### Knowledge is Power: A Field Experiment in the Chinese and US Stock Markets

Sonia Man-Lai Wong, Yuan Xue, Bohui Zhang, and Xiaofeng Zhao

ABFER 9th Annual Conference 23-26 May, 2022

## Motivation

• Literature:

 Financial knowledge affects individuals' financial decisionmaking

Financial decisions affect asset prices

• No one knows the **effect of financial knowledge on asset prices** 



- Research questions:
  - 1. Does the **provision of financial knowledge** via investor education affect **stock price efficiency**?
  - 2. If yes, does such a pricing impact influence companies' **reporting behaviors**?

## This study

### • A field experiment

oprovides investors with a concrete type of financial knowledge:
 accounting accruals

otest whether this treatment reduces accrual mispricing

### • Accruals

 Firms' estimates of future benefits and obligations
 The difference between a firm's reported earnings and its underlying cash flows



### Do we really understand accruals?

Total reported earnings (\$)



Companies A and B have the same level of reported earnings in the current year.



Which company is more likely to have higher earnings in the next year?

### Do we really understand accruals?

- Accruals have lower earnings persistence than cash flows.
  - Measurement errors in accruals (e.g., inventories are written down if they are obsolete).
  - oGreater errors when management faithfulness is low and the valuation of assets and transactions is highly subjective (Richardson et al., 2005; Chan et al., 2006).



• Many investors do not understand the low persistence of accruals relative to cash flows and consequently **fixate on the reported earnings** (Sloan, 1996; Xie, 2001).

## Accrual mispricing



If A and B are priced based on the reported earnings (\$100), B is essentially **overpriced** relative to A

There is a negative relationship between the level of accruals and future stock returns--accrual mispricing.

- One of the most robust anomalies documented to date.
- Traditional explanations such as risk and arbitrage costs are only partial.

Can educating investors about the implications and measurement of accruals mitigate accrual mispricing?

### Experimental design: groups and sample



All non-financial stocks that were publicly listed in China and the U.S. by the end of 2018.

Panel A: Chinese markets									
Treatment groups	S	С	T <sub>1</sub>	T <sub>2</sub>	Total				
Randomly assign the sample into four groups	577	577	577	577	2,308				
Panel B: US markets									
Treatment groups	S	С	T <sub>1</sub>	T <sub>2</sub>	Total				
Randomly assign the sample into four groups	636	637	637	637	2,547				

Experimental design: educational materials

• Earnings news

oA reminder of earnings announcement date (i.e., to broadcast the earnings announcement event)

- Conceptual knowledge obasic concept of accruals and the pricing implications of accruals for the firm's future performance
- Methodological knowledge othe methods used for estimating accruals, including models, key variables, and data sources
- Post the knowledge on a stock's tag page of social media
  OChina: Weibo, Xueqiu, and Guba EastMoney
  OUS: Twitter and StockTwits

### Experimental design: social media

# • A stock's tag page

oA "cashtag" with a stock ticker symbol that allows users to link their message to a particular company

oe.g., \$AAPL is linked to the page of Apple Inc.



### Experimental design: website

- We established a website, <u>http://www.financial-education-hub.com</u>
- Created a webpage for each stock under the domain.
  The full contents of conceptual knowledge (type 1 link page).
  The full contents of methodological knowledge (type 2 link page)
- We wrote a short essay by rephrasing the full contents of the two sets of accruals knowledge and included **hyperlinks** that link to the full page of accrual information

Experimental design: website

- Stocks in group T<sub>2</sub> ≻e.g., Coca-Cola (COKE)
  - type 1 page: <u>http://www.financial-education-hub.com/1/COKE</u>.
  - type 2 page: <u>http://www.financial-education-hub.com/2/COKE</u>.
  - ▶e.g., Shanghai New World Co. (新世界) (600628)
    - type 1 page: <u>http://www.financial-education-hub.com/1/600628</u>.
    - type 2 page: <u>http://www.financial-education-hub.com/2/600628</u>.
- Stocks in group T1
  - ≻e.g., Google (GOOG)
    - only type 1 page: <u>http://www.financial-education-hub.com/1/GOOG</u>.
  - ▶e.g., Jiangsu Hengrui Pharmaceuticals Co Ltd (恒瑞医药) (600276)
    - only type 1 page: <u>http://www.financial-education-hub.com/1/600276</u>.
- Stocks in group C and S
  ➢No linked pages

