viewed as a more nuanced collection of interactions where attention to one can serve simplify the next and neglect of one can serve amplify the difficulties caused by next.

II. Prior Research and Hypotheses

Prior research finds that courts sometimes consider the quality as well as the results of an agency’s economic analysis when determining whether a challenged regulation is arbitrary or

capricious and, thus, should be overturned (Cecot and Viscusi 2015). This usually occurs when the agency relies upon the analysis as part of the reason for its decisions – either because a statute requires the agency to consider economic factors or because the agency itself cites the economic analysis as justification for the regulation. Statutory requirements that implicate economic factors include directives that the agency consider benefits and costs, consider economic feasibility, or select a particular alternative based on the results of the analysis (Bull and Ellig 2018, 891-912).

In some cases, courts have considered whether the agency’s decisions were consistent with the findings of the economic analysis simply because the analysis is part of the record before the agency (Cecot and Viscusi 2015, 603-05). It is not clear, however, whether courts consistently hear or decide challenges to regulations on this basis. Executive Order 12866, the source of the RIA requirement for executive branch agencies, explicitly states that its requirements create no new grounds for judicial review (EO 12866, §10). In a few cases, courts have questioned whether an executive branch agency’s RIA can be reviewed (Bull and Ellig 2017, 762-63). Recent comprehensive regulatory reform bills have specified that the agency’s analysis can be reviewed by the court as part of the record before the agency, suggesting that this point required clarification (Bull and Ellig 2018, 876).

Judicial review of agency analysis is often quite deferential, especially if the analysis involves highly complex scientific questions. Nevertheless, courts have shown themselves willing to invalidate a regulation if the agency ignored important benefits, costs, or alternatives; employed assumptions or methods clearly contradicted by other evidence before the agency; failed to disclose sufficiently the methodology or assumptions employed in the analysis; or made decisions clearly contradicted by the analysis (Cecot and Viscusi 2015, 592-605; Bull and Ellig 2017, 767-76).

Economic analysis is sometimes regarded as inherently anti-regulatory (Ackerman and Heinzerling 2004, Steinzor et al. 2009), but there is no obvious bias in the court decisions involving agency economic analysis. A study of major cases in which federal appeals courts considered challenges to agencies’ economic analysis found that the courts rejected all challenges to the agency’s analysis in 57 percent of the cases. Sixty-two percent of these decisions could be regarded as “pro-regulatory,” in that the court rejected challenges brought by parties seeking less regulation. Of the cases where courts struck down some aspect of the agency’s decision, 44 percent of the court decisions suggested that the agency had over-regulated in light of the economic analysis, and 56 percent suggested that the agency had not regulated enough (Bull and Ellig 2017, 784-85).

Results from recent research interviewing 15 senior regulatory economists and 10 senior non-economists who work on regulations in federal agencies are consistent with the pattern revealed by court cases (Ellig 2019, 40-41). In responding to a question asking how they believed the agency’s economic analysis affected litigation risk, these federal regulatory officials indicated that they thought a high-quality economic analysis can aid the agency in court if it is sued because

it helps demonstrate that the regulation is not arbitrary or capricious. Several stated that this effect is not uniform, noting that the effect of the analysis is more significant when the agency actually uses it in decisions (such as when directed by statute). Most respondents said that the quality of the analysis had little effect on whether the regulation would be challenged in court. Instead, the likelihood of legal challenge depends largely on how costly and controversial the regulation is, rather than the quality of the agency's economic analysis.

This prior literature suggests two somewhat competing hypotheses, which we test empirically in the remaining sections of the paper. The first possibility is:

***Hypothesis 1:** A higher-quality economic analysis will generally reduce the likelihood that a regulation is overturned in court.*

This hypothesis would most likely be correct if courts regularly examine the quality and results of the agency's economic analysis as part of the record before the agency. Instead, it might be true that:

***Hypothesis 2:** A higher-quality economic analysis will generally reduce the likelihood that a regulation is overturned in court only if the agency states that it relied upon the analysis to make decisions about the regulation.*

Unlike hypothesis one, this hypothesis would most likely be correct if courts mostly examine the quality and results of the agency's economic analysis only in instances where the agency has explained how the analysis influenced its decisions.

III. Data

As described, the dataset covers 126 economically significant, prescriptive regulations for which the Office of Management and Budget's Office of Information and Regulatory Affairs (OIRA) concluded its review during the period from 2008 to 2013.³ From the total number of economically significant proposed rules reviewed by OIRA during that period, we excluded regulations that were never finalized by agencies and regulations that implemented federal spending programs or revenue-collection measures rather than prescribing mandates or prohibitions. The regulations in the data set were promulgated by 14 departments and 38 agencies. Table 1 summarizes the descriptions of the variables included in the analysis and presents the summary statistics.

³ As outlined section 2b of Executive Order 12866, executive branch agencies must submit significant proposed and final rules to OIRA for review "to ensure that regulations are consistent with applicable law, the President's priorities, and the principles set forth in this Executive order, and that decisions made by one agency do not conflict with the policies or actions taken or planned by another agency."

