Reading China:
Predicting Policy Change with Machine Learning

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The views expressed here are solely those of our own and do not represent the views of the American Enterprise Institute, Bates White Economic Consulting, or their other employees.
Policy Change Index (PCI) of China

PCI: the first *quantitative* indicator of China’s policy priorities.

- Runs from 1951 Q1 to 2018 Q3.
- Is a leading indicator.
- Can be updated in the future.
How to predict policy change?

• “Read” the *People's Daily* with machine learning.

• Detect changes in how the newspaper prioritizes issues.

Official newspaper, 1946-2018  
(Artificial) neural networks
Source of predictive power

People's Daily: nerve center of China’s propaganda system

Propaganda often precedes policies.

Detecting propaganda change ≈ Predicting policy change
Detecting propaganda change

Front page

proxy of Priorities (of the newspapers)

proxy of Future policies (of the gov’t)

Imagine an avid reader of the *People’s Daily* who

1. reads recent articles;
2. forms a paradigm about front-page content;
3. tests the paradigm on new articles.
Methodology: overview

A “context-free” method—it does not require an understanding of the Chinese context.
Methodology: modelling

Input
- Texts
- Metadata

Neural networks
- Word embedding
- Recurrent neural networks
- Multilayer perceptron

Output
- Front page?

$x$: each article as an observation.

$f$: a complicated function.

$y = f(x)$
Result: PCI
Result: PCI—with ground truth
Understanding substance of change

<table>
<thead>
<tr>
<th>Front page?</th>
<th>Classified on front page?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>false negatives</td>
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<table>
<thead>
<tr>
<th>Classified on front page?</th>
<th>No</th>
<th>Yes</th>
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<tr>
<td>No</td>
<td>✓</td>
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<tr>
<td>Yes</td>
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</tbody>
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Content of *mis*-classified articles has policy substance.
Potential Applications
App 1: PCI of other countries

Predicting other (ex-)Communist regimes’ policies:

- USSR’s Pravda
- GDR (East Germany)’s Neues Deutschland
- DPRK (North Korea)’s Rodong Sinmun
- Cuba’s Granma
- Vietnam’s Nhân Dân
App 2: Measuring centralization

Measuring degree of centralization in China:

- Replicate the same analysis on regional official newspapers.
- Compare $PCI_{Central}$, $PCI_{Region\ 1}$, $PCI_{Region\ 2}$, ...
- Conforming to $PCI_{Central}$ $\rightarrow$ Toeing the party line
App 3: Measuring media bias

Measuring media bias in the US:

• Replicate the same analysis on US newspapers.
• Compare \(PCI_{WaPo},\ PCI_{NYT},\ PCI_{WSJ},\ldots\)
• Divergence among \(PCI\)'s \(\rightarrow\) Polarization in media
Takeaways

• The first index to predict China’s “next big things.”
• A new way to uncover hidden patterns from trivial labels.
• A wide range of potential applications.
Interested in DIY?

- Website: www.policychangeindex.com
- Research paper: www.policychangeindex.com/Reading_China.pdf
- Source code: www.github.com/open-source-economics/PCI

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Questions?