

Reading China: Predicting Policy Change with Machine Learning

Julian TszKin Chan (Bates White Economic Consulting)

Weifeng Zhong (Mercatus Center at George Mason University)

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The views expressed here are the authors' and do not represent the views of Bates White, the Mercatus Center, or their other employees.

习近平：新时代要有新气象 更要有新作为

中国青年报

人民日报
RENMIN RIBAO

习近平应约同美国总统特朗普通电话
特别赞赏中共十九大胜利闭幕，祝贺习近平再次当选中共中央总书记



习近平同志主持会议并作重要讲话
习近平任中共中央总书记
党的十九届一中全会产生中央领导机构



会议并作重要讲话
中央政治局常委主席



证券时报

中国共产党第十九

State-run media tell a lot — about the state!

- Example: the *People's Daily*.
 - Official newspaper of the Communist Party of China;
 - “Throat and tongue” of the party;
 - Toed by other media in the country;
 - ...
 - The *Pravda* of China.

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 - The *Pravda* of China.
- The primary mission is *not* to report news, ...
- ... but to propagate official viewpoints and signal policy intention.

Machine learning can help decipher propaganda.

- Deciphering propaganda content has been complicated due to
 - Opaque system;
 - Manipulated data;
 - Difficulty in validation; ...
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- Machine learning — with some twists — can help!
- The method has a wide applicability in other contexts.

Policy Change Index (PCI) project

- First use case: China.
- Data: full text of the *People's Daily*, 1946-present.
- Use neural network models to detect changes in its priorities.
- Objective: *predict* policy change based *solely* on the newspaper.
- Output: the **Policy Change Index (PCI)** for China



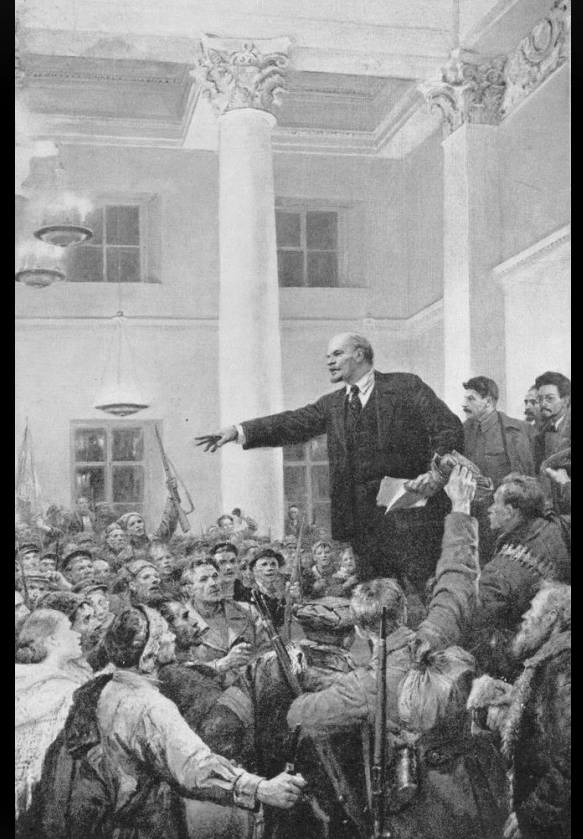
People's Daily, 1946-present

Source of predictive power

Constructing the PCI

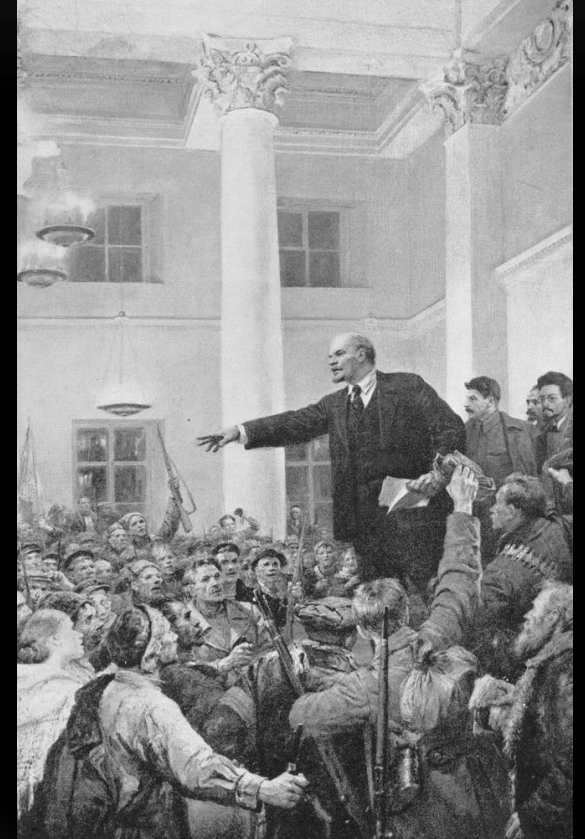
Results

Source of predictive power



Source of predictive power

- The Soviet tradition:
 - “[T]he whole task of the Communists is to be able to **convince** the backward elements.” (Lenin, 1920)
 - It is a fundamental necessity “to transform the press from an organ which primarily reports the political news of the day into a serious organ for the **economic education** of the mass of the population.” (Lenin, in early USSR years)
 - Even the film was considered “a great and invaluable force... aiding the working class and its Party to **educate** the toilers in the spirit of socialism.” (Stalin, 1935)



Source of predictive power

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Source of predictive power

- The Soviet tradition, in China:
 - “Newspapers **must** be run by politicians.” (Mao, 1957)
 - ...
 - The media should “uphold the **correct orientation** of public opinion in all aspects and at all stages.” (Xi, 2016)



Source of predictive power

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

+

Propaganda often precedes policies.

