THE RELATIONSHIP BETWEEN REGULATORY FORM & PRODUCTIVITY:

AN EMPIRICAL APPLICATION TO AGRICULTURE

Cooperative Agreement 2018

The George Washington University
Regulatory Studies Center
&
The U.S. Department of Agriculture

Regulatory Studies Center
THE GEORGE WASHINGTON UNIVERSITY

USDA

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About the Report

Under a cooperative agreement with the United States Department of Agriculture, the George Washington University Regulatory Studies Center produced this four-chapter report detailing the findings of its research on the relationship between regulation and agricultural productivity. This report does not represent an official position of the GW Regulatory Studies Center, the George Washington University, or the United States Department of Agriculture.

The U.S. Department of Agriculture Office of the Chief Economist

The Office of the Chief Economist (OCE) is a small staff office in the U.S. Department of Agriculture (USDA). OCE advises the Secretary of Agriculture on the economic implications of policies and programs affecting the U.S. food and fiber system and rural areas. OCE supports USDA policy decision making by analyzing the impact of proposals and coordinating a response among several USDA agencies. OCE also provides guidance and review of regulatory risk assessments and cost-benefit analyses for consistency, objectivity, and the use of sound science and economics.

The George Washington University Regulatory Studies Center

Established in 2009, the GW Regulatory Studies Center is an academic center of the George Washington University and its Trachtenberg School of Public Policy and Public Administration. The Center's mission is to improve regulatory policy through research, education, and outreach. The Center is a leading source for applied scholarship in regulatory issues, and a training ground for anyone who wants to understand the effects of regulation and ensure that regulatory policies are designed in the public interest.

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Foreword

This report provides a framework to examine the cumulative impact of regulation on productivity growth in certain industries within production agriculture. The impacts of regulations on those parties that are regulated are not easily measured when considering the totality of regulatory programs addressing a specific industry. The relationship between regulation and productivity growth is complex in part because regulations are not monolithic and may take many different forms. It is of interest whether one particular form constrains productivity more than other forms. To shed light on that, this report classifies regulatory restrictions according to the form the regulation takes. The regulatory taxonomy developed here is an innovative concept that provides a new level of understanding of regulatory tools employed to regulate production agriculture.

Some of the most interesting findings of the report—different relationships between growth in regulatory restrictions and productivity growth in crop-based agriculture based on different regulatory forms—are directly related to developing and applying the regulatory taxonomy to a set of regulations. Prior to this project, I have not seen a descriptive analysis of the relative frequency of regulatory forms used in agriculture. This is also the first empirical analysis of the relationship between regulatory form and productivity growth in various crop-based agricultural segments of which I am aware.

The analysis conducted here first had to enumerate the set of regulations affecting the agricultural sector. The Code of Federal Regulations (CFR) does not provide a catalog of regulated parties by industrial code to easily distinguish the regulations likely to affect a particular industry.

Examining the impact of a suite of regulations affecting an industry requires some method of accounting for the restrictions inherent in each separate regulation and summing up the restrictions contained in the entire suite. The sheer number of regulations contained in the CFR makes such an analysis a daunting task if each regulation must be individually read, coded for the industries affected and the restrictions contained within it. Application of artificial intelligence (AI) provides a means to identify relevant regulations for an industry and to provide a measure of regulatory restrictions.

This report uses RegData 3.1,[i] a set of databases providing total words and counts of restrictive words within CFR parts, to provide a measure of the regulatory restrictions. RegData uses machine learning to associate the various CFR parts with particular North American Industry Classification System (NAICS) codes. This solves the problem both of identifying relevant CFR parts for production agriculture and measuring the regulatory restrictions. It also provides the methodology for empirically representing the regulatory restrictions and CFR parts associated with various NAICS codes in production agriculture.

[i] Patrick A. McLaughlin and Oliver Sherouse, "RegData US 3.1 Annual (dataset)," QuantGov, accessed December 21, 2018. https://quantgov.org/regdata-us/.

Thus, this report contains the first comprehensive list of which I am aware of the regulations or CFR parts likely to affect production agriculture.

The report is not without its limitations. It is the first application of machine learning and AI to estimate regulatory constraints on agriculture. Future researchers will want to carefully examine the list of regulations associated with agricultural NAICS codes as generated by RegData. An additional, alternative method of associating industries with CFR parts may provide a more tightly defined list of regulations. Refining the list of restrictive words currently counted in RegData will provide for more nuanced analyses, perhaps allowing a more inclusive empirical analysis of regulatory forms. For example, words such as "records" or "recordkeeping" or "reports" may signal regulatory restrictions associated with the "monitoring, reporting, and verification" (MRV) form of regulations that are currently not explicitly tracked in RegData. It may be that the appearance of these words within a certain number of other modifying words provides a better estimate of regulatory restriction than simply counting the number of occurrences. Similar sets of words could be developed for other regulatory forms.

Although there are some aspects of the AI protocol used that could be refined or modified, I believe that these results are a proof of concept that AI can facilitate research into regulatory impact and analysis that would not have been possible five or ten years ago. This mirrors similar findings from the application of AI to legal research where a cottage industry has sprung up to provide litigation analytics such as statistics of a particular court or judge ruling on a motion.

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Acknowledgements

The authors greatly appreciate the expertise and financial support of the United States Department of Agriculture. This report benefited from the comments, suggestions, and insights of several individuals. The authors would like to thank Dr. Linda Abbott of the United States Department of Agriculture for her continued support and insightful comments throughout this project. The authors express great appreciation to Professors Susan Dudley, Brian Mannix, Tara Sinclair, and Christopher Carrigan at the George Washington University for their guidance, constructive suggestions, and substantive inputs during the planning and development of this report. The authors also wish to thank other GW Regulatory Studies Center colleagues for their comments on earlier drafts of this report, including Professor Jerry Ellig and Mark Febrizio. The authors also thank Dr. Tony Cox for his independent analysis and innovative work on Annex I. The authors are also grateful to reviewers at the United States Department of Agriculture for their helpful comments, and the Mercatus Center staff for their advice on using their RegData Project. Finally, the authors thank Julie Balla for her creative design and formatting of this report.