

# Replication Package for “The Economic Impact of Uncertainty about U.S. Regulations of the Energy Sector”

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## Overview

This repository provides the data and code to replicate the results from the paper titled “**The Economic Impact of Uncertainty about U.S. Regulations of the Energy Sector.**”

The package includes two main components:

1. **/measure\_uncertainty**: Data and Python code for measuring regulatory uncertainty, as described in Section 2 of the paper.
2. **/empirical\_analysis**: Data and Stata code for generating empirical results, as described in Section 3 of the paper.

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## Data Availability and Provenance Statements

This paper analyzes the full text and metadata of newspaper articles from the U.S. Newsstream database, accessed through ProQuest’s [TDM Studio](#). Due to copyright restrictions, the authors cannot distribute the full text of the news articles analyzed. However, this repository provides the ProQuest IDs and some metadata for all articles used in the analysis (available in `/measure_uncertainty/data/`). Researchers with access to ProQuest’s content can use this information to retrieve the full text and additional metadata of the articles.

To demonstrate the textual analysis process, this repository includes demo data for five news articles in XML format (located in `/measure_uncertainty/data/nlp_demo/xml_examples`), along with the Python scripts for performing the textual analysis and estimating the uncertainty measures. The estimated uncertainty indexes using all articles are provided in the `/measure_uncertainty/data` subdirectory.

Other economic data were obtained from publicly available data sources. See details in the Data Source section.

## Statement about Rights

- ☒ I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.

## License for Data

The data are licensed under a Creative Commons/CC-BY-NC license.

## Summary of Availability

- ☒ Some data **cannot be made** publicly available.

## Details on Datasets and Data Sources

The data used in the paper are stored in two subdirectories. The first subdirectory `/measure_uncertainty/data` contains data files used in the creation, analysis and visualization of the uncertainty measures. The second subdirectory `/empirical_analysis` contains data used in the baseline empirical analysis and robustness checks.

A summary of all raw data and sources is available in Table D1.1. The raw data were cleaned and/or merged to create final analysis-ready datasets. Table D1.2 lists all processed datasets constructed from the raw data and the name of the script that generated it.

**Table D1.1: Raw Data and Sources**

<i><b>Data Name</b></i>	<i><b>Data File</b></i>	<i><b>Location</b></i>	<i><b>Provided</b></i>	<i><b>Citation</b></i>
Demo news article text data	282091173.xml; 331720143.xml; 391942977.xml; 902573990.xml; 2581635619.xml	/measure_uncertainty/data/ nlp_demo/xml_examples	TRUE	U.S. Newsstream (2022) <sup>1</sup>
All news article text data	Not available	Not available	FALSE	U.S. Newsstream (2022) <sup>2</sup>
Trade journal and magazine text data	Not available	Not available	FALSE	ProQuest Central (2023) <sup>3</sup>
U.S. Energy Information Administration (EIA) glossary	eia_energy_glossary.xlsx	/measure_uncertainty/data/s upplementary_data	TRUE	EIA (2022) <sup>4</sup>
Loughran and McDonald dictionary (2018 version)	lm_sentiment.csv	/measure_uncertainty/data/s upplementary_data	TRUE	Loughran and McDonald (2011) <sup>5</sup>
U.S. Newsstream publication title list	us_newsstream_title_list.xls	/measure_uncertainty/data/s upplementary_data	TRUE	ProQuest (2022) <sup>6</sup>
Fonts used in figures	coolvetica_rg.otf; palatinolinotype_roman.ttf	/measure_uncertainty/data/s upplementary_data	TRUE	dafont.com (2024); online- fonts.com (2024) <sup>7</sup>
U.S. crude oil prices	WTISPLC.xls	/empirical_analysis/raw_data	TRUE	Federal Reserve Bank of St. Louis and EIA (2022) <sup>8</sup>

<sup>1</sup> U.S. Newsstream database accessed through ProQuest TDM Studio (<https://tdmstudio.proquest.com/home>) on 05/17/2022.