### Samples of initial posts

Groups	Sample
С	\$Ticker will announce its 2019 annual performance on March 15, 2020.
T <sub>1</sub>	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please note that a company may report high earnings but actually have low cash flows. This difference is called " accruals", which often refers to revenues or expenses that do not involve cash flows, but are included in the firm's current earnings. Accruals are estimated by the company, which may involve estimation errors. Some companies may even use accruals to manipulate earnings. As a result, high accruals may not result in high subsequent cash flows. Investors focusing on bottom-line earnings as reported by the company, but ignoring the quality of the earnings, may misunderstand the company's true performance. For example, if two companies report the same level of earnings, the one with high accruals would be more likely to feature lower profitability in the following year. For more knowledge on the nature and effects of accruals, please see: <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a> .
T <sub>2</sub>	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please note that a company may report high earnings but actually have low cash flows. This difference is called " accruals", which often refers to revenues or expenses that do not involve cash flows, but are included in the current earnings. Accruals are estimated by the company, which may involve estimation errors. Some companies may even use accruals to manipulate earnings. As a result, high accruals may not result in high subsequent cash flows. Investors focusing on bottom-line earnings as reported by the company, but ignoring the quality of the earnings, may thus misunderstand the company's true performance. For example, if two companies report the same level of earnings, the one with high accruals is more likely to report lower profitability in the following year. For more knowledge on the nature and effects of accruals, please see: <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a> . If you want to estimate the quality of \$Ticker's earnings that are released, you can calculate the accruals level, and the portion that may not be realized in cash flows. For details on this method, please see: <a href="http://www.financial-education-hub.com/2/\$Ticker">http://www.financial-education-hub.com/2/\$Ticker</a> .

### Samples of initial posts

Groups	Sample	Earnings
С	\$Ticker will announce its 2019 annual performance on March 15, 2020.	announcement news
T	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please n report high earnings but actually have low cash flows. This difference is called refers to revenues or expenses that do not involve cash flows, but are includ earnings. Accruals are estimated by the company, which may involve estimation may even use accruals to manipulate earnings. As a result, high accruals subsequent cash flows. Investors focusing on bottom-line earnings as reporte ignoring the quality of the earnings, may misunderstand the company's true per if two companies report the same level of earnings, the one with high accruals feature lower profitability in the following year. For more knowledge on the accruals, please see: http://www.financial-education-hub.com/1/\$Ticker.	ote that a company may " accruals", which often ed in the firm's current errors. Some companies may not result in high ed by the company, but rformance. For example, would be more likely to e nature and effects of
T2	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please n report high earnings but actually have low cash flows. This difference is called refers to revenues or expenses that do not involve cash flows, but are included Accruals are estimated by the company, which may involve estimation errors. So use accruals to manipulate earnings. As a result, high accruals may not result i flows. Investors focusing on bottom-line earnings as reported by the company, of the earnings, may thus misunderstand the company's true performance companies report the same level of earnings, the one with high accruals is mo profitability in the following year. For more knowledge on the nature and effects <u>http://www.financial-education-hub.com/1/\$Ticker</u> . If you want to estimate the earnings that are released, you can calculate the accruals level, and the portion in cash flows. For details on this method, please see: <u>http://www.financial- Ticker</u> .	ote that a company may " accruals", which often in the current earnings. me companies may even in high subsequent cash but ignoring the quality e. For example, if two re likely to report lower s of accruals, please see: the quality of \$Ticker's that may not be realized -education-hub.com/2/\$

### Samples of initial posts

	Groups	Sample	Conceptual								
	С	\$Ticker will announce its 2019 annual performance on March 15, 2020.	knowledge								
	<b>T</b> <sub>1</sub>	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please	note that a company may								
		report high earnings but actually have low cash flows. This difference is called	l " accruals", which often								
		refers to revenues or expenses that do not involve cash flows, but are included in the firm's current									
		earnings. Accruals are estimated by the company, which may involve estimation errors. Some companies									
		may even use accruals to manipulate earnings. As a result, high accruals	may not result in high								
		subsequent cash flows. Investors focusing on bottom-line earnings as report	ed by the company, but								
		ignoring the quality of the earnings, may misunderstand the company's true pe	erformance. For example,								
		if two companies report the same level of earnings, the one with high accruals	s would be more likely to								
		feature lower profitability in the following year. For more knowledge on the	ne nature and effects of								
	_	accruals, please see <u>http://www.financial-education-hub.com/1/\$Ticker</u>									
	T <sub>2</sub>	STicker will announce its 2019 annual performance on March 15, 2020. Please	note that a company may								
		report high earnings but actually have low cash flows. This difference is called	accruals", which often								
т.		refers to revenues or expenses that do not involve cash flows, but are included	d in the current earnings.								
Ŋ	/pe I	Accruals are estimated by the company, which may involve estimation errors. So	ome companies may even								
	link	use accruais to manipulate earnings. As a result, high accruais may not result	in high subsequent cash								
		nows. Investors focusing on bottom-line earnings as reported by the company	, but ignoring the quality								
		of the earnings, may thus misunderstand the company's true performance	ce. For example, if two								
		companies report the same level of earnings, the one with high accruais is more the pature and offect	ts of accruals plaasa soo:								
		http://www.financial-education-hub.com/1/\$Ticker_If_you_want_to_estimate	the quality of Sticker's								
		earnings that are released, you can calculate the accruals level, and the portion	that may not be realized								
		in cash flows. For details on this method nlease see. http://www.financia	l-education-hub com/2/¢								
		Ticker.									

