Accrual anomaly in emerging markets

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Abstract

This paper investigates the presence and the drivers of the accrual anomaly in emerging markets during 2000-2016. Our empirical results show that cash flows are more attributable to earnings persistence than accruals, while both of these earnings components are mispriced in certain emerging markets. We find the evidence of accrual anomaly in nine emerging markets including Brazil, China, India, Indonesia, Malaysia, Peru, South Korea, Taiwan, Thailand, and a pooled sample of Arabian markets (Qatar, Saudi Arabia, and the United Arab Emirates), while abnormally high hedge returns of an accrual-based trading strategy are found in China and South Korea stock markets. Further analysis indicates that the mispricing of accruals and cash flows in emerging markets are the mutual product of investor naivety and managerial incentives. The mechanism tests suggest that insider trading incentives and contracting incentives are the potential motives of the aggressive use of accrual accounting. We conclude that corporate managers deliberately contribute to information asymmetry that drives the misvaluation. Our paper provides new insights into market inefficiency in emerging markets across the globe.

Keywords: accruals, accrual anomaly, cash flows, emerging markets, insider trading, managerial discretion, market efficiency, stock returns.

JEL: G11, G12, G14, G15

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1.Introduction

Sloan (1996) introduces the accrual anomaly as the mispricing of accruals and cash flows component of earnings. In the presence of accruals mispricing, the author finds evidence of abnormal buy-and-hold returns from an accrual-based equity trading strategy (hereafter ABTS), which shorts on high-accruals decile and longs on the low-accruals decile portfolios. The rationale behind this trading strategy is due to the complexity in the structure of accounting earnings and how the U.S. stock market reacts to the announcement of information on earnings and earnings' components. To be specific, earnings can be partitioned into two distinctive components: accruals and cash flows. The cash flows components record real cash transactions while accruals components adjust for the mismatching between real cash transactions and actual delivery of products and/or services. As accruals are created in the process of working capital management and other corporate operations, they convey information about a firm's fundamentals (Wu, Zhang and Zhang, 2012), working capital management policies (Shi and Zhang, 2012) and earnings management activities (Jones, 1991; Beneish and Vargus, 2002). Furthermore, the accruals and the cash flows are indicators for future earnings and earnings persistence of the firm as earnings persistence decreases when accruals increase, and increases in the rise of the cash flows (Sehgal, Subramaniam, and Deisting, 2012, p.49).

Sloan (1996) provides a theoretical explanation for the anomaly that investors fixate on earnings and overweight accruals components over cash flows components in predicting future accounting earnings. Thus, market misprices accruals, and the arbitrage opportunity is created via the ABTS. Sloan explains that investors' inability to capture information content of the cash flows and accruals component of earnings is to be blamed for this anomaly. Sloan (1996)'s hypothesis became well-known as 'Naïve investor hypothesis', or in another name, called 'the fixation hypothesis'.

Accrual anomaly has been widely investigated in developed equity markets since 1996. However, accrual anomaly studies in emerging markets are limited, provide conflicted inferences, and focus mainly on popular emerging markets, such as China, India, South Korea (see Appendix 1). Emerging markets differ from developed markets in term of risk and returns, liquidity, market maturity, market capitalization, accounting standards, political sociology, the presence of imperative regulatory bodies. These differences encourage emerging markets to function distinctively, create more investment opportunities in an opaque investment environment. Regarding accrual anomaly, the question is whether it differentiates the findings in developed markets compared with younger and emerging markets with distinctive characteristics? After all, no prior study has attempted to investigate the accrual anomaly in the context of emerging markets. Thus, the literature on financial anomalies in emerging markets lacks systematic empirical studies about the accrual anomaly and convincing explanations for its origin other than the fixation hypothesis.

The rejection of rational market pricing inferred from the results of Mishkin test (Sloan, 1996) is questioned by Kraft, Leone, and Wasley (2007), and Konstantinidi, Kraft and Pope (2016) (hereafter KKP). These authors argue that the Mishkin test suffers an omitted variable problem in the test of rational pricing using accounting variables. Hence, one may mistakenly reject the rational conditions in the pricing of accruals and cash flows, then provides false evidence of the accrual anomaly. Consequently, scholars have been restlessly investigating the driving factors of

the accrual anomaly other than investors naivety. They build up a rich and growing literature by examining the anomaly from different perspectives. For instances, Kothari et al. (2006) view the accrual anomaly as the consequence of agency problem; Wu and Zhang (2010) study the accrual anomaly in the q-theory approach; Gu (2012), Avramov, Chordia, Jostova, and Philipov (2013) examine the accrual anomaly from corporate finance approach; or considering the accrual anomaly as another capital market anomaly in disguise (Desai, Rajgopal and Venkatachalam, 2004). The debate on the cause of the anomaly remains ambiguous as researchers keep providing conflict evidence on the factors that drive the anomaly. Furthermore, the literature on this matter exclusively uses data from the U.S. and other developed markets without considering emerging markets data. Therefore, existing findings may not be robust to a set of emerging markets that have been attracting enormous capital flows from around the world.

