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

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

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We 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 this effect is strengthened when both conceptual and methodological knowledge about accruals is provided. We also document a real effect of financial knowledge on firms. Treatment firms experience a decline in discretionary accruals in the post-experiment period, especially when they are heavily owned by individual investors or less monitored by institutions.

JEL Classification: G14; G41, G53, C93

Keywords: Financial knowledge, accrual mispricing, investor education, field experiment, social media

*Wong is based at based at the Faculty of Business, Lingnan University, 8 Castle Peak Road, Tuen Mun, New Territories, Hong Kong. Xue is based at Huazhong University of Science and Technology, 1037 Luoyu Road, Wuhan, China. Zhang is based at the School of Management and Economics and Shenzhen Finance Institute, The Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), Longxiang Boulevard, Longgang District, Shenzhen, China, 518172. Zhao is based at the Faculty of Business, Lingnan University, 8 Castle Peak Road, Tuen Mun, New Territories, Hong Kong. Authors' contact information: Sonia Man-Lai Wong: soniawong@ln.edu.hk; Yuan Xue: xueyuan@hust.edu.cn; Bohui Zhang: bohuizhang@cuhk.edu.cn, (86)755-23518868; Xiaofeng Zhao: x4zhao@ln.edu.hk, (852)26168156. We appreciate the helpful comments made by Chunrong Ai, Hai Lu, Bin Miao, Jeffery NG, Pengfei Sui, T.J. Wong, Wei Xiong, Wenhao Yang, and the conference and seminar participants at the Asian Bureau of Finance and Economic Research (ABFER) (scheduled), China Business Research Network (CBRN) and The Chinese University of Hong Kong, Shenzhen. We obtained human ethics approval from our university to conduct the experimental exercise in this project (Ref.no. EC068/1920).

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Abstract

We 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 this effect is strengthened when both conceptual and methodological knowledge about accruals is provided. We also document a real effect of financial knowledge on firms. Treatment firms experience a decline in discretionary accruals in the post-experiment period, especially when they are heavily owned by individual investors or less monitored by institutions.

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1. Introduction

"*Knowledge is power. Information is liberating. Education is the premise of progress, in every society, in every family*"

— Kofi Annan

Having knowledge of financial concepts and skills is important to make sound financial decisions. Prior studies examine how financial knowledge affects individuals' financial decision-making in a variety of areas, including market participation and asset allocation.[1] Despite the established link between financial decisions and asset prices, these studies do not directly assess the effects of financial knowledge on asset prices. In this study, we address this gap in the literature by examining whether financial knowledge is linked to asset pricing. Education can equip investors with new knowledge and better skills to process public information (e.g., corporate disclosures) and, in turn, supply the market with more informed investors. To investigate this idea, we study whether the provision of financial knowledge via investor education affects stock price efficiency and whether such an effect further influences companies' reporting behaviors.

This topic presents both conceptual and empirical challenges. First, in perfect market conditions, where investors have full capacity and adequate knowledge to process information, educating investors would have no effect on investors' decision-making and, in turn, would not necessarily improve stock market efficiency (Simon, 1987). Although, in reality, investors have limited cognitive resources and imperfect knowledge (Simon, 1955; Kahneman and Tversky, 1973), education may still be ineffective if investors lack motivation and the appropriate expertise to understand educational materials (Piaget, 2003; Fernandes et al., 2014).[2] Furthermore, investors may fail to apply the acquired knowledge in real-world decision making (Hilgert et al., 2003; Merkoulova and Veld, 2021).[3]

[1] Recent studies show that individuals with low financial literacy are more likely than others to make poor financial decisions (Von Gaudecker, 2015; Bianchi, 2018), avoid diversification (Merkoulova and Veld, 2021), hold risky assets with low expected returns (Bianchi, 2018), discount professional financial advice (Cole et al., 2011), hold lower risk-adjusted stock returns (Von Gaudecker, 2015), avoid planning for retirement (Banks et al., 2010; Song, 2020), hold insufficient savings (Cole et al., 2011), default on mortgage payments (Gerardi et al., 2013), and have lower credit scores (Brown et al., 2019). Please see Lusardi and Mitchell (2014) for a review of the literature on financial literacy and economic decisions.

[2] Fernandes et al. (2014) note that interventions to improve financial knowledge offer limited explanations for people's financial behaviors. The authors suggest that a lack of self-motivation and self-control with regard to learning might inhibit an individual's learning effectiveness.

[3] For example, individuals may be plagued by certain personal traits that are inherited and hard-wired (Altman, 2012) or that are dictated by a certain institutional and incentive environment (Posner, 2009).

Second, education can be provided to both retail and institutional investors. If stock prices are set by marginal investors who are sophisticated institutional investors (Hand, 1990; Collins et al., 2003), educating only unsophisticated retail investors may not have an effect on price efficiency. Moreover, the provision of financial knowledge to institutional investors may be questionable because they may already possess rich knowledge and experience through their daily work. For example, Cole et al. (2011) and Kaiser and Menkhoff (2017) note that the returns on financial education diminish as the level of financial literacy increases.

Third, it is challenging to determine whether financial knowledge has a causal effect on price efficiency. One key challenge in determining the effect relates to the notion that both financial knowledge and price efficiency are endogenously determined and their proxies suffer from measurement errors (Lusardi and Mitchell, 2014; Bianchi, 2018). For example, financial knowledge and market outcomes can be simultaneously determined by individuals' time preferences and wealth endowment, neither of which are easily observed (Jappelli and Padula, 2013; Meier and Sprenger, 2013). Moreover, a reverse relationship exists between price efficiency and financial knowledge. For example, investors can learn from past stock price movements to accumulate investment knowledge.

To tackle these challenges and investigate our research question, we conducted a field experiment that involved educating investors about accounting accruals, a concrete type of financial knowledge. Accruals are the difference between a firm's reported earnings and its underlying cash flows and represent the firm's estimates of future benefits and obligations. The accrual component of earnings is in principle less persistent than the cash flow component in predicting firms' future earnings. However, a large number of studies show that due to limited cognitive capacity, investors often do not understand the low persistence of accruals and overprice stocks with high announced accruals (Sloan, 1996; Xie, 2001; Richardson et al., 2005; Chan et al., 2006; Allen et al., 2013).

We focus on accruals for three reasons. First, many studies identify accrual mispricing as one of the most pervasive and robust types of financial anomaly (Fama and French, 2008; Hirshleifer et al., 2012; Avramov et al., 2013). Furthermore, although a large number of works seek to explain this anomaly (e.g., the explanations based on risk (Khan, 2008) and arbitrage costs (Mashruwala

Consistent with these views, Cole et al. (2011) show that a program to improve individuals' financial knowledge is not effective in increasing demand for financial products.

et al., 2006)), the mechanisms underlying accrual mispricing remain unclear (Richardson et al., 2010). Second, unlike basic financial concepts such as compounding, inflation, interest rates, diversification, and the difference between bonds and stocks (Van Rooij et al., 2011; Lusardi and Mitchell, 2014), accruals are a more advanced concept and becoming educated on the concept may have a more marked effect on individuals' overall financial literacy (Lusardi and Mitchell, 2014). Third, given that understanding accruals' economic implications requires a relatively high level of cognitive ability (Collins et al., 2003), the concept of accruals provides an ideal base to test the effectiveness of investor education.

We conducted randomized controlled trials (RCTs) to examine whether providing accrual knowledge to investors could reduce accrual mispricing. Our experiment has two main features. First, we disseminated knowledge to investors via social media platforms. Evidence shows that, as critical information sources for investors, social media have significant effects on investor behaviors and stock returns (Miller and Skinner, 2015). For example, the stock price rebound for GameStop and AMC in January 2021 demonstrated the increasing influence of social media on individual investors' investment decisions and stock price movements.[4]

Second, we conducted an experiment for firms listed on the Chinese and US markets. The U.S., the world's largest developed market, is governed by stringent securities regulations and features the participation of many institutional investors. Conversely, despite being the largest emerging market and the second largest stock market in the world by capitalization, the Chinese stock market is subject to lax regulations and enforcement. Moreover, the Chinese market is dominated by unsophisticated investors. For example, stock market efficiency is impeded in China, given that approximately 90% of daily trades in China are driven by retail investors, one third of whom lack at least a high school degree (Titman et al., 2021). In light of the large institutional differences between the two countries, any consistent findings would support the generalizability of our analysis.

Our experiment covers the January to December 2020 period and focuses on all publicly listed firms in China and the U.S.[5] We present two sets of educational materials on accruals' concepts and pricing implications. The first set of materials contains a conceptual introduction of accruals,

[4] See https://www.investmentnews.com/gamestops-saga-what-the-stock-surge-proves-about-financial-literacy-205019.

[5] We designed the experiment in 2019 when we observed Chinese and U.S. firms' annual financial information in the 2018 fiscal year.

including the properties and earnings implications of high and low accruals (e.g., the definition of accruals and the relationship between accruals and cash flow realization; hereafter *conceptual knowledge*). The second set of educational materials features an introduction to the methods used for estimating accruals, including models, key variables, and data sources (e.g., the formulas and spreadsheet tools for estimating accruals; hereafter *methodological knowledge*). To facilitate the mastery of our educational materials, we also created and inlaid an anime video that rephrased the text articles.[6] The materials are presented in Chinese and English in the Chinese and US markets, respectively.

We then disseminated the educational materials to randomized groups of investors via Weibo, Xueqiu, and Guba EastMoney in China and via Twitter and StockTwits in the U.S. during a 19-day window around firms' earnings announcement days in 2020.[7] Specifically, we communicated the two sets of knowledge and the upcoming earnings announcement news on each stock's tag page on each social media platform for the *treatment group* of stocks. We also communicated a subset of stocks with the conceptual knowledge and earnings announcement news only. Notably, we included a hyperlink in the communication posts. The hyperlink is tied to a webpage (tailor-made for each stock) under our domain (http://www.financial-education-hub.com), which allows investors to access the full contents of our educational materials.

We created a *control group* of stocks and communicated upcoming earnings announcement news as a placebo. In theory, any observed difference in accrual pricing between the *treatment* and *control groups* should reflect the effect of accrual education. We also created a *comparison group* of stocks for which we did not provide any supplementary information. We use the *comparison group* to examine whether accrual mispricing exists in the absence of any intervention. Our final sample includes 2,284 and 2,387 stocks with valid information from the Chinese and US markets, respectively. Our educational materials received 26,834,089 reads in total (15,000 reads per stock) and 3,397,437 reads (1,800 reads per stock) by the second day in China and the U.S., respectively.[8] Our diagnostic tests show that there is no significant difference in firm characteristics between

[6] Prior studies show that the use of visuals and audio can help improve individuals' learning effectiveness (Stephen, 2015; Nekrasov et al., 2021).
[7] Weibo is the Chinese version of Twitter, Xueqiu is similar to StockTwits, and EastMoney is the largest stock message board platform in China.
[8] The number of reads in the U.S. is based on Twitter only because StockTwits does not provide information on reading volume.

treatment and control firms. The stock price movement before our experiment is also parallel for treatment and control firms.

We begin our analysis by testing the existence of accrual mispricing. Based on firms in the comparison group, we find that high accruals are associated with higher announcement returns and have lower future returns after earnings announcements in both markets. For example, a one standard deviation increase in accruals is associated with a 0.5% (1.1%) increase in the two-day abnormal return around earnings announcements in China (the U.S.). The results support the existence of accrual mispricing.

Next, we test whether accrual education reduces accrual mispricing. In a difference-in-differences (DID) analysis, we find that earnings announcement returns for stocks with high accruals are lower in the treatment group than in the control group in both markets. Specifically, relative to control stocks, a one standard deviation increase in accruals for treatment stocks is associated with a 0.3% (1.8%) reduction in the two-day abnormal return in China (the U.S.). These results indicate that the education treatment results in a price discount on stocks with high accruals. Consistent with the idea that accruals are overpriced, we further document that stocks with high accruals in the control group have significantly lower future returns. A one standard deviation increase in accruals is associated with a 3.2% (14.6%) decline in buy-and-hold abnormal returns in the subsequent year in China (the U.S.). The reduction is reduced to 0.6% (4.9%) for treatment stocks. These results suggest that the education treatment effectively reduces accrual mispricing. We also conduct a placebo test based on historical accruals and find no analogous treatment effects, suggesting that our results are falsifiable.

We then explore the heterogeneity of the education effect. We first examine whether the education effect varies according to knowledge type (conceptual vs. methodological knowledge). Interestingly, we find that the education effect of conceptual knowledge is more immediate than the effect of methodological knowledge. Methodological knowledge has a limited incremental effect over conceptual knowledge in the two-day window of earnings announcements, but it significantly adds to conceptual knowledge in reducing accrual mispricing in the longer term. In fact, we note the most significant reduction in the negative relationship between accruals and future long-term stock returns when both types of knowledge are provided. These results are consistent with the notion that, relative to conceptual information, individuals need to spend more time and effort in processing methodological information. Taken together, the evidence suggests that while

investors can improve accrual pricing when they are exposed to conceptual knowledge, they can price accruals more competently when they are exposed to both knowledge types.

Moreover, we show that the education effect is stronger for stocks when investors have more engagement with educational materials (e.g., more reading, comments, retweets, likes, and saves on communication posts, and more clicks on the hyperlinks included in the posts) and for stocks that are heavily owned by retail investors. In addition, the presence of investors with high levels of engagement with educational materials results in methodological knowledge having a significant short-term effect in the U.S. However, this effect is limited in China, where investors are generally less sophisticated and face more challenges in processing methodological knowledge.

Finally, we assess whether educating investors can affect firms' earnings management decisions. We show that, relative to control firms, treatment firms in both the Chinese and US markets have lower discretionary accruals in the post-experiment period. The reduction magnitude is around 8% (5%) of the standard deviation of quarterly discretionary accruals in China (the U.S.). This finding implies that managers may have a lower incentive to manage accruals to boost short-term prices after investors obtain the skills required to see through the trick of earnings management. Particularly, this real effect on managers' earnings decisions is more pronounced when the impact of education treatment on the market reactions to high accruals is stronger. Furthermore, we find that the reduction in accruals is larger for stocks that feature a large number of retail investors and for firms with weak external monitoring pressures. We posit that empowering individual investors with financial knowledge may act as a substitute for formal institutions in monitoring opportunistic management behaviors.

One may argue that our exercise may arouse the attention of investors who know accruals and inspire them to apply the knowledge they had already known, leading to the concern that our results are driven by the attention effect rather than the education effect. However, this attention argument is inconsistent with the long-term persistence of accrual mispricing, because investors' inattention will always be fixed in the long run. Moreover, if this attention argument is true, the treatment effects of conceptual knowledge and the combination of conceptual and methodological knowledge would be indistinctive. However, we find that adding methodological knowledge to conceptual knowledge can significantly improve the long-term pricing of accruals. Lastly, as a caveat, we acknowledge that some investors could be the audience of both treatment and control stocks, leading to the transmission of the treatment effect to the control group. However, this

spillover effect, if exists, may cause the underestimation of our treatment effects and would not bias the direction of our estimation.

Our study contributes to the literature on the effects of financial knowledge in financial markets. Existing studies mainly focus on the effects of financial knowledge on individuals' financial decisions and behaviors (Lusardi and Mitchell, 2014). To the best of our knowledge, ours is the first work to directly test the influence of financial knowledge on asset pricing. Indeed, our study demonstrates that educating investors about financial knowledge has a causal effect on asset pricing efficiency. In addition, we find that the provision of financial knowledge to investors can noticeably constrain firms' opportunistic behaviors, thereby serving as an alternative mechanism for improving corporate governance.

Our study also enhances the body of literature that examines financial anomalies and pricing efficiency. Notably, McLean and Pontiff (2016) posit that the academic discovery of financial anomalies can promote market efficiency by empowering investors to identify arbitrage opportunities. Our study shows that disseminating and educating investors about the discovered knowledge is also important to improve market efficiency. Previous studies on accrual anomaly use explanations such as risk (Khan, 2008; Chichernea et al., 2015), transaction costs (Collins et al., 2003; Mashruwala et al., 2006), limited attention (Hirshleifer et al., 2011; Miao et al., 2016), and insufficient supplementary accounting information (Balsam et al., 2002; Louis et al., 2008). We extend this body of literature by demonstrating a new explanation—investors' limited knowledge about accounting accruals. This perspective also sheds a light on the understanding of other price anomalies.

Our approach has policy implications. Individuals in many developed and developing countries have low levels of financial literacy (Van Rooij et al., 2011; Merkoulova and Veld, 2021).[9] Although many financial education programs have been introduced worldwide to rectify this problem (Kaiser et al., 2021), the effectiveness of these programs is debatable (Lusardi and Mitchell, 2014). Our study shows that investor education using social media platforms can effectively enhance individual investors' financial knowledge and improve market outcomes, offering significant implications for the design and planning of financial education programs.

[9] A recent survey of 26 large economies by the OECD International Network on Financial Education shows that less than 61% of adults in these countries appear to have a basic level of knowledge of and use of finance (OECD, 2020).