### Sample of initial posts

Groups	Sample	Methodological	
С	\$Ticker will announce its 2019 annual performance on March 15, 2020.	knowledge	
T <sub>1</sub>	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please report high earnings but actually have low cash flows. This difference is called refers to revenues or expenses that do not involve cash flows, but are incluse earnings. Accruals are estimated by the company, which may involve estimation may even use accruals to manipulate earnings. As a result, high accruals subsequent cash flows. Investors focusing on bottom-line earnings as report ignoring the quality of the earnings, may misunderstand the company's true per if two companies report the same level of earnings, the one with high accruals feature lower profitability in the following year. For more knowledge on the accruals, please see: <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a> .	note that a company may I " accruals", which often ded in the firm's current nerrors. Some companies may not result in high ced by the company, but erformance. For example, s would be more likely to ne nature and effects of	
T <sub>2</sub>	\$Ticker will announce its 2019 annual performance on March 15, 2020. Please is report high earnings but actually have low cash flows. This difference is called refers to revenues or expenses that do not involve cash flows, but are included Accruals are estimated by the company, which may involve estimation errors. So use accruals to manipulate earnings. As a result, high accruals may not result flows. Investors focusing on bottom-line earnings as reported by the company of the earnings, may thus misunderstand the company's true performance companies report the same level of earnings, the one with high accruals is may profitability in the following year. For more knowledge on the nature and effect <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a> . If you want to estimate earnings that are released, you can calculate the accruals level, and the portion in cash flows. For details on this method, please see: <a href="http://www.financial-ticker">http://www.financial-education this method, please see: <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a>. If you want to estimate earnings that are released, you can calculate the accruals level, and the portion in cash flows. For details on this method, please see: <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a>. If you want to estimate earnings that are released, you can calculate the accruals level, and the portion in cash flows. For details on this method, please see: <a href="http://www.financial-education-hub.com/1/\$Ticker">http://www.financial-education-hub.com/1/\$Ticker</a>.</a>	note that a company may I " accruals", which often d in the current earnings. ome companies may even in high subsequent cash but ignoring the quality ce. For example, if two ore likely to report lower ts of accruals, please see: the quality of \$Ticker's that may not be realized I-education-hub.com/2/\$	/pe 2 link

### Sample of initial posts (Chinese)

	Groups	Sample
	С	\$Ticker将于2020年3月15日公布2019全年业绩。
	T <sub>1</sub>	\$Ticker将于2020年3月15日公布2019全年业绩。请注意,有些公司公布的账面利润可能很高但实际的现金流却很少。这个差额叫做"应计项目",通常是指那些不直接形成当前现金流却计入当前损益的收入或费用。"应计项目"需要通过公司的估计得出,通常会出现估算错误。一些公司甚至利用"应计项目"来操纵盈利。因此,公告利润的"应计项目"部分在未来未必能兑现成实际的现金流。为此,投资者只关注公司所公布的利润而忽视其质量,可能会误读公司业绩。比如,两家当前利润一样的公司,"应计项目"高的那家公司下一年的盈利可能会更低。关于这方面的具体的知识: http://www.financial-education-hub.com/1/\$Ticker.
	T.	\$Ticker将于2020年3月15日公布2019全年业绩 请注音 有些公司公布的账面利润可能很喜伯实
T	/pe 1	际的现金流却很少。这个差额叫做"应计项目",通常是指那些不直接形成当前现金流却计入当前损
	link	益的收入或费用。"应计项目"需要通过公司的估计得出,通常会出现估算错误。一些公司甚至利
	$\mathbf{n}$	用"应计项目"来操纵盈利。因此,公告利润的"应计项目"部分在未来未必能兑现成实际的现金流。
		为此,投页有六大注公可所公布的利用间忽视其灰里,可能云侯侯公可业须。比如,内家目削利 词。样的公司 "点法项目"言的那家公司下 在的及利可能会再低 关工注言面的目体的知识。
		<u>油一件的公司, 应证现日 高的那家公司下一</u> 年的盈利可能会更低。大于这万面的具体的知识;
		http://www.innancial-coucation-nub.com/1/311cker. 如您值昇311cker/开公币利准的顶重,可以计算具
		应可须且可会仲小干,以及个能无境规境並加时即刀,会仲刀法·mup.//www.illianciai-education-
		Type 2
		link

### Experimental execution

• Sent social media posts to investors in designated groups during a 19-day window around firms' announcement of annual earnings.

Day	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9
Is there a tweet?																			
$(\mathbf{X}' \cdot \mathbf{C})$	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y
(Y IF yes)																			
Tweet No.	1		2		3	4	5	6	7	8	9	10	11	12	13		14		15
<i>Note</i> : Day o is the earnings announcement day																			

• Experimental period

oChina: from January to May 2020, during which Chinese firms' annual financial reports for 2019 were released.

oUS: from January to December 2020, during which US firms' annual performance for the fiscal year of 2019 (2020) was announced, if the firms' fiscal year ended during January to May (June to December).