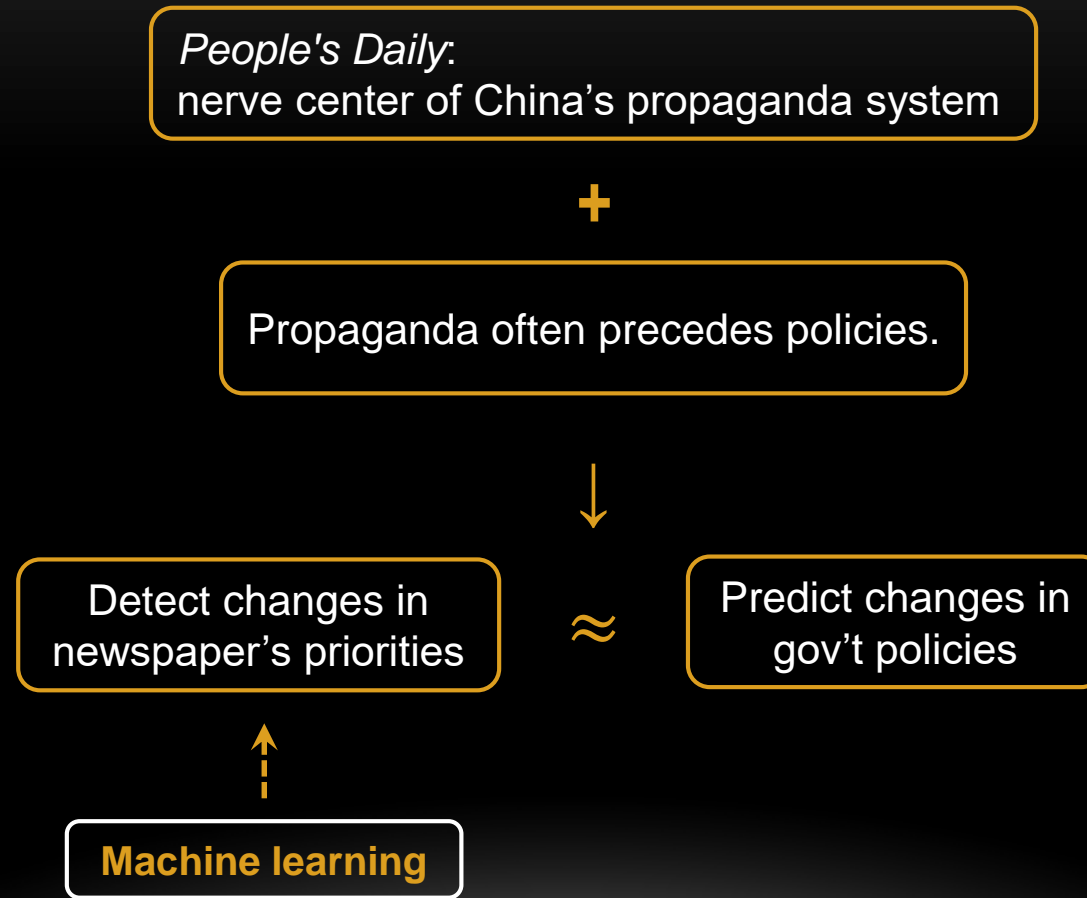


Detect changes in
newspaper's priorities

≈

Predict changes in
gov't policies

Source of predictive power



Source of predictive power

Constructing the PCI

Results

Start with something *seemingly* trivial

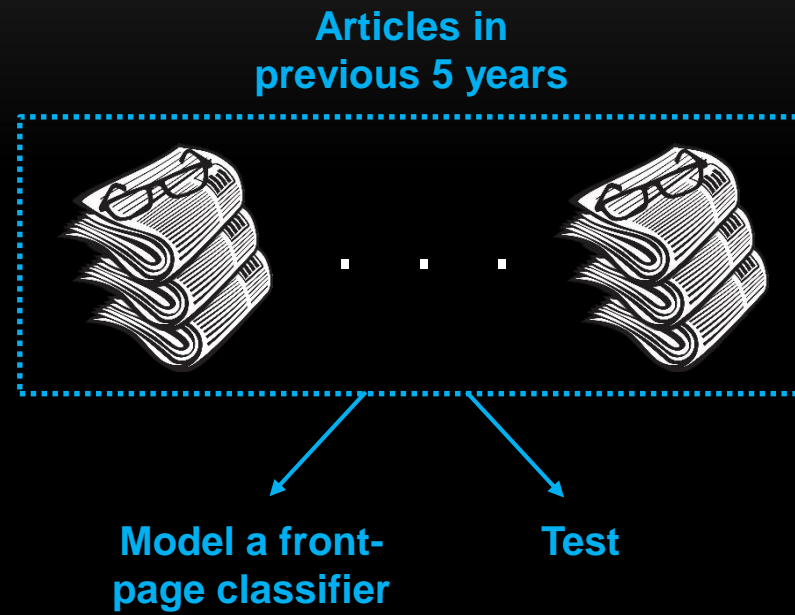
Build an algorithm that classifies **front-page** articles
("reverse-engineering" the editor's mind).

