

Creating a Database for Corporate Structure and Regulatory Risk in the Oil & Gas Industry

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Introduction

- ❖ Double Major in Economics and Statistics, with a minor in Spanish
- ❖ Expected Graduation May 2016
- ❖ Anadarko Fellowship for Excellence in Energy Scholarship-Undergraduates

Objective

- ❖ Increasing public concern about oil & gas practices
 - ❖ Wyoming Setback Rule
- ❖ How does corporate management and governance affect environmental compliance?
- ❖ How do we even begin to answer this?

Create database that links historical compliance information to their corporate parents, their practices, and financial statements

Techniques

- Python to webscrape
- Access & Excel to manage the database
- Stata & R for statistical techniques
- Different Sampling Techniques

Population & Sampling Frame

The screenshot displays the ECHO (Enforcement and Compliance History Online) website. At the top, the URL is <https://echo.epa.gov>. The EPA logo and "United States Environmental Protection Agency" are on the left, while language options (Español, 中文: 繁體版, 中文: 简体版, Tiếng Việt, 한국어) are on the right. A navigation bar includes "Learn the Issues", "Science & Technology", "Laws & Regulations", and "About EPA". A search bar for "Search EPA.gov" is also present.

The main content area features the ECHO logo and the text "Enforcement and Compliance History Online". There are links for "Log In" and "Contact Us".

The "Search Community" section is the central focus, containing a description: "Use EPA's Enforcement and Compliance History Online website to search for facilities in your community to assess their compliance with environmental regulations. You can also investigate pollution sources, examine and create enforcement-related maps, or explore your state's performance. [Learn more about ECHO](#)".

Below the description is a "Quick Search" section with a text input field labeled "Enter city, state and/or zip code" and a "Search" button. There are also links for "Tutorial" and "More Search Options".

Surrounding the central search area are several interactive buttons: "Search Community" (house icon), "Explore Facilities" (factory icon), "Create Maps" (compass icon), "Analyze Trends" (bar chart icon), "Help" (question mark icon), "Resources" (book icon), and "Advanced Tools" (wrench icon).

At the bottom left, there is a "Latest News" section with a sub-tab for "ECHO News" and a list of news items:

- ▶ [Version 2.0 of CVA DMR Pollutant Loading Tool Launched](#)
- ▶ [What's New in ECHO](#)
- ▶ [ECHO Modernization Information](#)
- ▶ [Join the ECHO Listserv](#)

Challenging Numbers

Between-Subjects Factors

	N
PADD 1	598
2	6326
3	10163
4	12971
5	356

Total Observations: 30414

.03

Double Sampling to stratify

- Auxiliary information needed: Corporate Owner

Element & Sampling Unit

- Violators & Non-violators based on formal penalty count
- Classification

Simple

Random

Sampling

Finding what corporation they were under

- Department of Environmental Quality for each state
- Subsidiary or not

Merging with Financial Data

Ups & Downs

Next Steps

- ❖ Figuring out ratios and response
 - ❖ Factor variables, amount in millions, ratio variables
 - ❖ Accounting for unseen influences
- ❖ Two Step Cluster Analysis of Variance
 - ❖ Look at possible multicollinearity issues
- ❖ Regression
 - ❖ Possibly bootstrapping for finite populations

To Be Continued...

- Kruskal Wallis test
 - CWA
 - Possibly different targeting in different regions
- How corporate finance practices in the oil and gas industries affect compliance risk
- Using leadership strategies variables like offering a golden parachute, classified board, and whether or not a subsidiary might be correlated with more risk-taking culture