

(Almost) 200 Years of News-Based Economic Sentiment

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ABFER 2024
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Summary

Objective: this paper examines the prediction of economic sentiment from newspapers on economic fundamentals at country and state levels

Sample: 200 million newspaper pages (1 billion news articles) from 13,000 US local newspapers over the 170-year period from 1850 to 2019

Methods: a natural language processing technique of word embeddings

Findings:

- The economic sentiment measure is highly correlated with the existing survey-based economic sentiment measures
- The measure predicts future GDP growth , even after controlling for the past GDP growth at both national and state levels
- The measure predicts GDP growth even with the control of professional GDP forecasts
- The prediction is driven by the future component of the sentiment
- The prediction is through the labor channel rather than the capital channel

Comments

1. Contribution to the literature
2. Economic sentiment and Michigan consumer sentiment survey
3. Sentiment over current and future events
4. Economic sentiment and GDP components
5. Trend of economic sentiment
6. Others

1. Contribution to the literature

This study contributes to the literature that examines the prediction of news-based sentiment on economic fundamentals

The economic sentiment measure over **such a long period** and at a much **higher geographic granularity**:

1. How does the prediction over the 200-year period in this study differ the prediction over a short period (e.g., 35 years from 1980 to 2015, [Shapiro, Sudhof, and Wilson, 2022](#)) ?
 - [Shapiro's](#) sentiment shocks produce positive impulse responses for consumption, output, interest rates, and inflation, while no prediction for industrial production and inflation but significant predictive power for employment, consumption, and services [in this study](#)
 - Conceptually and theoretically, do we expect such difference? Or is it driven by the different measurement or simply the different sampling?

1. Contribution to the literature

The economic sentiment measure over **such a long period** and at a much **higher geographic granularity**:

- Compared with the prediction in a short period, do we expect a weaker (insignificant) or stronger (significant) prediction of economic sentiment in the 200-year period? How does the long period sample advance our understanding of the prediction of economic sentiment?

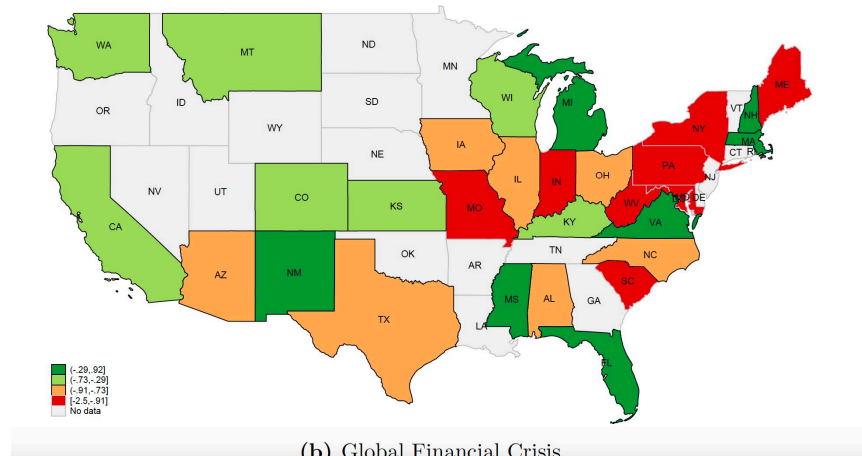
2. State-level economic sentiment also predict state GDP growth

- Can such economic sentiment at the higher geographic granularity provide a different economic implication of the prediction on economic fundamentals? If only about the the state-level prediction, the additional economic intuition might be limited.

1. Contribution to the literature

Some thoughts:

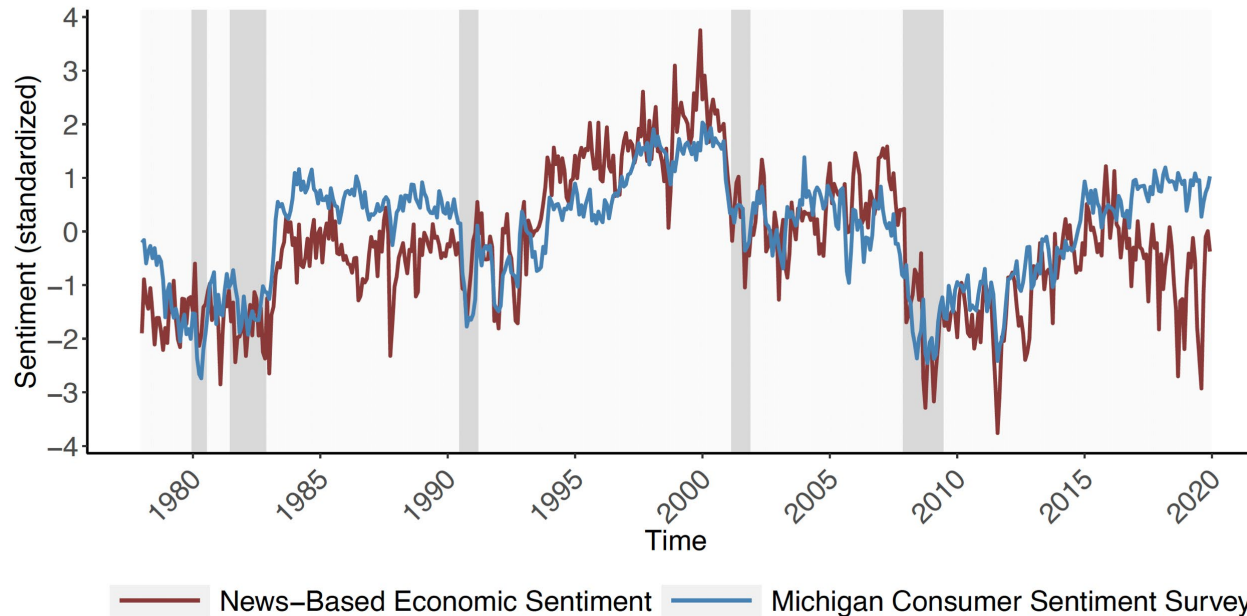
1. The **time-series variation** in the popularity of positive and negative terms, and also in the popularity of economic topics. Importantly, such variation in the prediction of economic fundamentals
2. The **cross-state variation** in the popularity of positive and negative terms, and also in the popularity of economic topics. Importantly, such variation in the prediction of economic fundamentals



2. Economic sentiment and Michigan consumer sentiment survey

To validate their economic sentiment measure, they compare the measure with the Michigan consumer sentiment index:

Figure 5: National Economic Sentiment and Michigan Consumer Survey



- Evidence is quite convincing.
- Is it possible to study the lead-lag relation between the economic sentiment measure and Michigan consumer sentiment index?