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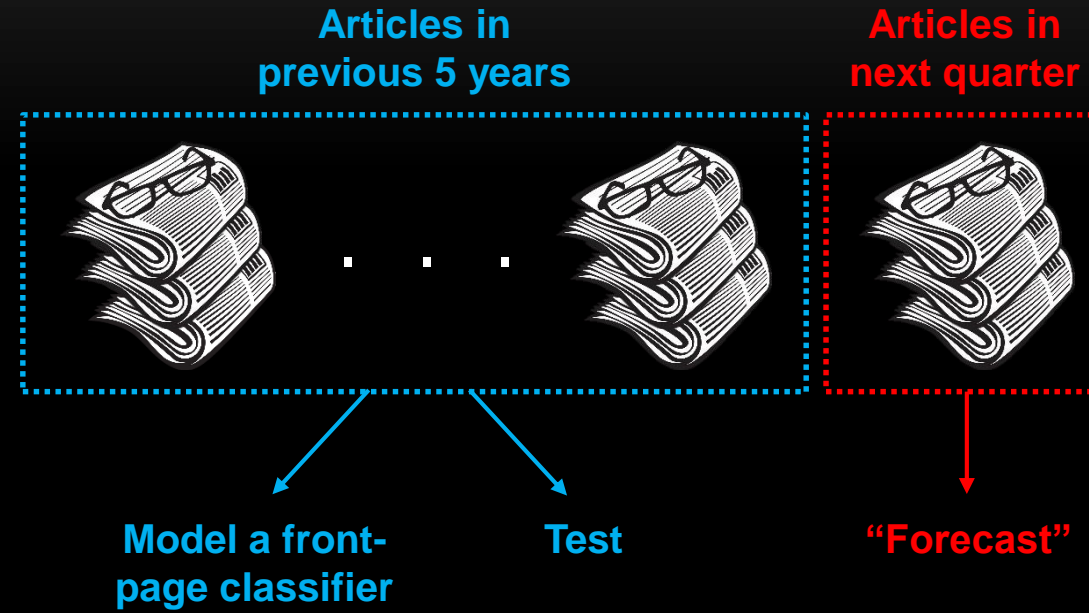
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But what's the point?

