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?

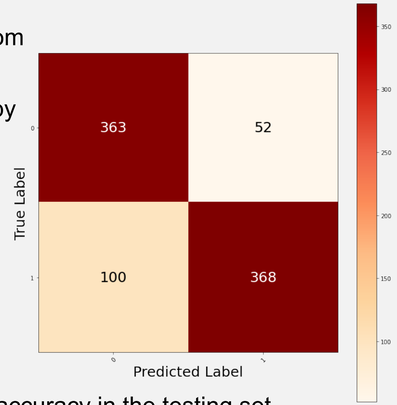
Data

- 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 & 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



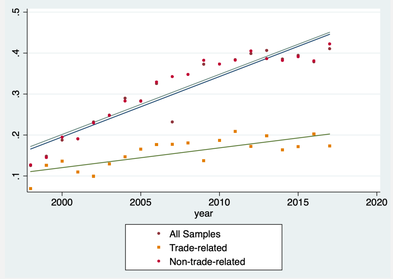
The trained model reaches **82.79%** accuracy in the testing set. Then apply the learning algorithm to selected newspaper articles

Key Variables

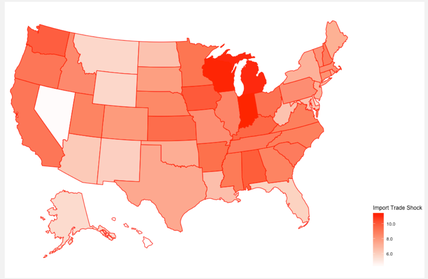
Media Slant

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

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



Annual Average Media Slant in All & Subgroups, 1998-2017. Annual average negative news ratios in all, trade-related and non-trade-related samples exhibit an upward trend.



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^{1998} is the employment in 1998 and ΔM_{j}^{China} denotes is the change in Chinese imports over 1998 to 2017.

Model Specification

To investigate the effect of the exposure to Chinese imports on media slant, we follow the strategy in Autor et al. (2013):

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

- $\Delta NegRatio_{i,t} \equiv NegRatio_{i,t} - NegRatio_{i,1998}$ 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 newspaper-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).

References

Autor, Dorn, and Hanson, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States,"*The American Economic Review*, 2013, pp. 2121–2168.
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