How Increased Chinese Exports Drive Media Slant in U.S. Local Newspapers?

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Introduction

- Despite the benefits of globalization, the increased imports from China have resulted in various **adverse effects**:
  - Surging U.S. manufacturing unemployment (Autor el al., 2013; Acemoglu et al., 2016)
  - Deterioration in public health (McManus and Schaur, 2016; Pierce and Scott, 2016)
  - "China-bashing" in election campaign strategies (Ramirez and Rong, 2012)
- Measurement of **media slant** in existing studies relies on "negative keyword detection", which is biased due to subjectivity and ambiguity.

Research Questions

- **How increased Chinese exports drive media slant in U.S. local newspapers?**
- How to perform sentiment analysis on news via deep learning for NLP?
- What is the main topics of negative reports about China?

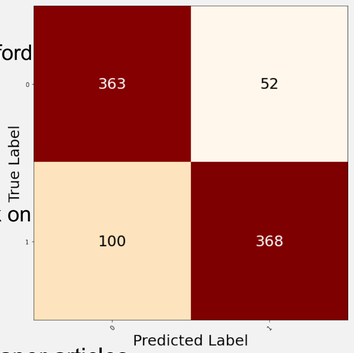
Data

- 114,788 pieces of articles from 157 local newspapers: *Newslibrary*
- Newspaper circulation covering 52 states: *Alliance of Audited Media*
- 4-digit Harmonized System international trade: *U.N. Comtrade*
- State-level industrial and demographic structures: *U.S. Census Bureau*

Sentiment Analysis using LSTM

To identify negative China-related reports, LSTM is adopted. The learning algorithm is as follows:

- Choose movie reviews dataset from Stanford AI Lab as training set
- Tokenize and vectorize the texts by "nltk", and remove English stop words
- Split the dataset into training & testing set
- Import "keras" to construct neural network on the Tensorflow framework



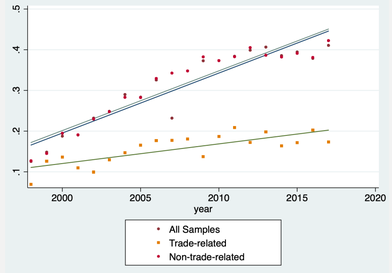
The trained model reaches **82.79%** accuracy in the testing set.
Then apply the model to selected newspaper articles.

Key Variables

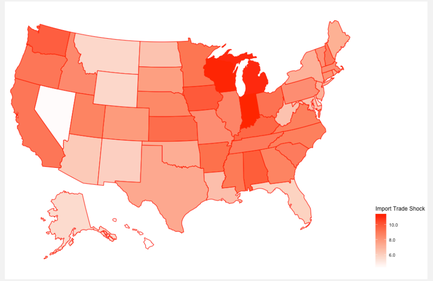
Media Slant

$$NegRatio_{i,t} = \frac{\#\ Negative^{j}_{i,t}}{\#\ China_{i,t}}$$

where j denotes all, trade-related and non-trade-related reporting.



Annual Average Media Slant in All and Subgroups, 1998-2017



U.S. Exposure to Chinese Imports across States, 1998-2018
Calculated according to Autor et al. (2013). Darker color indicates greater increase in Chinese import competition.

Imported Trade Shocks from China

$$\Delta Import_{i}^{China} = \sum_{s} \frac{Circulation_{i,s}^{1998}}{Circulation_{i}^{1998}} \sum_{s} \frac{L_{s,j}^{1998}}{L_{s}^{1998}} \frac{\Delta M_{j}^{China}}{L_{j}^{1998}}$$

where i denotes newspaper, j denotes industry and s denotes state; $Circulation$ is weekly circulation, L is the employment and ΔM_{j}^{China} denotes is the change in Chinese imports over 1998 to 2017.

Model Specification

$$\Delta NegRatio_{i,t} = \alpha + \beta \Delta Imports_{i,t}^{China} + \gamma X_{i,1998} + \Delta \varepsilon_{i,t}$$

- $\Delta NegRatio_{i,t} \equiv NegRatio_{i,t} - NegRatio_{i,1998}$ captures the change in media slant against China by newspaper i from 1998 to year i;
- $\Delta Imports_{i,t}^{China}$ denotes the newspaper-level change in Chinese imports;
- $X_{i,1998}$ is a host of circulation-weighted shares of readership attributes: female population, Asian population, population with a bachelor's degree and median income level.

Empirical Results

Baseline

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta NegRatio$	All Sample	All Sample	Trade	Trade	Non-trade	Non-trade
$\Delta Imports$	0.0283***	0.0281***	0.00999***	0.00974***	0.0286***	0.0284***
	(17.80)	(17.28)	(6.13)	(5.80)	(17.89)	(17.32)
Controls	No	Yes	No	Yes	No	Yes
Constant	0.157***	0.119*	0.104***	0.00173	0.161***	0.116*
	(16.38)	(2.10)	(11.60)	(0.23)	(16.68)	(2.03)
N	3140	3140	3140	3140	3140	3140

Robustness Checks with TextBlob Sentiment Analysis

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta NegRatio$	All Sample	All Sample	Trade	Trade	Non-trade	Non-trade
$\Delta Imports$	0.0457***	0.0466***	0.0178***	0.0173***	0.0464***	0.0474***
	(22.18)	(22.21)	(7.62)	(7.19)	(22.42)	(22.48)
Controls	No	Yes	No	Yes	No	Yes
Constant	0.242***	0.304**	0.177***	0.00442	0.244***	0.302**
	(18.32)	(3.09)	(13.38)	(0.43)	(18.50)	(3.07)
N	3140	3140	3140	3140	3140	3140

"TextBlob" is a python package for sentiment analysis that uses simple dictionary-based algorithm.

Conclusions

- Newspapers whose circulation states face greater exposure to Chinese import shocks report more negative news about China.
- The source of negative descriptions more stems from non-trade-related topics rather than trade-related ones.
- The increase of female and Asian population shares restrain the rise of negative trade-related coverage (not shown above).

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