2. Literature and hypothesis development

2.1. Related literature

Financial knowledge or literacy refers to people's ability to process economic information and make informed financial decisions (Lusardi and Mitchell, 2014). Individuals' accumulation of financial knowledge can affect the development of financial markets. Cole et al. (2011) note that limited financial literacy presents a significant barrier to demand for financial services, as a lack of familiarity with financial products results in reduced demand levels for these products. Supporting this view, Van Rooij et al. (2011) find that individuals with low financial literacy are less likely to buy stocks and more likely to rely on informal channels, such as family and friends, for financial advice.

Moreover, financial knowledge affects individuals' investment performance. For example, Von Gaudecker (2015) finds that investors with high levels of financial literacy receive higher risk-adjusted returns. Moreover, Grinblatt et al. (2011) posit that there is a monotonical relationship between an individual's IQ and the Sharp ratio of their investment portfolio. Furthermore, in their study exploring the mechanism underlying the relationship between financial literacy and returns, Bianchi (2018) notes that more literate investors actively rebalance their portfolios, tend to hold riskier positions that have higher expected returns, and are less likely to engage in trend-chasing behaviors.

Financial knowledge also affects individuals' debt-related choices. In a study assessing variation in the timing of the enactment of financial reforms in high school curricula across a variety of US states, Brown et al. (2016) suggest that exposure to financial and quantitative education reduces the reliance on nonstudent debt and improves repayment behavior. Brown et al. (2019) show that individuals who grew up in financially underdeveloped reservations enter consumer credit markets later and have lower credit scores when reaching adulthood. Klapper et al. (2012) find that individuals with higher financial literacy are less likely to use informal sources of borrowing and have a greater ability to cope with macroeconomic shocks than their less financially literate peers. Moreover, individuals with low financial literacy are less likely than others to plan for retirement (Banks et al., 2010; Song, 2020) and accumulate savings (Cole et al., 2011) and more likely to default on mortgage payments (Gerardi et al., 2013). Given the substantial costs of financial illiteracy, Lusardi et al. (2017)'s finding that 30–40 percent of wealth inequality is attributable to financial knowledge is not surprising.

The above studies examine the effects of basic financial concepts on individuals' financial decisions, such as market participation and asset allocation (Lusardi and Mitchell, 2014). Yet, few studies directly link more concrete financial knowledge to price efficiency in financial markets. We seek to fill this gap in the literature.

2.2. Hypothesis development

Accruals are fundamental to earnings measurements and represent firms' estimates of future benefits and obligations.[10] Accountants use accruals to recognize the financial effects of transactions when they become probable, rather than when the cash consequences are realized. For example, a positive (negative) accrual occurs when there is an increase in account receivables (payables). Accruals reverse when either (i) the expected future benefits are realized (e.g., account receivables are collected and payables are paid off) or (ii) there is evidence indicating that future benefits are unlikely to materialize (e.g., inventories are written down if they are obsolete).[11] As a result of measurement errors or the possible occurrence of case (ii), accruals have lower earnings persistence than cash flows. In other words, the current level of accruals has a weaker power than the current level of cash flows in predicting future earnings.

Earnings persistence depends on the reliability of accruals. When managers demonstrate low faithfulness, and the valuation of assets and transactions is highly subjective, accruals are likely to feature low reliability and persistence (Dechow and Dichev, 2002; Richardson et al., 2005; Chan et al., 2006). As such, the correct pricing of accruals involves two costly cognitive processes: investors should 1) conceptually understand the distinctive implications of the accrual and cash flow components of a given company's reported earnings; and 2) methodologically apply formulas and models to estimate the level of accruals and construct measures to gauge their quality.

Despite the need for these processes in determining the correct pricing of accruals, a large body of literature suggests that investors fail to process accrual information correctly and efficiently. Indeed, many investors do not understand the low persistence of accruals relative to cash flows and consequently fixate on reported earnings (Sloan, 1996; Xie, 2001; Richardson et al., 2005; Chan et al., 2006; Allen et al., 2013). As such, high accruals are overpriced and

[10] See our education materials in Internet Appendixes 1.1 and 1.2 for a detailed introduction to accruals.

[11] Case (i) means that accruals correctly anticipate future benefits or obligations. Case (ii) refers to accrual estimation errors (i.e., accruals reverse without cash flow realization), which can be caused either by unintentional estimation errors or reporting manipulation and distortion.

negatively related to future stock returns. Some studies attribute this accrual mispricing to investors' limited cognitive capacity.[12] Notably, Sloan (1996), who first identified accrual mispricing, suggests that such mispricing is caused by "the inability of investors to distinguish fully between the different properties of the accrual and cash flow components of earnings" (p.290).

Consistent with this view, accrual mispricing is reduced when cash flow information becomes more accessible, thereby allowing investors to use this information alongside reported earnings to assess firms' future profitability (Mohanram, 2014; Miao et al., 2016). Based on their model assessing the implications of investors' limited cognitive capacity, Hirshleifer et al. (2011) predict that accrual mispricing increases as investors' attention to firms' earnings decreases. In line with this theory, accrual mispricing is less serious when the sources of accrual information (balance sheets, statements of cash flows, and cash flow forecasts) are more salient and require less cognitive effort to process (Louis et al., 2008; Radhakrishnan and Wu, 2014; Miao et al., 2016).

We suggest that educating investors about the implications and measurement of accruals can improve investors' cognitive capacity to understand and process accrual information, thereby enhancing the efficiency of accrual pricing. For example, accrual education may trigger active cognitive learning (VanLehn, 1996; Piaget, 2003), whereby investors update their understanding of the nature of accruals and recognize the differential properties of the cash flow and accrual components of earnings. This advancement of learning and knowledge can help investors reduce information complexity and cognitive burden when processing accrual information, enabling them to organize accounting information (e.g., earnings, cash flows, and accruals) more efficiently (Hirshleifer and Teoh, 2003). In this way, investors can evenly distribute their focus over the cash flow and accruals components of earnings, making them less likely to fixate on bottom-line reported earnings.

Educating investors on methodological knowledge can equip them with new skills to estimate and evaluate the level and quality of accruals. Engaging in such practices enables investors to price accruals more accurately (Billett, 2010). Supporting this idea, Li et al. (2020) find that financial analysts with enhanced technical skills can apply valuation models more effectively (e.g., isolate the most sensitive variable) and yield more accurate estimates of firm earnings.

[12] Studies also explore accrual mispricing based on risk (Khan, 2008) and arbitrage costs (Mashruwala et al., 2006). However, these explanations only provide a partial explanation for accrual mispricing (Richardson et al., 2010).

Furthermore, existing studies show that investors have a greater incentive to collect information when information processing costs are reduced and the benefits of utilizing the collected information are enhanced (Blankespoor, 2019; Kim et al., 2019). Similarly, to the extent that accrual education reduces investors' cognitive burden in the processing of accrual information and allows them to make more informed investment decisions, investors may feel motivated to search for additional information, which may further improve their ability to price accruals (Bertrand and Morse, 2011). For example, investors may collect additional information on firms' customers and suppliers to better understand the reliability of accruals.

With the treatment of education, investors are therefore likely to become more sophisticated in processing accrual information. When investor sophistication increases in the market, the probability that marginal investors can better price accruals increases, and accrual mispricing is attenuated (Hand, 1990; Collins et al., 2003). Our hypothesis is as follows:

H1: *Accrual mispricing of stocks receiving the treatment of investor education is lower than that of control stocks that do not receive the treatment.*

3. Experimental design and data

For our study, we procured information on the concept and pricing implications of accruals from top-tier accounting and finance journals. We then proceeded to disseminate this knowledge to randomized groups of investors via social media platforms in China and the U.S. We explain the design and execution of the experiment in the following subsections.[13]

3.1. Educational materials

To disseminate knowledge to investors, we established a website, http://www.financial-education-hub.com, and created a webpage for each stock. Each webpage contains the full contents of either the conceptual knowledge or the methodological knowledge of accruals. The pages are in Chinese (English) for Chinese (US) firms.

The full contents of the conceptual knowledge of accruals are the same for all stocks. Samples are provided in Internet Appendix 1.1. The article begins with a "highlight" and a brief "example,"

[13] To comply with research conduct and ethical review requirements, we applied for and obtained human ethics approval from our university. The committee confirmed that our data collection procedures did not expose participants to any physical, psychological, or criminal risks.

which are intended to provide investors with a quick understanding of the basic concept of accruals, and the pricing implications of accruals for the firm's future performance. The body of the article includes seven parts, including the definition of accruals, the reasons for the use of accruals in accounting, the relationship between accruals and cash flow realization, the implications of accruals on firms' future performance (i.e., the low earnings persistence of accruals), potential factors that affect the low earnings persistence of accruals, other reasons for low future profitability following high accruals, and a summary. A list of references is also included at the end of the article. To facilitate investor learning, we created an anime video that rephrases the article. The video is embedded in the article just below the highlight.

The contents on methodological knowledge of accruals are unique for each stock. Samples are provided in Internet Appendix 1.2. Upon loading the page, readers can jump to the conceptual knowledge article by clicking the relevant company name. This function is important because investors may need to familiarize themselves with the concept of accruals before being able to use the concept in a meaningful way. To facilitate investors' knowledge applications, the webpage contains a spreadsheet module to calculate a firm's accruals, including normal and abnormal accruals.[14] The variables, formulas, demos, and implications of accruals with different levels are provided on the webpage. The historical data of the firm are already included in the spreadsheet file. To view the results, readers need to input the firm's most recently announced numbers, including current assets, current liabilities, cash holdings, debts in current liabilities, total assets, operating earnings, and cash flows from operating activities.

Samples of the spreadsheet and results are provided in Internet Appendix 1.3. The results include a line chart that shows the firm's earnings, accruals, and abnormal accruals from 2009 onward. It also specifies the level of accruals in the current year and the average level in the past ten years. Readers can also view the level of abnormal accruals for the current year and the volatility of abnormal accruals in the past ten years to access the firm's accrual quality.[15] We also provide the firm's rank for each indicator relative to the industry and the entire market.[16]

[14] We provide two methods to estimate abnormal accruals. The first method involves regressing a firm's working-capital accruals on the firm's cash flows in historical, contemporary, and future periods (see Dechow and Dichev (2002)). The second method involves regressing firms' total accruals on the reciprocal of total assets, change in sales, net property, plant, and equipment (PPE), and return on assets (ROA) (see Kothari et al. (2005)).

[15] The abnormal accruals reported in the spreadsheet are estimated at the individual firm level based on the model of Dechow and Dichev (2002).

[16] The quartile of each indicator for each industry and the whole market are estimated, and the data are embedded in the spreadsheet.

3.2. Experimental sample

3.2.1 Experimental period

The actual experiment period in China took place between January and May 2020, during which Chinese firms' annual financial reports for 2019 were released.[17] The actual experiment period in the U.S. was 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). For simplicity, hereafter, we refer to the annual earnings that were announced in 2020 as earnings in 2019 for both markets.

3.2.2 Sample firms

The initial experimental subjects include all stocks that were publicly listed in China and the U.S. by the end of 2018, the last year for which data on annual performance were available before our experiment. We exclude firms in the financial services industries (the China Securities Regulatory Commission (CSRC) industry classifications are "J" and "K" in China, and the Standard Industrial Classification (SIC) codes are from 6000 to 6999 in the U.S.) because financial firms are subject to regulations and have disclosure practices different from firms in other industries (Firth et al., 2019).

To ensure a sufficient number of observations for investors to evaluate the quality of accruals when reading our educational materials, we exclude stocks with insufficient financial information from 2009 to 2018 (i.e., the number of observations is not fewer than four).[18] We further exclude stocks with no trading information in 2018. The final number of unique stocks in our experiment is 2,308 in China and 2,547 in the U.S. The filtering process for constructing the sample is reported in Appendix 1.

3.2.3 Treatment assignment

We created four randomized groups of stocks in each country.[19] We communicated the upcoming earnings announcement news and the conceptual knowledge to investors for stocks in the first

[17] The fiscal year end for firms listed in China is December, and all firms listed on China's two stock exchanges are required to file their annual performance from January to May of the following year.

[18] To estimate firm-level abnormal accruals as in Dechow and Dichev (2002), the minimum number of observations is four.

[19] We ranked stocks by return on assets in FY2018 within each of the two stock exchanges (SHSE and SZSE) in China and the three exchanges (NYSE, Nasdaq, and Amex) in the U.S. Every fourth stock within each market was selected

treatment group, named "T_1". We communicated the upcoming earnings announcement news, and both the conceptual and methodological knowledge to investors in the second treatment group, named "T_2". We communicated the upcoming earnings announcement news, as a placebo, to investors in the control group, named "C". The difference in accrual pricing between T_1 (T_2), and C therefore reflects the treatment effect of accrual knowledge.

The final group is a comparison group named "S". We did not make any intervention to the stocks in this group. We created this group to verify the existence of accrual mispricing in our experiment period. Specifically, we test whether the level of accruals is positively related to the short-term stock return around earnings announcements and negatively related to the long-term stock return in the subsequent period. Because stocks in the four groups are randomly assigned, it is reasonable to believe that accrual mispricing, if observed in group S, also applies to stocks in the three other groups.

The number of firms in each treatment group is shown in Appendix 1. There are 577 stocks in each group in China. There are 637 stocks in groups T_1, T_2, and C and 636 stocks in group S in the U.S. We compare the four groups of firms along a variety of firm characteristics in the year before the experiment and test the differences between the groups. The results are reported in Table 1. Supporting the validity of randomization, we show that the four groups of firms feature no significant intergroup differences in any of the indicators, including the natural logarithm of market capitalization (*MV*), total liability/total assets (*Leverage*), market-to-book ratio (*MB*), return on assets (*ROA*), cash flows/total assets (*CashFlows*), cash holdings/total assets (*Cash*), working capital accruals/total assets (*WorkingCapital*), total accruals/total assets (*Accruals*), and abnormal accruals estimated, based on Dechow and Dichev (2002) ($Accruals_{DD}$), and Kothari et al. (2005) ($Accruals_{KLW}$), respectively.[20]

[Insert Table 1 about here]

as a stock in a designated group. We ranked stocks based on return on assets as return on assets or earnings is the primary factor for which to control.

[20] Working capital accruals (WCA) is the change in current assets – the change in cash holding – the change in current liabilities + the change in short-term debt. Total accruals (TA) is the change in current assets – the change in cash holding – the change in current liabilities + the change in short-term debt + depreciation. These definitions are consistent with the definitions in our educational materials in Internet Appendix 1.2.

3.3. Experimental execution

3.3.1 Knowledge dissemination platforms

We used social media to disseminate information on accruals to investors in the designated groups.[21] The platforms we used included Weibo, Xueqiu, and Guba EastMoney in China and Twitter and StockTwits in the U.S.

Twitter, one of the largest social networking platforms in the world, allows users to post text messages, each of which contains up to 280 characters. StockTwits is a specialized social networking platform for stock investors that features a Twitter-like format. Investors can post messages of up to 1,000 characters and use "cashtags" with a stock ticker symbol to link a user's message to a particular company (a tag page) (e.g., $AAPL is linked to the page of Apple Inc.). Twitter also incorporated the "cashtags" function into its platform in 2012.

Weibo, the largest microblogging and social networking platform in China, is regarded as the main channel for users to obtain trending news in the country (Feng and Johansson, 2019). Similar to Twitter, Weibo uses cashtags with stock tickers to index users' thoughts and ideas about companies and their associated stocks. Xueqiu, a specialized social platform for stock investors in China, is similar to StockTwits and has a large base of users that track firms' fundamentals. Guba EastMoney is the most popular stock message board in China. Unlike Xueqiu, the platform focuses on the dissemination of financial and corporate news.

3.3.2 Constructing social media posts

We constructed social media posts by rephrasing the full contents of the two sets of accruals knowledge in a short essay. The posts include hyperlinks that link to the full page of accrual information.[22] The initial samples of social media posts for each group of stocks are provided in

[21] Social media platforms have become crucial sources of information for investors (Lee et al., 2015; Jame et al., 2016). Recent surveys show that social media outpaced print newspapers in the U.S. as a news source in 2018, see https://www.pewresearch.org/fact-tank/2018/12/10/social-media-outpaces-print-newspapers-in-the-u-s-as-a-news-source/. The 2020 annual report on the development of news media in China also shows that social media platforms have become the primary channel through which Chinese people obtain new information (CASS, 2020). Indeed, both regulators and companies are beginning to embrace social media platforms as viable disclosure channels for important information (Lee et al., 2015). Supporting the informational role of social media, recent studies show that investors are able to obtain crucial information from social media platforms such as Twitter (Blankespoor et al., 2014; Bartov et al., 2018; Tang, 2018), StockTwits (Cookson and Niessner, 2020), and Weibo (China's Twitter) (Feng and Johansson, 2019).

[22] Social media platforms usually limit the number of characters in each post. Hyperlinks are widely used to direct investors to pages featuring more thorough content. Blankespoor et al. (2014) find that firms' bid-ask spread is reduced when firms use Twitter to send links to press releases to market participants.