2. Economic sentiment and Michigan consumer sentiment survey

1) News-based economic sentiment **leads** consumer sentiment

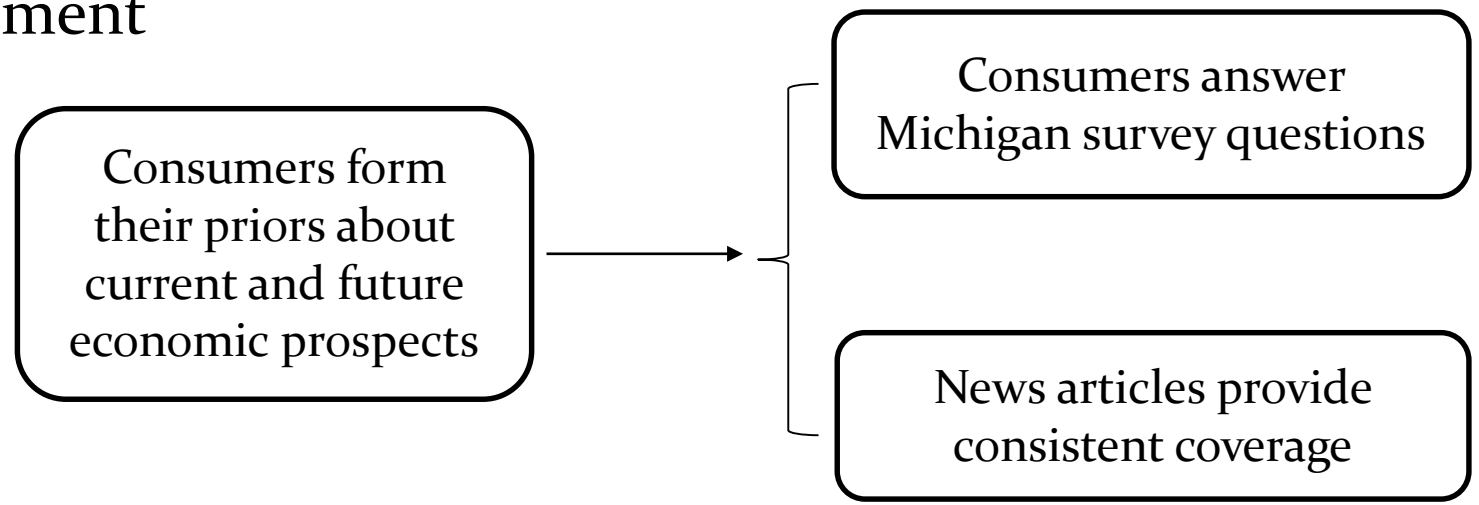


	$\Delta \ln(Consumption_t)$				
	VI	VII	VIII	IX	X
$\Delta \ln(Employment_{t-1})$	*				
$Term\ Spread_{t-1}$	0.068 (1.50)			0.064 (1.40)	0.059 (1.27)
$\Delta Sent_{t-1}$	*	0.135** (2.04)	0.202** (2.55)	0.106 (1.34)	0.173* (1.74)
$\Delta Sent_{t-2}$			0.185** (2.13)		0.164* (1.76)
$\Delta Sent_{t-3}$			0.234** (2.21)		0.216* (1.75)
$\Delta Sent_{t-4}$			0.126 (1.11)		0.115 (1.18)
$\Delta Sent_{t-5}$			0.097 (1.19)		0.100 (1.14)
$\Delta \ln(Consumption_{t-1})$	0.083 (0.52)			0.071 (0.44)	0.039 (0.25)
F statistic ($\Delta Sent$ (t-2 to t-n))			1.581		1.075
P-value ($\Delta Sent$ (t-2 to t-n))			0.179		0.369
Observations	290	290	290	290	290
Adjusted R-squared	0.01	0.01	0.02	0.02	0.02

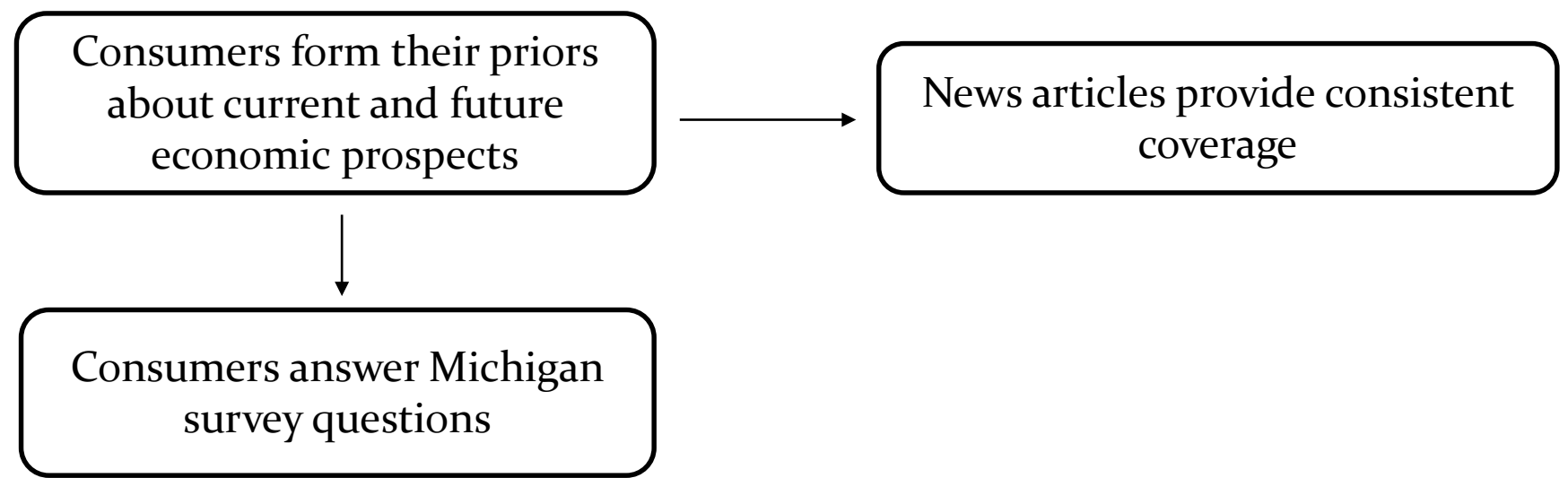
This explanation is also consistent with the finding in Table 9

