Reading China:

Predicting Policy Change with Machine Learning

Julian TszKin Chan   Weifeng Zhong

(Bates White)   (AEI)

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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

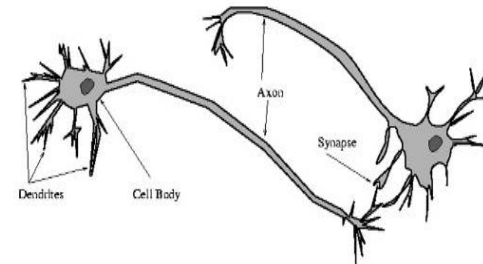PCI: the first *quantitative* indicator of China's policy priorities.

- 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.

Official newspaper, 1946-2018   (Artificial) neural networks

- Detect changes in how the newspaper prioritizes issues.

Source of predictive power

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

+

Propaganda often precedes policies.

↓

Detecting propaganda change ≈ Predicting policy change
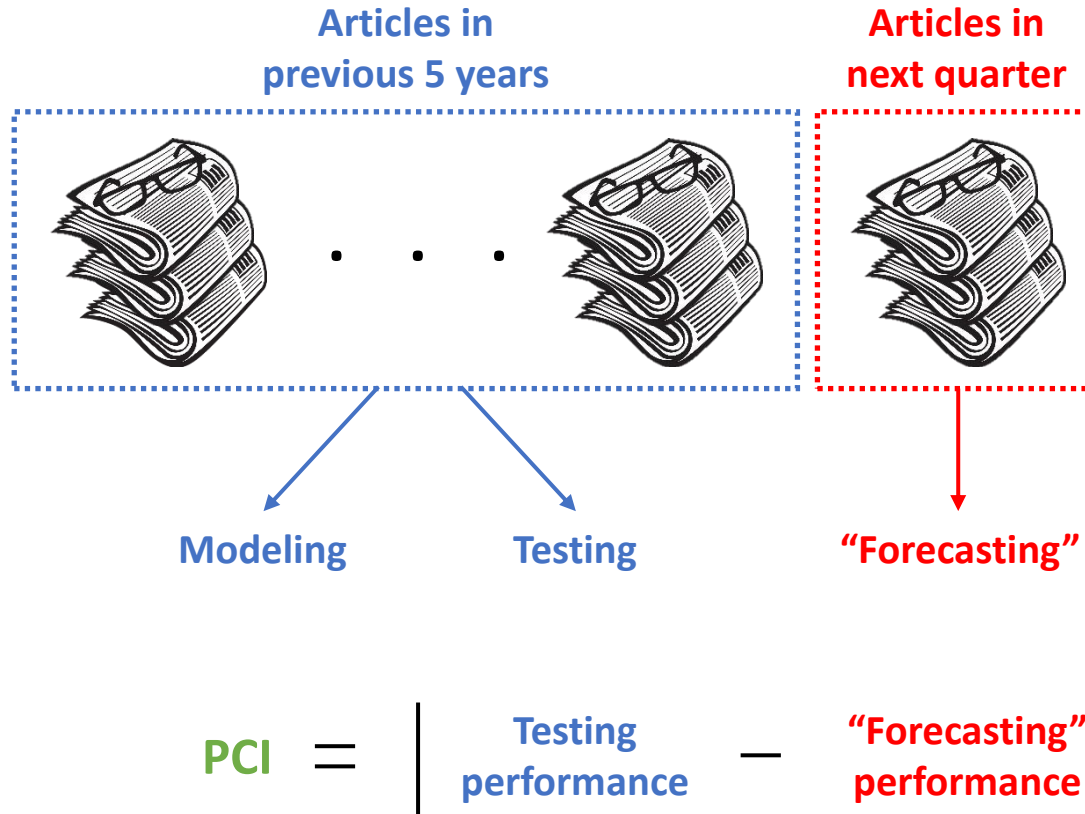
Detecting propaganda change

Front page

$\xrightarrow{proxy\ of}$ Priorities (of the newspapers)

$\xrightarrow{proxy\ of}$ 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

Articles in previous 5 years   Articles in next quarter

Modeling   Testing   "Forecasting"

$$\text{PCI} = \left| \text{Testing performance} - \text{"Forecasting" performance} \right|$$

*A "context-free" method—it does **not** require an understanding of the Chinese context.*