Internet Appendix 2. Panels A and B present posts in English and Chinese, respectively. $Ticker is the trading symbol of a stock. The URL address links to our website, and we provide two types of links. One type is a link to the full contents of the conceptual knowledge of accruals (type 1 link page), and the other type is a link to the full contents of the methodological knowledge of accruals (type 2 link page).

We communicated stocks in group T_1 with a type 1 link page and stocks in group T_2 with both types 1 and 2 link pages. For example, Coca-Cola (ticker: COKE) is in group T_2 and has both a type 1 page (http://www.financial-education-hub.com/1/COKE) and a type 2 page (http://www.financial-education-hub.com/2/COKE). Google (ticker: GOOG) is in group T_1 and only has a type 1 page (http://www.financial-education-hub.com/1/GOOG). Stocks in groups C and S have no linked pages.[23] To increase readability, we rephrased the posts to make each one unique.

3.3.3 Sending social media posts

We sent social media posts to investors in designated groups during a 19-day window around firms' earnings announcement dates.[24] The initial communication schedule is provided in Internet Appendix 3. We posted seven, one, and seven social media posts before, on, and after announcement day, respectively. In total, we aimed to communicate 15 posts for each firm on each social media platform. However, as some platforms do not allow users to communicate the same or very similar information during a certain period, we adjusted our posting frequency on platforms that featured such restrictions.

The specific adjustment varies from platform to platform, depending on the severity of the restrictions. In practice, we reduced our communication frequency from the above-described daily frequency to every other day for Guba EastMoney (11 posts per firm in total), every three days for Xueqiu (five posts per firm in total), and every five days for StockTwits (three posts per firm in total). We did not make any adjustments to our Twitter and Weibo posts, as these platforms are the least restrictive with regard to users' posting activities.

[23] It is worth noting that Guba EastMoney does not allow hyperlinks on their posts. However, the platform does not restrict the number of characters on each post. As such, we posted full-length articles on the stocks' tag pages and did not use hyperlinks.

[24] The earnings dates for Chinese firms are from cninf.com (CNINF), a platform designated by the China Securities Regulatory Commission (CSRC) to issue corporate disclosures for publicly listed firms. The earnings dates for U.S. firms are from Nasdaq.com and investing.com.

We created three types of accounts with fictional names on each platform. Each type of account only posts information that is targeted to one group of stocks. For example, when posting upcoming earnings announcements news and conceptual knowledge for group T_1, the same accounts were always used to post the information in this group. The purpose of having separate accounts is to avoid treatment contamination among the different groups of stocks.[25] Moreover, to avoid unnecessary duplicate posts, we created new posts only when the previous post was buried, i.e., when the most recent 20 posts on the stock's home/tag page did not belong to us or when our most recent post was no longer on the first page of the stock's home/tag page.

3.3.4 Data collection

We collected the number of reads and other response indicators (e.g., the number of comments, retweets, likes, reshares, and saves) the day after posting to measure each post's reading volume.[26] We completed the experiment by the end of December 2020, when we had 2,284 stocks (T_1: 569, T_2: 569, C: 573, and S: 573) with valid information for the Chinese market and 2,387 stocks (T_1: 599, T_2: 599, C: 594, and S:595) with valid information for the US market. Filtering information is provided in Appendix 1.

The number of posts sent and the reading volumes are presented in Table 2. We sent a total of 54,734 posts in China. The day after posting, we received 26,834,089 reads, 13,060 comments, 13,704 retweets or reshares, 808 likes (based on Xueqiu and Weibo only), and 392 saves (based on Xueqiu only) in total. On average, each stock received around 32 communications (or 1.8 per day during the 19-day window), 15,000 reads (or 1,100 per day), 7.6 comments (or 0.5 per day), 8 shares (or 0.6 per day), 0.5 likes, and 0.2 saves. The number of posts, reads, and comments on each day of the experiment among the treatment and control groups are shown in Internet Appendix 4. Samples of the responses to the posts are provided in Internet Appendix 5.

In the U.S., we sent a total of 28,429 posts. The day after posting, we received 3,397,437 reads (based on Twitter only), 2,680 comments (based on Twitter comments and StockTwits replies), 2,321 retweets or reshares, and 3,937 likes. On average, each stock received around 15

[25] For example, visitors to the account may see past posts of various types.

[26] The indicators available vary from platform to platform. Specifically, they include reads (Guba EastMoney, Xueqiu, Weibo, and Twitter), comments (EastMoney, Xueqiu, Weibo, and Twitter), retweets or reshares (EastMoney, Xueqiu, Weibo, and Twitter), likes (Xueqiu, Weibo, Twitter, and StockTwits), reshares (Twitter and StockTwits), replies (StockTwits), and saves (Xueqiu).

communications (or 1.1 per day) and 1,800 reads (140 per pay) on Twitter. We obtained a higher reading volume in China than in the U.S. This finding is consistent with the existence of a higher number of retail investors in China than in the U.S. (Titman et al., 2017).

[Insert Table 2 about here]

3.4. Estimation model

We test the effect of the education treatment on the pricing of accruals by running the model as follows:

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

where $AR_{i,t}$ 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. We use the two-day cumulative abnormal return from day zero (earnings announcement day) to day one based on the market model to measure the market reaction to the earnings announcement (*CAR*(0,1)). We use the buy-and-hold return from day 11 to day 251 minus the return of the matched portfolio of 5 × 5 size and book-to-market portfolios in the same window to measure the future long-term abnormal return after the earnings announcement (*CAR*(11, 251)). We start from day 11 because we stopped posting on day ten and use *CAR*(11, 251) to study the future abnormal return after the treatment.

$Treat_i$ is our treatment indicator. It equals one if firm *i* is in treatment groups T_1 or T_2, and zero if it is in control group C. We use $Treat_i$ to examine the average treatment effect of accrual education. We also differentiate the conceptual and methodological effects by using $T_{1,i}$ and $T_{2,i}$, respectively. $T_{1,i}$ equals one if firm *i* is in treatment group T_1 and zero if it is in the control group C. $T_{2,i}$ equals one if stock *i* is in treatment group T_2, and zero if it is in control group C.

$Accruals_i$ measures firm *i*'s total or normal accruals announced in 2020. Following Sloan (1996), Richardson et al. (2005), and Chan et al. (2006), we define the measure as 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. Previous studies suggest that the mispricing of total accruals mainly stems from unexpected discretionary accruals (Xie, 2001). As such, we also construct a variable for unexpected discretionary accruals ($Accruals_{UD,i}$), which is discretionary accruals in the current year minus discretionary accruals in the previous year (Balsam et al., 2002; Louis et al., 2008). Following Kothari et al. (2005), we regress *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, and use the residuals as the measure of discretionary accruals.

We control for the earnings announcement surprise (SUE_i), which is defined as the announced earnings per share minus the consensus analyst forecasts in the past year, scaled by the stock price before the earnings announcement.[27] We also control for industry fixed effects (***J***). Lastly, because stock prices changed substantially in the early months of 2020 due to the COVID-19 pandemic, we further control for the fixed effects of the months (***T***) in which firms announced their earnings.

4. Main results

4.1. Verifying the existence of accrual mispricing

Before reporting the estimates of Equation (1), we conduct a test to verify the existence of accrual mispricing in the Chinese and US stock markets during our experiment period. If accruals have low earnings persistence, investors should offer such accruals at a price discount relative to the cash flow component of earnings. A lack of such a discount would result in accrual overpricing and a negative relationship between current accruals and subsequent future returns (Sloan, 1996; Xie, 2001). To conduct the test, we regress accrual announcement returns (*CAR*(0,1)) and future abnormal returns (*CAR*(11, 251)) on accruals based on the sample of the comparison group S.

The results are reported in Table 3, and the summary statistics of variables used in this analysis are reported in Appendix 2. Panel A of Table 3 presents the results for *CAR*(0,1). We find that investors generally take a positive view of high accruals. In the Chinese market, investors react positively to earnings surprises (*SUE*) and to both total accruals (*Accruals*) and unexpected discretionary accruals ($Accruals_{UD}$). Specifically, a one standard deviation increase in *Accruals* and $Accruals_{UD}$ is associated with 0.5% (0.09 × 0.06) and 0.4% (0.13 × 0.03) increases in *CAR*(0,1), respectively. The change is similar for a one standard deviation change in *SUE*, namely 0.4% (0.01 × 0.4). These results suggest that investors do not distinguish between the accrual component and the earnings news component. A similar result is found in the U.S. market. A one standard deviation increase in *Accruals* is associated with a 1.1% (0.07 × 0.15) increase in *CAR*(0,1), which is similar to the 1.1% (0.03 × 0.38) change in *CAR*(0,1) for a one standard deviation increase in

[27] If analyst forecasts are not available, we follow Louis et al. (2008) and use the earnings per share of the previous year to proxy for the expected earnings per share.

SUE. The coefficient on $Accruals_{UD}$ is negative but nonsignificant, suggesting that US investors are less likely to take a positive view of high $Accruals_{UD}$ than their Chinese counterparts.

Panel B presents the results for *CAR*(11,251). Consistent with previous studies, we find that high accruals are associated with lower returns in the year of earnings announcements. In the Chinese market, a one standard deviation increase in *Accruals* ($Accruals_{UD}$) is associated with a 5.3% (5.8%) decrease in *CAR*(11,251). The analogous change in returns is 5.6% (3.5%) for *Accruals* ($Accruals_{UD}$) in the US market. However, the coefficient on $Accruals_{UD}$ lacks statistical significance.

Overall, we find evidence of accrual mispricing in both markets, and the effects of this mispricing seem to be stronger in the Chinese market.

[Insert Table 3 about here]

4.2. Education treatment and the pricing of earnings announcement

We plot the cumulative abnormal returns during the experiment window for stocks with high accruals in Figures 1 and 2. A stock is defined as having high accruals if it has unexpected discretionary accruals ($Accruals_{UD}$) in the top tercile of all sample stocks. Figure 1 plots the result for the Chinese stock market. We find that the returns for the treatment and control groups are parallel in the pre-experiment period. The stock prices of control group C increases during the experiment period. The abnormal return is around 2% from the earnings announcement day (day zero) to day one and about 5% over the entire experiment window. This finding is consistent with previous results that the market generally takes a positive view of high accruals.

In contrast, stock prices for treatment groups T_1 and T_2 are suppressed. Their returns from day zero to day one are close to zero. The returns over the entire experiment period are around 0% (-1%) for treatment group T_1 (T_2). These findings suggest that the market shows less enthusiasm for news of high accruals for treatment stocks than for control stocks.

Figure 2 plots the results for the US stock market, where we find a similar pattern. The returns of the three groups of stocks are parallel in the pre-experiment period. The return of the control group over the experiment period is around 1.5%. The return of T_1 over the period is close to -1%, and the return of T_2 is around -1.5%. Overall, the results suggest that the treatment of accrual knowledge mitigates the market's reaction to high accruals.

[Insert Figures 1 & 2 about here]

We then conduct a formal test by estimating Equation (1) based on the sample of groups T_1, T_2, and C. Our dependent variable is the two-day earnings announcement return ($CAR(0,1)$). Before reporting the results, we conduct a placebo test by alternatively estimating the equation based on an annual panel for a six-year period before the experiment from the fiscal year 2013 to the fiscal year 2018. The results are reported in Panel A of Table 4. Consistent with the existing of accrual mispricing, the coefficients on *Accruals* and $Accruals_{UD}$ are significantly positive in both markets (except for $Accruals_{UD}$ in the US market). Importantly, we find that the coefficients on the treatment variable *Treat* and its interaction terms with *Accruals* and $Accruals_{UD}$ are indistinctive from zero (*t*-values are smaller than 0.5). The results suggest that the treatment effects, if any, are falsifiable, which provides us with the confidence to use the setting to evaluate the market reaction to the education treatment.

The estimates of Equation (1) based on the experiment period are reported in Panel B. The summary statistics of the variables used for this analysis are reported in Appendix 2. We find that our education treatment results in a discount on the pricing of accruals in both the Chinese and US markets.

Columns (1) and (2) show the results for the Chinese market. The coefficient on *Accruals* is 0.02, significant at the 1% level. The coefficient on *Treat*×*Accruals* is -0.03, significant at the 1% level. In other words, a one-standard deviation increase in *Accruals* for treatment stocks is associated with a 0.3% (0.09 × 0.03) decline in $CAR(0,1)$. The results suggest that when investors receive the education treatment, they no longer take a positive view on high *Accruals*. Similar results are found in Column (2), where the accrual measure is $Accruals_{UD}$. The coefficients on *Treat*×$Accruals_{UD}$ and $Accruals_{UD}$ have similar magnitudes but opposite signs, suggesting that investors receiving the treatment no longer take a positive view on high $Accruals_{UD}$.

Columns (3) and (4) report the results for the US market. The coefficient on *Accruals* is nonsignificant, and the coefficient on *Treat*×*Accruals* is -0.26, significant at the 1% level. This result implies that relative to control stocks, there is a reduction of 1.8% (0.07 × 0.26) in $CAR(0,1)$ for a one standard deviation increase in *Accruals* for treatment stocks. The treatment also introduces a discount on the pricing of $Accruals_{UD}$. A one-standard deviation increase in $Accruals_{UD}$ for treatment stocks is associated with 0.8% (0.13 × 0.06) lower announcement returns relative to control stocks.

It is worth mentioning that the coefficients on *Treat* alone are significantly negative in Columns (1) to (3). This finding implies that our education treatment may allow investors to assess firms' earnings quality beyond the measures of *Accruals* and $Accruals_{UD}$.

[Insert Table 4 about here]

4.3. Knowledge treatment and the pricing of accruals in subsequent periods

The above evidence shows that accrual education can mitigate investors' overreaction to accruals. If this is indeed the case, treatment stocks should be less likely to experience a price reversal in the subsequent period than control stocks. To test this prediction, we estimate Equation (1) by replacing the dependent variable with the one-year abnormal return after the experiment (*CAR*(11,251)). The results are reported in Table 5. As expected, we find that high accruals are associated with lower future returns, but this negative relationship is mitigated by the education treatment.

As shown in Column (1) for the Chinese market, a one standard deviation increase in *Accruals* is associated with an approximately 3.2% (0.09 × 0.35) reduction in *CAR*(11,251) for control stocks. The decline is reduced to only 0.6% (0.09 × (0.35 – 0.28)) for treatment stocks. A one-standard deviation increase in $Accruals_{UD}$ is associated with an 8.2% (0.13 × 0.63) reduction in *CAR*(11, 251) for control stocks, as shown in Column (2). This negative relationship diminishes in treatment stocks because the treatment increases the future stock return by around 10.9% (0.13 × 0.84).

In the US market, a one standard deviation increase in *Accruals* for control stocks is associated with a 14.6% (0.07 × 2.08) decline in *CAR*(11, 251), as shown in Column (3). The reduction is lowered to 4.9% (0.07 × (2.08 – 1.37)) for treatment stocks. A one-standard deviation increase in $Accruals_{UD}$ results in an approximately 7.7% (0.13 × 0.59) decline in *CAR*(11, 250) for control stocks. The reduction disappears in treatment stocks, as the education treatment improves the return by 9.0% (0.13 × 0.69), as shown in Column (4).

Moreover, we find that the coefficients on *Treat* are significantly negative in all columns except Column (3). This finding may imply that our education program has persistent effects on the pricing of accruals that are announced in subsequent periods. To test this argument, we re-estimate Equation (1) to investigate the impact of education treatment on the markets' short-term reaction to firms' 2020 accruals (the accruals in the next year of the experiment). We find that high

accruals in 2020 for treatment stocks continue to experience a pricing discount relative to the control stocks in both markets.[28] The results thus support our argument and suggest that our education program has a lasting effect.

Overall, our results suggest that providing investors with accrual knowledge reduces their overreaction to the accrual component in earnings announcements, and therefore the price reversal in subsequent periods, in both the Chinese and US markets.

[Insert Table 5 about here]

4.4. Conceptual vs. methodological knowledge

Next, to examine whether and how the mitigation effect on accrual mispricing varies by applying the treatment of different types of accrual knowledge, we replace *Treat* with T_1 or T_2 and repeat the estimation of Equation (1). T_1 indicates the application of the conceptual knowledge treatment, and T_2 indicates the application of both conceptual and methodological knowledge treatments. If the results associated with T_2 are stronger than those associated with T_1, this would suggest that the treatment of methodological knowledge has incremental effects relative to conceptual knowledge.

The results are presented in Table 6. Panel A reports the results for *CAR*(0,1). Columns (1) and (2) report the effects of T_1 and T_2, respectively, on the pricing of *Accruals* in the Chinese market. We find that both the coefficients on $T_1 \times Accruals$ and $T_2 \times Accruals$ are significantly negative. Furthermore, we test the differences between the two coefficients. However, the P-value of the test, as reported at the bottom of columns, suggests that the difference between the two coefficients is nonsignificant.