<sup>2</sup> The text data are not provided due to copyright restrictions. However, users can retrieve the articles from the U.S. Newsstream database using the ProQuest IDs in all\_uncertainty\_scores\_baseline.csv (located in /measure\_uncertainty/data) through ProQuest TDM Studio (<https://tdmstudio.proquest.com/home>). Data used in the paper were accessed on 05/17/2022.

<sup>3</sup> The text data are not provided due to copyright restrictions. However, users can retrieve the articles from the ProQuest Central database using the ProQuest IDs in all\_uncertainty\_scores\_journal.csv (located in /measure\_uncertainty/data) through ProQuest TDM Studio (<https://tdmstudio.proquest.com/home>). Data used in the paper were accessed on 05/12/2023.

<sup>4</sup> Terms related to fuel groups “natural gas” and “petroleum” in the EIA glossary. Available at <https://www.eia.gov/tools/glossary/>, accessed on 02/18/2022.

<sup>5</sup> Loughran-McDonald Master Dictionary w/ Sentiment Word Lists. Available at <https://sraf.nd.edu/loughranmcdonald-master-dictionary/>, accessed on 05/21/2020.

<sup>6</sup> ProQuest Title Lists System. Available at <https://about.proquest.com/en/customer-care/title-lists/>, accessed on 07/02/2022.

<sup>7</sup> Available at <https://www.dafont.com/coolvetica.font> and <https://online-fonts.com/fonts/palatinolinotype>, accessed on 12/28/2024.

<sup>8</sup> Spot Crude Oil Price: West Texas Intermediate (WTI), Dollars per Barrel, Monthly, Not Seasonally Adjusted, Federal Reserve Bank of St. Louis and EIA. Available at <https://fred.stlouisfed.org/series/WTISPLC>, accessed on 04/06/2022.



<b>Data Name</b>	<b>Data File</b>	<b>Location</b>	<b>Provided</b>	<b>Citation</b>
Texas unemployment rate	TXUR.xls	/empirical_analysis/raw_data	TRUE	BLS (2023) <sup>18</sup>
New York unemployment rate	NYUR.xls	/empirical_analysis/raw_data	TRUE	BLS (2023) <sup>19</sup>
New Mexico unemployment rate	NMUR.xls	/empirical_analysis/raw_data	TRUE	BLS (2023) <sup>20</sup>
Political party of the U.S. president	party.pdf	/empirical_analysis/raw_data	TRUE	U.S. House of Representatives: History, Arts & Archives (2023) <sup>21</sup>
Macroeconomic uncertainty	MacroUncertainty.xlsx	/empirical_analysis/raw_data	TRUE	Jurado et al. (2015) <sup>22</sup>
Economic policy uncertainty (EPU) index	epu_index.xlsx	/empirical_analysis/raw_data	TRUE	Baker et al. (2016) <sup>23</sup>
Categorical EPU indexes	categorical_epu_index.xlsx	/measure_uncertainty/data/supplementary_data	TRUE	Baker et al. (2016) <sup>24</sup>
Climate policy uncertainty (CPU) index	cpu_index.csv	/measure_uncertainty/data/supplementary_data	TRUE	Gavriilidis (2021) <sup>25</sup>
Geopolitical risk (GPR) index	gpr_index.xls	/measure_uncertainty/data/supplementary_data	TRUE	Caldara and Iacoviello (2022) <sup>26</sup>

<sup>18</sup> Unemployment Rate in Texas, Percent, Monthly, Seasonally Adjusted, BLS. Available at <https://fred.stlouisfed.org/series/TXUR>, accessed on 02/02/2023.

<sup>19</sup> Unemployment Rate in New York, Percent, Monthly, Seasonally Adjusted, BLS. Available at <https://fred.stlouisfed.org/series/NYUR>, accessed on 02/02/2023.