### Experimental execution

- Use accounts with fictional names on each platform.
- Each post is unique by rephrasing the full contents of the two sets of accruals knowledge.
- Collected the number of reads and other response indicators on the next day of each post.

	Panel A: The Chinese market										
	Total volume per firm										
	(1)	(2)	(3)	(4)	(5)	(6)					
Group	Posts	Reads	Comments	Retweets	Likes	Saves					
С	32.49	15,767	6.12	4.74	0.53	0.17					
T <sub>1</sub>	31.67	16,152	8.97	6.73	0.50	0.23					
T	31.08	14,776	7.64	12.38	0.37	0.29					
			Panel A: The US ma	ırket							
			Total volume per fi	rm							
	(1)	(2)	(3)	(4)	(5)						
Group	Posts	Reads (Twitter)	<b>Comments/replies</b>	<b>Retweets/Reshares</b>	Likes						
С	14.61	1,743	1.39	1.85	2.04						
T <sub>1</sub>	15.01	1,485	1.68	1.04	2.27						
T <sub>2</sub>	15	2,105	1.16	0.75	1.88						

### Experimental execution



### Samples of real posts

t,

ılt

×

(2)

1 Reshare

Then: 12.83

Now: 12.83

1/20/20, 03:11 PM

1/20/20, 09:56 AM

~

### Tı



### AustinAbdon @AbdonAustin Updates from SEC's web, the whole year performance of \$FC was released today. When earnings quality is low, high reported earnings may relate to low future earnings, see: financial-education-hub.com/1/FC. Here is a method to estimate SFC 's earnings quality, see: financial-education-hub.com/2/FC. 9:21 AM · Nov 17, 2020 · Twitter Web App II View Tweet activity Q 17 C Dann @Dann4U2 · Nov 17

 $T_2$ 

Replying to @Abdo I think SFC might reach \$0.40 soon on #MXC\_Exchange I am planning to buy the dips the volume is kicking good today! 13 Ċ.

仚

education-hub.com.... The forecast, in any case, isn't great and as a rule has mistakes. Sometimes, companies may increase accruals to inflate profits. As such, high accruals may be a signal of low future income. According to this intuition, for firms reporting the same earnings in 2019, those with high accruals are more likely to deliver poorer future performance. To know the quality of SAAL's reported earnings, You can use the method at financialeducation-hub.com... to calculate the firm's accruals level, and the portion that may not be able to be collected in cash.



### Samples of real posts (Chinese)

Guba



### Tı

项目的操纵可能违反通用会计准则GAAP。例如,为了提高当期收益,企业可能会选择将间接费用 资本化,而将其排除在库存成本的计算之中,这将导致大量存货成本的估计差错,并导应计项目的 转回与未来现金流不匹配。

应计项目误差也可能不是公司故意制造的。这是基于应计项目不同于后来实际发生的现金流而 得出的一种事后特征,例如,在某个时间点,市场需求出人意料地下费,库存不得不以较低的价格 出售,甚至报废。在这种情况下,即使在没有任何报表操纵的情况下也会出现应计项目和实际发生 现金的不匹配。另外、GAAP要求企业以不同于其预期价值的金额进行资产核算,这也将导致在没 有任何操纵的情况下出现对应计项目的估计误差。

总之 成计师目代表公司时中国 > 展开研究中文 国会协会教育中了 成而自正振奏 / 课论 < 98 D3W2 C 88 62

对重曲时,均产在财富与(粉化/培养社区发表的用有份单。但这位不同于文字、石块、曲体、数据及能表) 仅仅代本个人成点。与本 同处立场天关,不时当时成石州处理建议,最此进作风险自由。

200 200 200

1946 D AT

情况, 会问对 分长期合作客 的政策工作。 阅读 1716

全部评论(3) 只有作者 八方多谓地任我行 请问一事意海师会大幅下滑码

日 神台 白 点数 什么思妙的呢:没有到我跟她大跌,情况不太妙,很可能真是和你没意不高,要打折扣 2020-01-23 14:34:23 日神2 白 4時 **曾** 什么是对的呢

辛苦了

代老师zo 05-01 01:32 - 来自常球

> S端贝卡(SH600439)S 端贝卡2020/4/30公布了其2019年报,需要注意了,公司报告的利 润通常与其现金流不同。这种区别被称为"应计项目",反映了公司尚未收到现金的利润部 分。未实到现金的利润是预估出来的,具有很大的主观性,容易被操纵,使得这部分利 润的质量较低,难以转化为现金流入。因此,两...展开>

	h	1	
100	 -	-	-
10210	 10	-	-

□ 转发 □ 评论(1) 凸 號(1) 凸 收還 ② 设置 ≥ 修改 直 删除

1 IFI2 全部评论 (1) 晶近 器具 糖 hmaya 🥥 05-01 07:27 应收账款多了近一个亿... 主要是为了加快 即燃纤维的告诉 金回收,运当书 制了银行承兑目 4, 788, 586, 00 0.10 14, 406, 150, 00 間枯算方式 主要是根据市场 原载雅 745 354 851 48 4.88 161, 582, 638, 75