The effects of T_1 and T_2 on the pricing of $Accruals_{UD}$ in the Chinese market are reported in Columns (3) and (4), respectively. The coefficient on $T_1 \times Accruals_{UD}$ is -0.04 and significant at the 5% level, and the coefficient on $T_2 \times Accruals_{UD}$ is -0.07 and significant at the 1% level. However, the difference between the two coefficients is nonsignificant. The estimates based on the US market are shown in Columns (5) to (8). We obtain similar patterns as in the Chinese market. Specifically, the coefficient on $T_2 \times Accruals$ ($T_2 \times Accruals_{UD}$) is more significant and negative than

[28] Specifically, there is a significant price discount on high accruals for both T_1 and T_2 stocks in the Chinese market, and for T_2 stocks in the US. The results are available upon a request.

it is on $T_1 \times Accruals$ ($T_1 \times Accruals_{UD}$). However, the differences between the two coefficients remain nonsignificant.

The lack of statistical significance for the incremental effect of methodological knowledge in the short term is expected as investors may need to spend more time processing and applying methodological than conceptual knowledge. This finding is consistent with the findings reported in Figures 1 and 2 where, relative to stocks in group T_1, the prices of stocks in group T_2 continue to be corrected after the first day of earnings announcements. Moreover, these stocks eventually feature a more complete correction during the 19-day experiment window.

Consistent with T_2, and enabling a more complete mispricing correction during the experiment period, we find that the long-term abnormal return $CAR(11, 251)$ is higher in stocks with high accruals when they receive the treatment of T_2 than when they receive the treatment of T_1, as reported in Panel B. The results support the incremental effects of methodological knowledge.

Specifically, in the Chinese market, the coefficient on the interaction term with *Accruals* is significantly positive when it is associated with T_2 but not with T_1. The P-value of the coefficient test is 0.014, suggesting that the difference between the two coefficients is highly significant. The coefficient on the interaction term with $Accruals_{UD}$ is positive and more significant when it is associated with T_2 rather than with T_1. The difference between the two coefficients has statistical significance (P-value = 0.092).

In the US market, we also find that high accruals are associated with higher $CAR(11, 251)$ for stocks given the T_2 treatment than for stocks given the T_1 treatment. In particular, the coefficient on $T_2 \times Accruals$ is 1.86, while the coefficient on $T_1 \times Accruals$ is 0.62. The difference between the two coefficients is significant at the normal statistical level (P-value = 0.055). The coefficient on $T_2 \times Accruals_{UD}$ is also greater than the coefficient on $T_1 \times Accruals_{UD}$, but this difference lacks statistical significance.

Overall, the results imply that while the addition of methodological knowledge to conceptual knowledge may have a limited effect in the short term, methodological knowledge has an incremental effect over conceptual knowledge in mitigating accrual mispricing over a longer period. The evidence therefore suggests that although accrual mispricing can be mitigated by providing conceptual knowledge, this achievement may be more pronounced when conceptual knowledge is provided in conjunction with methodological knowledge.

[Insert Table 6 about here]

5. Additional analyses

Our findings thus far suggest that accrual education can significantly mitigate accrual mispricing. In this section, we conduct additional analyses to corroborate our findings.

5.1. Engagement with educational materials

The effectiveness of education depends on the intensity with which individuals read and engage with educational materials. If our experiment indeed 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.

To conduct the test, we use the variable *Reads* to measure investors' reading volume on our social media posts. *Reads* equals 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. In addition, we use the variable *CSLS* to measure investors' engagement with our posts. *CSLS* equals one if our posts made for a particular stock receive more comments or replies than the sample median (i.e., if the total number of comments or replies across all platforms in a particular country is higher than the sample median) or are "retweeted/shared," "liked," or "saved" on any of the platforms, and zero otherwise. In addition, we create a variable *WebView* to measure the hit count of webpages that contain the full contents of educational materials. It 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. We augment *Reads*, *CSLS*, and *WebView* into Equation (1) and re-run the regressions.

The results are reported in Table 7. The dependent variable is $CAR(0, 1)$. To save space, we only report the estimates for the unexpected discretionary accruals ($Accruals_{UD}$). In the Chinese market, we find that the coefficients on $Treat \times Accruals_{UD} \times Reads$, $Treat \times Accruals_{UD} \times CSLS$, and $Treat \times Accruals_{UD} \times WebView$ are negative and significant at the 1% level, suggesting that there is a greater discount on the pricing of accruals in treatment stocks when investors engage with our educational materials more intensively.[29]

[29] The interaction terms $Treat \times Webview$ and $Accruals_{UD} \times Webview$ are omitted to avoid multicollinearity because *WebView* indicates a subgroup of the treatment stocks and takes the value of zero in all control stocks.

In the US market, the coefficients on $Treat \times Accruals_{UD} \times Reads$ and $Treat \times Accruals_{UD} \times WebView$ are also negative and significant. The coefficient on $Treat \times Accruals_{UD} \times CSLS$ is negative but nonsignificant. The weaker results associated with *CSLS* are consistent with the lack of variety of engagement functions on social media platforms in the US (as compared to China). For example, both Twitter and StockTwits do not have the 'save' function, which reduces the variation and therefore the measurement effectiveness of *CSLS*.

We re-run the analysis using the treatment indicators T_1 and T_2. The results are reported in Appendix 3. *Reads*, *CSLS*, and *WebView* enhance the treatment effects of both T_1 and T_2 in the Chinese market. However, the coefficient tests show that there is no significant difference between T_1 and T_2, consistent with the absence of the incremental effect of methodological knowledge in the short term. In the US market, *Reads* and *WebView* increases the treatment effects of T_2 but not of T_1. In addition, we find that the standalone effect of T_2 is improved by both *Reads* and *CSLS*. Such an effect is not observed for T_1. These results suggest that while the incremental effect of methodological knowledge is not significant in the short term in general (as shown in Panel A of Table 6), it becomes significant when investors engage with our education materials more intensively, corroborating the notion that the application of methodological knowledge requires large amounts of effort on the part of investors. However, more intensive study does not impart methodological skills to Chinese investors in the short term. As we note below, this peculiarity is likely related to the lack of investor sophistication in China.

[Insert Table 7 about here]

5.2. 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). As such, we expect our education program to be more beneficial in terms of stocks dominated by these investors. We measure the intensity of retail investors (*RI*) using 100% minus the number of shares held by institutional investors over the total number of tradable shares. We add *RI* into Equation (1) and re-estimate the model.

The results are reported in Table 8. We find that the coefficient on $Treat \times Accruals_{UD} \times RI$ is significantly negative in the Chinese market, suggesting that our accrual education program is particularly helpful for retail investors in China. Although the coefficient on the interaction term

is also negative in the US market, the result lacks statistical power. The results are consistent more often with unsophisticated retail investors in China than in the U.S. (Titman et al., 2021).

We further estimate the model using the separate treatment indicators T_1 and T_2. The results are reported in Appendix 4. We find that the coefficient is significantly negative for the interaction term of T_1 in the Chinese market, and that the coefficient is negative but nonsignificant for T_2. In contrast, the coefficient is significant for the interaction term of T_2 but nonsignificant for the interaction term of T_1 in the US market. These results suggest that the provision of conceptual knowledge is more effective than the provision of both conceptual and methodological knowledge to retail investors in China. In the U.S., the provision of both types of knowledge is more effective than the provision of conceptual knowledge alone.

The results are consistent with the notion that Chinese investors are generally less sophisticated than US investors. Chinese retail investors may face greater cognitive constraints and have a lower learning capacity (Chen et al., 2004). Educating Chinese retail investors by focusing on the basic conceptual knowledge of accruals is thus more effective than providing both conceptual and methodological knowledge (that is, more is less). In contrast, in the U.S., effective education entails the provision of more concrete knowledge (i.e., adding methodological knowledge), as US retail investors are relatively more sophisticated than Chinese retail investors. Supporting this view, Lusardi and Mitchell (2011) show that acquiring more sophisticated financial knowledge is crucial for individual literacy in the U.S.. Given the fact of more (less) retail investors in the Chinese market (the US market), the evidence also explains the lack (existence) of the incremental effect of methodological knowledge for Chinese (US) investors, as shown in the analysis of educational materials engagement.

[Insert Table 8 about here]

5.3. Robustness tests

We conduct further analyses as robustness checks. To save space, we do not tabulate the results, though they are available upon request. First, we use alternative windows to measure earnings announcement returns, which include windows from days zero to two ($CAR(0, 2)$), from days -5 to 5 ($CAR(-5, 5)$), and from days -10 to 10 ($CAR(-10, 10)$). We find similar results using these alternative windows.

Second, to mitigate the concerns that our results are driven by outlines, we alternatively measure *Accruals* and $Accruals_{UD}$ using a decile rank. We also find robust results.

Third, we repeat our analysis based on alternative models. Specifically, we re-estimate our analysis by dropping announcement month fixed effects or industry fixed effects. We also repeat our analysis by controlling for firm characteristics such as firm size, return on assets, cash flows, and stock return, and volatility in the quarter before earnings announcements. Our results are robust to these alternative specifications.

6. Real effect

Finally, we examine whether accrual education has a real effect on management decisions. Previous studies show that firm managers are myopic and have incentives to report high earnings to boost prices. For example, Bhojraj et al. (2009) show that managers cut discretionary expenditures and manage accruals to beat analyst forecasts. The authors find that firms that manage accruals to beat analyst forecasts have better short-term stock price performance but worse long-term performance than firms that do not manage accruals but miss the forecasts.

One implication of the findings of Bhojraj et al. (2009) is that investors do not adequately understand accruals and therefore buy stocks with high accruals, assuming that these stocks have high earnings. This implication leads to the following questions: (1) Are firms disincentivized to manage accruals when investors see through the trick of earnings management (i.e., when the benefits of overpricing have disappeared)? (2) Empirically, do the discretionary accruals of treatment firms decrease in the post-experiment period relative to control firms? We attempt to answer these questions in this section.

6.1.Education treatment and future accruals

We address the above questions by conducting a DID analysis. The model is specified as follows:

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

where $Accruals_{KLW,i,q}$ is the discretionary accruals for firm or stock i in year-quarter q. We use the same model as introduced in Section 3.4 to compute discretionary accruals. Specifically, we regress firms' total accruals (*Accruals*) on the reciprocal of total assets, the change in sales/total

assets, net property, plant, and equipment/total assets, and return on assets in each industry-year-quarter. The residuals obtained are our quarterly measure of discretionary accruals.

$Post_q$ indicates the post-experiment period; it equals one for quarterly earnings announcements after our experiment and zero otherwise. We include the lag of discretionary accruals ($Accruals_{KLW,i,q-1}$) to model the autocorrelations of discretionary accruals (Baber et al., 2011; Allen et al., 2013). We further control for firm fixed effects (vector ***I***) and industry-year-quarter fixed effects (vector ***JQ***). The standalone $Treat_i$ is absorbed by firm fixed effects.

We estimate the model using a window from Q1 2018 to Q4 2020. Therefore, we essentially test the change in discretionary accruals for treatment firms in the period of four quarters after and eight quarters before the experiment relative to the change for control firms. The variable summary statistics for this analysis are reported in Appendix 2.

The estimates of Equation (2) are reported in Panel A of Table 9. Interestingly, we find that the coefficients on *Treat*×*Post* are significantly negative in both markets. The results suggest that treatment firms reduce discretionary accruals after the experiment more often than control firms. The results have economic significance. Specifically, the DID estimate is 0.004 (0.002) in the Chinese (US) market, which is 8% (5%) of the standard deviation of $Accruals_{KLW}$.

We repeat the analysis using separate treatment indicators. The results are reported in Panel A of Appendix 5. We find that the real effects are significant for both T_1 and T_2, confirming the real effects of our education program on firm management decisions. The magnitude of the coefficients on the interaction associated with T_1 and T_2 is similar, suggesting that the real effect is primarily driven by the treatment of conceptual knowledge. To the extent that the incremental effect of methodological knowledge is limited in the short term, the evidence herein implies that managers' disincentive to manage accruals is mainly driven by the depressed market return on the announcement day of accruals.

[Insert Table 9 about here]

6.2. The effect of education

To confirm the link between the education treatment effect and the real effect on firm management decisions, we examine how the real effect varies with the market reaction to the education treatment. If the real effect acts through the education treatment, the real effect would be more pronounced when the education impact on the market reaction to high accruals is stronger.

To conduct the test, we create a variable *EduEffect* to measure the strength of the education effect. It equals one if a firm's *Accruals* is above the sample median and its *CAR*(0,1) is below the sample median, and zero otherwise. We augment *EduEffect* in Equation (2) and re-estimate the regressions.

The results are reported in Panel B of Table 9. We find that the coefficients on *Treat*×*Post*×*EduEffect* are significantly negative while the coefficients on *Treat*×*Post* become nonsignificant. Moreover, we estimate the model by focusing on treatment stocks only, allowing comparison within treatment stocks with various levels of the education effect. We observe the same pattern. The results thus suggest that the real effect concentrates on stocks with a stronger education effect. We also do the analysis based on the separate treatment variables. The results are reported in Panel B of Appendix 5. We find that the real effects of both T_1 and T_2 are more pronounced when the education effect is stronger.

6.3. The effects of investor naïveté and institutional discipline

If managers manage accruals to boost earnings by taking advantage of investors' naivete, the level of manipulation would be higher when there are more naïve investors and managers' speculative behaviors are less likely to be monitored. When investors become more financially savvy, the benefits for managers to manage earnings decrease. As a result, the real effect should be stronger when firms have more retail investors and face weaker external intuitional pressure ex-ante. We conduct analyses to test this prediction.

The ownership of retail investors (*RI*) is measured in the same way as before (see section 5.2). We measure the monitoring strength of financial institutions by *Institution*. This variable is an index, which is the count of the following events: 1) a firm has high institutional ownership (higher than the sample median); 2) a firm has high analyst coverage (higher than the sample median), and 3) a firm hires one of the big four auditors. A higher value indicates stronger institutional monitoring strength. Both *RI* and *Institution* were measured in the year just before we conducted the experiment (an ex-ante basis). We augment *RI* and *Institution* in Equation (2).

The estimated results are reported in Table 10. As expected, we find that the coefficient on *Treat*×*Post*×*RI* (*Treat*×*Post*×*Institution*) is significantly negative (positive) in both countries, meaning that the real effect of our educational program is indeed more pronounced when ownership by retail investors is higher and when institutional strength is weaker. The results

obtained using separate treatment indicators are reported in Panels C and D of Appendix 5. Consistent with previous results, the real effect of the treatment of conceptual knowledge increases with ownership by retail investors and decreases with institutional strength.

[Insert Table 10 about here]

7. Conclusion

This study examines the impact of investor education on stock mispricing. We provided financial knowledge about the concept and pricing implications of accounting accruals to randomized groups of investors in China and the US via social media platforms and examined whether investor education mitigated accrual mispricing and reduced earnings management.

We find reduced mispricing of treatment stocks relative to control stocks in both markets. The effect is most significant when knowledge that facilitates the conceptual understanding of accruals is provided in conjunction with knowledge that facilitates the quantitative application of accruals. We further find that the effect is stronger when investors are less sophisticated and have more engagement with our educational materials.

Finally, investor education has a real effect on firms' reporting decisions. Treatment firms experience a reduction in opportunistic management behavior in the post-experiment period, especially when the impact of education treatment on the market reaction to high accruals is stronger. Moreover, the effect on opportunistic management behavior is stronger for firms that are owned by more retail investors and face weaker discipline from external institutions.

Overall, our results suggest that investor education has a causal effect on asset pricing and firm decision-making, signifying the power of knowledge in promoting financial market development and efficiency.

