

New Zealand Economic Policy Uncertainty (EPU)

Group Name: Lord of The Rings EPU (LOTR — EPU)¹

“There's some good in this world, Mr. Frodo, and it's worth fighting for.”

— J. R. R. Tolkien, The Lord of the Rings

Our objective is to create an economic policy uncertainty (EPU) index for New Zealand. A description of our aims, methodology and outcomes is given in this report.

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Brief Overview:

Our objective is to create an economic policy uncertainty (EPU) index for New Zealand.

This index was first introduced for the United States by Baker, Bloom and Davis (2016) in the Quarterly Journal of Economics. Moreover, it has been applied to countries as India², Croatia³, Chile⁴.

This project focuses on New Zealand as it was not a part of Baker, Bloom and Davis' initial study. Furthermore, as it is a predominantly English speaking country⁵, news sources (in English) readily available. For this purpose, we scraped 169,535 newspaper articles from 3 of New Zealand's top news sources: New Zealand Herald, Stuff and TVNZ. The data we collected ranges from January 2009 to March 2020. The Internet Archive⁶ was used to achieve this task. We continue with creating this index by constructing a weighted average of a measure of repetition of specific keywords in newspaper articles.

The methodology for creating an index using our dataset creates an opportunity for Policy Makers and Social Science Researchers to create various indices in real time on the topics of interest. For example, if a policy stakeholder is interested in understanding people's trust around the healthcare system of New Zealand, our program can be utilized in order to gain context and provide assistance in terms of evidence-based research. Additionally, our dataset consists of news articles published in the last 10 years, allowing users to further perform and conduct analysis of news reporting on important topics over the years.

¹ Our team name was initially Team Name. LOTR — EPU was chosen as New Zealand is home to the grand Lord of the Rings landscapes.

² Scott R. Baker, Nicholas Bloom, and Steven J. Davis. 2016.

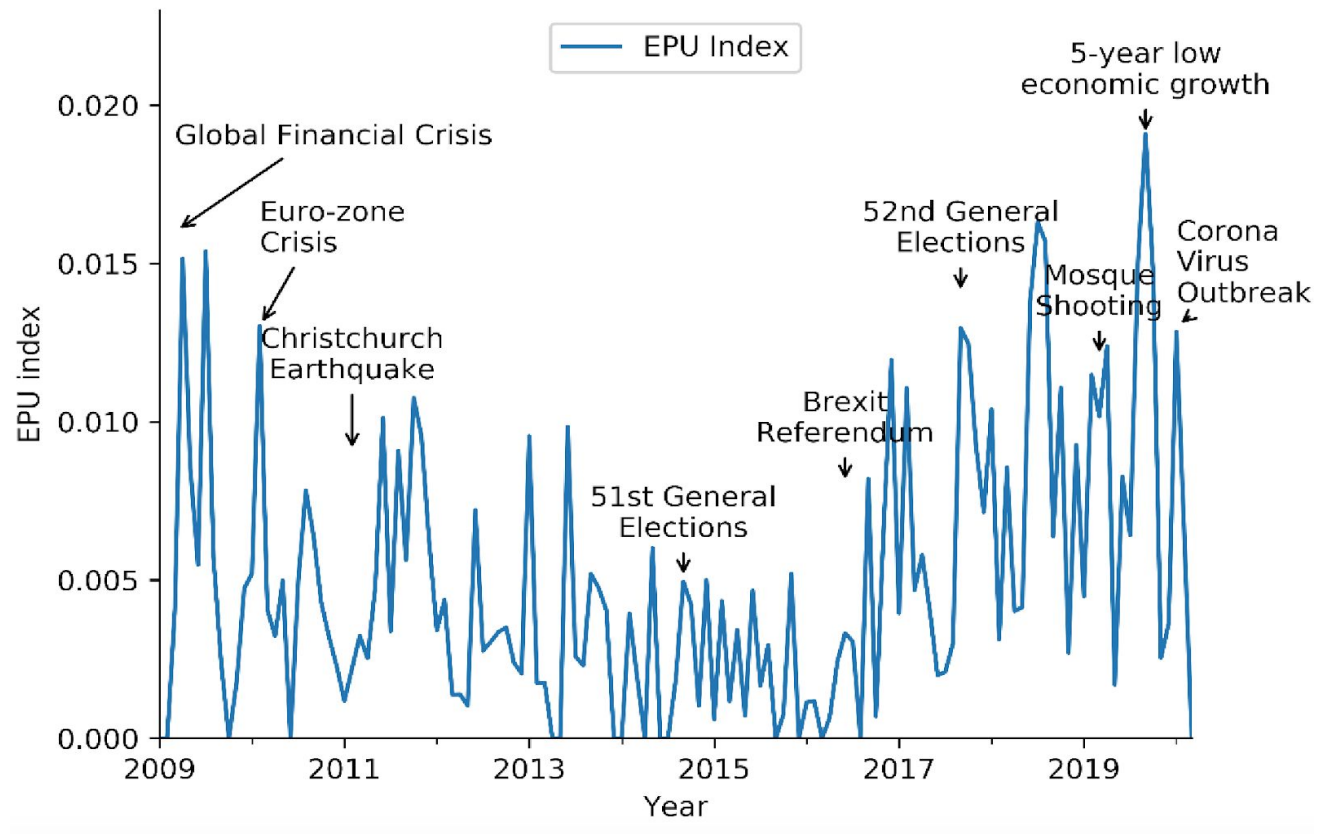
³ Peter Sorić, Ivana Lolić. 2017.