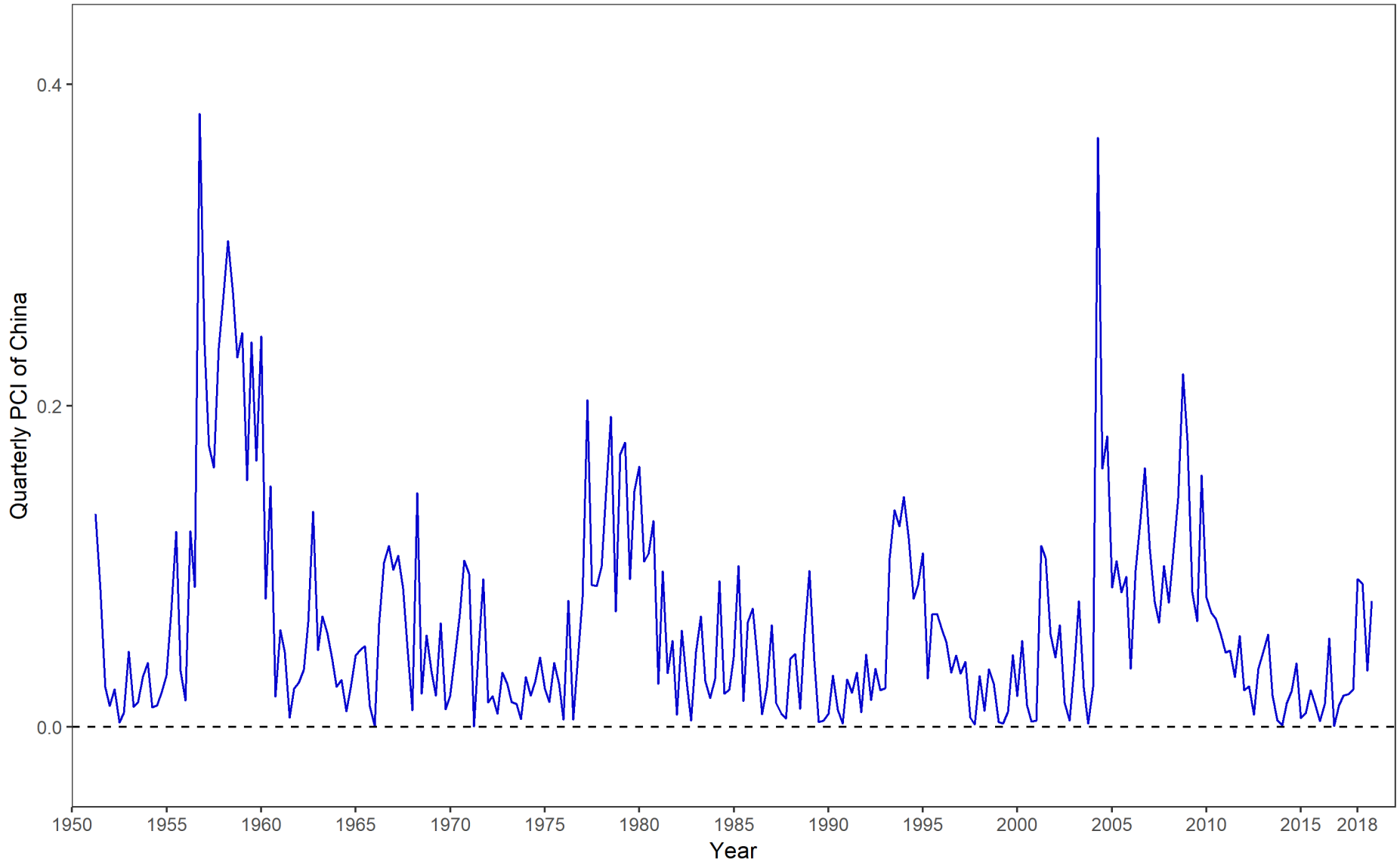# Methodology: modelling

Input

Neural networks

Output