2. Economic sentiment and Michigan consumer sentiment survey

2) News-based economic sentiment **co-moves with** consumer sentiment



3) News-based economic sentiment **lags behind** consumer sentiment

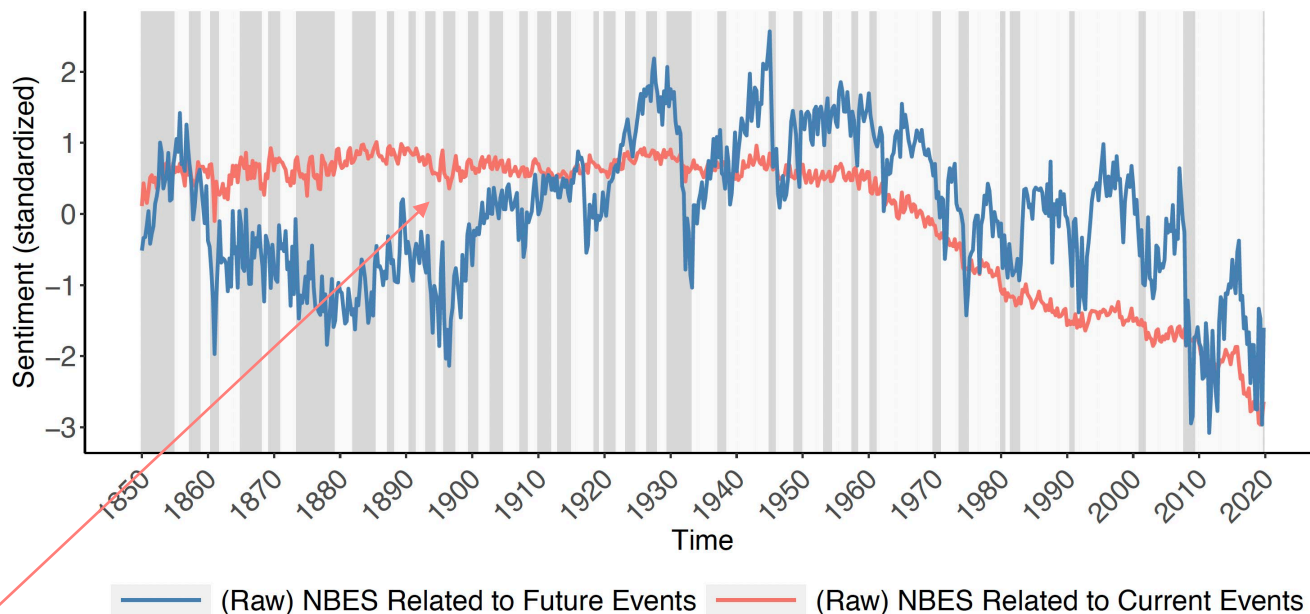


3. Sentiment over current and future events

To better understand the source of predictability of our news-based economic sentiment measure, the authors decompose it into current and future components (**this attempt is quite intuitive**)

- The current economic sentiment is quite stable

Figure 10: National Economic Sentiment about Current and Future



Shouldn't we expect a large variation in the current economic sentiment at least aligned with the current economic fundamentals?

3. Sentiment over current and future events

Additional suggestions:

- More details and examples on how the content of newspaper pages is classified into current or future events
- What is the fraction of content related to current or future events?
- What about short-term future events vs. long-term future events?
- Given the prediction of economic sentiment is driven by the future component, why not use it as the main measurement?