308 153

舒奏神探于2020/3/17公布其2019全年业绩。这里特别提醒各位投资者、公司报告的利润通常与其 现金流不同。这种区别被称为"应计项目",反映了公司尚未收到现金的利润部分。"应计项目" 是公司预估出来的。这个过程会出现有意或无意的错误、导致这部分利润在未来转变成现金流入的 可能性较底。据此,对于那些2019年报告利润相同的公司,那些"应计项目"高的公司更有可能在 未来表现不佳。如何判断公司未来业绩。这里给你整理了详细内容。见下图1(图里还提供了视频介 #228才第400世代加上) 。

### 10 股往金来VVV 即R力 \*\*\*\*\* 3 3 41/8877801 回 #i2 白 AM 👕 股友n08iQm 前年(1 🔞 + + + + ®) 他真正的看点是乙秆 10 PH2 0 AM 股友n0BlQm 回動 股友n0BlQm: 关键型要相对失效的准备。就看你能力和心态。 2020-03-08 17:04:23 回 ##@ 约1 股友n08/Qm 回复 股友n08/Qm : 看看面於時期 2020-03-08 16:46:59 □ 沖泊 白 点幣 N930/n0BIOm : ST#UR2880/1956/36 2020-03-08 16:04:01 回 PP2 白 2 2 股友n088Qm 副新志 \* \* \* \* \* \* @

实204的都知道他现在情况。不是买他利润多少。IFRX可本照样冲上53.1美金,为什么? 日 998 白 AM

老师分析到位,专业! EFIE D AT

當 他学报春来发酵 mach \*\*\*\*\* ③ 没看懂,在你说的应该遗市了,

日 FR2 | 白1

间读 1745

🍟 daoje 10407) \star = = = 👘 这样一看他不得缺倒2元公下?

**W**赴新聞sk

04-22 01:04 来自雪铼

\$太极集闭(SH600129)\$ 太极集闭将于2020/4/28公布其2019全年业绩, 这里特别提醒各 位投资者。公司报告利润包括已实到现金的利润(现金流)和尚未实到现金的利润(\*应计项 目")。然而,"应计项目"是公司估算出来的,这种估算可能会有误差甚至错误,比如一些 公司甚至利用"应计项目"来操纵报告利润。这导致当期报告利润的"应计项目"部分在未来 并不能兑现为实际现金流。为了说明这点,假设公司A和B公告利润相同。A公告利润包 念的"应计项目"高于B. 可以预测A未来的收益会低于B. 如何判断公司未来业结击向。这 里为你准备了相关材料。200页链接。如想估算太极集团所公布利润的质量,可以计算 其"应计项目"的具体水平,以及不能兑现成现金流的部分,具体方法参看: · · · · 网页链接

四 99发	口 评论(1)	台灣	合教院	② 设置	∠ 惊改	自 删除	1	改起☆
全部评论	仑 (1)					副近	89	败
× #	<b>1金大元帅</b> 1上卖,下午3	彩史情					04-22	68.35

### Ex-ante firm characteristics of control and treatment firms

			Pane	el A: The Ch	inese ma	arkets				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
_	S	С	T <sub>1</sub>	<u> </u>	T_1	– C	$T_2$	- C	T	- T,
Variable		Av	e.		Dif.	P-value	Dif.	P-value	Dif.	P-value
MV	15.63	15.69	15.63	15.68	-0.06	(0.35)	-0.01	(o.85)	0.05	(0.44)
Leverage	0.46	0.47	0.45	0.45	-0.01	(0.30)	-0.02	(0.22)	-0.00	(0.84)
MB	2.83	2.83	2.88	2.86	0.05	(o.8o)	0.03	(0.90)	-0.03	(o.89)
ROA	-0.00	0.00	-0.00	0.00	-0.01	(o.46)	-0.00	(o.68)	0.00	(0.76)
CashFlows	0.05	0.05	0.05	0.05	-0.00	(0.73)	0.00	(1.00)	0.00	(o.73)
Cash	0.16	0.16	0.16	0.17	-0.00	(0.70)	0.00	(0.71)	0.01	(o.43)
WorkingCapital	-0.01	-0.00	0.00	-0.00	0.00	(0.52)	-0.00	(o.78)	-0.01	(0.36)
Accruals	-0.03	-0.03	-0.02	-0.02	0.00	(0.72)	0.00	(0.75)	-0.00	(0.96)
Accruals <sub>DD</sub>	-0.02	-0.01	-0.02	-0.01	-0.01	(0.15)	-0.00	(0.63)	0.00	(0.37)
Accruals <sub>KLW</sub>	-0.00	-0.00	0.00	0.00	0.00	(o.54)	0.00	(0.79)	-0.00	(0.73)
			Pa	anel B: The	US mark	ets				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	S	C	T	T	<u> </u>	– C	T	<u>- C</u>	<u> </u>	- T <sub>1</sub>
Variable		Av	e.		Dif.	P-value	Dif.	P-value	Dif.	P-value
MV	20.92	20.81	20.95	21.00	0.14	(0.33)	0.18	(0.20)	0.05	(0.74)
Leverage	0.59	0.57	0.57	0.57	-0.00	(0.80)	-0.00	(0.76)	-0.00	(0.95)
MB	3.22	3.12	3.29	3.20	0.17	(0.58)	0.08	(0.80)	-0.09	(0.77)
ROA	-0.04	-0.05	-0.04	-0.03	0.01	(0.40)	0.02	(0.22)	0.00	(0.69)
CashFlows	0.03	0.03	0.04	0.04	0.00	(0.76)	0.01	(0.56)	0.00	(0.78)
Cash	0.17	0.17	0.18	0.19	0.01	(0.32)	0.02	(0.14)	0.01	(0.63)
WorkingCapital	-0.00	-0.00	0.00	-0.00	0.00	(0.15)	0.00	(0.50)	-0.00	(0.42)
Accruals	-0.04	-0.05	-0.04	-0.04	0.01	(0.14)	0.01	(0.14)	0.00	(1.00)
Accruals <sub>DD</sub>	-0.00	-0.00	-0.00	-0.00	0.00	(0.42)	-0.00	(o.78)	-0.00	(0.26)
Accruals <sub>KLW</sub>	0.00	0.00	0.01	0.00	0.00	(o.48)	0.00	(0.60)	-0.00	(0.86)