Our dependent variable is dichotomous, indicating whether any part of the rule was invalidated through judicial review. To construct the variable, we first identified the Code of Federal Regulations (CFR) sections added or revised by the associated final rule. We then used Thomson Reuter’s Westlaw database to track whether each section was invalidated by courts after the final rule was promulgated. Westlaw labels a CFR section as “unconstitutional or preempted” when it was held invalid by courts and links to the specific court case in which such determination was made. Since a rule may revise or add multiple CFR sections, we coded the variable as one if any of the CFR sections was set aside by courts and zero if no CFR section was invalidated. This process identified 23 rules with at least one CFR section overturned by courts.

The independent variables that measure the quality of a rule’s economic analysis and the claimed use of the analysis in the agency’s rulemaking are derived from the Regulatory Report Card dataset developed by the Mercatus Center at George Mason University (Ellig and McLaughlin 2012; Ellig 2016). The first variable assesses the overall quality of the agency’s RIA on a 0-20 scale. A higher score indicates a more thorough and complete analysis of four key elements of RIAs: the systemic problem the regulation seeks to solve, regulatory alternatives, the regulation’s proposed benefits, and its proposed costs.

The Report Card data set also includes a variable that assesses the extent to which the agency claimed the analysis affected rulemaking decisions. From this, we created a dichotomous variable indicating whether the agency claimed to use any part of the analysis in a decision about the regulation. Doing so allows us to test Cecot and Viscusi’s (2015) claim that courts are more likely to examine an agency’s RIA when the agency indicated it relied upon the RIA to make decisions. Readers may suspect that this variable contains a large number of “false positives,” in which the agency claimed to use the RIA even though it did not, perhaps to satisfy OIRA. In reality, table 1 shows that the mean value of this variable is 0.421, suggesting that agencies claimed to use the analysis for only 42.1 percent of the regulations. In the econometric analysis, we test whether the quality of the analysis is correlated with the likelihood that the associated regulation is invalidated through judicial review, conditional on whether the agency claimed that the analysis affected decision-making associated with the rulemaking.

In addition, we control for a variety of rule-specific and agency-specific characteristics. One set of variables controls for the level of complexity and controversy of a rule, since a more complex and controversial rule may be more likely to be challenged and challenged successfully in courts. These variables include the time the agency spent promulgating the rule, measured as the time elapsed from the date when the proposed rule was received by OIRA for review to the date the final rule was published in the Federal Register; the length, measured by the word count of the preamble in the notice of proposed rulemaking; whether the rule has estimated benefits or costs exceeding \$1 billion annually; the number of public comments received by the agency for the proposed rule; and the number of interest group meetings convened by OIRA for the rulemaking.

Rulemaking deadlines may constrain the agency's ability to follow a thorough decision-making process in rulemaking, making the promulgated rule more vulnerable to court challenges. We therefore include two variables that indicate whether the rulemaking faced statutory or judicial deadlines (as indicated at reginfo.gov). Additionally, since our sample covers rules proposed across the George W. Bush and Barack Obama administrations, we include a dummy variable indicating whether President Obama was in office when review of the proposed rule was completed by OIRA.

Recent research shows that a wider breadth of expertise involved in a rulemaking work group is indirectly associated with an increased likelihood the promulgated rule will be invalidated through judicial review (Carrigan and Mills 2019). To that end, we control for two variables that measure the breadth of agency expertise in rulemaking following Carrigan and Mills (2019): the number of agency personnel listed in the notice of proposed rulemaking as contacts for further information and a count of the number of types of personnel represented by the contacts. The job titles of the contacts were analyzed and classified into one or multiple groups including economic and policy analysts, legal staff, regulatory staff, and subject matter experts. Internet searches were performed to determine a contact's expertise if the job titles did not provide sufficient information.

The regression analyses also include a set of variables that control for agency-specific characteristics that may affect judicial review outcomes. Those variables include a measure of the agency's effective independence from politicians with respect to appointing its key officials and reviewing its policy (Selin 2015); the degree of diversity in the policy issues addressed by the agency's agenda (Workman 2015); and an expert assessment of the agency's ideology based on its mission, policy views, and history, where negative numbers represent more "liberal" agencies and positive numbers represent more "conservative" agencies (Clinton and Lewis 2008).

Statutory constraints on the rulemaking and the accompanying analysis may affect the level of scrutiny courts will exercise. The extent to which courts examine agency economic analysis depends on how clearly the relevant statute language directs the agency to consider or ignore different economic factors (Bull and Ellig 2018; Cecot and Viscusi 2015). Four variables in our analysis indicate statutory requirements that affect the importance of economic analysis in the rulemaking. They are whether the statute prohibited the agency from considering costs, whether the statute required the agency to consider benefits and costs in some way, whether the statute required the agency to consider economic feasibility of the rule, and whether the statute required the agency to consider technological feasibility.

The degree of discretionary authority the statute granted the agency could also affect the likelihood that the rule would be overturned. Four variables in our analysis indicate whether the statute required the agency to issue a new regulation, whether the statute prescribed the stringency of the regulation, whether the statute prescribed the form of the regulation, and whether the statute prescribed who is covered by the regulation.

IV. Results

The regressions in table 2 test the relationship between the overall quality of the RIA, the claimed use of the RIA in agency decision-making, and the likelihood that a rule was invalidated through judicial review. Probit regression was used throughout. Since regulations issued by the same department may have numerous unobserved similarities, standard errors are clustered by department to allow for intragroup correlation in all regressions.