<sup>20</sup> Unemployment Rate in New Mexico, Percent, Monthly, Not Seasonally Adjusted, BLS. Available at <https://fred.stlouisfed.org/series/NMURN>, accessed on 02/02/2023.

<sup>21</sup> Party Government Since 1857, Presidency, U.S. House of Representatives: History, Arts & Archives. Available at <https://history.house.gov/Institution/Presidents-Coinciding/Party-Government/>, accessed on 02/02/2023.

<sup>22</sup> Total Macro Uncertainty, 12-Month Forecast Horizon, Monthly, Jurado et al. (2015). Available at <https://www.sydneyludvigson.com/macro-and-financial-uncertainty-indexes>, accessed on 02/02/2023.

<sup>23</sup> U.S. EPU Index, News-based, Monthly, Baker et al. (2016). Available at [https://www.policyuncertainty.com/us\\_monthly.html](https://www.policyuncertainty.com/us_monthly.html), accessed on 07/24/2024.

<sup>24</sup> Categorical U.S. EPU indexes, Baker et al. (2016). Available at [https://www.policyuncertainty.com/categorical\\_epu.html](https://www.policyuncertainty.com/categorical_epu.html), accessed on 07/24/2024.

<sup>25</sup> CPU index, Gavriilidis (2021). Available at [https://www.policyuncertainty.com/climate\\_uncertainty.html](https://www.policyuncertainty.com/climate_uncertainty.html), accessed on 12/28/2024.

<sup>26</sup> GPR index, Caldara and Iacoviello (2022). Available at <https://www.matteoiacoviello.com/gpr.htm>, accessed on 08/08/2024.

**Table D1.2: Processed Data**

<i><b>Data File</b></i>	<i><b>Location</b></i>	<i><b>How Created</b></i>	<i><b>Description</b></i>	<i><b>Provided</b></i>
all_uncertainty_sco res_baseline.csv	/measure_uncertainty /data	Calculated from sentiment analysis of relevant news article text data. Relevant articles were identified from all news articles in U.S. Newsstream through ProQuest TDM Studio, using the approach discussed in Section 2.2 of the paper (Python code for identifying relevant articles and calculating uncertainty scores from demo text data is available in /measure_uncertainty/python_code).	ProQuest ID, publication title, publication date, and uncertainty scores calculated based on different sections of a news article, including: <ul style="list-style-type: none"> <li>○ “RegUncertaintyScore”: Uncertainty score from the regulatory section;</li> <li>○ “EconUncertaintyScore”: Uncertainty score from the economic section;</li> <li>○ “UncertaintyScore”: Uncertainty score from the full text of the article.</li> </ul>	TRUE
all_uncertainty_sco res_broadterm.csv	/measure_uncertainty /data	Calculated from sentiment analysis of an alternative set of relevant news article text data. Relevant articles were identified from all news articles in U.S. Newsstream through ProQuest TDM Studio, using a broader set of energy terms as discussed in Section 2.5 of the paper (Python code for identifying relevant articles and calculating uncertainty scores from demo text data is available in /measure_uncertainty/python_code).	ProQuest ID, publication title, publication date, and uncertainty score for each news article.	TRUE
all_uncertainty_sco res_journal.csv	/measure_uncertainty /data	Calculated from sentiment analysis of trade journal and magazine article text data. Relevant articles were identified from trade journals and magazines in ProQuest Central through ProQuest TDM Studio, using the same approach as the baseline (Python code for identifying relevant articles and calculating uncertainty scores from demo text data is available in /measure_uncertainty/python_code).	ProQuest ID, publication title, publication date, and uncertainty score for each journal/magazine article.	TRUE

