



# COVID-19 Economic Impact Analysis: A Topic Modelling Approach

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Make today matter



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# Research Questions

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**Can topic modelling be used to identify and highlight the economic impacts that COVID-19 had on different countries?**

- Will Latent Dirichlet Allocation (LDA) extract topics that reveal what the economic impacts of COVID-19 were?
- Can cosine similarity be used to reveal the differences and similarities in how groups of countries were affected by COVID-19?

# Problem Statement

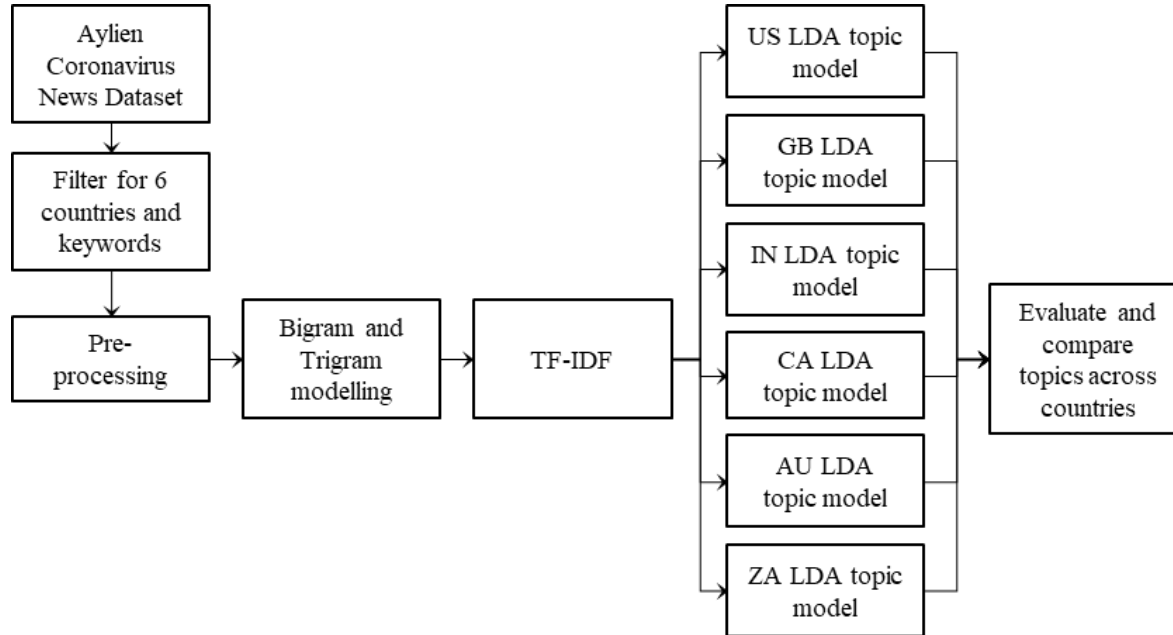
Why is it important to answer the research questions?

**DATA** + **NLP** = **INFORMATION**

- Understanding the economic impacts of COVID-19 can lead to more informed policy and decision making.
- Better planning for future scenarios.

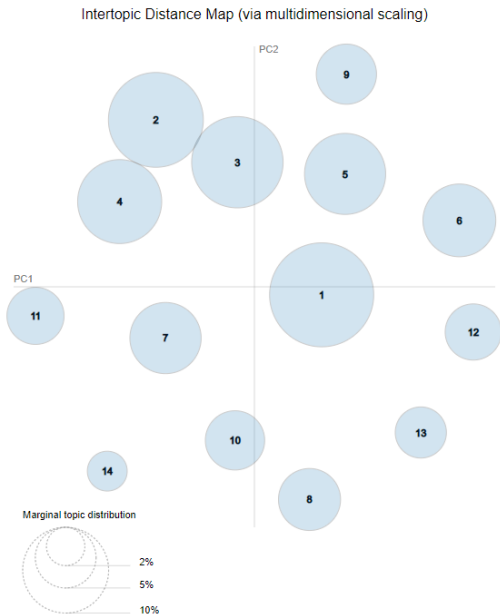
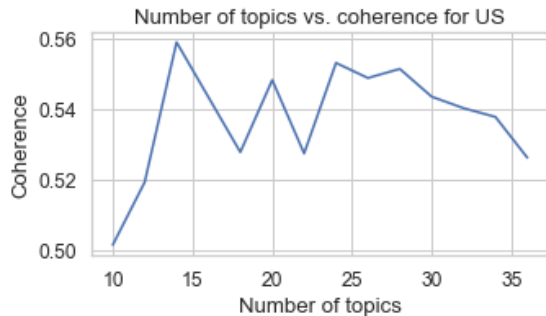
# Methodology and Approach