Academics are doubtful about the reliability of prior research because of the significant measurement error of accruals estimation and the validity of their approaches. Accruals and accruals components were computed using different approaches, but the balance sheet (hereafter BS) approach has been the dominant method for estimating accruals in the accounting literature since the 1990s. The most prominent BS method to estimate accruals is Jones-type models discussed in Jones (1991), and Dechow, Sloan, and Sweeney (1995), which have been clouded by critics from recent studies. Pae (2011) and Dopuch, Mashruwala, Seethamraju, and Zach (2011) show that Jones-type models might produce biased results when evaluating extreme performing firms. Similarly, Hribar and Collins (2002), and Shi and Zhang (2011) argued that conclusions drawn from empirical models that apply the BS approach for computing accruals are potentially contaminated when it comes to the returns of accrual-based trading strategies. To be specific, these computations might probably create a huge magnitude of accruals estimation and misclassification of accrual-based portfolios. Using the results from this approach to test accrual-related events might inflate the frequency of Type II errors. Considering the popularity of BS-based accruals measurements in the literature, it is crucial to address the issue of accruals measurement error in accrual anomaly studies.

Our paper aims to study the presence and the drivers of the accrual anomaly in emerging markets during 2000-2016. Our empirical results show that current earnings are in a positive association with future earnings, meaning that current earnings are persistent and informative about the future earnings of firms in emerging markets. In general, cash flows are more attributable to earnings persistence than accruals, while both of these earnings components are mispriced in certain emerging markets. We find the evidence of accrual anomaly in nine emerging markets including Brazil, China, India, Indonesia, Malaysia, Peru, South Korea, Taiwan, Thailand, and a pooled sample of Arabian markets (Qatar, Saudi Arabia, and the United Arab Emirates), while abnormally high hedge returns of the ABTS are recorded in the China and South Korea stock markets.

Further, previous studies that use the Mishkin test (Mishkin, 1983) to test rational pricing of earnings components are potentially biased due to the assumption that investors price accruals and cash flows surprise equally. Further analysis indicates that the mispricing of accruals and cash flows are the mutual product of investor naivety and managerial incentives. This is consistent with the agency theory of overvalued equity (Jensen, 2005) and investor naively extrapolating on past growth in stock pricing (Shi and Zhang, 2012). Our mechanism tests

suggest that insider trading incentives and contracting incentives are the potential motives of the aggressive use of accruals to increase information asymmetry and thus creating misvaluation. The findings also reveal that the mechanism of speculative insider trades affecting accruals management and accruals mispricing cannot be applied in Islamic and Islam-influenced emerging markets in which speculative transactions using private information are prohibited not only by Islamic Law but also by the long-lasting Islamic values.

Our study contributes to the accounting and finance literature in several ways. To the best of our knowledge, this is the first study investigating the accrual anomaly and its drivers in the context of emerging markets across the globe. Second, our study sheds light on the accrual anomaly literature by providing empirical evidence of the measurement errors of the BS approach to estimate accruals proxies and then propose a benchmark for portfolios allocation that results in highly profitable hedge returns. Third, our study provides new insight into the discussion of accruals mispricing under the presence of sophisticated investors in South Korea stock market. Fourth, our study offers alternative explanations to the accruals and cash flows mispricing in emerging markets. Fifth, we contribute to the discussion about the potential bias in the BS approach to estimate accruals in the accounting literature. Last but not least, our analysis confirms the validity of a new Mishkin-type test (KKP, 2016)[2] to test the market efficiency in emerging markets.

The remainder of our paper is organized as follows. Section 2 introduces the variable definitions and data samples. Section 3 discusses the empirical results. Section 4 provides mechanism tests and further discussions. Section 5 concludes our study.

2. Data sample and variables construction

2.1. Variables construction

2.1.1. Total accruals

As the findings on the accrual anomaly are sensitive to the proxies of accruals and the components of accruals, inferences in the accrual anomaly literature must be consistent with different accruals measurement and research designs. However, accruals convey not only information about firm growth but also the managerial discretion of corporate managers over financial reporting quality. All of the studies in the accounting literature use information from the Balance sheet (BS hereafter) approach to calculating accruals in the period before 1988 because Cash flows statement (CFS hereafter) data is not available then. Until the 2000s, scholars can only access to accruals from the BS approach for large sample data sets, but not for the CFS approach.