Column 1 shows the results of a regression of the likelihood that the regulation is overturned by courts on the quality of the RIA, while controlling for all of the covariates introduced in the previous section. However, this regression does not include the binary variable measuring whether the agency explained how the RIA was used in its decision-making. The results indicate RIA quality is not statistically significant even at the 10 percent level. Similarly, although column 2 incorporates the indicator of whether the agency claimed that the RIA affected its regulatory decision-making, the analysis also reaches a similar conclusion, namely that there is no relationship between the quality of RIA and the odds that the regulation will survive court challenge. The indicator appraising claimed RIA use also does not statistically significantly affect the likelihood that the regulation is overturned. As a result, the first two models offer little evidence to support hypothesis one, suggesting that judicial review outcomes are not individually affected by either the quality of the RIA or whether the agency explains how the RIA influenced rulemaking decisions.

Of course, as described, another possibility is that the relationship between RIA quality and the judicial review outcome is contingent on whether the agency states that it relied upon the analysis to make rulemaking decisions. An RIA that is higher quality may reduce the likelihood that a regulation is overturned in court only in the case that the agency states that the RIA affected its decision-making. Similarly, a lower-quality RIA may increase the likelihood that the rule is set aside or remanded to the agency only if the agency claimed to use the RIA. These priors accord with the general expectation that the agency's statement about its use of the RIA in the rule's preamble may bring additional court attention to the RIA when the rule is challenged (Cecot and Viscusi 2015). At the same time, the quality of the RIA may have little effect on the likelihood that courts overturn the rule if the agency does not claim that analysis played a role in its decision-making. As such, the relationship between the quality of the RIA and the judicial review outcome may be different depending on whether the agency claimed to use the RIA. The statistical insignificance of RIA quality in columns 1 and 2 would then be due to the fact that agencies did not claim to use the RIA for the majority of regulations in the sample.

To test for the possibility that an interacting relationship exists between the variables, column 3 of table 1 adds an interaction term of the quality and claimed use of the RIA. The results reveal a statistically significant coefficient on the interaction term at the five percent level, which suggests a contingent relationship between the quality of the RIA, the claimed use of the RIA, and

the likelihood that the regulation is overturned by courts. Specifically, when the agency does not state that it relied on the economic analysis, the quality of the analysis is not correlated with the probability that the regulation is later invalidated, as the coefficient on RIA quality is not statistically significant. Nevertheless, when the agency indicates that it relied on the RIA, an improvement in the quality of the analysis is associated with a decrease in the likelihood that any CFR sections changed by the rule are later overturned by a court. These results provide support for hypothesis two.

This correlation is quantitatively important as well as statistically significant. If the agency claimed to use the RIA, a one-point improvement in the quality of the RIA is associated with a 3.7 percentage-point reduction in the probability that the associated regulation is invalidated (calculated at the means of all the covariates). Stated differently, a one standard deviation improvement in the quality of the RIA is associated with a 10.5 percentage-point reduction in the likelihood that the associated regulation is invalidated. Considering that a little more than 18 percent of the rules in the data set were at least partially invalidated, this effect is substantial.

To more specifically explore the probability that a regulation is invalidated through judicial review at different levels of RIA quality, figure 1 plots the adjusted predictions when claimed RIA use equals one and when claimed RIA use equals zero (again setting all other covariates at their means). Clearly, when the agency states that it used the RIA in decision-making, a higher-quality RIA is associated with a much lower predicted probability that the final rule is overturned by a court than a lower-quality RIA, holding all the other independent variables at their means. Yet when the agency does not explain its use of the RIA, there is little difference between the rules with high-quality or low-quality RIAs in terms of the litigation risk. Certainly, while the true probability that a regulation is overturned by courts depends on various unobserved factors, the probabilities shown in figure 1 hold the other factors captured by the models constant. *Ceteris paribus*, it seems that the relationship between the RIA quality and the likelihood that the associated regulation is overturned by courts is contingent upon whether the agency states that it relied on the RIA in deciding on its regulatory approach.

Figure 2 offers a slightly different perspective on the questions of whether and when an agency faces greater litigation risk because it claimed to use its RIA. The figure shows that the agency's claim that it relied on the RIA is clearly associated with a larger likelihood that the rule will be invalidated through judicial review only when the RIA accompanying a rule is of very low quality. Figure 2 plots the estimated differences in the probabilities of being invalidated between a rule for which the agency claims it used the RIA and a rule for which the agency does not claim it used the RIA, evaluated at different levels of RIA quality and at the means of all of the other covariates. The 95 percent confidence intervals of the estimates are completely above zero only at RIA quality scores less than or equal to five. This result confirms the belief that an explanation of the RIA's role in the agency's decision may invite an increased level of court scrutiny when that agency is sued, leading to a higher risk of being overturned. Our results further suggest that such

expectations should only hold for rules accompanied by low-quality economic analyses. The confidence intervals indicate that RIAs with scores greater than or equal to 13.51—one standard deviation higher than the mean of 10.67—are more likely associated with regulations that are upheld when reviewed in court. Thus, our results are consistent with the observations of interview subjects in federal regulatory agencies who noted that a high-quality RIA can reduce litigation risk, but a poor RIA might increase litigation risk (Ellig 2019).