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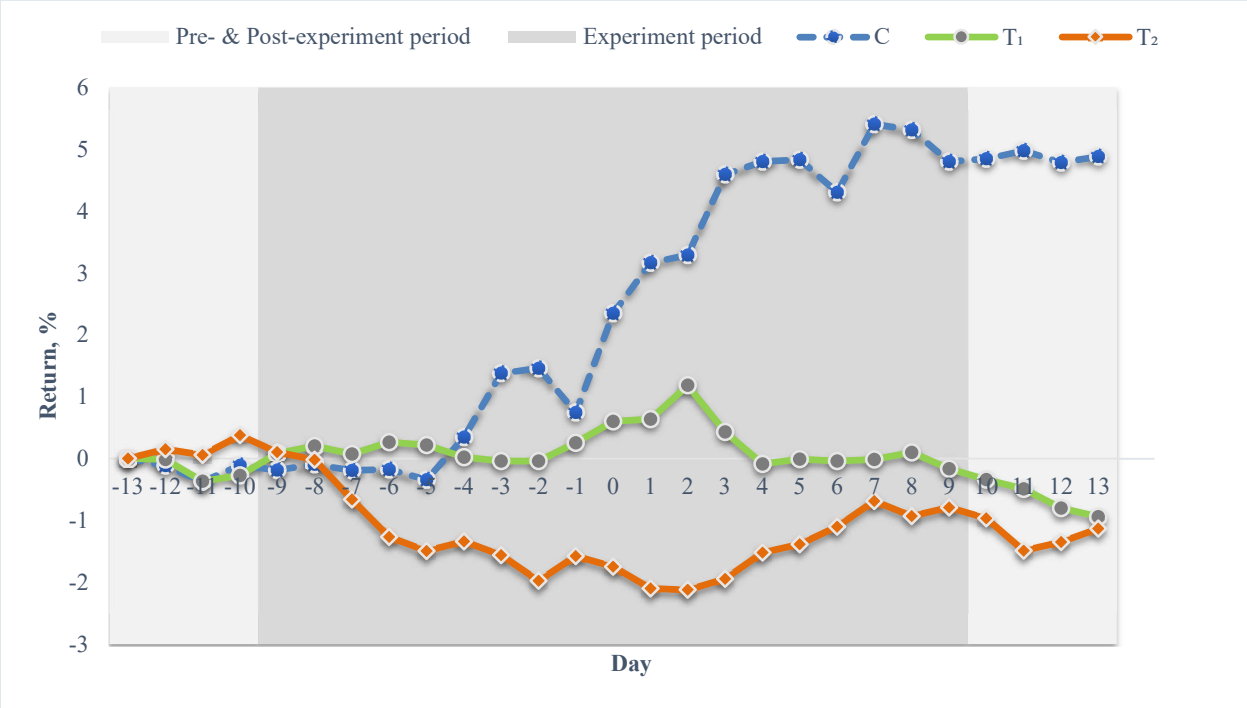
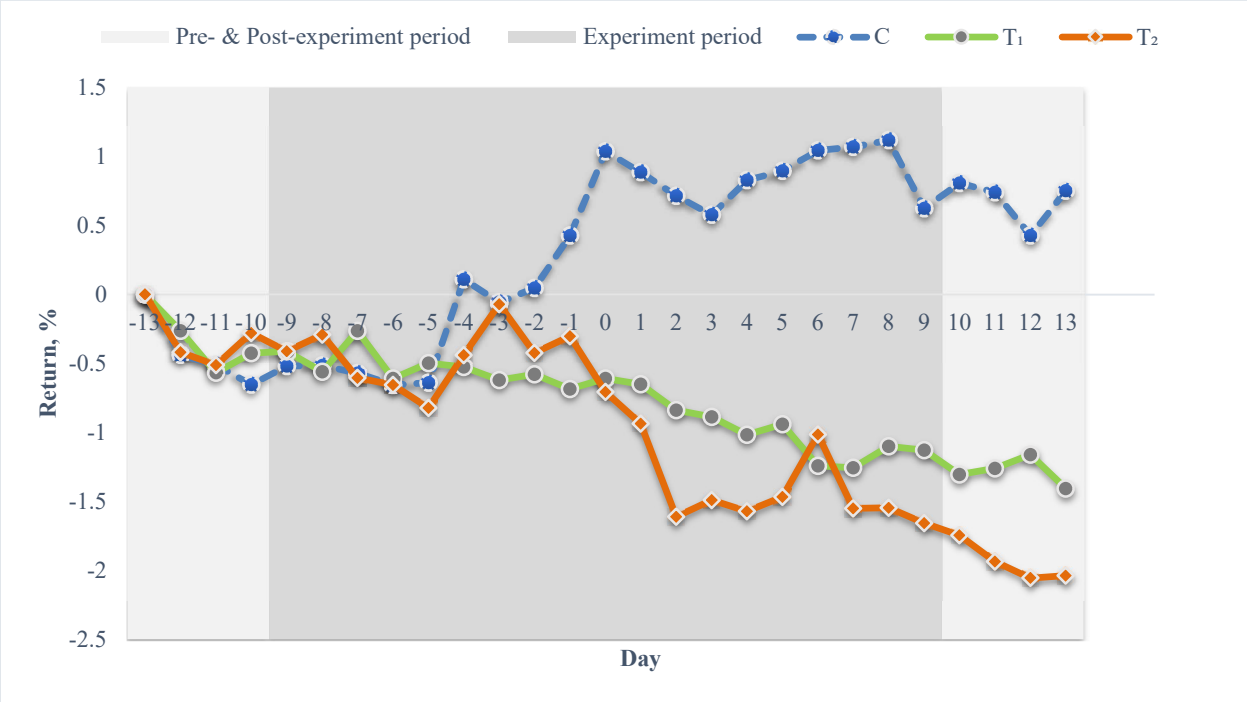
Figure 1—Accruals Announcement Returns during the Experiment Window for Stocks with High Accruals in the Chinese Stock Market



Notes: The figure plots the cumulative abnormal returns during the experiment window for stocks with high accruals in the Chinese market. A stock is defined as having high accruals if it has unexpected discretionary accruals ($Accruals_{UD}$) in the top tercile of all sample stocks (i.e., above the 60% percentile). Specifically, $Accruals_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year wherein *Accruals* is the change in current assets minus the change in cash holdings minus the change in current liabilities plus the change in short-term debt plus depreciation, scaled by total assets. The blue (green, orange) line represents the cumulative abnormal returns for stocks with high accruals in the control group C (treatment group T_1, treatment group T_2). The dark-gray area represents the experiment period. The light-gray areas represent the pre- and post-experiment period. Day zero is the earnings announcement day (the vertical dash line).

Figure 2—Accruals Announcement Returns during the Experiment Window for Stocks with High Accruals in the U.S. Stock Market



Notes: The figure plots cumulative abnormal returns during the experiment window for stocks with high accruals in the US market. A stock is defined as having high accruals if it has unexpected discretionary accruals ($Accruals_{UD}$) in the top tercile of all sample stocks (i.e., above the 60% percentile). Specifically, $Accruals_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year wherein *Accruals* is the change in current assets minus the change in cash holdings minus the change in current liabilities plus the change in short-term debt plus depreciation, scaled by total assets. The blue (green, orange) line represents the cumulative abnormal returns for stocks with high accruals in the control group C (treatment group T_1, treatment group T_2). The dark-gray area represents the experiment period. The light-gray areas represent the pre- and post-experiment period. Day zero is the earnings announcement day (the vertical dash line).

Table 1—Comparing Ex-ante Firm Characteristics between Control and Treatment Firms

Panel A: The Chinese markets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	S	C	T_1	T_2	$T_1 - C$		T_2 - C		T_2 - T_1	
Variable	Ave.				Dif.	P-value	Dif.	P-value	Dif.	P-value
MV	15.63	15.69	15.63	15.68	-0.06	(0.35)	-0.01	(0.85)	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	(0.80)	0.03	(0.90)	-0.03	(0.89)
ROA	-0.00	0.00	-0.00	0.00	-0.01	(0.46)	-0.00	(0.68)	0.00	(0.76)
CashFlows	0.05	0.05	0.05	0.05	-0.00	(0.73)	0.00	(1.00)	0.00	(0.73)
Cash	0.16	0.16	0.16	0.17	-0.00	(0.70)	0.00	(0.71)	0.01	(0.43)
WorkingCapital	-0.01	-0.00	0.00	-0.00	0.00	(0.52)	-0.00	(0.78)	-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)
$Accruals_{DD}$	-0.02	-0.01	-0.02	-0.01	-0.01	(0.15)	-0.00	(0.63)	0.00	(0.37)
$Accruals_{KLW}$	-0.00	-0.00	0.00	0.00	0.00	(0.54)	0.00	(0.79)	-0.00	(0.73)

Panel B: The US markets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	S	C	T_1	T_2	$T_1 - C$		T_2 - C		T_2 - T_1	
Variable	Ave.				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)
$Accruals_{DD}$	-0.00	-0.00	-0.00	-0.00	0.00	(0.42)	-0.00	(0.78)	-0.00	(0.26)
$Accruals_{KLW}$	0.00	0.00	0.01	0.00	0.00	(0.48)	0.00	(0.60)	-0.00	(0.86)

Table 2—Reading Volume of Social Media Posts

Panel A: The Chinese market

A1: Total volume of all firms

Group	(1) Posts	(2) Reads	(3) Comments	(4) Retweets	(5) Likes	(6) Saves
C	18,715	9,081,608	3,526	2,732	306	97
T_1	18,181	9,271,280	5,149	3,864	289	129
T_2	17,838	8,481,201	4,385	7,108	213	166
Total	54,734	26,834,089	13,060	13,704	808	392

A2: Total volume per firm

Group	(1) Posts	(2) Reads	(3) Comments	(4) Retweets	(5) Likes	(6) Saves
C	32.49	15,767	6.12	4.74	0.53	0.17
T_1	31.67	16,152	8.97	6.73	0.50	0.23
T_2	31.08	14,776	7.64	12.38	0.37	0.29

A3: Daily volume per firm

Group	(1) Posts	(2) Reads	(3) Comments	(4) Retweets	(5) Likes	(6) Saves
C	1.81	1,129	0.44	0.34	0.04	0.02
T_1	1.76	1,156	0.64	0.48	0.04	0.03
T_2	1.73	1,059	0.55	0.89	0.03	0.04

Panel B: The US market

B1: Total volume of all firms

Group	(1) Posts	(2) Reads (Twitter)	(3) Comments/replies	(4) Retweets/Reshares	(5) Likes
C	9,309	1,110,517	885	1180	1,298
T_1	9,563	945,797	1,067	662	1,444
T_2	9,557	1,341,123	738	479	1,195
Total	28,429	3,397,437	2,690	2,321	3,937

B2: Total volume per firm

Group	(1) Posts	(2) Reads (Twitter)	(3) Comments/replies	(4) Retweets/Reshares	(5) Likes
C	14.61	1,743	1.39	1.85	2.04
T_1	15.01	1,485	1.68	1.04	2.27
T_2	15.00	2,105	1.16	0.75	1.88

B3: Daily volume per firm

Group	(1) Posts	(2) Reads (Twitter)	(3) Comments/replies	(4) Retweets/Reshares	(5) Likes
C	1.16	137	0.11	0.16	0.16
T_1	1.18	116	0.13	0.09	0.17
T_2	1.17	159	0.09	0.06	0.14

Table 3—Testing for Accruals Mispricing

Panel A: *CAR*(0,1)

	The Chinese market		The US market	
	(1)	(2)	(3)	(4)
Accruals	**0.060*** **		**0.150***	
	(2.73)		**(1.74)**	
***Accruals*$_{UD}$**		**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

Panel B: *CAR*(11,251)

	The Chinese market		The US market	
	(1)	(2)	(3)	(4)
Accruals	**-0.583****		**-0.797****	
	(-2.40)		**(-2.23)**	
***Accruals*$_{UD}$**		**-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

Notes: The sample consists of stocks in comparison group S. The dependent variable in Panel A is *CAR*(0,1), and the cumulative abnormal return from day zero to day one (day zero is earnings announcement day) is based on the market model. The dependent variable in Panel B is *CAR*(11,251), the buy-and-hold return from day 11 to day 251 minus the return of the matched portfolio of 5×5 size, and book-to-market portfolios in the same window. *Accruals* is 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. *Accruals*$_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *SUE* measures the earnings announcement surprise, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before the earnings announcement. The fixed effects of industries and earnings announcement months are included. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 4—Financial Education and the Pricing of Accruals in the Short-term Window

Panel A: Placebo test

	The Chinese market		The US market	
	(1)	(2)	(3)	(4)
Treat×Accruals	**-0.001**		**-0.009**	
	(-0.05)		**(-0.42)**	
Accruals	0.056***		0.029*	
	(4.16)		(1.69)	
Treat×Accruals$_{UD}$		**0.001**		**-0.000**
		(0.12)		**(-0.40)**
Accruals$_{UD}$		0.042***		-0.000
		(4.53)		(-0.04)
Treat	-0.001	-0.001	0.003	0.003
	(-0.68)	(-0.72)	(0.85)	(0.96)
SUE	0.085***	0.089***	0.034**	0.036**
	(5.31)	(5.58)	(2.36)	(2.48)
Industry and month FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Observations	10,047	10,047	9,097	9,097
R-squared	0.014	0.015	0.028	0.027

Panel B: Baseline analysis

	The Chinese market		The US market	
	(1)	(2)	(3)	(4)
Treat×Accruals	**-0.030*** **		**-0.256*** **	
	(-3.47)		**(-4.06)**	
Accruals	0.020***		-0.008	
	(3.33)		(-0.15)	
Treat×Accruals$_{UD}$		**-0.058*** **		**-0.058** **
		(-4.00)		**(-1.97)**
Accruals$_{UD}$		0.059***		0.028
		(6.03)		(1.33)
Treat	-0.011***	-0.009***	-0.011**	0.001
	(-5.53)	(-4.12)	(-2.48)	(0.44)
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

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The dependent variable is *CAR*(0,1), and the cumulative abnormal return from day zero to day one (day zero is earnings announcement day) is based on the market model. *Treat* equals one if a stock is in T_1 or T_2 and zero if it is in C. *Accruals* is 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. $Accruals_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *SUE* measures earnings announcement news, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before earnings announcements. The fixed effects of industries and earnings announcement months are included. Panel A reports the results of a placebo test, which are estimated based on a period before the experiment (from the fiscal year 2013 to 2018) with year fixed effects included in this analysis. Panel B reports the estimates based on our experiment period (fiscal year 2019). The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 5—Financial Education and Pricing of Accruals in a Long-term Window

	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$_{UD}$		**0.844*** **		**0.689*** **
		(5.77)		**(4.75)**
Accruals$_{UD}$		-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	0.305	0.287

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The dependent variable is *CAR*(11,251), the buy-and-hold return from day 11 to day 251 (day zero is the earnings announcement date) minus the return of the matched portfolio of 5×5 size and book-to-market portfolios in the same window. *Treat* equals one if a stock is in T_1 or T_2 and zero if it is in C. *Accruals* is 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. *Accruals$_{UD}$* is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *SUE* measures earnings announcement news, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before earnings announcements. The fixed effects of industries and earnings announcement months are included. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 6—Conceptual vs. Methodological Education

Panel A: *CAR*(0,1)								
	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*	**-0.041*** **	**-0.030*** **			**-0.152** **	**-0.324*** **		
	(-2.66)	**(-3.34)**			**(-2.10)**	**(-4.09)**		
Accruals	0.020***	0.020***			-0.048	-0.000		
	(3.20)	(3.32)			(-0.94)	(-0.00)		
Treat×*Accruals*$_{UD}$			**-0.041** **	**-0.072*** **			**-0.069***	**-0.092** **
			(-2.27)	**(-3.87)**			**(-1.94)**	**(-2.49)**
Accruals$_{UD}$			0.058***	0.059***			0.033	0.040*
			(5.70)	(6.22)			(1.56)	(1.87)
Treat	-0.008***	-0.016***	-0.005*	-0.013***	-0.006	-0.013***	0.001	0.000
	(-3.01)	(-6.44)	(-1.81)	(-5.26)	(-1.26)	(-2.61)	(0.44)	(0.08)
SUE	0.647***	0.459***	0.607***	0.435***	0.642***	0.506***	0.603***	0.461***
	(5.51)	(4.00)	(5.21)	(3.83)	(5.32)	(3.81)	(4.98)	(3.45)
P-value (dif. b/t T_1 and T_2)	0.2115		0.3505		0.1609		0.3705	
Industry and month FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,142	1,142	1,142	1,142	1,193	1,193	1,193	1,193
R-squared	0.112	0.121	0.129	0.141	0.232	0.261	0.226	0.248

Panel B: *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*** **		
	(-0.94)	**(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*$_{UD}$			**0.734*** **	**1.124*** **			**0.598*** **	**0.753*** **
			(4.09)	**(5.97)**			**(3.27)**	**(4.15)**
Accruals$_{UD}$			-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)
SUE	1.973*	2.129*	2.088*	2.287**	0.769	1.738***	0.629	1.765***
	(1.73)	(1.83)	(1.83)	(1.99)	(1.25)	(2.69)	(1.02)	(2.69)
P-value (dif. b/t T_1 and T_2)	0.0140		0.0915		0.0547		0.3360	
Industry and month FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,142	1,142	1,142	1,142	1,191	1,193	1,191	1,193
R-squared	0.179	0.190	0.173	0.204	0.332	0.401	0.316	0.378

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The dependent variable in Panel A is *CAR*(0,1), the cumulative abnormal return from day zero to day one (day zero is earnings announcement day) based on the market model. The dependent variable in Panel B is *CAR*(11,251), the buy-and-hold return from day 11 to day 251 (day zero is earnings announcement day) minus the return of the matched portfolio of 5×5 size and book-to-market portfolios in the same window. *Treat* indicates T_1 or T_2. T_1 equals one if a stock is in T_1 and zero if it is in C. T_2 equals one if a stock is in T_2 and zero if it is in C. *Accruals* is 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. *Accruals*$_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *SUE* measures earnings announcement news, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before earnings announcements. The fixed effects of industries and earnings announcement months are included. The *t*-statistics are shown in brackets. The p-value of testing the difference in coefficients on *Treat*×*Accruals* between T_1 and T_2 is reported at the bottom of the columns. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 7—Financial Education Effect and Reading Volume