⁴ Rodrigo Cerda, Álvaro Silva, José Tomás Valente. 2016.

⁵ <https://www.new-zealand-immigration.com/migrate-to-new-zealand/language/>

⁶ <http://web.archive.org/>

Output:



The above is a EPU index for New Zealand using the data we scraped. Our index is responsive to major economic events that took place in New Zealand over the given time period.

Code Structure:

All scripts for this project are structured in 3 components:

1. Crawlers
2. Data Cleaning
3. Constructing indices and performing analysis

1. **Crawlers:** To effectively gather a large amount of data, the news sources were divided up into 3 resulting in 3 crawlers for scraping purposes.

- `herald_crawler.py`
- `stuff_crawler.py`
- `tvnz_crawler.py`

2. **Data Cleaning:** We have provided data cleaning scripts for each newspaper as each has different issues. Each script cleans the data scraped by the crawler and creates an output dataframe in pandas .pkl format for the next step.

- `herald_cleaner.py`
- `stuff_clean.py`
- `tvnz_clean.py`

Data Structure:

| newspaper | url | date | title | article |
|-----------|---|-------------------------|--|--|
| NZ Herald | https://www.nzherald.co.nz/business/news/article... | 2 Mar, 2020 5:00am | OneRoof Property Report: Your home's new valu... | There's good news for people who have owned a... |
| NZ Herald | https://www.nzherald.co.nz/lifestyle/news/arti... | 29 Feb, 2020 5:00am | How much should we really drink? | As young people turn their backs on alcohol, ... |
| NZ Herald | https://www.nzherald.co.nz/nz/news/article.cfm... | 25 Feb, 2020 11:52am | Local Focus: Council's Youth Committee needs ... | It's recruitment time for the Whanganui Youth... |
| NZ Herald | https://www.nzherald.co.nz/entertainment/news/... | 2 Mar, 2020 5:00am | Sideswipe: March 2: The perfect sub-woofers | "When I was about 19 I hired a portable solar... |
| NZ Herald | https://www.nzherald.co.nz/nz/news/article.cfm... | 2 Mar, 2020 12:25pm | Live coronavirus Q&A: Expert answers all your... | Infectious diseases expert Dr Siouxsie Wiles ... |

3. Index Creation and Graphing:

The `index_builder.py` script contains the `NewspaperIndex` class:

- This class includes a method, `make_index`, which will create an index based on the methodology mentioned under **Project's Accomplishments**.
- `plot_index` will create a line graph of the Economic Policy Uncertainty Index for New Zealand.

Project's Accomplishment:

Our project successfully achieved the following tasks:

1. Scrape newspaper articles from the past 10 years from 3 sources.
2. We created an index based on the methodology developed by Baker, Bloom and Davis (2016):

Count the number of articles containing specific keywords for each month, normalize the count by the total number of articles published by the same site during the same month, and estimate a weighted average for the site based on the relative number of articles compared to the other newspapers.

To be more precise, let $articles_{ikt}$ be the number of articles containing keywords k in newspaper i during period t , and $articles_{it}$ be the total count of articles for newspaper i during period t . We first calculate:

$$\frac{articles_{ikt}}{articles_{it}}$$

And then we estimate a weighted average for the newspaper that month depending on the number of articles published:

$$index_{it} = \frac{articles_{it}}{\sum_{j=0}^N articles_{jt}}$$

Where N is the total number of newspapers considered. Then we can calculate the final index as:

$$weighted\ index_t = \sum_{j=0}^N index_{jt}$$

3. Generalized the process of creating an index of interest
 - A researcher/policy practitioner would just need to put a list of words for a related topic to obtain an index for that topic.

Things we would have liked to do:

1. Query using SQL:
 - We use pandas dataframe to perform an analysis and create an index.
 - Given the size of our dataset, we wanted to develop a SQLite3based query management system to make necessary queries while creating various indices.
2. Create a Django interface:
 - We have a method in our class NewspaperIndex to create any index of interest.
 - We were hoping to create a Django interface where a user could create an index of their choice using a list of words allowing our program to be more interactive and user friendly.
3. News from YouTube.
 - We have used web articles from news websites to create this index.
 - News is now distributed over YouTube as well. We aimed to scrape auto-generated and/or already existing captions/subtitles of a news channel's YouTube videos to create a diverse dataset. We chose against using this method as auto-generated captions would provide inaccuracy in the text.