### Model

• Test the education treatment effect

 $AR_{i,t} = \beta_1 + \beta_2 Treat_i \times Accruals_i (Accruals_{UD,i}) + \beta_3 Treat_i + \beta_2 Accruals_i (Accruals_{UD,i}) + \beta_3 SUE_i + J + T + \varepsilon_{i,t}, \quad (1)$ 

- $AR_{i,t}$  is the earnings announcement return or future return in the subsequent period for firm i, which announced its 2019 earnings in month t of 2020.
  - 1. The two-day cumulative abnormal return from day zero (earnings announcement day) to day one (*CAR(o,1)*).
  - 2. The buy-and-hold return from day 11 to day 251 minus the return of the matched portfolio of  $5 \times 5$  size and book-to-market portfolios in the same window (*CAR(11, 251)*).
- $Treat_i$  is our treatment indicator. It equals one if firm i is in treatment groups T1 or T2, and zero if it is in control group C.

### Model

- Measurement of accruals:
  - Total or normal accruals (*Accruals<sub>i</sub>*): the change in current assets minus the change in cash holding minus the change in current liabilities plus the change in short-term debt plus depreciation, scaled by total assets (Richardson et al.,2005; and Chan et al.,2006)
  - Unexpected discretionary accruals ( $Accruals_{UD,i}$ ): the residuals of the model that regresses *Accruals* on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and the return on assets in each industry-year (Balsam et al., 2002; Louis et al., 2008).
- Control for
  - Earnings announcement surprise  $(SUE_i)$ : the announced earnings per share minus the consensus analyst forecasts in the past year, scaled by the stock price before the earnings announcement.
  - Industry fixed effects (**J**)
  - fixed effects of the months (T) in which firms announced their earnings.

# Testing for accruals mispricing

• We estimate Equation (1) based on stocks in the comparison **group S**.

Par	nel A: The depend	dent variable is (	CAR(0,1)	
	The Chinese	market	The U	IS market
	(1)	(2)	(3)	(4)
Accruals	<b>0.060</b> ***		0.150*	
	(2.73)		(1.74)	
Accruals <sub>UD</sub>		0.031*		-0.039
		(1.95)		(-0.95)
SUE	0.393**	0.417***	0.383**	0.396**
	(2.53)	(2.68)	(1.98)	(2.05)
Industry and month FEs	Yes	Yes	Yes	Yes
Observations	573	573	595	595
R-squared	0.172	0.167	0.281	0.278

- A one standard deviation increase in *Accruals* is associated with 0.5% (1.1%) increases in *CAR*(0,1), similar for a one standard deviation change in *SUE*, namely 0.4% (1.1%), in the Chinese (U.S.) market.
- Investors do not distinguish between the accrual component and the earnings news component.

### Testing for accruals mispricing

Panel B: The dependent variable is CAR(11,251)							
	The Chinese	e market	The US market				
	(1)	(2)	(3)	(4)			
Accruals	-0.583**		-0.797**				
	(-2.40)		(-2.23)				
Accruals <sub>UD</sub>		-0.446***		-0.253			
		(-2.60)		(-1.50)			
SUE	-1.909	-1.990	-0.902	-0.960			
	(-1.12)	(-1.17)	(-1.13)	(-1.20)			
Industry and month FEs	Yes	Yes	Yes	Yes			
Observations	573	573	595	595			
R-squared	0.193	0.195	0.389	0.385			

• Accruals are **negatively** related to future stock return.