	The Chinese market			The US market		
	(1)	(2)	(3)	(4)	(5)	(6)
***Treat*×*Accruals*$_{UD}$**	**-0.147*** **			**-0.109***		
×*Reads*	**(-4.12)**			**(-1.77)**		
Treat×*Reads*	0.008			-0.011*		
	(1.60)			(-1.88)		
Accruals$_{UD}$× *Reads*	0.032			0.078*		
	(1.14)			(1.67)		
Reads	-0.004			0.014***		
	(-1.01)			(2.97)		
***Treat*×*Accruals*$_{UD}$**		**-0.201*** **			**-0.039**	
×*CSLS*		**(-5.59)**			**(-0.44)**	
Treat×*CSLS*		0.002			-0.011	
		(0.31)			(-1.45)	
Accruals$_{UD}$× *CSLS*		0.056*			0.279***	
		(1.96)			(3.68)	
CSLS		-0.001			0.009	
		(-0.22)			(1.31)	
***Treat*×*Accruals*$_{UD}$**			**-0.124*** **			**-0.661*** **
×*WebView*			**(-4.59)**			**(-4.42)**
WebView			0.002			-0.048***
			(0.46)			(-4.64)
Treat×*Accruals*$_{UD}$	0.020	0.068**	-0.033**	-0.019	0.025	-0.048
	(0.68)	(2.20)	(-2.15)	(-0.52)	(0.30)	(-1.62)
Accruals$_{UD}$	0.033	0.012	0.058***	0.001	-0.221***	0.028
	(1.26)	(0.44)	(6.03)	(0.04)	(-3.01)	(1.35)
Treat	-0.013***	-0.009**	-0.009***	0.008*	0.009	0.002
	(-3.35)	(-2.09)	(-4.09)	(1.77)	(1.33)	(0.87)
SUE	0.449***	0.446***	0.455***	0.533***	0.546***	0.538***
	(4.87)	(4.86)	(4.92)	(4.73)	(4.91)	(4.81)
Industry and month FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,711	1,711	1,711	1,792	1,792	1,792
R-squared	0.125	0.133	0.119	0.185	0.201	0.192

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The dependent variable is *CAR*(0,1), the cumulative abnormal return from day zero to day one (day zero is earnings announcement day) based on the market model. *Treat* equals one if a stock is in T_1 or T_2 and zero if it is in C. *Accruals*$_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *Reads* equals one if the number of reads on educational posts made for a firm is above the median and zero otherwise. *CSLS* equals one if educational posts made for a firm receive a large number of comments or replies (higher than the median) or are "retweeted/shared," "liked," or "saved" and zero otherwise. *WebView* equals one if the number of web clicks of both type 1 and type 2 link pages of stocks are on the top quintile of the treatment stocks, and zero otherwise. *SUE* is earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before the announcement. The *t*-statistics are shown in brackets. The significance levels at the 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 8—Financial Education Effect and Retail Investors

	The Chinese market	The US market
	(1)	(2)
Treat*×*Accruals*$_{UD}$×*RI	**-0.230***	**-0.084**
	(-1.93)	**(-0.86)**
Treat×*RI*	0.017	0.034***
	(0.82)	(3.52)
Accruals$_{UD}$×*RI*	0.162	0.113
	(1.58)	(1.55)
RI	-0.031*	-0.012
	(-1.83)	(-1.49)
Treat×*Accruals*$_{UD}$	0.152	0.010
	(1.37)	(0.16)
Accruals$_{UD}$	-0.090	-0.047
	(-0.94)	(-0.93)
Treat	-0.024	-0.016***
	(-1.26)	(-2.84)
SUE	0.433***	0.549***
	(4.67)	(4.89)
Industry and month FEs	Yes	Yes
Observations	1,711	1,792
R-squared	0.112	0.190

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and control group C. The dependent variable is *CAR*(0,1), the cumulative abnormal return from day zero to day one (day zero is the earnings announcement day) based on the market model. *Treat* equals one if a stock is in T_1 or T_2 and zero if it is in C. *Accruals*$_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *RI* is the fraction of retail investors (100% - the number of shares held by institutional investors/total number of tradable shares) for a firm. *SUE* measures the earnings announcement surprise, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before earnings announcements. The fixed effects of industries and earnings announcement months are included. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 9—The Real Effect of Financial Education

Panel A: Baseline

	The Chinese market	the US market
	(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

Panel B: The education effect

	The Chinese market	The US market
	(1)	(2)
Treat* × *Post* × *EduEffect	**-0.009*****	**-0.005*****
	(-3.87)	**(-2.97)**
Treat × *Post*	-0.002	-0.001
	(-1.13)	(-0.71)
Post	-0.002	0.015***
	(-0.15)	(7.03)
$Accruals_{KLW,-1}$	-0.186***	-0.202***
	(-24.97)	(-17.22)
Firm FE	Yes	Yes
Year-quarter-industry FE	Yes	Yes
Observations	19,794	21,476
R-squared	0.042	0.180

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and control group C. The unit of observation is a firm in a certain quarter. The estimation window is from Q1 2018 to Q4 2020. The dependent variable is quarterly discretionary accruals, $Accruals_{KLW}$, which are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year-quarter. *Treat* equals one if a stock is in T_1 or T_2 and zero if it is in C. *Post* is a dummy, which equals one for the year-quarters after the educational experiment and zero otherwise. $Accruals_{KLW,-1}$ is one quarter lag of $Accruals_{KLW}$. *EduEffect* measures the market reaction of the financial education treatment. It equals one if a firm's *Accruals* is above the sample median and its *CAR(0,1)* is below the sample median, and zero otherwise. The fixed effects of firms and year-quarter-industry are included. The standalone treatment variable is absorbed by fixed effects. Panel A reports the baseline estimates. Panel B reports the estimates when the interaction term with *EduEffect* is further added. *EduEffect* and its interaction terms with *Treat* and *Post* are absorbed by the fixed effects. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 10—The Real Effects of Financial Education: Retail Investors and Institutions

	The Chinese 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)	
Treat×Post×Institution		**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

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The unit of observation is a firm in a certain quarter. The estimation window is from Q1 2018 to Q3 2020. The dependent variable is the quarterly discretionary accruals, $Accruals_{KLW}$, which are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year-quarter. *Treat* equals one if a stock is in T_1 or T_2 and zero if it is in C. *Post* is a dummy, which equals one for the year-quarters after the educational experiment and zero otherwise. *RI*, measured in the year in which we conducted the experiment, is the fraction of retail investors (100% - the number of shares held by institutional investors/total number of tradable shares) for a firm. *Institution* measures the monitoring strength from financial institutions. This variable is an index measured in the year in which we conducted the experiment. It is the count of the following events: 1) a firm has high institutional ownership (higher than the median); 2) a firm has high analyst coverage (higher than the median); 3) a firm hires one of the Big four auditors. $Accruals_{KLW,-1}$ is one quarter lag of $Accruals_{KLW}$. The fixed effects of firms and year-quarter-industry are included. The standalone treatment variable and its interaction with *RI* and *Institution* are absorbed by fixed effects. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Appendix 1—Sample Construction and Filtering

Panel A: Chinese markets

The initial number of stocks listed in China's stock markets by the end of 2018	3,689
- delete B shares	99
- delete stocks in financial and real estate industries (i.e., CSRC industry classification is "J" and "K")	317
- delete stocks with insufficient historical financial information from 2009 to 2018 ($n \leq 3$) to estimate accruals	1,062
- delete stocks with no trading information in 2018	2
The final sample for the experiment	2,308

Treatment groups	S	C	T_1	T_2	Total
Randomly divide the sample into four groups	577	577	577	577	2,308
- delete stocks that were delisted or did not file annual reports in 2020	2	1	3	3	9
- delete stocks that were suspended for trading in 2020	2	3	5	5	15
Final sample for analysis	573	573	569	569	2,284

Panel B: US markets

The initial number of stocks listed in US stock markets by the end of 2018 (included in CRSP/Compustat merged dataset)	5,320
- delete inactive stocks (i.e., COSTAT = "A")	127
- delete stocks in the financial and real estate industries (i.e., SIC 6000–6999)	1,508
- delete stocks with insufficient historical financial information from 2009 to 2018 ($n \leq 3$) to estimate accruals	1,093
- delete stocks with no trading information in 2018	45
The final sample for the experiment	2,547

Treatment groups	S	C	T_1	T_2	Total
Randomly assign the sample into four groups	636	637	637	637	2,547
- delete stocks that were delisted or did not file annual reports in 2020	25	33	25	25	108
- delete stocks that were suspended for trading in 2020	16	10	13	13	52
Final sample for analysis	595	594	599	599	2,387

Appendix 2—Variables Summary Statistics

Panel A: The Chinese market

Variables	(1) N	(2) Mean	(3) STD	(5) P25	(6) P50	(7) P75
Accrual mispricing test:						
CAR(0,1)	573	-0.01	0.05	-0.03	-0.01	0.02
CAR(11, 251)	573	-0.16	0.42	-0.40	-0.24	-0.01
Accruals	573	-0.03	0.09	-0.07	-0.02	0.03
$Accruals_{UD}$	573	-0.00	0.13	-0.08	-0.00	0.07
SUE	573	-0.00	0.01	-0.00	0.00	0.00
The analysis of short- and long-term returns of accrual announcement:						
CAR(0,1)	1,711	-0.01	0.05	-0.03	-0.01	0.02
CAR(11, 251)	1,711	-0.15	0.40	-0.40	-0.23	-0.00
Accruals	1,711	-0.02	0.09	-0.07	-0.02	0.03
$Accruals_{UD}$	1,711	0.00	0.13	-0.07	-0.00	0.07
SUE	1,711	-0.00	0.01	-0.00	0.00	0.00
Treat	1,711	0.67	0.47	0.00	1.00	1.00
T_1	1,142	0.50	0.50	0.00	0.00	1.00
T_2	1,142	0.50	0.50	0.00	0.00	1.00
Reads	1,711	0.50	0.50	0.00	0.00	1.00
CSLS	1,711	0.63	0.48	0.00	1.00	1.00
WebView	1,711	0.10	0.30	0.00	0.00	0.00
RI	1,711	0.92	0.22	0.95	0.99	1.00
The analysis of real effect:						
$Accruals_{KLW,-1}$	19,794	-0.00	0.05	-0.02	-0.00	0.02
Treat	19,794	0.67	0.47	0.00	1.00	1.00
T_1	13,156	0.50	0.50	0.00	0.00	1.00
T_2	13,229	0.50	0.50	0.00	1.00	1.00
Post	19,794	0.34	0.47	0.00	0.00	1.00
EduEffect	19,794	0.17	0.38	0.00	0.00	0.00
RI	19,794	0.98	0.03	0.97	0.99	1.00
Institution	19,794	0.74	0.76	0.00	1.00	1.00

Panel B: The US market

Variables	(1) N	(2) Mean	(3) STD	(5) P25	(6) P50	(7) P75
Accrual mispricing test:						
CAR(0,1)	595	-0.01	0.11	-0.05	-0.01	0.04
CAR(11, 251)	595	-0.08	0.50	-0.34	-0.08	0.20
Accruals	595	-0.05	0.07	-0.08	-0.04	-0.02
$Accruals_{UD}$	595	0.00	0.14	-0.06	0.00	0.06
SUE	595	-0.00	0.03	-0.00	0.00	0.00
The analysis of short- and long-term returns of accrual announcement:						
CAR(0,1)	1,792	-0.01	0.10	-0.06	-0.01	0.04
CAR(11, 251)	1,790	-0.05	0.50	-0.32	-0.06	0.21
Accruals	1,792	-0.04	0.07	-0.07	-0.04	-0.01
$Accruals_{UD}$	1,792	0.01	0.13	-0.05	0.00	0.07
SUE	1,792	-0.00	0.03	-0.00	0.00	0.00
Treat	1,792	0.67	0.47	0.00	1.00	1.00
T_1	1,193	0.50	0.50	0.00	1.00	1.00
T_2	1,193	0.50	0.50	0.00	1.00	1.00
Reads	1,792	0.50	0.50	0.00	1.00	1.00
CSLS	1,792	0.60	0.49	0.00	1.00	1.00
WebView	1,792	0.01	0.08	0.00	0.00	0.00
RI	1,792	0.49	0.34	0.16	0.53	0.78
The analysis of real effect:						
$Accruals_{KLW,-1}$	21,476	-0.00	0.04	-0.02	0.00	0.02
Treat	21,476	0.67	0.47	0.00	1.00	1.00
T_1	14,261	0.50	0.50	0.00	1.00	1.00
T_2	14,258	0.50	0.50	0.00	1.00	1.00
Post	21,476	0.33	0.47	0.00	0.00	1.00
EduEffect	21,476	0.14	0.35	0.00	0.00	0.00
RI	21,476	0.49	0.50	0.00	0.00	1.00
Institution	21,476	1.32	0.95	1.00	1.00	2.00

Appendix 3—Financial Education Effects and Reading Volume: Conceptual vs. Methodological Education

Panel A: *Reads*

	The Chinese market		The US market	
	Treat=*T1*	Treat=*T2*	Treat=*T1*	Treat=*T2*
	(1)	(2)	(3)	(4)
Treat ×*Accruals$_{UD}$* × *Reads*	**-0.126*** **	**-0.165*** **	**-0.024**	**-0.208*** **
	(-2.97)	**(-3.94)**	**(-0.33)**	**(-2.67)**
Treat × *Reads*	0.001	0.013**	-0.001	-0.019***
	(0.25)	(2.41)	(-0.10)	(-2.98)
Accruals$_{UD}$ × *Reads*	0.029	0.033	0.093**	0.069
	(0.98)	(1.18)	(1.99)	(1.47)
Reads	-0.005	-0.003	0.012**	0.018***
	(-1.15)	(-0.87)	(2.56)	(3.87)
Treat ×*Accruals$_{UD}$*	0.022	0.019	-0.085*	-0.011
	(0.65)	(0.56)	(-1.77)	(-0.25)
Accruals$_{UD}$	0.036	0.033	0.000	0.014
	(1.32)	(1.29)	(0.01)	(0.54)
Treat	-0.007	-0.020***	0.002	0.012**
	(-1.42)	(-4.64)	(0.32)	(2.39)
SUE	0.606***	0.435***	0.582***	0.428***
	(5.21)	(3.85)	(4.82)	(3.21)
Industry and month FEs	Yes	Yes	Yes	Yes
Observations	1,142	1,142	1,193	1,193
R-squared	0.139	0.161	0.236	0.262

Panel B: *CSLS*

	The Chinese market		The US market	
	Treat=*T1*	Treat=*T2*	Treat=*T1*	Treat=*T2*
	(1)	(2)	(3)	(4)
Treat ×*Accruals$_{UD}$* × *CSLS*	**-0.220*** **	**-0.177*** **	**-0.158**	**-0.051**
	(-5.17)	**(-4.16)**	**(-1.65)**	**(-0.50)**
Treat × *CSLS*	-0.003	0.004	-0.002	-0.025***
	(-0.47)	(0.72)	(-0.24)	(-2.92)
Accruals$_{UD}$ × *CSLS*	0.053*	0.059**	0.301***	0.302***
	(1.77)	(2.08)	(4.10)	(3.87)
Reads	-0.001	-0.000	0.004	0.011
	(-0.22)	(-0.07)	(0.67)	(1.56)
Treat ×*Accruals$_{UD}$*	0.088**	0.046	0.101	-0.008
	(2.50)	(1.30)	(1.18)	(-0.09)
Accruals$_{UD}$	0.014	0.010	-0.241***	-0.229***
	(0.51)	(0.36)	(-3.37)	(-3.02)
Treat	-0.003	-0.014***	0.002	0.017**

	(-0.49)	(-3.09)	(0.24)	(2.38)
SUE	0.607***	0.423***	0.583***	0.443***
	(5.27)	(3.73)	(4.85)	(3.36)
Industry and month FEs	Yes	Yes	Yes	Yes
Observations	1,142	1,142	1,193	1,193
R-squared	0.155	0.156	0.243	0.276

Panel C: *WebView*

	The Chinese market		The US market	
	Treat=*T1*	Treat=*T2*	Treat=*T1*	Treat=*T2*
	(1)	(2)	(3)	(4)
Treat ×*Accruals*$_{UD}$ × *WebView*	**-0.094*** **	**-0.066***	**0.137**	**-0.676*** **
	(-2.64)	**(-1.76)**	**(1.45)**	**(-4.55)**
WebView	0.004	0.001	0.001	-0.041***
	(0.92)	(0.32)	(0.22)	(-3.90)
Treat ×*Accruals*$_{UD}$	-0.018	-0.056***	-0.082**	-0.067*
	(-0.92)	(-2.71)	(-2.23)	(-1.80)
Accruals$_{UD}$	0.057***	0.059***	0.033	0.039*
	(5.68)	(6.20)	(1.55)	(1.86)
Treat	-0.007**	-0.013***	0.001	0.002
	(-2.12)	(-4.82)	(0.36)	(0.58)
SUE	0.611***	0.434***	0.607***	0.452***
	(5.26)	(3.82)	(5.01)	(3.41)
Industry and month FEs	Yes	Yes	Yes	Yes
Observations	1,142	1,142	1,193	1,193
R-squared	0.135	0.144	0.227	0.264