How were the research questions answered?



# Model Optimisation

Optimise for maximum coherence, minimal topic overlap, and good marginal distribution



# Topic Modelling Results and Performance

The models were found to be mostly logically coherent

Table 1: Topic model results

Country	Number of topics	Coherence
US	14	0.559
GB	18	0.548
IN	20	0.560
CA	16	0.552
AU	22	0.541
ZA	22	0.489

## Some not so good results:

- It was difficult to identify the direction of the impact (good vs. bad)
- For some countries such as South Africa, there were slight overlap in topics

Table 2: Example of top 5 topics extracted for the US

Topic	Top words	Topic assigned
1	time, need, feel, people, help, crisis, talk, tell, change...	Mental health
2	reopen, business, open, store, restaurant, close, plan...	Lockdown restrictions of stores and restaurants
3	stock, investor, market, share, price, economy, fall, demand...	Stock market and investment
4	government, response, police, lawmaker, president, bill...	Law and policy
5	test, people, report, death, vaccine, outbreak, case...	Covid testing and vaccines

# Topic Comparison Across Countries

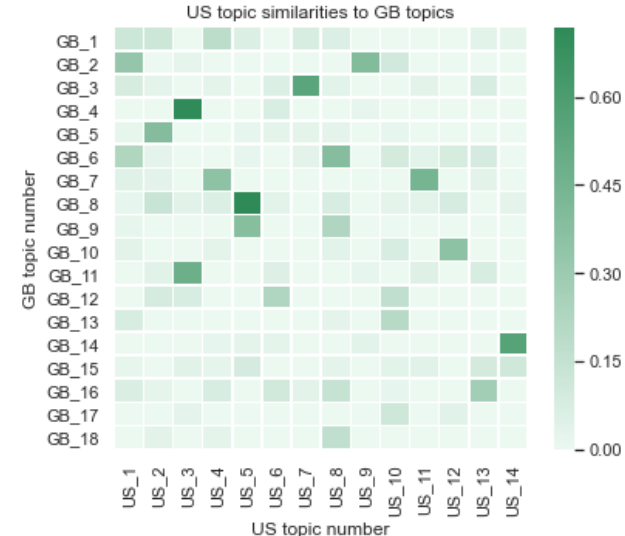
There were themes that were present across all countries, but also some topics unique to specific countries

## Main themes common across all countries:

- Lockdown restrictions and its impact on store, restaurants and pubs
- Stock markets, investments, and economic growth
- Economic and financial support programs and measures
- Social and mental wellbeing
- Education
- COVID-19 cases, deaths, testing, and the vaccine

## Topics unique to some countries:

- BLM protests in US, UK, Canada, and Australia
- Digital tech and solutions in US, India, and Canada
- Panic buying and property market in Australia
- Corruption, alcohol and cigarette bans in South Africa
- Construction and infrastructure projects in Canada



# Limitations and Future Work

There is always room to build and discover...

## Limitations

- News articles from only one data source were used
- Limited data available for South Africa
- Topics from only six countries were extracted
- LDA was the only topic modelling method used and tested
- Difficulty seeing whether the impact was positive or negative

## Future Work

- Run the experiment using alternative topic modelling methods and compare (such as LSA and NMF)
- Expand dataset to include more countries
- Combine the study with sentiment analysis
- Include social media data to include economic impact from a public point of view



# Thank You



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