Accruals announcement returns during the experiment window for stocks with high accruals (*Accruals*<sub>UD</sub> in the top tercile) in the **Chinese stock market** 



Accruals announcement returns during the experiment window for stocks with high accruals (*Accruals*<sub>UD</sub> in the top tercile) in the **US stock market** 



We estimate Equation (1) based on stocks in the treatment **groups T1** and **T2** and the control **group C**.

The dependent variable is CAR(0,1)								
	The Chinese market		The US	market				
	(1)	(2)	(3)	(4) discour				
Treat×Accruals	-0.030***		-0.256***	on accrua				
	(-3.47)		(-4.06)					
Accruals	0.020***		-0.008	pricing.				
	(3.33)		(-0.15)					
Treat×Accruals <sub>UD</sub>		-0.058***		-0.058**				
		(-4.00)		(-1.97)				
Accruals <sub>UD</sub>		0.059***		0.028				
		(6.03)		(1.33)				
Treat	-0.011***	-0.009***	-0.011**	0.001				
	(-5.53)	(-4.12)	(-2.48)	(o.44)				
SUE	0.466***	0.446***	0.588***	0.545***				
	(4.99)	(4.80)	(5.27)	(4.84)				
Industry and month FEs	Yes	Yes	Yes	Yes				
Observations	1,711	1,711	1,792	1,792				
R-squared	0.095	0.107	0.196	0.179				

The dependent variable is CAR(11,251)						
	The Chinese market		The US	market		
	(1)	(2)	(3)	(4)		
Treat×Accruals	0.278***		1.374***			
	(3.21)		(4.42)			
Accruals	-0.347***		-2.075***			
	(-5.74)		(-8.44)			
Treat×Acccruals <sub>UD</sub>		0.844***		o.689***		
		(5.77)		(4.75)		
Accruals <sub>UD</sub>		-0.628***		-0.594***		
		(-6.41)		(-5.73)		
Treat	-0.073***	-0.094***	-0.007	-0.079***		
	(-3.53)	(-4.49)	(-0.35)	(-5.60)		
SUE	1.880**	2.095**	1.177**	1.098**		
	(2.01)	(2.25)	(2.14)	(1.98)		
Industry and month FEs	Yes	Yes	Yes	Yes		
Observations	1,711	1,711	1,790	1,790		
R-squared	0.136	0.142	0.337	0.316		

In the Chinese (U.S.) market, a one standard deviation increase in *Accruals* is associated with a 3.2% (14.6%) reduction in *CAR*(11,251) for control stocks. The decline is reduced to 0.6% (4.9%) for treatment stocks.

### Conceptual vs. methodological knowledge

- Test how the mitigation effect on accrual mispricing varies by applying the treatment of different types of accrual knowledge.
- Replace *Treat* with *T*<sup>1</sup> or *T*<sup>2</sup> and repeat the estimation of Equation (1).
  - oT1: the application of the conceptual knowledge treatment,
  - oT2: the application of both conceptual and methodological knowledge treatments.

### Conceptual vs. methodological knowledge

Panel B: The dependent variable is CAR(11, 251)								
	The Chinese market			The US market				
	$Treat = T_1$	$Treat = T_2$	$Treat = T_1$	$Treat = T_2$	$Treat = T_1$	$Treat = T_2$	$Treat = T_1$	$Treat = T_2$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat×Accruals	-0.139	0.380***			0.620*	1.862***		
	(- <b>o.9</b> 4)	(4.14)			(1.69)	(4.83)		
Accruals	-0.372***	-0.319***			-1.729***	-2.115***		
	(-6.10)	(-5.30)			(-6.66)	(-8.63)		
Treat×Accruals <sub>UD</sub>			<b>0.73</b> 4 <sup>***</sup>	1.124***			0.598***	0.753***
			(4.09)	(5.97)			(3.27)	(4.15)
Accruals <sub>UD</sub>			-0.655***	-0.601***			-0.563***	-0.545***
			(-6.60)	(-6.21)			(-5.18)	(-5.17)
Treat	-0.021	-0.117***	-0.037	-0.143***	-0.012	-0.007	-0.042**	-0.099***
	(-0.83)	(-4.73)	(-1.47)	(-5.79)	(-0.46)	(-0.29)	(-2.50)	(-6.05)
P-value (dif. b/t $T_1$ and		140		015		- 4-	0.00	60
T <sub>2</sub> )	0.0	140	0.0	915	0.0	547	0.3	300

The treatment of methodological knowledge has significant incremental effects relative to conceptual knowledge in the long-term window.

### Engagement with educational materials

- If our experiment affects the pricing of accruals via the educational process, we should see a stronger education effect when investors read and engage with our educational materials more intensively.
- *Reads*: equal to one if the total number of posts read on all social media platforms of a country for a stock is above the sample median and zero otherwise.
- *CSLS*: equal to one if our posts made for a particular stock receive more comments or replies than the sample median or are "retweeted/shared," "liked," or "saved" on any of the platforms, and zero otherwise.
- *WebView*: equals one if the number of web clicks of both type 1 and type 2 link pages of a stock are on the top quintile of the treatment stocks, and zero otherwise.