In a wide range of literature, accruals are usually computed using indirect BS method. However, there has been a rising concern of estimation error of BS accrual estimation discussed in Hribar and Collins (2002). The indirect BS approach for estimating accruals depends on the assumptions of the articulation between accrual components of revenues and expense items in

[2] The KKP test can be exercized using user-created commands in Stata. Two ado files are available upon request from Dr. Sonia Konstantidini at Sonia.konstantinidi.1@city.ac.uk.

the statement of income and working capital accounts in the BS (Hribar and Collins, 2002). However, this assumption will be violated if there are non-articulated items or non-articulation events in a firm's operation (Shi and Zhang, 2011). The total accruals are computed using the BS approach based on the followed equation:

$$TACCR_{BS} = \Delta CA - \Delta CL - \Delta Cash + \Delta STD - Dep \quad (1)$$

Where $TACCR_{BS}$ is the BS-based total accruals. All other variables' definitions are presented in Appendix 2.

On the contrary, the CFS approach, which was put into practice in 1988 in the U.S., has no such assumption and can ensure the availability of accurate accruals data in CFS (Hribar and Collins, 2002, p.106). In other words, the CFS approach directly lists the adjustments to earnings to compute operating cash flows, which are, conceptually, accruals. More specifically, total accruals can be computed using the CFS approach as follows:

$$TACCR_{CF} = Earnings - OCF \quad (2)$$

where $TACCR_{CF}$ is the CFS-based total accruals, Earnings stand or net income, while OCF stands for the operating cash flows of the firm.

In the accrual anomaly literature, academics traditionally interpret proxies of accruals using total assets or other company-size proxies as deflators of accruals in regression analysis, as illustrated in the following equation:

$$Total\ Accural\ Proxy = \frac{TotalAccruals}{Average\ Total\ Assets} \quad (3)$$

We will use both $TACCR_{BS}$ and $TACCR_{CF}$ as the proxies for total accruals in our study to address the issue of BS approach's measurement error.

2.1.2. Discretionary accruals quality

There is a wide range of measures of discretionary accruals as the proxies for managerial discretion over earnings quality. The most commonly used accruals models include Jones-type accruals models (Jones, 1991; Dechow, Sloan, and Sweeney, 1995), the Dechow and Dichev (2002)'s accruals quality model, the performance-matched discretionary accruals model proposed by Kothari, Loene, and Wasley (2005), and the discretionary accruals quality model of Francis, LaFond, Olsson, and Schipper (2005). In 2010, Dechow, Ge, and Schrand announced their influential study of the earnings quality proxies that indicate the pros and cons of each of the accrual models in the literature.

In general, discretionary accruals are usually computed as the residual of the total accrual regression models. Jones (1991) model normal accruals (e.g., non-discretionary accruals) as the function of fixed assets' depreciation and growth in revenues using accounting items from BS and income statement. If the normal accruals are estimated precisely, then the residual from the regression model is undoubtedly the abnormal accruals (e.g., discretionary accruals – hereafter DACCR). As the first to modeling discretionary accruals, Jones (1991) cannot avoid some

limitations in her research. The accrual estimation generated from the Jones model (Jones, 1991) suffers low predictability for future earnings (Xie, 2001). The explanatory power of the Jones model is also questioned by Kothari, Sabino, and Zach (2005b) as it can only explain a small portion of the variation of accruals. Dechow et al. (2010) add weight to the argument by indicating that there is a high probability of Type I misclassification errors in Jones model regression. The fact that the residual of Jones model (e.g., DACCR) highly correlates with total accruals, and they together are in positive correlation with earnings while negatively correlate with operating cash flows, indicate that there are factors that should be considered to include into the accrual generating process other than just revenues growth and fixed assets. Taking the measurement error of the BS-based accruals proxies into consideration, if total accruals are miscalculated due to research designs, then Jones model might subject to both Type I and Type II errors (Dechow et al., 2010).

Dechow and Dichev (2002) model working capital accruals as a function of operating cash flows in three consecutive accounting periods (hereafter the DD model). The authors treat the fitted value as the innate accruals quality which represents the fundamental performance of the firm, while the absolute value and the five-year rolling standard deviation of residuals of the residuals estimated from the DD model are used to evaluate accruals quality (Dechow and Dichev, 2002). However, their accrual quality proxy is unsigned and thus do not provides the direction of the accrual estimation error, which should be recorded by the sign of the difference between the amount accrued and the amount realized (McNichols, 2002, p.62). This unsigned accrual proxy might cause misclassification in accruals-based portfolios and hence subject to Type I error in firm-year observations with negative residuals.