4. Economic sentiment and GDP components

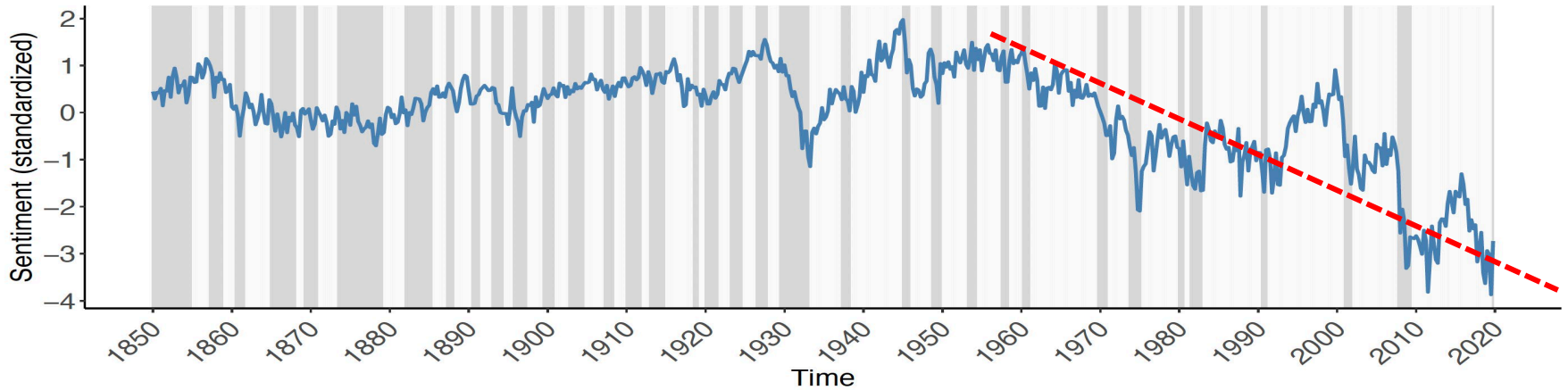
The paper explores the sources of economic predictability by the sentiment through the lens of the inputs to GDP provided by the agents in the economy: capital and labor

$$\Delta \ln(Inv/Prod)_t = \sum_{n=1,2..6} \theta_n \Delta Sent_{t-n} + \gamma \Delta \ln(Inv/Prod)_{t-1} + \beta Term Spread_{t-1} + \epsilon_t.$$

- No evidence that economic sentiment affects GDP growth through the capital channel, while economic sentiment predicts employment and consumption growth.
- Why? Is it due to the fact that journalists collect limited information about investment and production?
- Following the same method as the economic sentiment decomposition, is it possible to create a topic-specific dictionary of words related to investment, production, employment, and consumption?

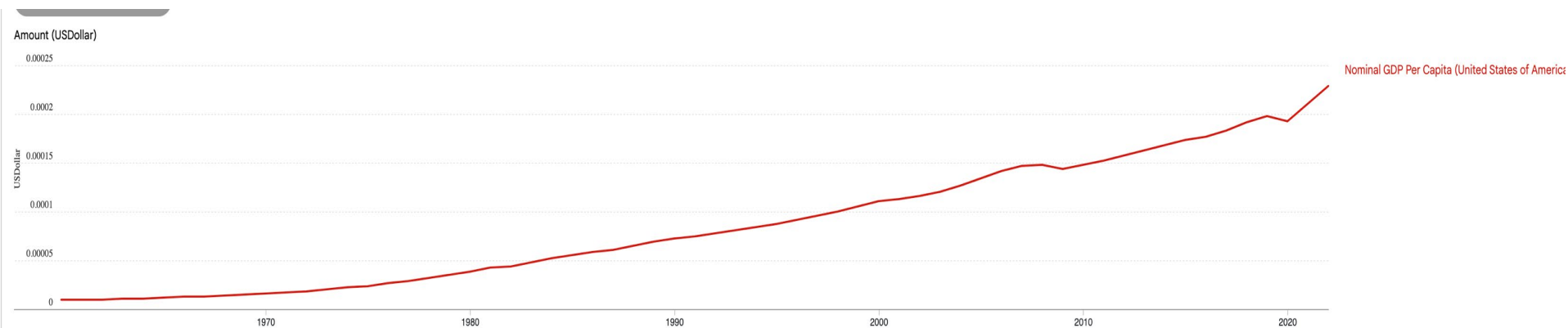
5. Trend of economic sentiment

The measure show a downward trend that begins in the 1970s



What drives this trend?