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The dependent variable is *CAR(0,1)*, the cumulative abnormal return from day zero to day one (day zero is earnings announcement day) based on the market model. *Treat* indicates T_1 or T_2. T_1 equals one if a stock is in T_1 and zero if it is in C. T_2 equals one if a stock is in T_2 and zero if it is in C. *Accruals*$_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *Reads* equals one if the number of reads on the educational posts made for a firm is above the median and zero otherwise. *CSLS* equals one if the education posts made for a firm receive a large number of comments/replies (higher than the median) or are "retweeted/shared," "liked," or "saved" and zero otherwise. *WebView* equals one for group T_1 (T_2) if the number of web clicks of type 1 link page (both type 1 and type 2 link pages) are on the top quintile, and zero otherwise. *SUE* measures earnings announcement news, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before earnings announcements. The fixed effects of industries and earnings announcement months are included. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Appendix 4—Financial Education Effects and Retail Investors: Conceptual vs. Methodological Education

	The Chinese markets		The US markets	
	Treat = T_1	Treat = T_2	Treat = T_1	Treat = T_2
	(1)	(2)	(3)	(4)
Treat ×$Accruals_{UD}$ × *RI*	**-0.365****	**-0.174**	**0.024**	**-0.248****
	(-2.35)	**(-1.41)**	**(0.21)**	**(-2.03)**
Treat × *RI*	0.002	0.033	0.041***	0.037***
	(0.09)	(1.46)	(3.88)	(3.38)
$Accruals_{UD}$ × *RI*	0.157	0.169*	0.086	0.112
	(1.49)	(1.69)	(1.21)	(1.53)
RI	-0.026	-0.031*	-0.021**	-0.006
	(-1.48)	(-1.88)	(-2.55)	(-0.70)
Treat ×$Accruals_{UD}$	0.294**	0.088	-0.063	0.058
	(2.03)	(0.77)	(-0.89)	(0.80)
$Accruals_{UD}$	-0.087	-0.095	-0.026	-0.029
	(-0.88)	(-1.02)	(-0.53)	(-0.57)
Treat	-0.007	-0.043**	-0.020***	-0.019***
	(-0.28)	(-2.05)	(-3.10)	(-2.90)
SUE	0.589***	0.421***	0.605***	0.469***
	(5.05)	(3.70)	(5.02)	(3.52)
Industry and month FEs	Yes	Yes	Yes	Yes
Observations	1,142	1,142	1,193	1,193
R-squared	0.138	0.147	0.238	0.264

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The dependent variable is *CAR(0,1)*, the cumulative abnormal return from day zero to day one (day zero is earnings announcement day) based on the market model. *Treat* indicates T_1 or T_2. T_1 equals one if a stock is in T_1 and zero if it is in C. T_2 equals one if a stock is in T_2 and zero if it is in C. $Accruals_{UD}$ is discretionary accruals in the current year minus discretionary accruals in the previous year. Discretionary accruals are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year. *RI* is the fraction of retail investors (100% - the number of shares held by institutional investors/total number of tradable shares) for a firm. *SUE* measures earnings announcement news, which is the announced earnings per share minus the consensus of analyst forecasts in the past year, scaled by the stock price before earnings announcements. The fixed effects of industries and earnings announcement months are included. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Appendix 5—The Real Impact of Financial Education: Conceptual vs. Methodological Education

Panel A: Baseline				
	The Chinese market		The US market	
	Treat = T_1	Treat = T_2	Treat = T_1	Treat = T_2
	(1)	(2)	(3)	(4)
Treat × *Post*	**-0.005*** **	**-0.003***	**-0.002** **	**-0.002***
	(-2.66)	**(-1.71)**	**(-2.21)**	**(-1.76)**
Post	0.007	-0.015	0.014**	0.014***
	(0.33)	(-0.92)	(2.85)	(3.36)
$Accruals_{KLW,-1}$	-0.199***	-0.188***	-0.194***	-0.192***
	(-21.68)	(-20.55)	(-7.67)	(-9.12)
Firm FE	Yes	Yes	Yes	Yes
Year-quarter-industry FE	Yes	Yes	Yes	Yes
Observations	13,156	13,229	14,261	14,258
R-squared	0.051	0.048	0.186	0.187
Panel B: The education effect				
	The Chinese market		The US market	
	Treat = T_1	Treat = T_2	Treat = T_1	Treat = T_2
	(1)	(2)	(3)	(4)
Treat × *Post* × *EduEffect*	**-0.007** **	**-0.011*** **	**-0.003**	**-0.008*** **
	(-2.24)	**(-3.40)**	**(-1.32)**	**(-2.99)**
Treat × *Post*	-0.003	-0.000	-0.002	-0.000
	(-1.63)	(-0.23)	(-1.07)	(-0.12)
Post	0.007	-0.016	0.014***	0.014***
	(0.32)	(-0.97)	(5.34)	(5.30)
$Accruals_{KLW,-1}$	-0.198***	-0.189***	-0.195***	-0.192***
	(-21.63)	(-20.57)	(-12.29)	(-14.61)
Firm FE	Yes	Yes	Yes	Yes
Year-quarter-industry FE	Yes	Yes	Yes	Yes
Observations	13,156	13,229	14,261	14,258
R-squared	0.051	0.049	0.186	0.188
Panel C: Retail investors				
	The Chinese market		The US market	
	Treat = T_1	Treat = T_2	Treat = T_1	Treat = T_2
	(1)	(2)	(3)	(4)
Treat × *Post* × *RI*	**-0.109***	**-0.106***	**-0.003**	**-0.004**
	(-1.69)	**(-1.72)**	**(-1.21)**	**(-1.39)**
Post × *RI*	0.073	0.069	0.002	0.001
	(1.64)	(1.56)	(0.76)	(0.68)
Treat × *Post*	0.101	0.100*	-0.001	0.000
	(1.61)	(1.67)	(-0.42)	(0.08)
Post	-0.064	-0.083*	0.013**	0.013***
	(-1.33)	(-1.78)	(2.61)	(3.14)

$Accruals_{KLW,-1}$	-0.199***	-0.189***	-0.195***	-0.192***
	(-21.70)	(-20.58)	(-7.68)	(-9.11)
Firm FE	Yes	Yes	Yes	Yes
Year-quarter-industry FE	Yes	Yes	Yes	Yes
Observations	13,156	13,229	14,261	14,258
R-squared	0.051	0.048	0.186	0.187

Panel D: Institution

	The Chinese market		The US market	
	Treat = T_1	Treat = T_2	Treat = T_1	Treat = T_2
	(1)	(2)	(3)	(4)
Treat × *Post* × *Institution*	**0.007****	**0.005****	**0.004****	**0.002**
	(2.56)	**(2.05)**	**(2.19)**	**(1.18)**
Post × *Institution*	-0.004**	-0.005**	-0.003**	-0.003*
	(-2.37)	(-2.41)	(-2.50)	(-2.06)
Treat × *Post*	-0.010***	-0.007***	-0.008**	-0.004
	(-3.71)	(-2.69)	(-2.62)	(-1.61)
Post	0.011	-0.012	0.017***	0.017***
	(0.52)	(-0.70)	(3.59)	(3.94)
$Accruals_{KLW,-1}$	-0.199***	-0.189***	-0.195***	-0.192***
	(-21.72)	(-20.58)	(-7.75)	(-9.19)
Firm FE	Yes	Yes	Yes	Yes
Year-quarter-industry FE	Yes	Yes	Yes	Yes
Observations	13,156	13,229	14,261	14,258
R-squared	0.051	0.048	0.186	0.187

Notes: The sample consists of stocks in the treatment groups T_1 and T_2 and the control group C. The unit of observation is a firm in a certain quarter. The estimation window is from Q1 2018 to Q3 2020. The dependent variable is the quarterly discretionary accruals $Accruals_{KLW}$, which are residuals from regressing firms' total accruals (i.e., *Accruals*) on the reciprocal of total assets, the change in sales/total assets, net property, plant, and equipment/total assets, and return on assets in each industry-year-quarter. *Treat* indicates T_1 or T_2. T_1 equals one if a stock is in T_1 and zero if it is in C. T_2 equals one if a stock is in T_2 and zero if it is in C. *Post* is a dummy, which equals one for the year-quarters after the educational experiment and zero otherwise. *EduEffect* measured the market reaction of financial education treatment. It equals one if a firm's *Accruals* is above the sample median and its *CAR(0,1)* is below the sample median, and zero otherwise. *RI*, measured in the year that we conducted the experiment, is the fraction of retail investors (100% - the number of shares held by institutional investors/total number of tradable shares) for a firm. *Institution* measures the monitoring strength from financial institutions. The variable is an index measured in the year in which we conducted the experiment. It is the count of the following events: 1) a firm features high institutional ownership (higher than the median); 2) a firm features high analyst coverage (higher than the median); 3) a firm hires one of the Big 4 auditors. $Accruals_{KLW,-1}$ is one quarter lag of $Accruals_{KLW}$. The fixed effects of firms and year-quarter-industry are included. The standalone treatment variable and its interactions with *RI* and *Institution* are absorbed by the fixed effects. The *t*-statistics are shown in brackets. The significance levels at 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Internet Appendix

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

Internet Appendix 1.1: The Conceptual Knowledge of Accruals

Panel A: English version

A partial copy of the article "Conceptual Knowledge of Accruals" for Coca Cola (Ticker: COKE). The full article is available at: http://www.financial-education-hub.com/1/COKE.

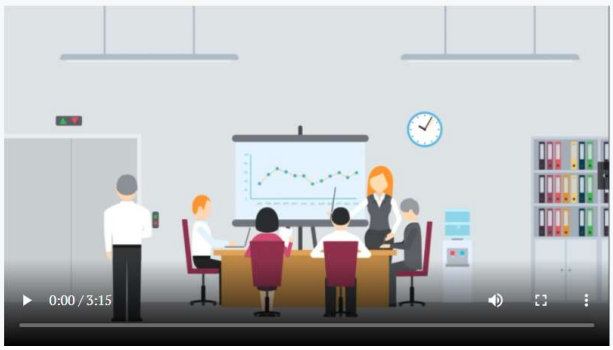
Highlight

Firms' reported earnings often differ from their actual cash flows. This difference is referred to as "accruals" and represents the component of earnings that have not yet been received. Due to estimation errors, the value of accruals is not necessarily equal to the amount of cash that is received, causing high accruals in the current period in relation to low earnings in subsequent periods. This effect is called low earnings persistence of accruals.

Example

In 2019, company A reports earnings of $100 million (i.e., operating income after depreciation). Cash flows and accruals are $20 million and $80 million, respectively. Company B also reports earnings of $100 million. Its cash flows and accruals are $70 million and $30 million, respectively.

Based on the concept of low earnings persistence of accruals, holding all other factors constant, A is expected to have lower earnings than B in 2020.



Panel B: Chinese version

A partial copy of the article "Conceptual Knowledge of Accruals" for Shanghai New World Co. (Ticker: 600628). The full article is available at: http://www.financial-education-hub.com/1/600628.

摘要

公司报告的利润经常与实际的现金流不同。这个差异被称为"应计项目"，代表了尚未收到现金的利润部分。由于估计误差，应计项目的金额可能不等于未来收到现金的金额，导致当期应计项目高的公司后期的收益会更低。这种效应被称为应计项对盈利的低持续性。

例子

2019年，A公司公布的利润是1亿元（折旧费用后的营业收入）。现金流和应计项目部分分别占2 000万元和8 000万元。公司B公布的利润也是1亿元。现金流和应计项目部分分别占7 000万元和3 000万元。

根据应计项目低持续性的特性，在其他方面都相同的情况下，可以预计A公司在2020年的收益将会低于B公司。

Internet Appendix 1.2: The Methodological Knowledge of Accruals

Panel A: English version

A partial copy of the article "Methodological Knowledge of Accruals" for Coca Cola (Ticker: COKE). The full article is available at: http://www.financial-education-hub.com/2/COKE.

Estimate Accruals and Earnings Quality

High accruals may associate lower subsequent earnings (i.e., low earnings persistence of accruals; please see Coca Cola Consolidated Inc). This page gives you a quick way to compute the accruals of **Coca Cola Consolidated Inc** and identify the quality of the firm's reported earnings, which will help you to evaluate the firm's future performance.

A spreadsheet module

A spreadsheet module is provided for **Coca Cola Consolidated Inc** to calculate its accruals, error terms, and the standard deviation of the errors . Please click AccrualCalculator to download the module. The definition of accruals is provided in **Appendix A** of this web page. A larger error term and higher standard deviation of the error terms means poorer quality of accruals and reported earnings (see **Appendix B** for detailed introduction).

To view the results, please input the 2019 financial information based on the firm's just announced financial report. That is, update the information in the **green cells** as shown below. Information for other years is already included.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
				million $			
Year (t)	Current assets (CA)	Current liabilities (CL)	Cash and short-term investments (Cash)	Debts in current liabilities (Debt)	Total assets (TA)	Cash flow from operating activities (CF)	Earnings (operating income after depreciation) (E)
	Source: balance sheet	Source: balance sheet	Source: balance sheet	Source: balance sheet	Source: balance sheet	Source: Statement of Cash Flow	Source: Income Statement
2019							

After inputting the information, you will see the results on the bottom right-hand side of the sheet (see example below), including the firm's 2019 accruals, average accruals over the last ten years, 2019 accruals error, and the standard deviation of accruals errors over the last ten years. Moreover, the position of these statistics in the firm's industry and market are also presented. **Q1** indicates a very low level (1st quartile, or the bottom 25%), Q2 indicates a low level (2nd quartile), Q3 indicates a high level (3rd quartile), and **Q4** indicates a very high level (4th quartile or top 25%).

Panel B: Chinese version

A partial copy of the article "Methodological Knowledge of Accruals" for Shanghai New World Co. (Ticker: 600628). The full article is available at: http://www.financial-education-hub.com/2/600628.

估计"应计项目"和利润的质量

当期"应计项目"较高的公司其后期往往会录得较低的收益（这个特性被称为"应计项目"的低持续性，请参看 **新世界**）。这个页面提供一个快速计算 **新世界** "应计项目"的方法，从而确定其报告收益的质量，并帮助你评估此公司未来的业绩。

电子表格模板

这里提供了一个电子表格模板，专门为 **新世界** 用于计算 其 应计项目 具体水平 、应计项目与 实际 现金流之间的误差项，以及 这些 误差项的方法。请点击 应计项目计算器 下载这个模板。 应计项目的定义见本网页 **附录 1** 。 当 误差项越大 或 误差项的标准差越大 时，意味着 其 应计项目和报告收益的质量 就越差 (**附录 2**见详细的介绍)。

查看结果前，请先根据公司刚刚公布的财务报告输入2019年的财务信息。也就是请更新如下所示绿色单元格中的信息。其他年份的资料已经包括在表格内。

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
				单位: 百万元人民币			
年 (t)	流动资产 (CA)	流动负债 (CL)	现金及短期投资 (Cash)	流动负债中的债务部分(Debt)	总资产 (TA)	经营活动现金流量 (CF)	利润 (折旧后营业收入) (E)
	来源: 资产负债表	来源: 资产负债表	来源: 资产负债表	来源: 资产负债表	来源: 资产负债表	来源: 现金流量表	来源: 损益表
2019							

输入信息后，你将在右下角看到结果(如下图所示)。 其包括公司2019年应计项目的水平， 过去十年应计项目的平均水平，2019年应计项目与实际现金流之间的误差项，以及过去十年这个误差项的方差。此外，还给出了公司这些指标在其所在行业和整个市场中的位置。**Q1**表示本指标处于非常低的水平(在最底部的25%)， Q2表示较低水平(处于25%-50%之间)， Q3表示较高水平(处于50%-75%之间)， **Q4**表示非常高水平(处于最顶部的75%)。

Internet Appendix 1.3: Spreadsheet Module for Estimating Accruals and Abnormal Accruals

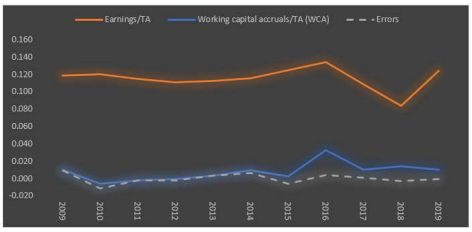
Panel A: English version

The module for Coca Cola (Ticker: COKE)

Notes: Please update the firm's financial informaiton in 2019 in the green cells, the analysis results will be updated accordingly

Firm Ticker: COKE | Firm: Coca Cola Consolidated Inc | Industry: Candy & Soda | 4

obs.	Year (t)	[1] Current assets (CA)	[2] Current liabilities (CL)	[3] Cash and short-term investments (Cash)	[4] Debts in current liabilities (Debt)	[5] Total assets (TA)	[6] Cash flow from operating activities (CF)	[7] Earnings (operating income before depreciation) (E)
		million $						
		Source: balance sheet	Source: balance sheet	Source: balance sheet	Source: balance sheet	Source: balance sheet	Source: Statement of Cash Flow	Source: Income Statement
	2019	830	622	10	24	3,127	290	374
1	2019	830.3	622.2	9.6	24.4	3126.9	290.4	374.3
2	2018	797.4	601.7	13.5	8.6	3009.9	168.9	256.8
3	2017	794.5	639.5	16.9	8.2	3073.0	307.8	266.7
4	2016	593.8	457.9	21.9	7.5	2449.5	162.0	248.5
5	2015	436.0	326.6	55.5	7.1	1850.8	108.3	179.0
6	2014	287.0	227.4	9.1	6.4	1433.1	91.9	147.1
7	2013	239.2	208.8	11.8	25.9	1276.2	96.4	144.3
8	2012	241.3	216.3	10.4	25.2	1283.5	83.2	150.5
9	2011	311.8	302.5	93.8	124.6	1361.2	109.7	149.6
10	2010	264.7	176.7	49.4	3.9	1307.6	98.1	154.6
11	2009	230.2	162.0	22.3	3.8	1283.1	79.5	155.9
12	2008	248.3	346.1	45.4	179.5	1315.8	96.6	146.4
13	2007	198.3	159.3	9.9	10.0	1291.8	95.5	152.5



