Regulatory Burden: Measurement and Impact

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Abstract

I apply supervised machine learning and data mining techniques using Python on documents of all US federal rules and regulations to build measures of regulatory burden on firms. I obtain 1) dollar costs, 2) paperwork hours required to comply with regulations, and 3) number of restrictions (measured by words like shall, must, prohibited etc.) for every industry from 1970-2017. I also build these measures for small businesses within an industry. I show that regulatory burden on businesses in US has been substantially increasing and small entities bear higher regulatory costs per employee. Increased regulatory burden, especially on smaller firms, can explain many well-documented features and secular trends of US economy - increased concentration[1], increased markups[2], stagnation of wages[3], decreased labour share[4], wage inequality[5] and jobless growth[6].

[1] Grullon et al. (2018)
[2] De Loecker and Eeckhout (2017)
[3] Figure 5
[4] Barkai (2016)
[5] Song et al. (2018)
[6] Jaimovich and Siu (2012)

1 Substantial Increase in Regulatory Burden since 1970s

Federal rules and regulations that businesses in the US need to comply by have grown exponentially since the 1970s. Crude measures like number of pages in the federal register (Figure 1) clearly depict this point.[7]

Many regulations tend to increase fixed costs for firms and due to lower revenues, increase in fixed costs can force the small firms to reduce employment, wages and ultimately close down more than the large firms.

Regulators and legislators understand that regulations can place a disproportionate burden on small businesses and it is evident from the Regulatory Flexibility Act (RFA) 1980. RFA requires agencies to consider the impact of their regulatory proposals on small entities, to analyse effective alternatives that minimise small entity impacts, and to make their analyses available for public comment.

2 Building the Dataset

In addition to being noisy because many federal register pages have nothing to do with regulation, using federal register pages as measurement of regulation also runs the risk of counting deregulation as an increase in regulation because deregulation requires the publication of pages in the Federal Register. Even more important, not all regulations are created equal in their effects on different sectors of the economy or on the economy as a whole.

I will use the following steps to build the dataset which overcome these concerns:

1. **Training for industry specific regulations**: Algorithm learns what words, phrases, and other features can best identify when a unit of text is relevant to a specific industry by analysing compilation of training documents. Training documents will be collected based on rules in Unified Agenda that clearly mention the industries that are affected (NAICS codes). More than 10000 such documents are

[7]The Code of Federal Regulations (CFR) is the codification of the general and permanent rules and regulations (sometimes called administrative law) published in the Federal Register by the executive departments and agencies of the federal government of the United States.

available. Figure 2 presents an example of one such rule which will be used as a training document. I will vectorise the training using bigram counts.

2. **Training for regulatory and deregulatory rules**: Second set of training documents will be if the rule is deregulatory or regulatory. Executive Order 13771 (signed in 2017) mandates the agencies to classify the regulations as deregulatory or regulatory. Many rules mentioned in the CFR might be deregulatory but counting them as regulations and their relevant restrictions will be misleading. Figure 3 provides an example of one such training document. Around 2000 such rules are available.

   Another potential method of obtaining the training documents for deregulatory actions will be if it produces reduction in costs (costs to firms is lesser than zero). I describe in next steps the methodology to capture costs of a regulation.

3. **Capturing the costs and paperwork hours associated with regulations**: While above two steps use supervised machine learning, this step relies on data mining required numbers from text of documents based on certain patterns. A website of the American Action Forum (www.regrodeo.com) manually collects costs in US dollars and paperwork from text document of the regulations of most significant regulations. An example from the website is provided in Figure 4. I propose to do the same for each rule using data mining techniques. Costs and paperwork hours estimates are provided for many rules by agencies under the RFA and paperwork reduction act, respectively.

4. **Identifying if the rule significantly affected small businesses**: I rely on the rule-making agency's evaluation if the rule will affect significant number of small entities under the RFA.

Having applied the above steps to every regulation passed since 1970, I will obtain monetary costs in US dollars, paperwork hours and number of relevant restrictions (measured by words like shall, must, prohibited etc) for every industry and for small businesses within an industry annually.