The dependent variable is CAR(0,1)						
	The Chine	se market	The US market			
	(1)	(2)	(3)	(4)	(5)	(6)
Treat×Accruals <sub>UD</sub> ×Reads	-0.147***			-0.109*		
	(-4.12)			(-1.77)		
Treat×Accruals <sub>UD</sub> ×CSLS		-0.201***			-0.039	
		(-5.59)			(-0.44)	
Treat ×AccrualsUD			-0.124***			-0.661***
×WebView			(-4.59)			(-4.42)

### Retail investors

- Retail investors are the primary users of social media.
- They have less accounting and financial knowledge and a limited understanding of the implications and applications of accruals (Balsam et al., 2002)
- Our education program should be more beneficial to stocks dominated by retail investors.
- *RI*: 100% minus the number of shares held by institutional investors over the total number of tradable shares.

The dependent variable is CAR(0,1)					
The Chinese market The US market					
	(1)	(2)			
Treat×Accruals <sub>UD</sub> ×RI	-0.230*	-0.084			
	(-1.93)	(- <b>o.86</b> )			

### Real effects

- Managers are myopic and have incentives to report high earnings to boost prices.
- This motivates us to ask:

oAre firms disincentivized to manage accruals when investors see through the trick of earnings management (i.e., when the benefits of overpricing have disappeared)?

•Empirically, do the discretionary accruals of treatment firms decrease in the post-experiment period relative to control firms?

### **Real effects**

### • The DID model:

$$Accruals_{KLW,i,q} = \beta_1 + \beta_2 Treat_i \times Post_q + Post_q + \beta_3 Accruals_{KLW,i,q-1} + I + JQ + \varepsilon_{i,q}, \qquad (2)$$

 $\circ Accruals_{KLW,i,q}$  is the discretionary accruals for firm or stock i in year-quarter q.

- $\circ Post_q$  indicates the post-experiment period; it equals one for quarterly earnings announcements after our experiment and zero otherwise.
- $\circ$  Control for the lag of discretionary accruals (*Accruals*<sub>*KLW*,*i*,*q*-1</sub>), firm fixed effects (vector *I*), and industry-year-quarter fixed effects (vector *JQ*).

• Estimate the model using a window from Q1 2018 to Q4 2020.

### **Real effects**

The dependent variable is <i>Accruals<sub>KLW</sub></i>						
	The Chinese market The US mar					
	(1)	(2)				
Treat×Post	-0.004**	-0.002**				
	(-2.51)	(-2.30)				
Post	-0.002	0.015***				
	(-0.10)	(3.50)				
$Accruals_{KLW,-1}$	-0.187***	-0.202***				
	(-25.01)	(-9.42)				
Firm FE	Yes	Yes				
Year-quarter-industry FE	Yes	Yes				
Observations	19,794	21,476				
R-squared	0.041	0.179				

The DID estimate is 0.004 (0.002) in the Chinese (US) market, which is 8% (5%) of the standard deviation of  $Accruals_{KLW}$ .

### Investor naïveté and institutional discipline

The real effect is stronger when firms have more retail investors and face weaker external intuitional pressure ex-ante.

The dependent variable is Accruals <sub>KLW</sub>							
	The Chine	ese market	The US	market			
	(1)	(2)	(3)	(4)			
Treat×Post×RI	-0.103*		-0.004*				
	(-1.88)		(-1.77)				
Post×RI	0.068		0.002				
	(1.53)		(0.79)				
<b>Treat</b> × <b>Post</b> × <b>Institution</b>		0.006**		0.003**			
		(2.48)		(2.47)			
Post×Institution		-0.004**		-0.003**			
		(-2.26)		(-2.36)			
Treat×Post	0.096*	-0.009***	-0.000	-0.006**			
	(1.80)	(-3.53)	(-0.19)	(-2.82)			
Post	-0.068	0.002	0.014***	0.019***			
	(-1.47)	(0.14)	(3.27)	(4.17)			
$Accruals_{KLW,-1}$	-0.187***	-0.187***	-0.202***	-0.202***			
	(-25.03)	(-25.04)	(-9.43)	(-9.47)			
Firm FE	Yes	Yes	Yes	Yes			
Year-quarter-industry FE	Yes	Yes	Yes	Yes			
Observations	19,794	19,794	21,476	21,476			
R-squared	0.042	0.042	0.179	0.180			

### Conclusion

- Conducted a field experiment by providing knowledge about the pricing implications of accounting accruals to investors in **randomized stock groups via social media platforms** in both China and the U.S.
- Treatment stocks experience a **reduction in accrual mispricing** relative to control stocks, and treatment firms experience a **decline in discretionary accruals** in the post-experiment period.
- Our evidence signifies the **power of knowledge** in improving the stock market efficiency and corporate governance.