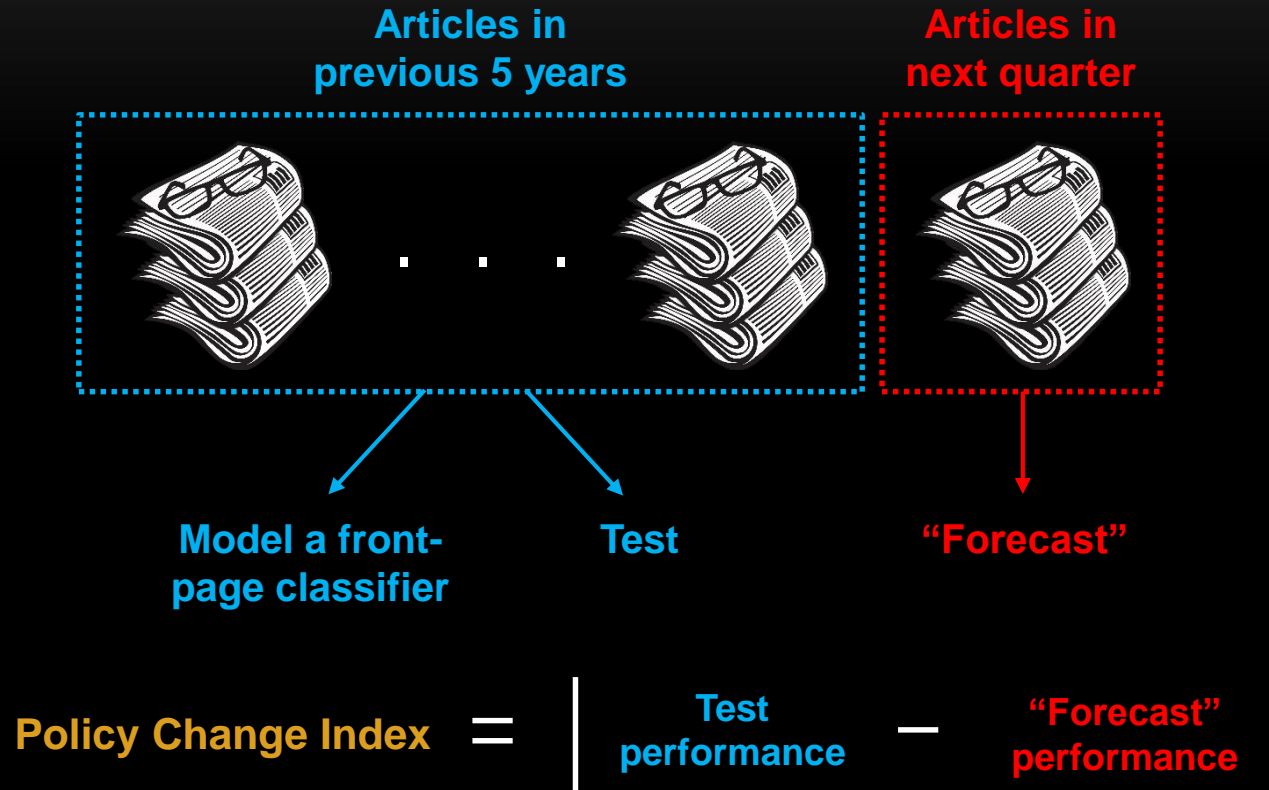
The framework



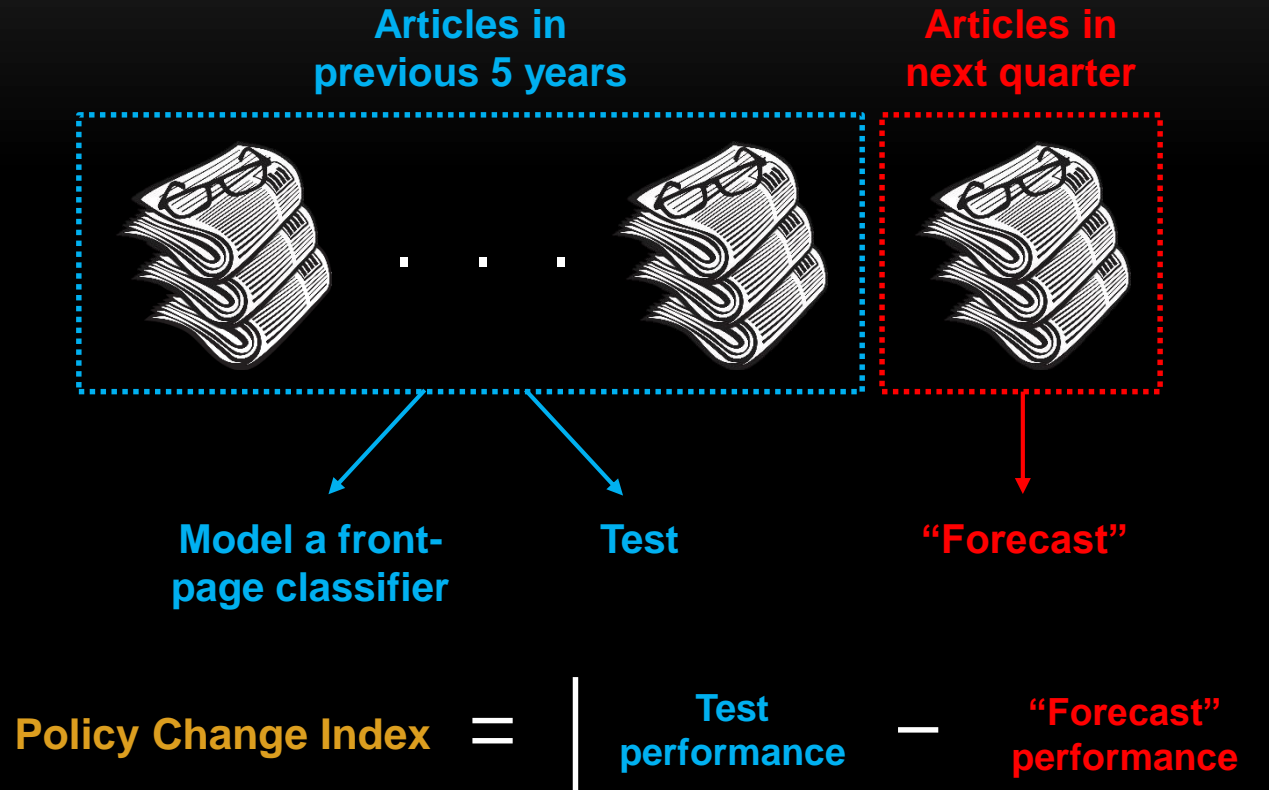
The framework



The framework



The framework



PCI $\gg 0 \Rightarrow$ Change in the newspaper’s priorities

Data structure

sample_df

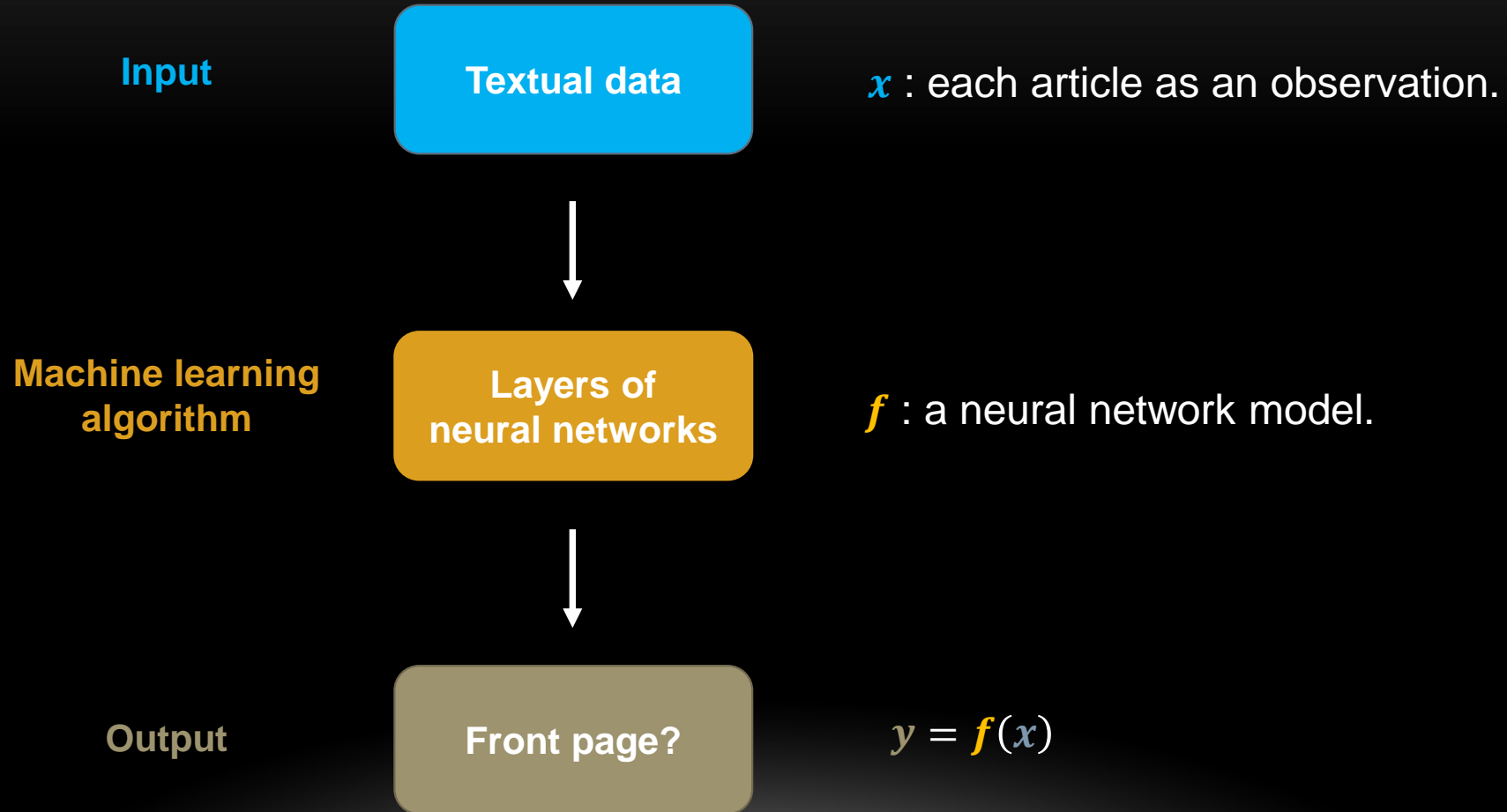
id	date	page		title	body
20181202525	2018-12-31 00:00:00	1.0	今年粮食总产量13158亿斤 农业农村发展取得新成绩，乡村振兴开局良好	本报北京12月30日电 （记者高云才、郁静娴）记者从30日召开的全国农业农村厅局长会议获...	
20181202526	2018-12-31 00:00:00	1.0	新时代改革再出发的重要里程碑 ——写在党的十八届三中全会召开五周年之际	本报评论员 改革开放40年来，我们党带领人民绘就了一幅波澜壮阔、气势恢宏的历史画卷。其...	
20181202527	2018-12-31 00:00:00	1.0	改革引领中国经济新航向（在习近平新时代中国特色社会主义思想指引下——新时代新作为新篇章） ...	本报记者 许志峰 吴秋余 王 珂 林丽鹏 巨轮向前，离不开航标指引方向。 1978年...	
20181202528	2018-12-31 00:00:00	1.0	产量连续六年超1200亿斤，实现“十五连丰” 黑龙江 粮食再丰收，粮仓更稳固	本报哈尔滨12月30日电 （记者方圆）此刻的黑土地，正在冬眠蓄力。今年黑龙江粮食又是一...	