I aim to analyse secular trends of the US economy mentioned in the abstract and explain what percentage of these trends can be explained by increased regulatory burden.

References

Barkai, S. (2016). Declining labor and capital shares. *Stigler Center for the Study of the Economy and the State New Working Paper Series*, 2.

De Loecker, J. and Eeckhout, J. (2017). The rise of market power and the macroeconomic implications. Technical report, National Bureau of Economic Research.

Grullon, G., Larkin, Y., and Michaely, R. (2018). Are us industries becoming more concentrated? *Forthcoming, Review of Finance*.

Jaimovich, N. and Siu, H. E. (2012). The trend is the cycle: Job polarization and jobless recoveries. Technical report, National Bureau of Economic Research.

Song, J., Price, D. J., Guvenen, F., Bloom, N., and Von Wachter, T. (2018). Firming up inequality. *The Quarterly Journal of Economics*, 134(1):1–50.

Appendix:

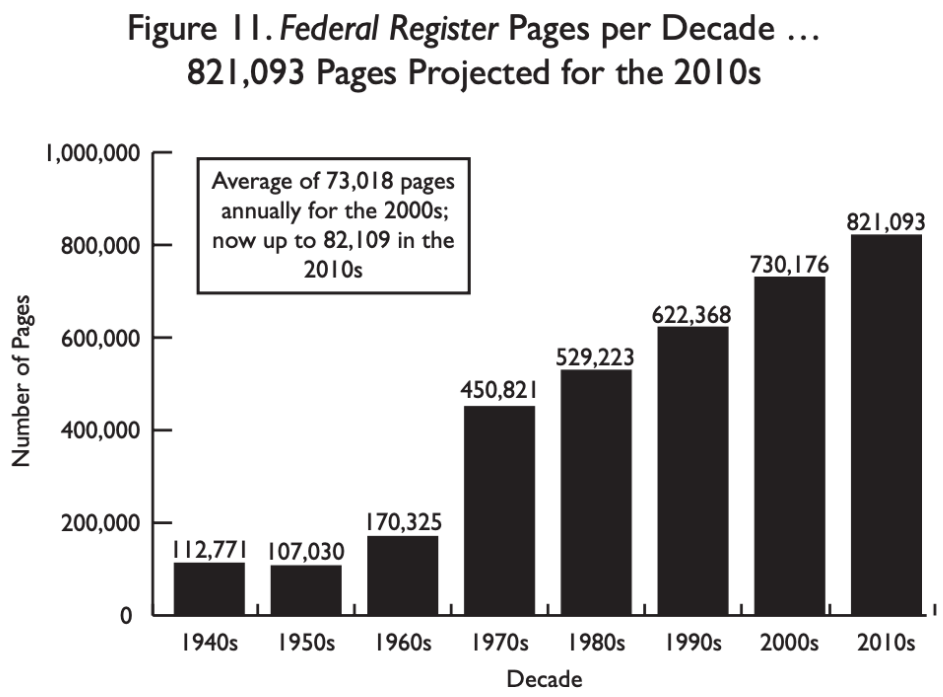


Figure 1

Agency: Environmental Protection Agency(EPA)
RIN Status: Previously published in the Unified Agenda
Major: No
EO 13771 Designation: Other
CFR Citation: 40 CFR 141 40 CFR 143
Legal Authority: 42 U.S.C. 300f et seq., Safe Drinking Water Act
Legal Deadline: None
Timetable:

Action	Date	FR Cite
NPRM	01/17/2017	82 FR 4805
NPRM Comment Period Extended	04/11/2017	82 FR 17406
Final Rule	06/00/2019	

Priority: Substantive, Nonsignificant
Agenda Stage of Rulemaking: Final Rule Stage
Unfunded Mandates: No