Most of the control variables hold similar magnitudes and levels of statistical significance across all the specifications. The length of the preamble of the proposed rule demonstrates a statistically significant, negative association with the likelihood that the associated final rule is invalidated. A possible explanation is that a longer preamble may contain a more thorough justification of the agency's regulatory approach, thus reducing the likelihood that the rule will be struck down as arbitrary or capricious. The number of comments received for the proposed rule shows a nonlinear, marginally significant correlation with the judicial review outcome in the third regression in table 2. Since more comments can be an indicator of more controversial rules, the likelihood that a regulation will be overturned by courts may increase as the degree of controversy increases, until some point where the number of comments reaches a certain level such that the agency has to make changes to presumably improve its proposed rule in response to the vast amount of feedback and public attention.

The number of meetings with interest groups about the rulemaking conducted by OIRA is positively associated with the likelihood that portions of the final rule will be invalidated, as suggested by a coefficient statistically significant at the one percent level. More meetings can be a signal of a lower level of stakeholder agreement with the proposed rule and, thus, more potential candidates motivated to challenge the associated final rule in court. The existence of statutory deadlines is correlated with a lower probability the associated final rule will be set aside, perhaps because statutory deadlines imply stronger statutory authority for the agency rulemaking. The number of contacts listed in the notice of proposed rulemaking has a marginally significant correlation with the judicial review outcome, which is consistent with earlier research showing that increasing the breadth of agency staff members involved in the rulemaking leads to a greater likelihood that the associated final rule is invalidated (Carrigan and Mills 2019). However, the effect is weaker here likely because our models control for the pathway by which organization affects judicial review, namely through the pace at which the rule is promulgated. Agencies' effective independence is also marginally significant at the 10 percent level, suggesting that agencies that enjoy greater independence from their political overseers may receive more deference from the courts.

Clinton and Lewis' (2008) measure of agency ideology is negative and highly significant, suggesting that more conservative agencies face a lower likelihood that their rules will be set aside by courts. It is not clear whether this result indicates some type of ideological bias on the part of the judiciary, or if it is due to the specific nature of the regulations promulgated by the agencies

classified as more conservative by the Clinton and Lewis measure. The more conservative agencies in the sample issuing significant numbers of regulations are the Departments of the Interior (eight regulations) and Energy (17 regulations). Most of the Interior Department's regulations involved bag limits for hunting migratory birds, which are seldom controversial and were never overturned. Similarly, all but one of the Energy Department's rules are energy efficiency regulations promulgated under a highly structured process that includes extensive involvement by stakeholders who might otherwise challenge them in court.

The statutory requirement that the agency consider economic feasibility demonstrates a positive association with the probability that the rule is invalidated in the third regression. Consistent with observations by Cecot and Viscusi (2015) and Bull and Ellig (2018), such requirements may increase the degree of court scrutiny of the RIA when the rule is challenged in court. It is less clear why a regulation is more likely to be overturned when a statute mandates the form of the regulation, unless perhaps this restriction makes stakeholders more likely to challenge the regulation on other grounds (such as the stringency of the regulation).

In sum, our results show that hypothesis one does not hold without taking into account the condition specified in hypothesis two. Namely, a higher-quality RIA reduces the likelihood that a regulation will be invalidated through judicial review only if the agency states that it relied upon the analysis in making decisions about the regulation. Further, when the quality of the RIA is very low, the agency's explanation of the RIA's role in its decision increases the likelihood that the regulation will be overturned in court.

V. Conclusion

This paper began by recounting the 2015 U.S. Supreme Court ruling in *Michigan v. EPA* (576 US ___, 2015), which highlighted the growing recognition among courts that just as the agency's interpretation of the statute and the procedures it followed are subject to scrutiny, so should the economic analysis supporting its regulatory approach. Our results clearly support this shift. Using the complete set of economically significant, prescriptive federal regulations proposed between 2008 and 2013, the empirical analysis suggests that the quality of the regulatory agency's RIA can affect the outcome of judicial review when the rule is challenged by a potentially aggrieved party.

Yet although high quality analysis is associated with greater deference toward the agency as might be expected, this effect is conditional on whether the agency claimed it used the RIA in its regulatory decisions. When it did, better analysis is associated with fewer rule overturns, and lower quality analysis, in contrast, is tied to significantly more successful court challenges by plaintiffs. However, if the agency did not indicate that the analysis played a role in its regulatory decision, the quality of the analysis appeared to have no bearing on the court's judgment regarding whether to vacate or remand the rule to the agency.

While these results have specific implications for determining the separate roles that economic analysis as well as court review have in the rulemaking process, they also suggest the importance of considering rulemaking procedures as a collective system. Although the legal ossification scholarship has tended to view procedures as affecting rulemaking in only one direction, our findings illustrate the role that attention to one procedure can have for an agency's ability to minimize scrutiny at another procedural step. In fact, these results may indicate one reason why the empirical tests of the ossification thesis have tended not to find the anticipated effects (Yackee and Yackee 2010, 2012). Recognizing that rulemaking procedures can work to counteract each other, it is not surprising then that the pace and volume of rulemaking has not substantially slowed with the imposition of procedural constraints by the political actors that oversee the process.