20181202529	2018-12-31 00:00:00	1.0	伟大的变革——庆祝改革开放40周年大型展览 现场观众达223万人次 展览将持续到2019年...	据新华社北京12月30日电 “伟大的变革——庆祝改革开放40周年大型展览”自11月13日...	
20181202530	2018-12-31 00:00:00	1.0	航线不停、景区不休、生意不闲、游客不断 新疆 旅游无淡季，今冬更红火	本报乌鲁木齐12月30日电 （记者杨明方、阿尔达克）一年之中半年是降雪期，冬季雪深超过3...	
20181202531	2018-12-31 00:00:00	1.0		图片报道 徜徉知识海洋，感受阅读乐趣。十二月三十日是元旦小长假的第一天，全国各地的特色文化活动丰富...	
20181202532	2018-12-31 00:00:00	2.0	创造新的更大奇迹 ——党的十八届三中全会召开五周年述评	“全面发力、多点突破、蹄疾步稳、纵深推进”——庆祝改革开放40周年大会上，习近平总书记用...	
20181202534	2018-12-31 00:00:00	3.0	开启中国特色大国外交新征程（2018年度国际特别报道） ——国务委员兼外交部长王毅回顾20...	本报记者 赵嘉鸣 管克江 杜尚泽 焦 翔 王海林 国务委员兼外交部长王毅12月29日接...	
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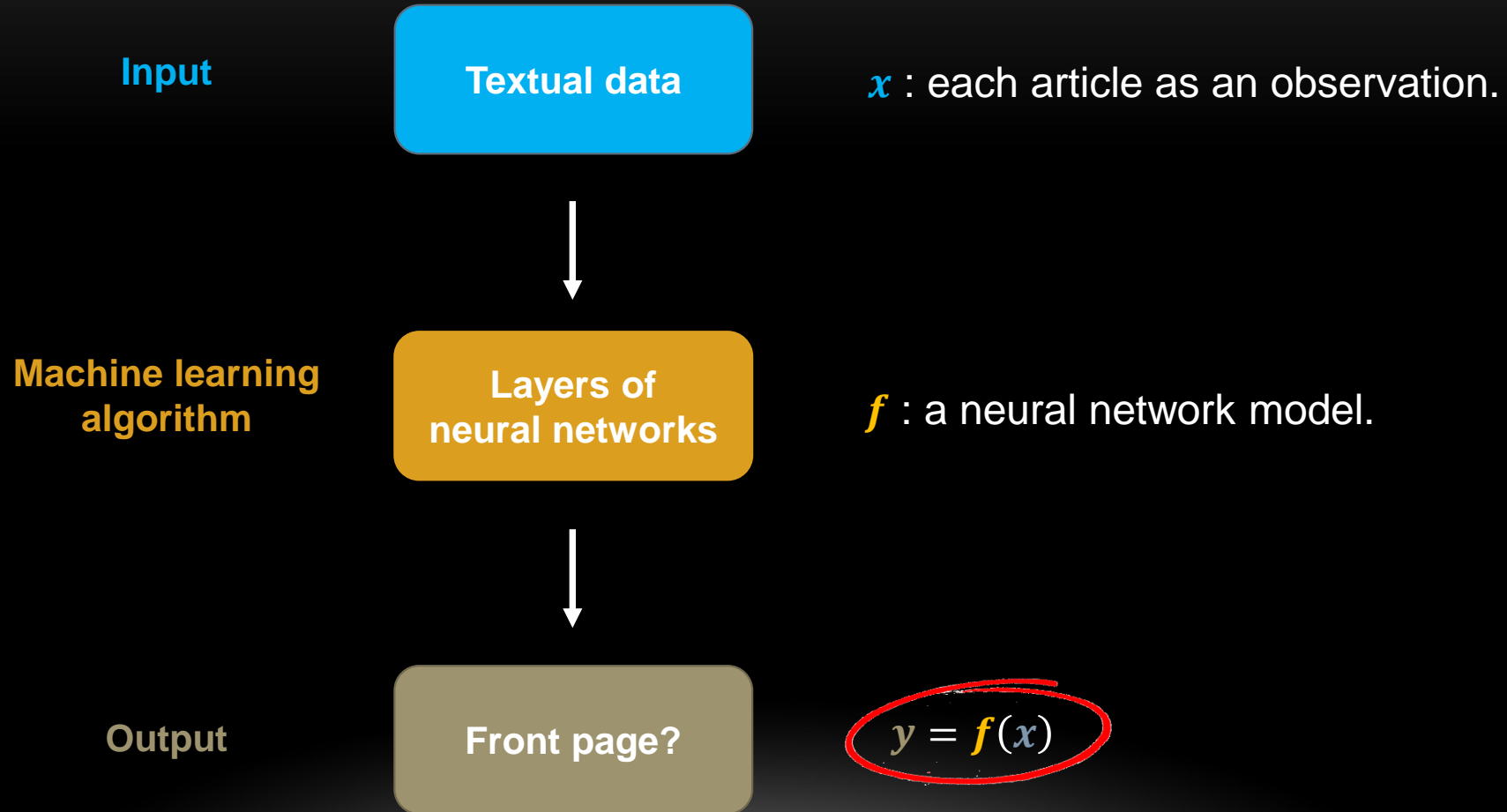
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Modeling