Regulatory Flexibility Analysis Required: No
Small Entities Affected: No
Included in the Regulatory Plan: No
Sectors Affected: 326122 Plastics Pipe and Pipe Fitting Manufacturing; 332911 Industrial Valve Manufacturing; 332913 Plumbing Fixture Fitting and Trim Manufacturing; 332919 Other Metal Valve and Pipe Fitting Manufacturing; 332996 Fabricated Pipe and Pipe Fitting Manufacturing; 332999 All Other Miscellaneous Fabricated Metal Product Manufacturing; 333318 Other Commercial and Service Industry Machinery Manufacturing; 333415 Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing; 333911 Pump and Pumping Equipment Manufacturing; 333999 All Other Miscellaneous General Purpose Machinery Manufacturing; 334514 Totalizing Fluid Meter and Counting Device Manufacturing; 335222 Household Refrigerator and Home Freezer Manufacturing; 335228 Other Major Household Appliance Manufacturing; 339991 Gasket, Packing, and Sealing Device Manufacturing

Government Levels Affected: Federal, Local, State, Tribal
Federalism: No

Figure 2: An example of a regulation identifying the industries affected (source: www.reginfo.gov)

EPA/OLEM **RIN:** 2050-AG93 **Publication ID:** Fall 2018
Title: Modernizing Ignitable Liquids Determinations
Abstract:

In this proposed rule, EPA is considering updating the flash point test methods for the determination of characteristically ignitable hazardous waste along with other minor changes. Currently, the required test methods refer to outdated standards developed by the American Society for Testing and Materials (ASTM standards) and require instrumentation that is no longer readily commercially available. For example, the standards require the use of mercury thermometers, which are becoming more difficult to acquire due to the use and availability being phased out for environmental and health and safety concerns. A proposed update to the flash point test methods will allow for the use of commercially available instrumentation and will no longer require mercury thermometers. EPA is also proposing to remove the requirements for mercury thermometers in the SW-846 air sampling and stack emissions methods. In addition, EPA intends to solicit public input on the alcohol exclusion for ignitable aqueous alcohols and whether a revision is necessary to improve existing waste management practices.

Agency: Environmental Protection Agency(EPA)
RIN Status: Previously published in the Unified Agenda
Major: Undetermined
EO 13771 Designation: Deregulatory
CFR Citation: 40 CFR 261
Legal Authority: 42 U.S.C. 6912 42 U.S.C. 6921(a), RCRA 3001(a)
Legal Deadline: None
Timetable:

Priority: Substantive, Nonsignificant
Agenda Stage of Rulemaking: Proposed Rule Stage
Unfunded Mandates: Undetermined

Figure 3: An example of a regulation identifying that it is deregulatory (source: www.reginfo.gov))