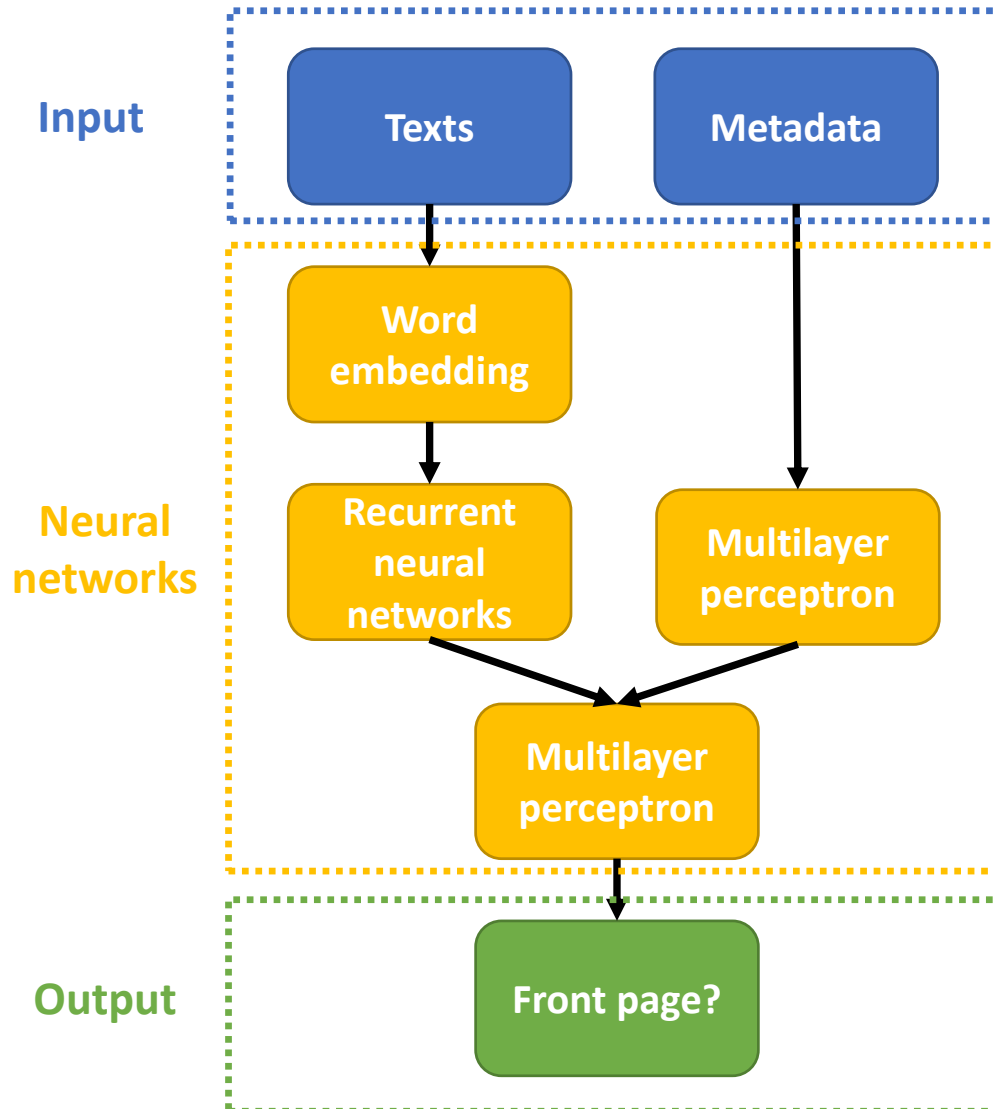
x : each article as an observation.

f : a complicated function.