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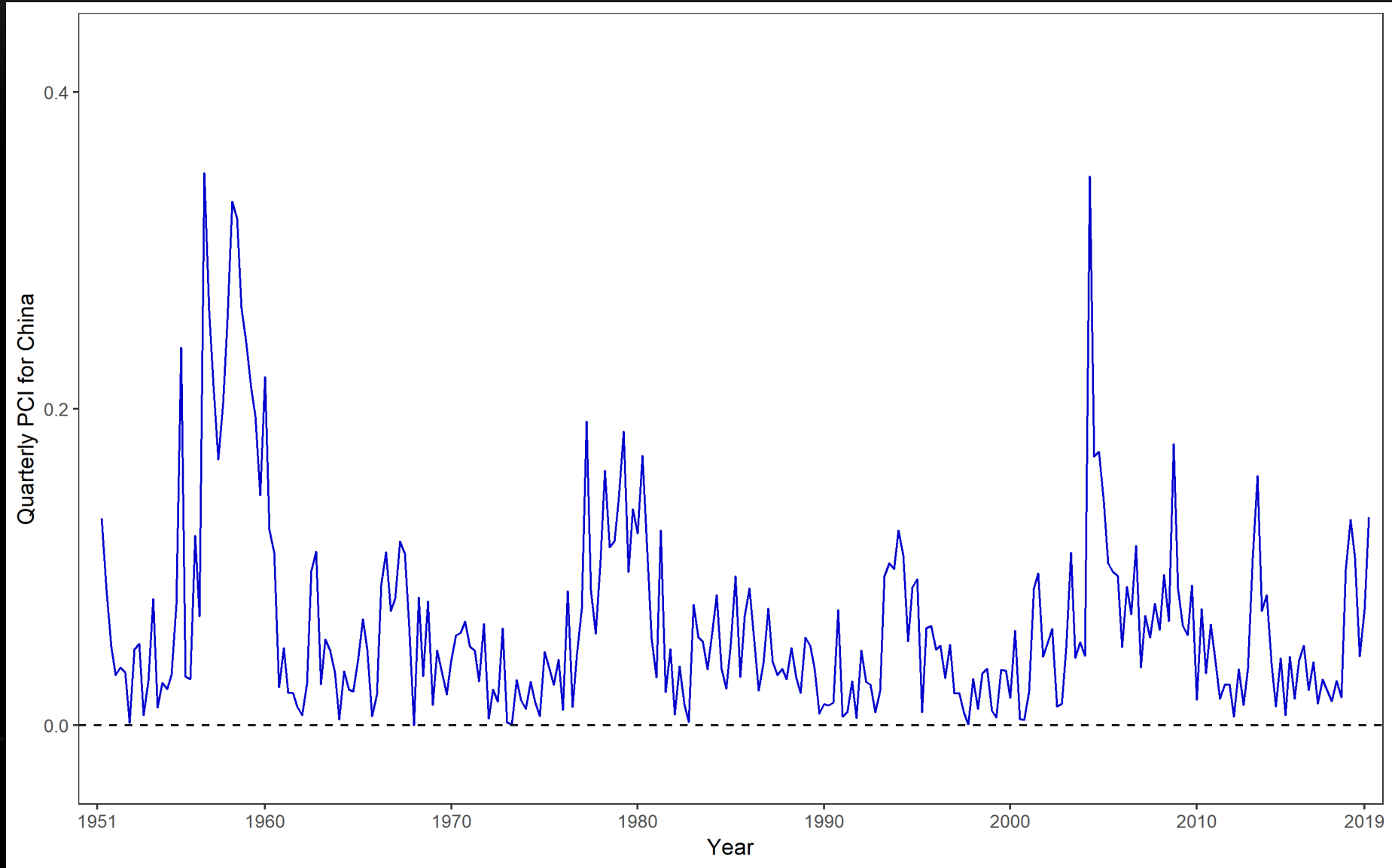