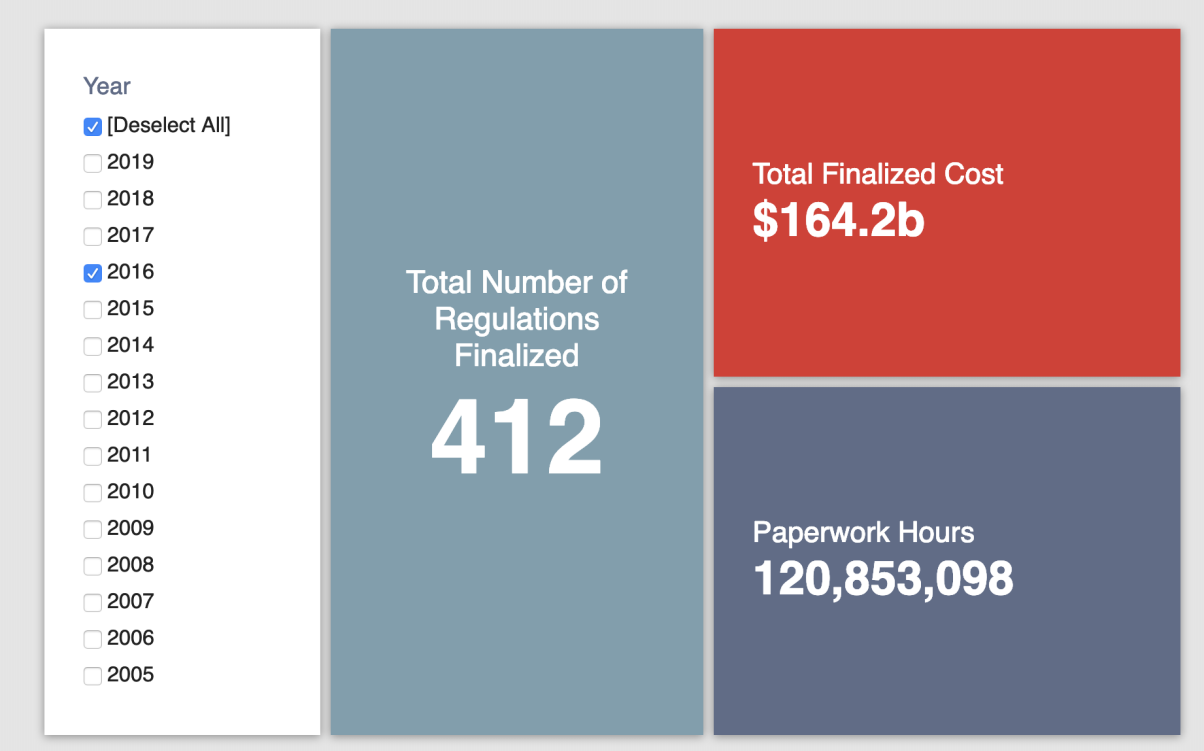


Figure 4: Costs and paperwork hours of major regulations of 2016 collected from text documents of regulations (source: www.regrodeo.com)

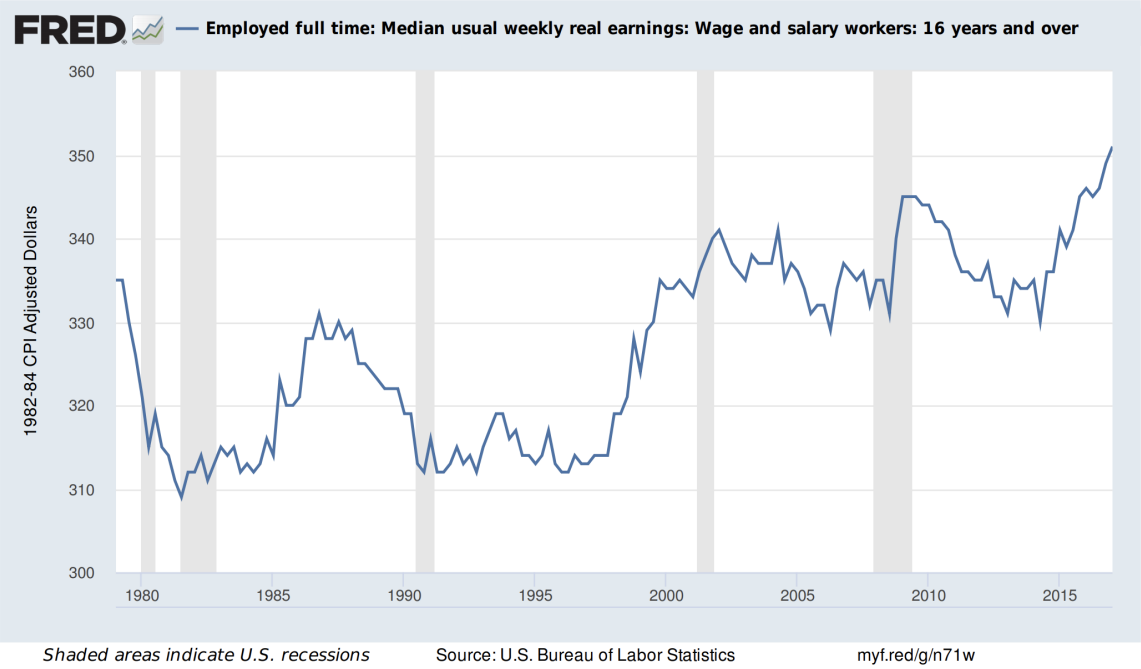


Figure 5