Francis et al. (2005) extend the DD model by adding revenues growth and net fixed assets into the accrual model to capture firm performance and depreciation of fixed assets as suggested by McNichols (2002). Moreover, the authors partition the rolling standard deviation of the residual estimated from the DD model into two distinct components using a regression of that standard deviation on different proxies of firm characteristics, variations of cash flows and performance. The Francis et al. (2005)'s discretionary accruals models are presented as follows:

$$TCA_{i,t} = \beta_0 + \beta_1 OCF_{i,t-1} + \beta_2 OCF_{i,t} + \beta_3 OCF_{i,t+1} + \beta_4 \Delta Revenues_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$\sigma(\varepsilon_i)_t = \lambda_0 + \lambda_1 \sigma(OCF)_{i,t} + \lambda_2 \sigma(Revenues)_{i,t} + \lambda_3 Size_{i,t} + \lambda_4 \log(OperatingCycle)_{i,t} + \lambda_5 NegEarn_{i,t} + \nu_{i,t} \quad (5)$$

Francis et al. (2005) define the fitted value of the later model as the firm-level innate estimation errors, while the residual represents discretionary estimation errors. Using discretionary estimation errors, one can conclude how corporate managers use accrual accounting to distort financial information regarding the fundamental performance of the firm (Francis et al., 2005). Hence, we employ this proxy with some reasonable adjustments[3] to assess the discretionary

[3] We make a few adjustments to the calculation of OperatingCycle variable and the dummy variable NegEarn counting number of years that a firm consecutively reports net losses. First, instead of taking log of Operating Cycle as mentioned in Francis et al. (2005) study, we scale Operating Cycle to 365 as the number of days per fiscal year to capture all firm-year observations with negative Operating Cycle which present aggressive working capital management. Second, we only count the number of fiscal years that the firms report negative earnings in a consecutive 5-year period instead of a 10-year period as discussed in Francis et al. (2005). This adjustment is to account for young firms or newly listed firms in the young and fast-growing emerging markets.

accrual quality (hereafter DAQ) of firms in emerging markets. In general, lower DAQ means higher accrual quality and vice versa.

Francis et al. (2005) calculate a proxy for OCF in equation (5) from the difference between BS-based total accruals and Income before extraordinary items that can simply be replaced by the *Net cash flows from operating activities* (OCF) directly taken from the CFS. In the construction of this variable, the difference between Francis et al. (2005)'s BS approach, and the CFS approach should not be negligible. Hence, we replace Francis et al. (2005)'s OCF proxy in equation (5) with OCF from the CFS, and then calculate an alternative measurement of managerial discretion ($v_{i,t}$). We name the residuals estimated from Francis et al. (2005)'s BS approach as DAQ_BS, while the alternative measure is named DAQ_CF.

2.1.3. Abnormal stock returns

We measure abnormal stock returns via three steps. First, we construct the size portfolios by cross-sectionally split firms in each market samples into five quintiles based on market capitalization as the benchmark. Subsequently, for each of the market capitalization quintiles, we further assign them to five quintiles based on book-to-market ratio, resulting in 25 benchmark portfolios in total[4]. Finally, the abnormal return for each stock is calculated as the monthly-compounded buy-and-hold return minus the cross-sectional mean of those returns of the corresponding benchmark portfolio. The computation of abnormal stock return is express in the following equation (6):

$$SizeRet_i = [\prod_{m=1}^{12}(1 + R_{i,m}) - 1\ ] - \frac{\sum_{i=1}^{N}[\prod_{m=1}^{12}(1 + R_{i,m}) - 1]}{N}$$

where $SizeRet_i$ is the cross-sectional market capitalization-adjusted and book-to-market-adjusted stock return of firm *i*, $R_{i,m}$ is the monthly stock return of firm *i* in month m in a fiscal year , *N* is the number of firms in the corresponding benchmark portfolio that firm *i* is in. This measure of abnormal returns represents the premium/discount of a stock in comparison to their size peers.