<b>Data File</b>	<b>Location</b>	<b>How Created</b>	<b>Description</b>	<b>Provided</b>
oil_regulatory_uncertainty_index_baseline.csv	/measure_uncertainty /data	6_estimate_uncertainty_index.py  The script reads in the pre-saved uncertainty scores ("RegUncertaintyScore") in all_uncertainty_scores_baseline.csv and outputs the estimated baseline oil regulatory uncertainty index.	Estimated baseline oil regulatory uncertainty index ("RegUncertaintyIndex").	TRUE
oil_regulatory_uncertainty_index_robust.csv	/measure_uncertainty /data	6_estimate_uncertainty_index.py  The script reads in the pre-saved uncertainty scores in all_uncertainty_scores_baseline.csv ("EconUncertaintyScore"), all_uncertainty_scores_broadterm.csv, and all_uncertainty_scores_journal.csv and outputs the estimated economic-adjusted oil regulatory uncertainty index, the broad-term-based index, and the journal-based index.	Estimated alternative oil regulatory uncertainty indexes for robustness checks: <ul style="list-style-type: none"> <li>o "RegUncertaintyIndex_Econ": Oil regulatory uncertainty index estimated while controlling for uncertainty scores of economic sections (i.e., economic-adjusted index).</li> <li>o "RegUncertaintyIndex_Broad": Oil regulatory uncertainty index estimated using a broader set of energy terms to refine the news articles under analysis (i.e., broad-term-based index);</li> <li>o "RegUncertaintyIndex_Journal": Oil regulatory uncertainty index estimated using trade journals and magazines (i.e., journal-based index).</li> </ul>	TRUE
oil_supply_uncertainty_index.csv	/measure_uncertainty /data	6_estimate_uncertainty_index.py  The script reads in the pre-saved uncertainty scores ("UncertaintyScore") in all_uncertainty_scores_baseline.csv and outputs the estimated oil supply uncertainty index.	Estimated general oil supply uncertainty index ("UncertaintyIndex").	TRUE
noun_chunks_by_month_reg.csv	/measure_uncertainty /data	Identified from the news article text data used in the baseline analysis, using spaCy (Python code for identifying top noun chunks from	All noun chunks and their occurrences from the regulatory sections with positive regulatory uncertainty scores	TRUE

<i><b>Data File</b></i>	<i><b>Location</b></i>	<i><b>How Created</b></i>	<i><b>Description</b></i>	<i><b>Provided</b></i>
		demo text data is available in 8_extract_noun_chunks.py).	that were published during a given month.	
noun_chunks_by_month_general.csv	/measure_uncertainty/data	Identified from the news article text data used in the baseline analysis, using spaCy (Python code for identifying top noun chunks from demo text data is available in 8_extract_noun_chunks.py).	All noun chunks and their occurrences from the full news articles with positive uncertainty scores that were published during a given month.	TRUE
pub_title_newspaper.csv	/measure_uncertainty/data/supplementary_data	Created based on the title list in us_newsstream_title_list.xls by manually combining alternative titles for a newspaper.	Crosswalk of publication titles and newspaper names; a newspaper name can correspond to multiple publication titles.	TRUE
wordcloud_mask.png	/measure_uncertainty/data/supplementary_data	Drawn using the Paint app in a Windows system.	An image used as the mask for generating the word cloud figures.	TRUE
data_2024.dta	/empirical_analysis	This file was manually compiled by copying and pasting data from the files listed in Table D1.1 and Table D1.2, with certain transformations applied (e.g., taking natural logs) in Excel. The file was then imported into Stata and saved as a .dta file. See Table D2 for the description of each variable and how original data were transformed.	Clean data used for empirical analysis.	TRUE



The data file `data_2024.dta` in `/empirical_analysis` combines the estimated oil regulatory uncertainty indexes with the economic data listed in Table D1.1 and Table D1.2. Table D2 provides a description of each variable in `data_2024.dta` along with its associated data file.