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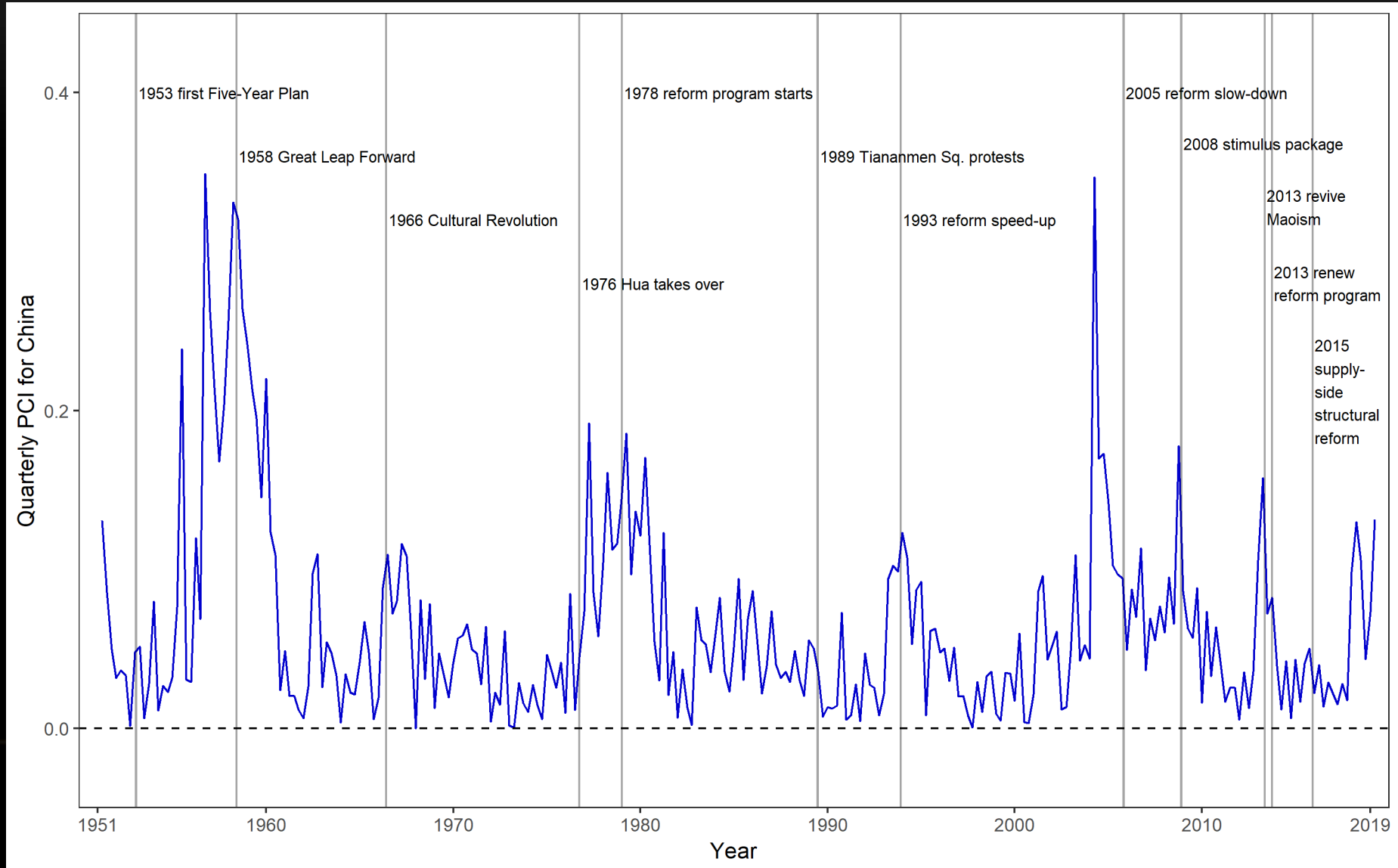
Constructing the PCI

