The Value of News

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This presentation:

Presents a broader research agenda where we investigate the value of news - in its literal form (newspaper content) - for understanding economic fluctuations.

Builds on one article in particular...

1 The Value of News, Larsen and Thorsrud (2015)

... but also presents results from related work:

2 Words are the new numbers: A newsy coincident index of business cycles, Thorsrud (2016)

3 Nowcasting using news topics. Big Data versus big bank, Thorsrud (2016)
Point of departure - Understand/predict economic fluctuations

Not only a question of academic relevance, but obviously also in practice

Norges Bank’s formal mandate(s): stable inflation (and financial stability) by controlling the key policy rate ⇒ need to:

- Understand what drives business cycle fluctuations
- Predict: Inflation targeting is essentially about predicting the future
How?

Traditionally:

Today:

- New technologies allow for alternative models and (unstructured) data sources, like text
A number is a fact, but the media in which it is presented/discussed/opinionated adds to the information.

The fact and the media are both part of the (agent’s) information set when forming expectations $\Rightarrow$ outcomes.

But, putting text into models is somewhat new (to economists) - until recently.
We show

When newspaper content is appropriately classified using a topic model - it adds valuable information for understanding economic fluctuations

In particular, we show that it can be used to:

- Explain and track business cycle fluctuations
- Nowcast GDP growth “better than the best”
- Predict intra-day returns (in-progress)
A short preview

Norwegian quarterly GDP growth and a daily news based business cycle index
Let’s rewind and dig into the details
Why do economic activity fluctuate?

A popular theory: The news driven business cycle view

▪ Key ingredient: Changes in expectations due to new information (news)

▪ Mechanism: Business cycles generated because agents in the economy receive signals about future economic developments, and then face a signal extraction problem - what is news and what is noise?
  ▪ Boom: Correctly predict signal as news
  ▪ Boom and bust: Incorrectly predict signal as news, when it was noise
Problem: Identifying new information

A problem with testing the news driven business cycle view is that the new information (news) is typically not observed.

One solution is to link news to innovations in asset prices, since asset prices should reflect all available information.

But:

- Asset prices change for a lot of reasons, likely containing both news and noise.
- News about what? Productivity, future policy, energy prices, etc.
- The content of the news shock should matter for the structural interpretation.
Our solution:

Use a primary source for news directly - the newspaper!
The newspaper data

Dagens Næringsliv (DN)

- Norway’s biggest business newspaper
- 4th largest irrespective of subject matter
- Founded in 1889, right-wing and neoliberal political stance

Retriever’s “Atekst” database: 25 years of newspaper data (almost 500 000 articles, over 1 billion words - Big Data)
Key hypothesis:

The more a newspaper writes about a topic the more likely it is that this topic reflects something of importance for the economy’s current and future needs and developments.
Three-step approach

1. Decompose the newspaper corpus into topics
2. Construct (tone adjusted) frequency measures of the topics, i.e., time series
3. Use the news time series to explain/predict economic fluctuations
We call this the Funding topic
A topic representation of the whole corpus
Topic time series

Topic: Monetary Policy (72)

Topic: Statup (61)

- Sign of topic frequencies identified by simple word counts of positive/negative words (defined by dictionary)
What is news and what is noise?

Run predictive experiments: Which news topics predict returns (and other macro variables)?

News = those topics that add marginal predictive power
Topics adding marginal predictive power
Why do economic activity fluctuate?

Changes in expectations, due to news, is the key ingredient in the news driven business cycle view.

We construct a weighted average of the news topics with marginal predictive power and identify news shocks as unexpected changes in this index (changes in expectations due to news).
The effects of a news shock

As the theory predicts
What constitutes a news shock?

Average contribution to the aggregate news shocks
Thus far...

Our findings suggest that the topics the newspaper writes about:

- Add marginal predictive power for a range of economic aggregates, including stock returns
- Unexpected news innovations lead to permanent increases in productivity and consumption - just as theory predicts

But:

- Worked on a quarterly aggregation level
- Newspaper data is available at a daily frequency, let’s exploit that!
A daily business cycle index based on news

Use the same news topics as derived earlier

Put them into a non-linear and high dimensional factor model to estimate a daily business cycle index

- Does it track GDP growth?
- Does it forecast GDP growth?
A Newsy Coincident Index

Norwegian quarterly GDP growth and a daily news based business cycle index

Fits the Norwegian business cycle remarkably well
Nowcasting evaluation: News versus SAM

Nowcasting performance is better or equally good as state-of-the-art forecast combination system.
Table: Ordinary least squares estimates - forecast efficiency test. The dependent variable is \( R_{tq} = \Delta GDP_{tq}^{5} - \Delta GDP_{tq}^{1} \). Standard errors (in parenthesis) and test statistics are derived using a residual bootstrap. *, **, *** denote the 10, 5, and 1 percent significance level, respectively.

<table>
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<th>( \alpha )</th>
<th>( \beta^{GDP} )</th>
<th>( \beta^{News} )</th>
<th>( R^2 )</th>
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<td>-0.210</td>
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<td>0.230</td>
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<tr>
<td>(0.110)</td>
<td>(0.133)</td>
<td>(0.145)</td>
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Thus, news reduces noise
Conclusion

A number is a fact, but the media in which it is presented/discussed/opinionated adds to the information.

When newspaper content is appropriately classified using a topic model - it adds valuable information for understanding economic fluctuations.

In particular, our findings suggest that news can be used to:

- Explain and track business cycle fluctuations
- Nowcast GDP growth “better than the best”
- Reduce noise