**Table D2: Data in `data_2024.dta`**

<i>Column Name</i>	<i>Description</i>	<i>Original Data File and Location</i>
"oilregunc2024"	Baseline oil regulatory uncertainty index	oil_regulatory_uncertainty_index_baseline.csv (/measure_uncertainty/data)
"oilregunc2024econ"	Economic-adjusted oil regulatory uncertainty index	"RegUncertaintyIndex_Econ" in oil_regulatory_uncertainty_index_robust.csv (/measure_uncertainty/data)
"oilregunc_journal"	Journal-based oil regulatory uncertainty index	"RegUncertaintyIndex_Journal" in oil_regulatory_uncertainty_index_robust.csv (/measure_uncertainty/data)
"logrwti"	Natural log of U.S. crude oil prices deflated by CPI: $= \ln(WTISPLC / CPIAUCSL)$	WTISPLC.xls (/empirical_analysis/raw_data) and CPIAUCSL.xls (/empirical_analysis/raw_data)
"logstock"	Natural log of S&P 500 index	^spx_m.csv (/empirical_analysis/raw_data)
"ffr"	Federal funds effective rate	FEDFUNDS.xls (/empirical_analysis/raw_data)
"logcpi"	Natural log of CPI	CPIAUCSL.xls (/empirical_analysis/raw_data)
"logipm"	Natural log of industrial production	INDPRO.xls (/empirical_analysis/raw_data)
"logdrill"	Natural log of U.S. oil drilling	IPN213111S.xls (/empirical_analysis/raw_data)
"logprodoil"	Natural log of U.S. oil production	MCRFPUS1m.xls (/empirical_analysis/raw_data)
logworldprodoil	Natural log of world oil production	globaloil.csv (/empirical_analysis/raw_data)
"kiliamindex_100"	Growth rate of world economic activity divided by 100	igrea.xlsx (/empirical_analysis/raw_data)
"caur"	California unemployment rate	CAUR.xls (/empirical_analysis/raw_data)
"txur"	Texas unemployment rate	TXUR.xls (/empirical_analysis/raw_data)
"nyur"	New York unemployment rate	NYUR.xls (/empirical_analysis/raw_data)
"nmur"	New Mexico unemployment rate	NMUR.xls (/empirical_analysis/raw_data)
"dum"	Dummy variable = 1 when the U.S. president is Republican; = 0 when Democrat	"Presidency" in party.pdf (/empirical_analysis/raw_data)
"jurado"	Macroeconomic uncertainty	"h=12" in MacroUncertainty.xlsx (/empirical_analysis/raw_data)
"epu"	EPU index	"News_Based_Policy_Uncert_Index" in epu_index.xlsx (/empirical_analysis/raw_data)
"epureg"	EPU regulation index	"8. Regulation" in categorical_epu_index.xlsx (/measure_uncertainty/data/supplementary_data)

<b>Column Name</b>	<b>Description</b>	<b>Original Data File and Location</b>
"cpu"	CPU index	"cpu_index" in cpu_index.csv (/measure_uncertainty/data/supplementary_data)
"gpr"	GPR index	"GPR" in gpr_index.xls (/measure_uncertainty/data/supplementary_data)

## Description of Programs/Code

The /measure\_uncertainty/python\_code subdirectory contains Python code to create, analyze, and visualize the uncertainty indexes. The /empirical\_analysis subdirectory contains Stata code used in the empirical analysis.

### 1. /measure\_uncertainty/python\_code

- master.py: A master file to execute all Python scripts in this subdirectory.
- 1\_parse\_xml.py: Parses the full text and metadata of each news article from XML files (executed on demo data).
- 2\_clean\_data.py: Cleans the parsed data and drops duplicates (executed on demo data).
- 3\_match\_keywords.py: Searches energy keywords in the full text to determine relevance of articles (executed on demo data).
- 4\_extract\_regulatory\_sections.py: Extracts "regulatory sections" from news articles (executed on demo data).
- 5\_quantify\_uncertainty.py: Calculates uncertainty scores for each regulatory section and the full text of each article (executed on demo data).
- 6\_estimate\_uncertainty\_index.py: Estimates the baseline oil regulatory uncertainty index, alternative oil regulatory uncertainty indexes, and general oil supply uncertainty index.
- 7\_visualize\_indexes.py: Plots oil regulatory uncertainty indexes, general oil supply uncertainty index, and other comparable indexes.
- 8\_extract\_noun\_chunks.py: Extracts noun chunks and their occurrences from text (executed on demo data).
- 9\_plot\_word\_clouds.py: Plots word clouds of top noun chunks from select articles.