Finally, these results have implications that extend beyond the regulatory context as well. The recent passage of the Foundations for Evidence-Based Policymaking Act of 2018 "requires agencies to plan to develop statistical evidence to support policymaking," which is operationalized through the requirement that agencies submit yearly plans to the Office of Management and Budget outlining data they intend to collect and "methods and analytical approaches that may be used to developed evidence to support policymaking" (Public Law 115-435, section 101). At least with respect to the rulemaking process, our results suggest that courts may already be moving in this direction.

References

- Ackerman, Frank, and Lisa Heinzerling. 2004. *Priceless: On Knowing the Price of Everything and the Value of Nothing*. New York: New Press.
- Balla, Steven J., and John R. Wright. 2005. Consensual Rulemaking and the Time it Takes to Develop Rules. In *Politics, Policy, and Organizations: Frontiers in the Scientific Study of Bureaucracy*, edited by George A. Krause and Kenneth J. Meier, 187–206. Ann Arbor: University of Michigan Press.
- Bull, Reeve T., and Jerry Ellig. 2017. “Judicial Review of Regulatory Impact Analysis: Why Not the Best?” *Administrative Law Review* 69: 725-____.
- Bull, Reeve T., and Jerry Ellig. 2018. “Statutory Rulemaking Considerations and Judicial Review of Regulatory Impact Analysis.” *Administrative Law Review* 70(4): 873-959.
- Carrigan, Christopher, and Russell W. Mills. 2019. “Organizational Process, Rulemaking Pace, and the Shadow of Judicial Review.” *Public Administration Review* 79(5): 721-736.
- Carrigan, Christopher, and Stuart Shapiro. 2017. “What’s Wrong with the Back of the Envelope? A Call for Simple (and Timely) Benefit-Cost Analysis.” *Regulation & Governance* 11(2): 203-212.
- Cecot, Caroline, and W. Kip Viscusi. 2015. “Judicial Review of Agency Benefit-Cost Analysis.” *George Mason Law Review* 22(575): 609-11.
- Clinton, Joshua D., and David E. Lewis. 2008. “Expert Opinion, Agency Characteristics, and Agency Preferences.” *Political Analysis* 16(1): 3–20.
- Ellig, Jerry. 2016. “Evaluating the Quality and Use of Regulatory Impact Analysis: The Mercatus Center’s Regulatory Report Card, 2008-2013,” Working Paper, Mercatus Center at George Mason University (July).
- Ellig, Jerry. 2019. “Agency Economists.” Report prepared for the Administrative Conference of the United States (September 11), <https://www.acus.gov/report/final-report-agency-economists>.
- Ellig, Jerry, and Patrick A. McLaughlin. 2012. “The Quality and Use of Regulatory Analysis in 2008.” *Risk Analysis* 32(5): 855–80.
- Katzen, Sally. 2011. “OIRA at Thirty: Reflections and Recommendations.” *Administrative Law Review* 63: 103–12.

- Masur, Jonathan, and Eric A. Posner. 2018. "Cost-Benefit Analysis and the Judicial Role." *University of Chicago Law Review* 85: 935-86.
- McGarity, Thomas O. 1992. "Some Thoughts on "Deossifying" the Rulemaking Process." *Duke Law Journal* 41(6): 1385-1462.
- Seidenfeld, Mark, 1997. "Demystifying Deossification: Rethinking Recent Proposals to Modify Judicial Review of Notice and Comment Rulemaking." *Texas Law Review* 75(3): 251-321.
- Selin, Jennifer L. 2015. "What Makes an Agency Independent?" *American Journal of Political Science* 59 (4): 971-987.
- Shapiro, Stuart. 2002. "Speed Bumps and Roadblocks: Procedural Controls and Regulatory Change." *Journal and Public Administration Research and Theory* 12(1): 29-58.
- Steinzor, Rena, Amy Sinden, Sidney Shapiro, and James Goodwin. 2009. "A Return to Common Sense: Protecting Health, Safety, and the Environment through 'Pragmatic Regulatory Impact Analysis'," Center for Progressive Reform White Paper #909 (October).
- Sunstein, Cass R. 2017. "Cost-Benefit Analysis and Arbitrariness Review." *Harvard Environmental Law Review* 41: 2-41.
- Wagner, Wendy E. 2009. "The CAIR RIA: Advocacy Dressed Up as Policy Analysis." In *Reforming Regulatory Impact Analysis*, edited by Winston Harrington, Lisa Heinzerling, and Richard D. Morgenstern, 56–81. Washington, DC: Resources for the Future.
- Workman, Samuel. 2015. *The Dynamics of Bureaucracy in the U.S. Government: How Congress and Federal Agencies Process Information and Solve Problems*. New York: Cambridge University Press.
- Yackee, Jason Webb, and Susan Webb Yackee. 2010. "Is Agency Rulemaking 'Ossified'? Testing Congressional, Presidential, and Judicial Procedural Constraints." *Journal of Public Administration Research and Theory* 20: 261-282.
- Yackee, Jason Webb, and Susan Webb Yackee. 2012. "Testing the Ossification Thesis: An Empirical Examination of Federal Regulatory Volume and Speed, 1950-1990." *George Washington Law Review* 80(5): 1414-1492.