Results

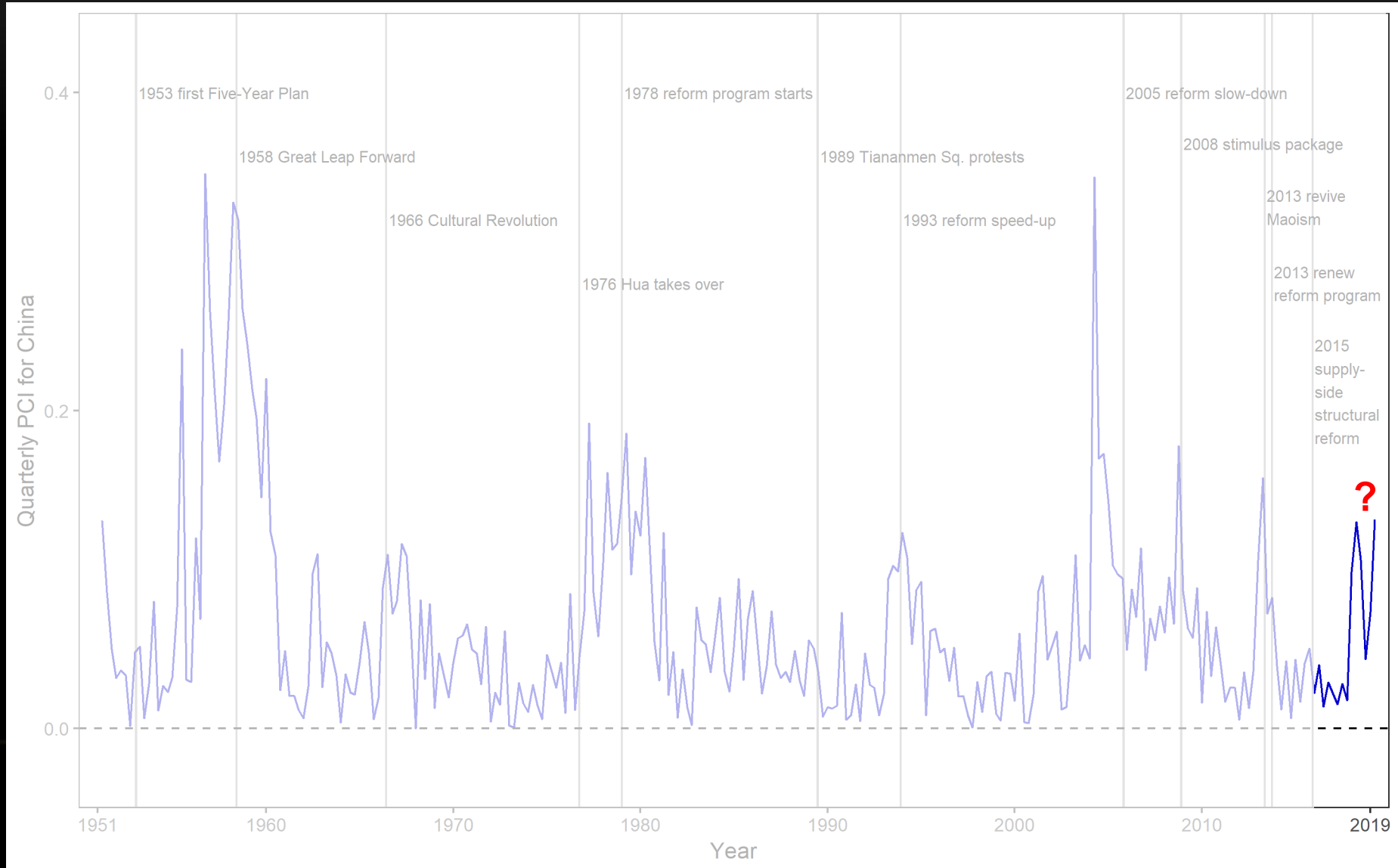
PCI for China



PCI for China — with ground truth



PCI for China — going forward

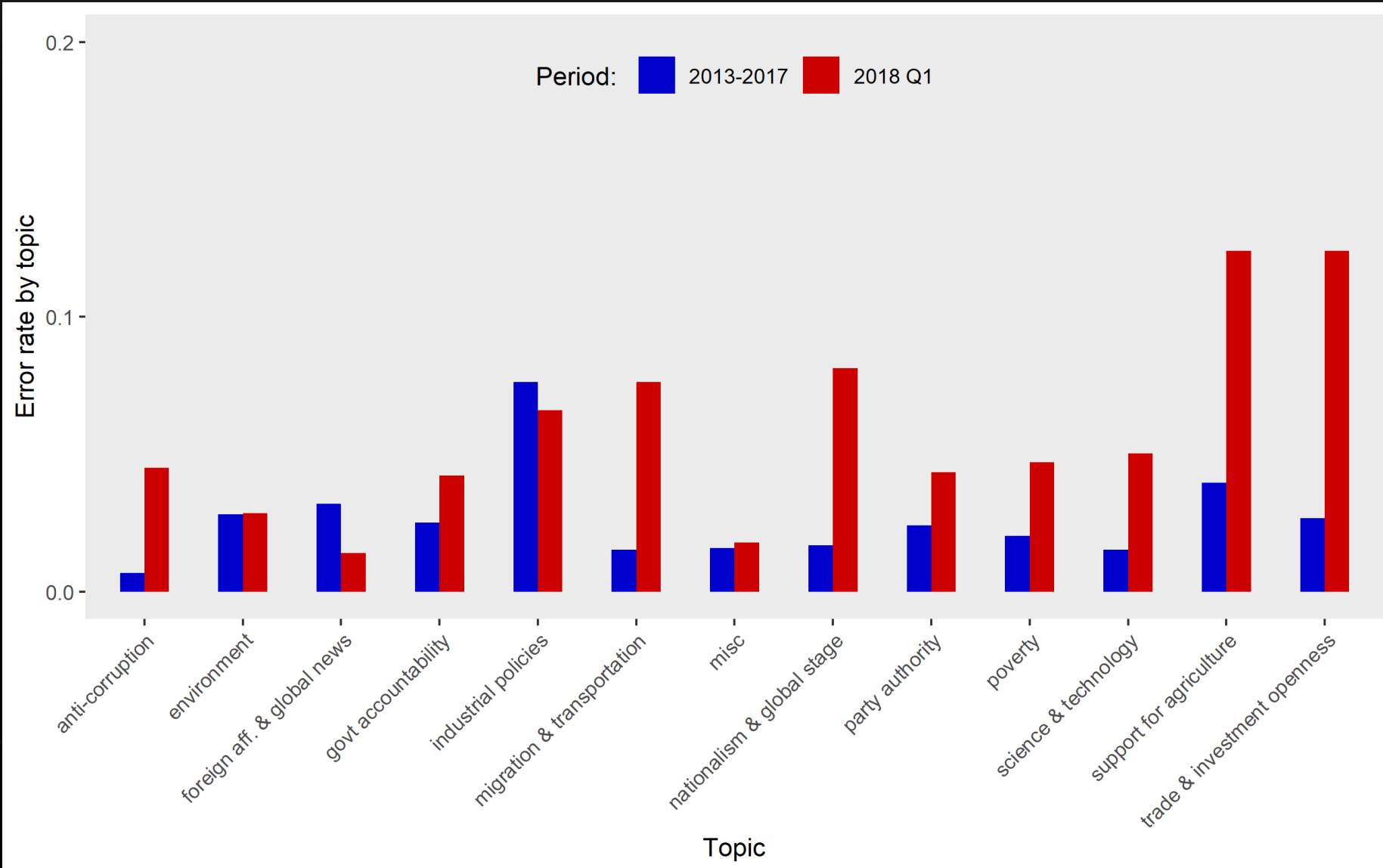


Understanding change

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

Content of *mis*-classified articles has policy substance.

Understanding change — the 2018 Q1 uptick



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⇒ Curb your enthusiasm for the US-China trade talks!

Takeaways: many applications

Generally

- PCI for other (ex-)Communist regimes, using:
 - Soviet Union's *Pravda*
 - East Germany's *Neues Deutschland*
 - Cuba's *Granma*
 - North Korea's *Rodong Sinmun*
 - Vietnam's *Nhân Dân*
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 - ...
- } Work in progress

More generally

- PCI for other countries:
 - The state may not control the media.
 - But politicians/policymakers still talk!

Even more generally

- Applicability well beyond predicting policies.
- Omitted here. See our [research paper](#).

Interested in DIY?

- Website: policychangeindex.org
- Newsletter: mercatus.org/PCInewsletter
- Repository: github.com/PSLmodels/PCI
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Questions?