A summary of the inputs and outputs for each Python script is available in Table D3.

**Table D3: Inputs and Outputs of Python Scripts**

<i>Python Script</i>	<i>Input File and Location</i>	<i>Output File and Location</i>
1_parse_xml.py	All files in /measure_uncertainty/data/nlp_demo/ xml_examples	parsed_xml.pkl (/measure_uncertainty/data/nlp_demo)
2_clean_data.py	parsed_xml.pkl (/measure_uncertainty/data/nlp_demo)	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)
3_match_keywords.py	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)
4_extract_regulatory_s ections.py	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)
5_quantify_uncertain ty.py	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)
6_estimate_uncertain ty_index.py	all_uncertainty_scores_baseline.csv; all_uncertainty_scores_broadterm.csv; all_uncertainty_scores_journal.csv (/measure_uncertainty/data)	oil_regulatory_uncertainty_index_baselin e.csv; oil_regulatory_uncertainty_index_robust. csv; oil_supply_uncertainty_index.csv (/measure_uncertainty/data)
7_visualize_indexes.py	oil_regulatory_uncertainty_index.csv; oil_supply_uncertainty_index.csv (/measure_uncertainty/data)	figure1.jpg; figure3.jpg; appendixC.jpg; appendixD.jpg (/measure_uncertainty/output)
8_extract_noun_chunk s.py	parsed_xml_clean.pkl (/measure_uncertainty/data/nlp_demo)	N/A
9_plot_word_clouds.py	noun_chunks_by_month_reg.csv; noun_chunks_by_month_general.csv (/measure_uncertainty/data)	figure2.jpg; figure4.jpg (/measure_uncertainty/output)

## 2. /empirical\_analysis

- `var_energy2024_baseline.do`: Produces the baseline VAR using data from `data_2024.dta`.
- `var_energy2024_robust.do`: Produces robustness checks using alternative VAR specifications and data from `data_2024.dta`.
- `LPoil2024.do`: Produces robustness checks with oil production using local projections and data from `data_2024.dta`.
- `LPoil2024drill.do`: Produces robustness checks with oil drilling using local projections and data from `data_2024.dta`.

### License for Code

The code is licensed under a MIT license.

### List of Figures and Programs

The provided code reproduces:

- ☒ All figures in the paper.