Table 1: Variable Descriptions and Summary Statistics

Variable	Description	Mean	Std. Dev.	Min	Max
Invalidated by court	= 1 if any CFR section updated or added by the final rule was later invalidated through judicial review; = 0 otherwise. Obtained from Westlaw.	0.183	0.388	0	1
RIA quality	Report Card quality of analysis score (a score ranging from 0 to 20); a higher score indicates more complete analysis.	10.667	2.843	2	18
Claimed RIA use	= 1 if the agency explained how any aspect of the RIA affected its decisions about the regulation; = 0 otherwise. Obtained from Report Card.	0.421	0.496	0	1
Review-to-rule time	Time elapsed from date when the proposed rule was received by OIRA to date the final rule was published in Federal Register (in thousand days). Obtained from reginfo.gov.	0.659	0.535	0.084	2.495
Preamble length	Word count of Federal Register notice of proposed rule, including only preamble and not rule (in thousand words).	60.385	56.527	0.387	306.062
Billion impact	= 1 if the rule has estimated benefits or costs >= \$1 billion annually; = 0 otherwise.	0.27	0.446	0	1
Comments	Number of comments received by the agency for the proposed rule (in thousand comments). Obtained from regulations.gov.	7.618	34.732	0	233.677
Interest group meetings	Count of number of meetings with interest groups for each rule. Obtained from the Obama administration's OMB website and reginfo.gov.	3.127	6.136	0	47
Statutory deadline	= 1 if there was a statutory deadline for the rulemaking; = 0 otherwise. Obtained from reginfo.gov.	0.302	0.461	0	1
Judicial deadline	= 1 if there was a judicial deadline for the rulemaking; = 0 otherwise. Obtained from reginfo.gov.	0.198	0.4	0	1
Obama	= 1 if the OIRA review of the proposed rule was completed when President Barack Obama occupied the White House; = 0 if the review was completed when President George W. Bush occupied the White House.	0.778	0.417	0	1

Variable	Description	Mean	Std. Dev.	Min	Max
Rule contacts	Number of agency personnel listed in the notice of proposed rule as contacts for further information.	2.310	2.676	1	24
Contact groups	Number of groups represented by agency rule contacts listed in the notice of proposed rule from four personnel groupings involved in rulemaking: economic and policy, legal, regulation, and subject matter. Function each contact performed determined by looking at job title provided in notice. Where insufficient information given in notice, internet searches performed to determine job title.	1.635	0.7	1	4
Effective independence	Obtained from Selin (2015), where larger values signify greater independence. Measures independence in terms of limits on both appointments of key decision makers and review of agency policy by politicians.	-0.023	0.59	-0.515	2.256
Policy concentration	Obtained from Workman (2015), where larger values signify more concentrated agenda (i.e. agency spends more time on less diverse set of issues). Computed score as average of policy concentration scores for Republican and Democratic administrations.	0.563	0.195	0.224	0.827
Agency ideology	Obtained from Clinton and Lewis' (2008) expert survey, where negative numbers represent more liberal agencies and positive numbers more conservative agencies.	-0.509	0.845	-1.43	1.25
Cost prohibited	= 1 if the statute prohibited the agency from considering costs; = 0 otherwise.	0.032	0.176	0	1
Benefit-cost consideration	= 1 if the statute required the agency to consider benefits and costs in some way; = 0 otherwise.	0.294	0.457	0	1
Economic feasibility	= 1 if the statute required the agency to consider economic feasibility; = 0 otherwise.	0.103	0.305	0	1
Technological feasibility	= 1 if the statute required the agency to consider technological feasibility; = 0 otherwise.	0.317	0.467	0	1
Regulation required	= 1 if the statute required the agency to issue a new regulation; = 0 otherwise (=	0.5	0.502	0	1

Variable	Description	Mean	Std. Dev.	Min	Max
	0 if the statute required a rulemaking but let the agency decide whether a new regulation is needed).				
Stringency prescribed	= 1 if the statute largely prescribed the stringency of the regulation; = 0 otherwise.	0.119	0.325	0	1
Form prescribed	= 1 if the statute prescribed the form of the regulation; = 0 otherwise.	0.817	0.388	0	1
Coverage prescribed	= 1 if the statute largely prescribed who is covered by the regulation; = 0 otherwise.	0.405	0.493	0	1