The firm's accrual level and quality			The firm's position in the industry or market. Q1-very low (1st quarter, bottom 25%), Q2-low (2nd quarter), Q3-high (3rd quarter), and Q4-very high (4th quarter)	
			industry	market
Accrual level	Accrual in 2019	0.011	Q2	Q3
	Average accruals over the past 10 years	0.008	Q3	Q3
Accrual quality	Accrual error in 2019	0.000	Q3	Q2
	Standard deviation of errors over the past 10 years	0.006	Q1	Q1

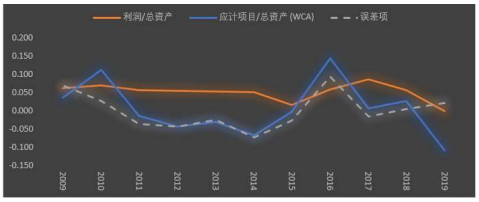
Panel B: Chinese version

The module for Shanghai New World Co. (Ticker: 600628)

注意：请在绿色部分输入本公司2019年的财产信息，分析结果将自动更新

股票代码: 600628 | 公司： 新世界 | 行业： 零售业 | 10

观测值	年 (t)	[1] 流动资产 (CA)	[2] 流动负债 (CL)	[3] 现金及短期投资 (Cash)	[4] 流动负债中的债务部分(Debt)	[5] 总资产 (TA)	[6] 经营活动现金流量 (CF)	[7] 利润 (营业收入) (E)
		单位: 百万元人民币						
		来源: 资产负债表	来源: 资产负债表	来源: 资产负债表	来源: 资产负债表	来源: 资产负债表	来源: 现金流量表	来源: 损益表
	2019	2,533	2,132	1,575	800	6,571	63	1.04
1	2019	2532.8	2132.3	1575.0	800.0	6570.5	62.8	1.0
2	2018	2548.0	1132.2	1364.3	200.0	5793.3	330.2	332.2
3	2017	2469.8	1384.3	1273.4	276.0	5856.0	417.9	498.3
4	2016	2670.8	1707.1	1663.1	747.0	5782.3	457.6	282.0
5	2015	1085.9	2142.4	677.7	1089.0	4784.8	500.0	82.7
6	2014	1237.6	2565.2	572.1	1268.0	5214.6	466.9	270.7
7	2013	1383.1	2765.4	670.4	1770.0	5226.7	414.8	277.1
8	2012	1245.1	2919.9	533.5	2081.0	5198.3	445.5	312.6
9	2011	1545.7	3460.9	737.1	2759.0	5568.3	383.2	284.9
10	2010	1258.9	3086.7	388.6	2393.0	5043.5	477.5	273.3
11	2009	554.2	2123.4	220.1	1523.5	3943.5	308.3	251.8
12	2008	502.1	2283.3	289.2	1662.0	3961.9	371.2	229.9
13	2007	467.7	2380.1	251.4	1754.3	4007.5	442.6	212.0



公司应计项目的水平和质量			公司指标在行业或市场中的位置. Q1-非常低(低于25%), Q2-比较低(25%-50%), Q3-比较高(50%-75%), Q4-非常高(高于75%)	
			行业	市场
应计项的目水平	2019年应计项目的水平	-0.108	Q1	Q1
	过去10年应计项目的平均水平	0.006	Q2	Q2
应计项目的质量	2019年应计项目估计误差	0.021	Q3	Q3
	过去十年应计项目估计误差的方差	0.050	Q3	Q2

Internet Appendix 2: Sample of Initial Posts on Social Media

Panel A: English version

Groups	Sample
C	$Ticker will announce its 2019 annual performance on March 15, 2020.
T_1	$Ticker will announce its 2019 annual performance on March 15, 2020. Please note that a company may report high earnings but actually have low cash flows. This difference is called " accruals", which often refers to revenues or expenses that do not involve cash flows, but are included in the firm's current earnings. Accruals are estimated by the company, which may involve estimation errors. Some companies may even use accruals to manipulate earnings. As a result, high accruals may not result in high subsequent cash flows. Investors focusing on bottom-line earnings as reported by the company, but ignoring the quality of the earnings, may misunderstand the company's true performance. For example, if two companies report the same level of earnings, the one with high accruals would be more likely to feature lower profitability in the following year. For more knowledge on the nature and effects of accruals, please see: http://www.financial-education-hub.com/1/$Ticker.
T_2	$Ticker will announce its 2019 annual performance on March 15, 2020. Please note that a company may report high earnings but actually have low cash flows. This difference is called " accruals", which often refers to revenues or expenses that do not involve cash flows, but are included in the current earnings. Accruals are estimated by the company, which may involve estimation errors. Some companies may even use accruals to manipulate earnings. As a result, high accruals may not result in high subsequent cash flows. Investors focusing on bottom-line earnings as reported by the company, but ignoring the quality of the earnings, may thus misunderstand the company's true performance. For example, if two companies report the same level of earnings, the one with high accruals is more likely to report lower profitability in the following year. For more knowledge on the nature and effects of accruals, please see: http://www.financial-education-hub.com/1/$Ticker. If you want to estimate the quality of $Ticker's earnings that are released, you can calculate the accruals level, and the portion that may not be realized in cash flows. For details on this method, please see: http://www.financial-education-hub.com/2/$ Ticker.

Panel B: Chinese version

Groups	Sample
C	$Ticker 将于 2020 年 3 月 15 日公布 2019 全年业绩。
T_1	$Ticker 将于 2020 年 3 月 15 日公布 2019 全年业绩。请注意，有些公司公布的账面利润可能很高但实际的现金流却很少。这个差额叫做“应计项目”，通常是指那些不直接形成当前现金流却计入当前损益的收入或费用。“应计项目”需要通过公司的估计得出，通常会出现估算错误。一些公司甚至利用“应计项目”来操纵盈利。因此，公告利润的“应计项目”部分在未来未必能兑现成实际的现金流。为此，投资者只关注公司所公布的利润而忽视其质量，可能会误读公司业绩。比如，两家当前利润一样的公司，“应计项目”高的那家公司下一年的盈利可能会更低。关于这方面的具体的知识：http://www.financial-education-hub.com/1/$Ticker.
T_2	$Ticker 将于 2020 年 3 月 15 日公布 2019 全年业绩。请注意，有些公司公布的账面利润可能很高但实际的现金流却很少。这个差额叫做“应计项目”，通常是指那些不直接形成当前现金流却计入当前损益的收入或费用。“应计项目”需要通过公司的估计得出，通常会出现估算错误。一些公司甚至利用“应计项目”来操纵盈利。因此，公告利润的“应计项目”部分在未来未必能兑现成实际的现金流。为此，投资者只关注公司所公布的利润而忽视其质量，可能会误读公司业绩。比如，两家当前利润一样的公司，“应计项目”高的那家公司下一年的盈利可能会更低。关于这方面的具体的知识：http://www.financial-education-hub.com/1/$Ticker. 如想估算$Ticker 所公布利润的质量，可以计算其“应计项目”的具体水平，以及不能兑现成现金流的部分，具体方法：http://www.financial-education-hub.com/2/$Ticker.

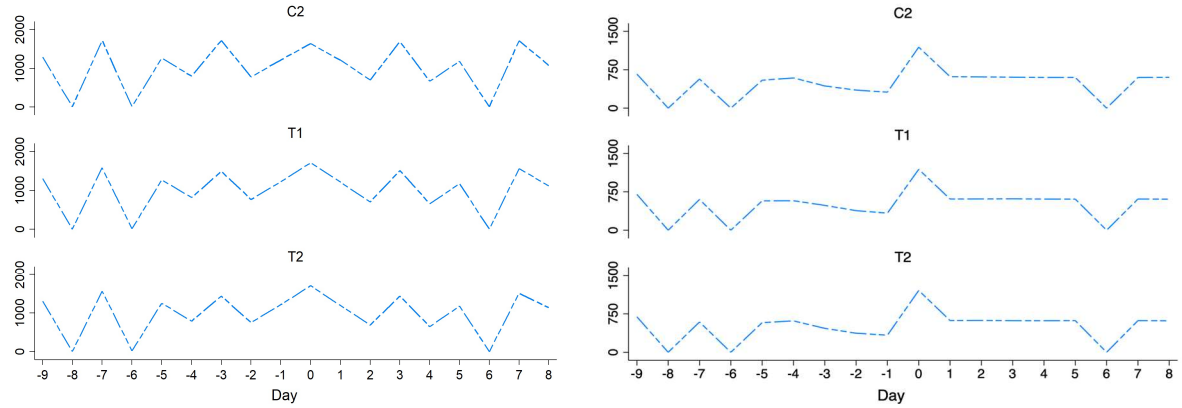
Internet Appendix 3: Posting Schedule on Social Media

Day	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9
Is there a post? (Y if yes)	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y
Post No.	1		2		3	4	5	6	7	8	9	10	11	12	13		14		15

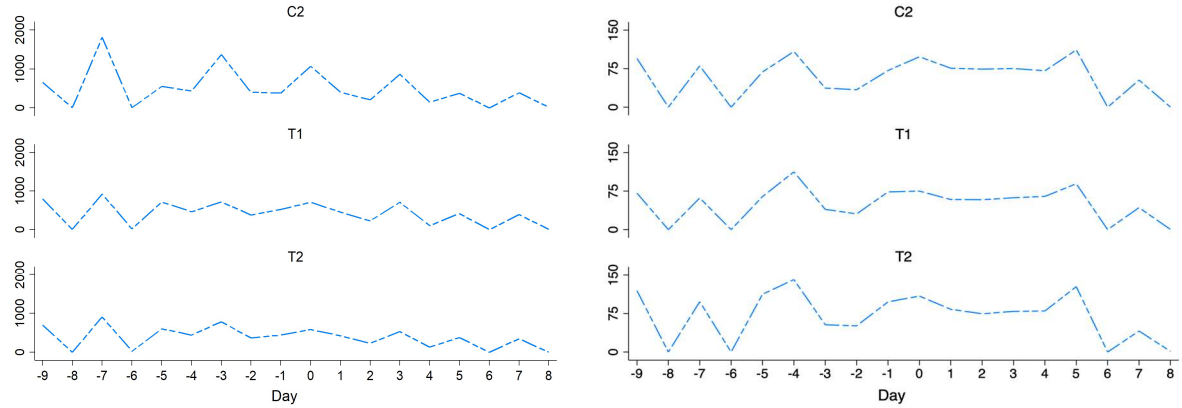
Note: Day 0 is earnings announcement day

Internet Appendix 4: Daily Experiment Activities during the Experiment Window among Treatment Groups T_1 and T_2 and Control Group C.

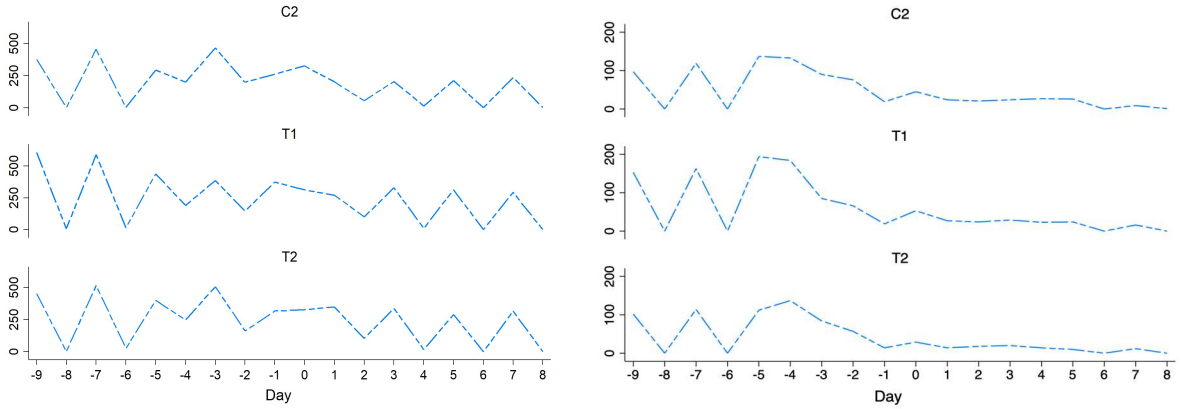
Panel A: The number of total posts (left: China, right: U.S.)



Panel B: The number of reads (in thousand) (left: China, right: U.S.)



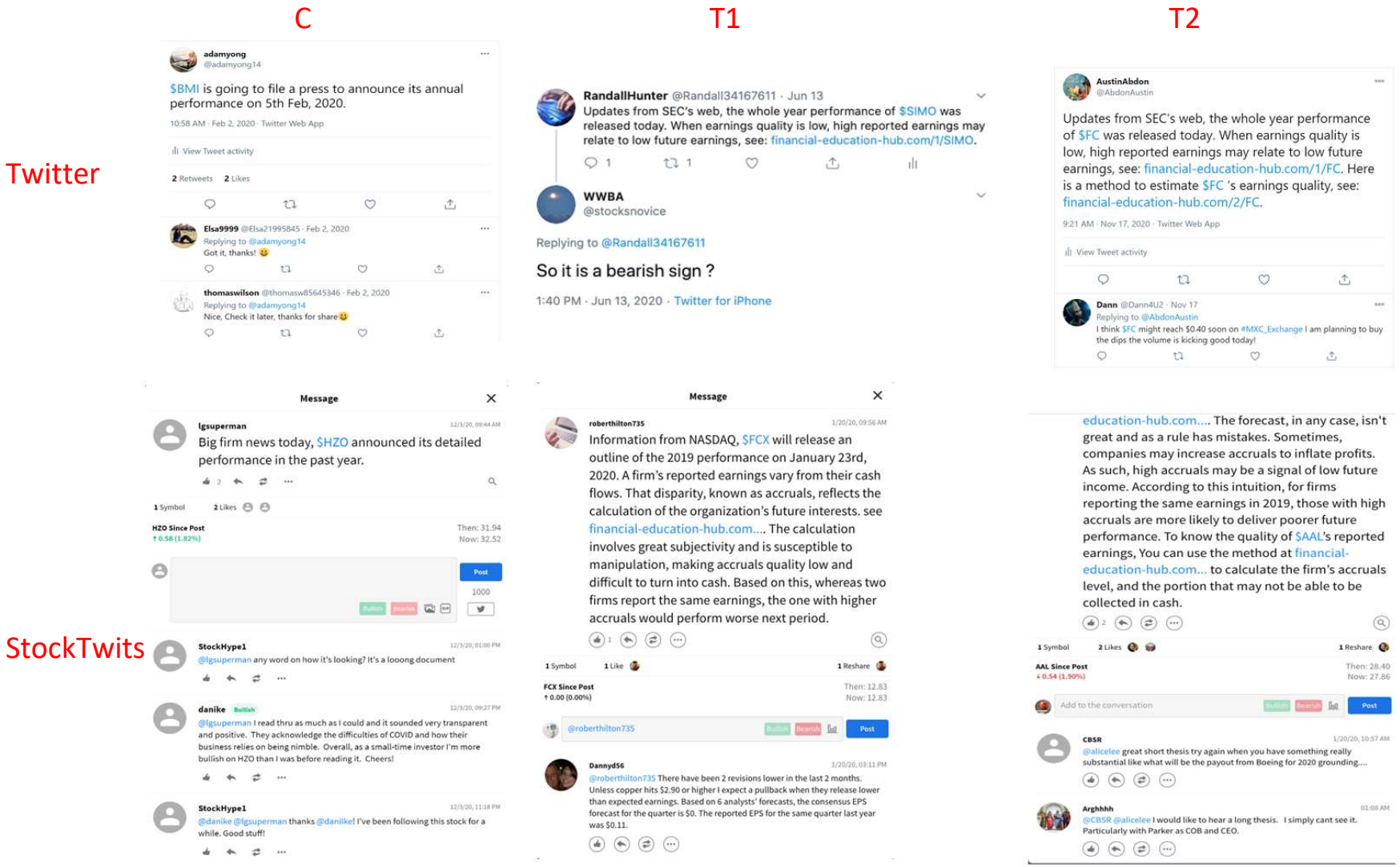
Panel C: The number of comments (left: China, right: U.S.)



Notes: Day zero is the earnings announcement day.

Internet Appendix 5: Samples of Post Responses

Panel A: Twitter and StockTwits



Panel B: Guba EastMoney and XueQiu

C

T1

T2

Guba

XueQiu