**Table D4: All Figures and Corresponding Programs**

<i>Figure #</i>	<i>Program</i>	<i>Line #</i>	<i>Output File and Location</i>
Figure 1	7_visualize_indexes.py	46-133	figure1.jpg (/measure_uncertainty/output)
Figure 2	9_plot_word_clouds.py	42-86	figure2.jpg (/measure_uncertainty/output)
Figure 3	7_visualize_indexes.py	149-222	figure3.jpg (/measure_uncertainty/output)
Figure 4	9_plot_word_clouds.py	89-137	figure4.jpg (/measure_uncertainty/output)
Figure 5	var_energy2024_baseline.do	14-31	figure5.eps (/empirical_analysis)
Figure 6	var_energy2024_baseline.do	14-31	figure6.eps (/empirical_analysis)
Figure 7	var_energy2024_baseline.do	34-44	figure7a.eps & figure7b.eps (/empirical_analysis/)
Figure 8	var_energy2024_baseline.do	47-59	figure8.eps (/empirical_analysis)
Appendix C	7_visualize_indexes.py	237-293	appendixC.jpg (/measure_uncertainty/output)
Appendix D	7_visualize_indexes.py	364-441	appendixD.jpg (/measure_uncertainty/output)
Appendix E.1.1	var_energy2024_robust.do	125-136	figureE11.eps (/empirical_analysis)
Appendix E.1.2	var_energy2024_robust.do	125-136	figureE12.eps (/empirical_analysis)
Appendix E.2.1	var_energy2024_robust.do	12-24	figureE21.eps (/empirical_analysis)
Appendix E.2.2	var_energy2024_robust.do	12-24	figureE22.eps (/empirical_analysis)
Appendix G.1.1	var_energy2024_robust.do	27-38	figureG11.eps (/empirical_analysis)
Appendix G.1.2	var_energy2024_robust.do	27-38	figureG12.eps (/empirical_analysis)
Appendix G.2.1	var_energy2024_robust.do	41-52	figureG21.eps (/empirical_analysis)
Appendix G.2.2	var_energy2024_robust.do	41-52	figureG22.eps (/empirical_analysis)
Appendix G.3.1	var_energy2024_robust.do	55-66	figureG31.eps (/empirical_analysis)
Appendix G.3.2	var_energy2024_robust.do	55-66	figureG32.eps (/empirical_analysis)
Appendix G.4.1	var_energy2024_robust.do	69-80	figureG41.eps (/empirical_analysis)
Appendix G.4.2	var_energy2024_robust.do	69-80	figureG42.eps (/empirical_analysis)
Appendix G.5.1	var_energy2024_robust.do	83-94	figureG51.eps (/empirical_analysis)
Appendix G.5.2	var_energy2024_robust.do	83-94	figureG52.eps (/empirical_analysis)

<b>Figure #</b>	<b>Program</b>	<b>Line #</b>	<b>Output File and Location</b>
Appendix G.6.1	var_energy2024_robust.do	97-108	figureG61.eps (/empirical_analysis)
Appendix G.6.2	var_energy2024_robust.do	97-108	figureG62.eps (/empirical_analysis)
Appendix G.7.1	var_energy2024_robust.do	111-122	figureG71.eps (/empirical_analysis)
Appendix G.7.2	var_energy2024_robust.do	111-122	figureG72.eps (/empirical_analysis)
Appendix H.1	LPoil2024.do	all lines	figureH1.eps (/empirical_analysis)
Appendix H.2	LPoil2024drill.do	all lines	figureH2.eps (/empirical_analysis)

## Computational Requirements

### Software Requirements

- ☑ The replication package contains one or more programs to install all dependencies and set up the necessary directory structure.
- Python 3.10+
  - A virtual Python environment should be created using requirements.txt in the home directory. Please run “pip install -r requirements.txt” as the first step. See [https://pip.pypa.io/en/stable/user\\_guide/#ensuring-repeatability](https://pip.pypa.io/en/stable/user_guide/#ensuring-repeatability) for further instructions on creating and using the requirements.txt file.
- Stata (code was last run with version 18)
  - var (as of April 2023)

### Memory, Runtime, Storage Requirements

Approximate time needed to reproduce the analyses on a standard 2025 desktop machine:

- ☑ 1-3 days

Approximate storage space needed:

- ☑ 25 MB - 250 MB

The code was last run on a **11th Gen Intel(R) Core(TM) i7-11700 @ 2.50GHz with 16 GB RAM**.

Note: The original analysis of the full text data of all news articles was run on a **16 vCPU Amazon EC2 instance with 64 GB RAM and 70 GB storage**, consuming 2-8 hours.

### Instructions to Replicators

- Download the replication package.
- Set up the working environment (see instructions in “Computational Requirements”).

- Run `/measure_uncertainty/python_code/master.py` to execute all Python scripts in the subdirectory and reproduce the output files, as outlined in Table D4.
- Run Stata code (.do files) in the `/empirical_analysis` subdirectory to reproduce results of the empirical analysis.

## References

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