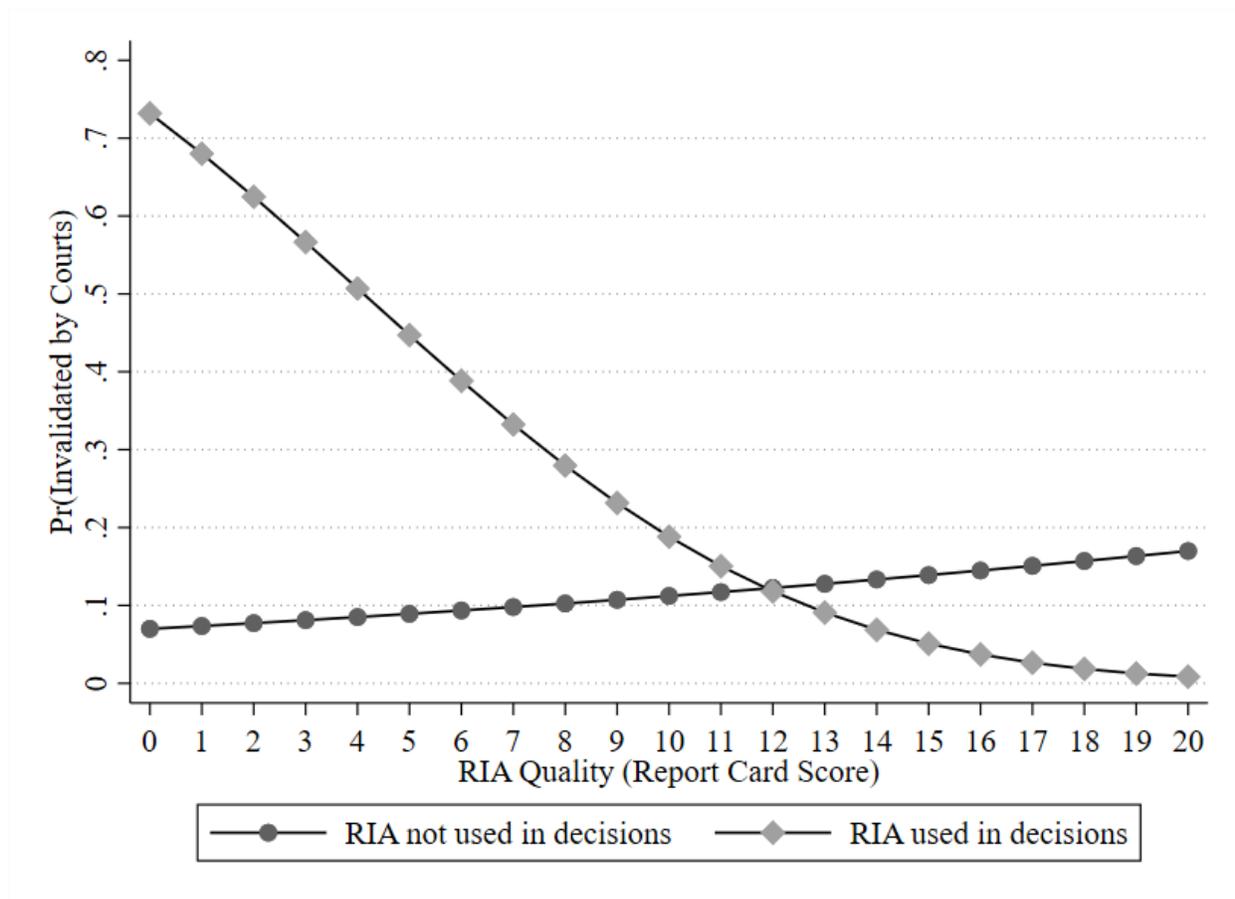
Table 2: Regressions of RIA and Judicial Review Outcome

Dependent Variable: Invalidated by court	(1) Probit	(2) Probit	(3) Probit
RIA quality	-0.0485 (0.051)	-0.0537 (0.051)	0.0261 (0.084)
Claimed RIA use		0.2703 (0.373)	2.0948* (1.093)
RIA quality X Claimed RIA use			-0.1764** (0.087)
Review-to-rule time	-0.3473 (0.252)	-0.3513 (0.253)	-0.3075 (0.265)
Preamble length	-0.0096*** (0.003)	-0.0099*** (0.003)	-0.0117*** (0.003)
Billion impact	0.2670 (0.398)	0.2216 (0.367)	0.1475 (0.362)
Comments	0.0238 (0.015)	0.0237 (0.016)	0.0304* (0.016)
Comments squared	-0.0001 (0.000)	-0.0001 (0.000)	-0.0001* (0.000)
Interest group meetings	0.0600*** (0.012)	0.0605*** (0.011)	0.0620*** (0.011)
Statutory deadline	-0.7090* (0.428)	-0.7724** (0.390)	-0.8607** (0.413)
Judicial deadline	0.1649 (0.326)	0.1808 (0.308)	0.1330 (0.303)
Obama	-0.3551 (0.512)	-0.2553 (0.472)	-0.3107 (0.480)
Rule contacts	0.1033 (0.064)	0.0989* (0.058)	0.1127* (0.064)
Contact groups	-0.2664 (0.367)	-0.2666 (0.371)	-0.3002 (0.385)
Effective independence	-0.3258* (0.194)	-0.2665 (0.167)	-0.2637* (0.156)
Policy concentration	-0.3507 (0.884)	-0.4530 (0.898)	-0.6212 (0.920)
Agency ideology	-0.6212*** (0.211)	-0.6676*** (0.212)	-0.6534*** (0.233)
Costs prohibited	-0.1158 (0.389)	0.0438 (0.533)	-0.0716 (0.500)
Benefit-cost consideration	-0.0499 (0.907)	-0.1183 (0.895)	0.0220 (0.865)
Economic feasibility	0.6525 (0.527)	0.6154 (0.506)	0.9384* (0.496)
Technological feasibility	-0.8431	-0.7856	-0.9260