$y = f(x)$

Result: PCI

Result: PCI—with ground truth

1953 first Five-Year Plan

1958 Great Leap Forward

1966 Cultural Revolution

1976 Hua takes over

1978 reform program starts

1989 Tiananmen Sq. protests

1993 reform speed-up

2005 reform slow-down

2008 stimulus package

2013 revive Maoism

2013 renew reform program

2015 supply-side structural reform

Quarterly PCI of China

Year
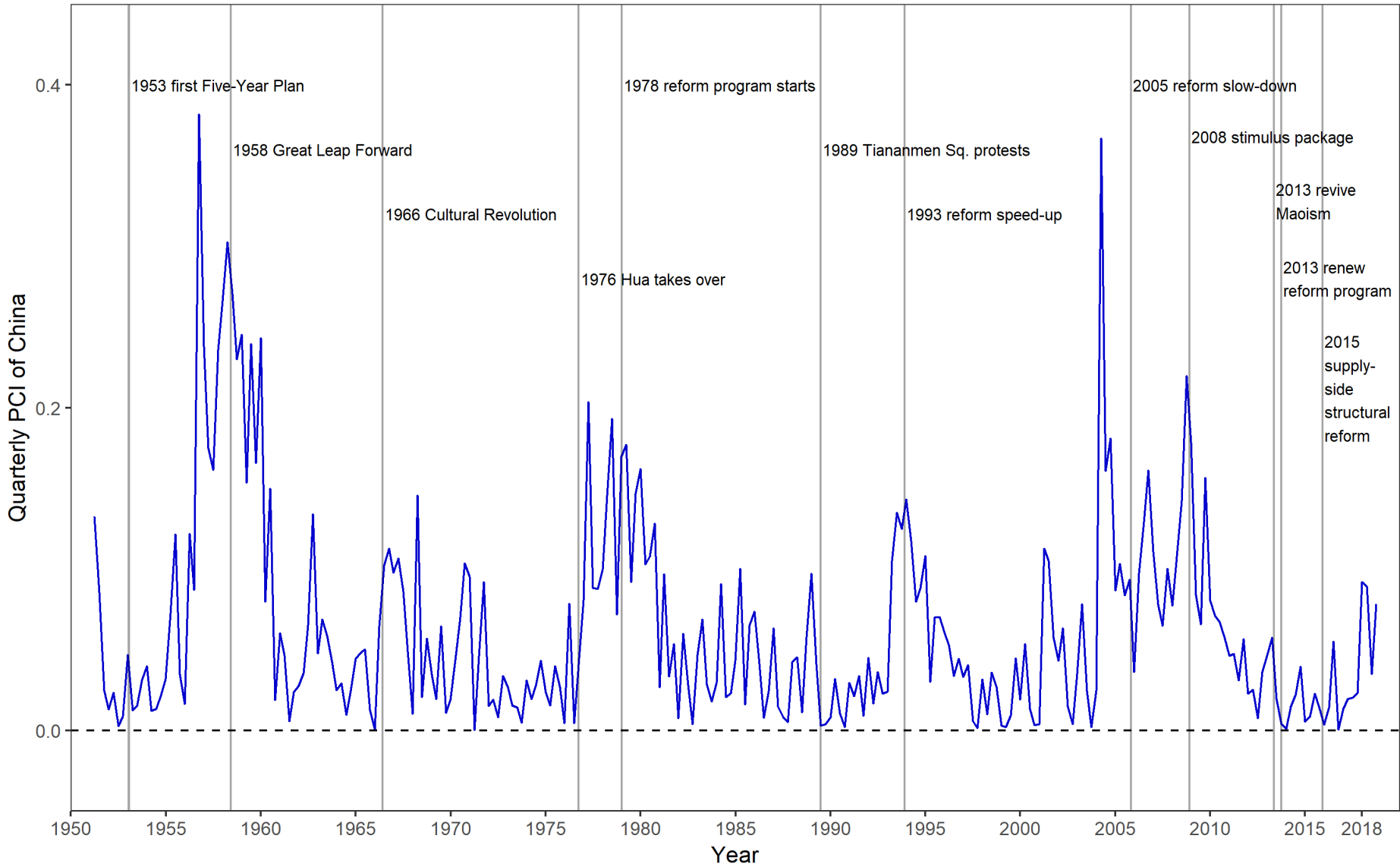
Understanding substance of change

		Classified on front page?	
		No	Yes
Front page?	No	√	false positives
	Yes	false negatives	√

- 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 $PCI_{Central}$ $\dashrightarrow$ 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"$_{WSJ}$, ...

- Divergence among "PCI"s $\cdots\rightarrow$ Polarization in media

App 4: Predicting vote change

Predicting vote change in legislation:

- *People's Daily* articles ⋯→ **Legislators' public statements**

- Page numbers of articles ⋯→ **Legislators' names**

- What if Sen. *A*'s statement is mistaken as Sen. *B*'s?

Source of predictive power:

- Political necessity to justify vote changes by making different statements *in advance*.

App 5: Predicting ideology change

Predicting changes in judges' ideological leaning:

- *People's Daily* articles ···➤ **Judges' judicial opinions**

- Page numbers of articles ···➤ **Judges' names**

- What if Judge *C*'s opinion is mistaken as Judge *D*'s?

Source of predictive power:

- Changes in ideological leaning tend to be gradual yet long-lasting.

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

Contact us:

- Julian TszKin Chan: ctszkin@gmail.com

- Weifeng Zhong: weifeng@weifengzhong.com

Questions?