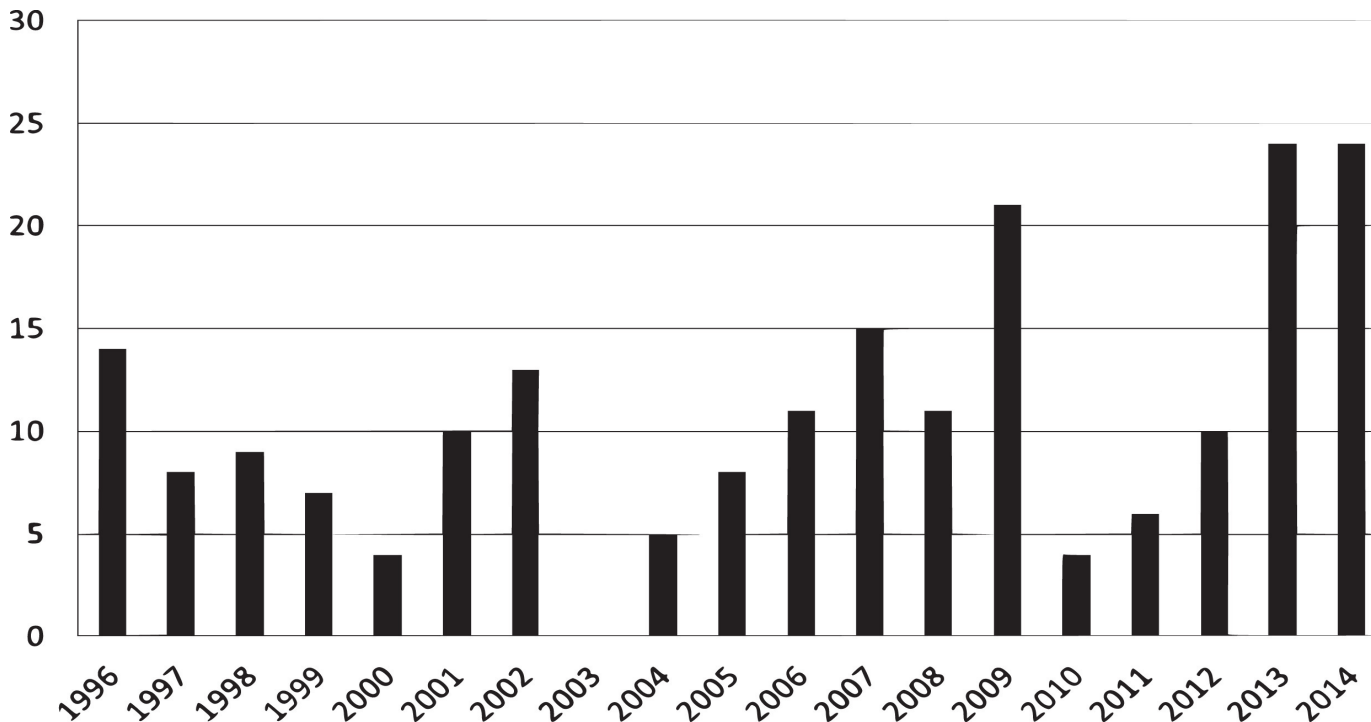
- Is it due to the secular stagnation of economy?



5. Trend of economic sentiment

The measure show a downward trend that begins in the 1970s

- Is it due to the increasing negativity bias in reporting macroeconomic news caused by media competition?
- However, Gao, Lee, and Murphy (2020) shows the substantial local newspaper closures in the past two decades



6.Others

- NLP method vs other methods: to empirically compare the economic sentiment measure with word-count techniques and those based BERT or ChatGPT in a small sample
- Table 1: the incremental R^2 of economic sentiment varies from 2% to 3%, is it this incremental R^2 large enough to justify its predictive power?
- Table 6: the incremental R^2 of experts' GDP forecast is 11%, while the incremental R^2 of economic sentiment proxies is only 4%.
- Writings: “our tests do not establish causality” vs. “economic sentiment influences the decision-making process”(investigate its influence on business cycles.)

Conclusion

Research question: important

Empirical tests: impressive

Main comments:

- The economic implications of long-sample periods
- Consumer sentiment survey
- Current and future events