	(0.929)	(0.892)	(0.848)
Regulation required	-0.1033	-0.0697	-0.0936
	(0.429)	(0.420)	(0.446)
Stringency prescribed	-1.2744	-1.2691	-1.2386
	(0.814)	(0.833)	(0.816)
Form prescribed	0.6483*	0.6667*	0.7883**
	(0.365)	(0.347)	(0.354)
Coverage prescribed	0.2965	0.3484	0.4492
	(0.300)	(0.310)	(0.307)
Constant	0.0435	-0.0467	-0.7503
	(1.433)	(1.462)	(1.720)
Observations	126	126	126
Cluster by Dept.	YES	YES	YES
Pseudo R2	0.266	0.270	0.283

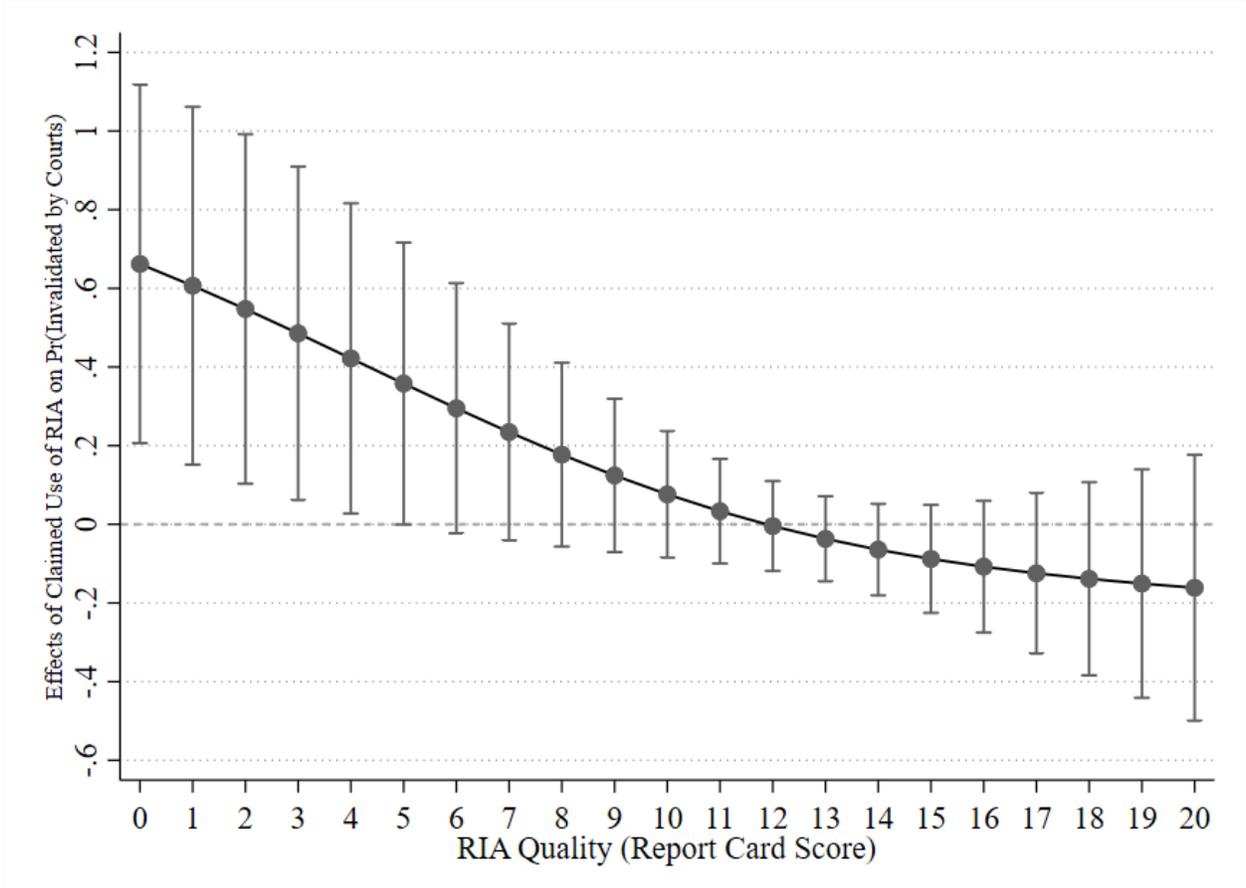
Standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1.

Figure 1: Adjusted Predictions of the Probability that a Rule Is Invalidated



Notes: The figure shows adjusted predictions of the probability that a rule is invalidated at different values of the RIA quality, conditional on whether the agency states that the associated RIA affected its rulemaking decision. All other variables were held at their means to generate the predictions.

Figure 2: Conditional Marginal Effects of the Agency’s Claimed Use of the RIA on the Probability that a Rule Is Invalidated



Notes: The figure shows the estimated difference in the probability of being invalidated for a rule for which the agency states that it used the RIA in making decisions and a rule for which the agency does not state that, evaluated at different levels of RIA quality and at the means of all of the covariates. Each vertical line represents the 95 percent confidence interval of the estimate at a given level of RIA quality