2.2. Data sample

2.2.1. Sample selection

We conduct the study using financial and stock returns data of listed companies in 20 emerging markets available over the 2000-2016 period on Bloomberg's database: Brazil, China, Egypt, Greece, India, Indonesia, Malaysia, Pakistan, Peru, Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, and the United Arab Emirates (hereafter UAE). There are a few reasons for choosing these markets. First, these markets are referred to as emerging markets based on the last annual market classification review of the

[4] Considering the size of some emerging markets is quite small in comparison to the United States market, our portfolio allocation is slightly different to those in the previous study in the literature, for example: Kothari et al. (2006) allocate the U.S. sample into 45 benchmark portfolios using a 9x5 portfolio setting of market capitalization and book-to-market ratio, respectively. In this study, market capitalization and book-to-market ratio is at fiscal year-end.

MSCI Emerging Market Index in 2018. Second, Bloomberg Terminal provides a sufficient number of usable firm-year observations for our empirical analysis of these markets. There is an important note that we group Qatar, Saudi Arabia, and the UAE in one market samples named QSU due to the lack of observations in Qatar and the UAE samples, their similarities[5], and also no prior study has investigated the accrual anomaly in these three markets. Third, these markets can provide a vivid illustration of emerging markets regarding not only market sizes, macroeconomic or microeconomic factors, but also political sociology, cultural, and geographical characteristics. This choice of data samples allows us to study the accrual anomaly in a broader context than a single market dataset.

Taking to the differences in measurement and the nature of accruals in financial institutions into consideration, we exclude all of these firms using the Bloomberg Industry Classification System (BICS) on Bloomberg Terminal. We manually remove the data errors[6] and winsorize the data items by the first and the 99th percentile to mitigate the effects of extreme values on the test results. Finally, our data sample consists of 124,935 firm-year observations across 18 market samples. Our largest market samples are China with 28,070 observations, while the smallest is Egypt with 1,632 observations. All financial and stock returns data are collected in local currencies[7] for the main purpose of avoiding biased in currency translation.

2.2.2. Descriptive statistics

Table 1 shows the mean, median, and standard deviation values of the variables by market samples during 2000-2016. All the variable definitions are reported in Appendix 2.

[Table 1 and Appendix 2]

As we collect data in local currencies, it is not necessary and also not able to compare figures between markets except SizeRet as the proxy for abnormal relative stock returns. From Table 1, it is observable that the mean and median of SizeRet are positive, while the mean is higher than the median in most of the samples. Further, the standard deviation of SizeRet is quite high in most of the markets. This implies that stocks in emerging markets usually have high size-adjusted returns, and the difference between its mean and median are somehow driven by a certain number of large positive and large negative values of abnormal returns in certain stocks. We find similar patterns in the statistics of OCF and EARN throughout the emerging markets. These patterns signal that listed firms in emerging markets generally perform well during 2000-2016 despite the Global Financial Crisis in 2008 and the following recession. Again, high standard deviation and relatively large difference between means and medians of OCF and

[5] In our samples, Qatar, Saudi Arabia, and the United Arab Emirates markets are the markets which are the most similar to each other in terms of political-socio, exchange rates to USD, culture, religion, and geography.
[6] Data errors include the values which are higher (lower) than the theoretical maximum (minimum) value of the corresponding data item. For example, we exclude all observations with negative values of Property, Plant, and Equipment.
[7] Except for the case of the merged QSU market sample, we convert all data (not including ratios) from local currencies to US dollar without the concern about currency translation error because of the stable exchange rate to USD in Qatar, Saudi Arabia, and the UAE during the studied period.

EARN might be due to the large dispersion in values of certain stocks in both tails. It is expected in emerging markets where both investment risk and expected returns are higher than those in developed markets. The similarities in the patterns of SizeRet, OCF, and EARN in all market samples suggest there might be a statistical association between those variables. We illustrate the correlation of these variables using two-way scatter plots in Figure 2.

[Figure 2]

By contrast, the mean and median of total accruals' proxies $TACCR_{BS}$ and $TACCR_{CF}$ are negative in all samples, while their median remains less negative value than their mean. It is also noticeable that the mean and median of $TACCR_{BS}$ are sustainably less negative than those of $TACCR_{CF}$. This is consistent with total accruals measure being inflated under the BS approach (Hribar and Collins, 2002).

3. Results

In this section, we report and discuss the results of our analysis. Based on those results, we confirm the presence of accrual anomaly in emerging markets. We then present the findings on the returns of the accruals-based trading strategy.

3.1. Earnings persistence in emerging markets

According to the accrual anomaly literature (Sloan, 1996; Richardson, Sloan, Soliman, and Tuna, 2005), accrual anomaly occurs as investors misprice the accruals and cash flow components of earnings, thus lead to mispricing of the earnings persistence of the firm. In this section, we perform a bivariate analysis of future earnings on current earnings using panel regression on the following model:

$$Earnings_{i,t+1} = \alpha_0 + \alpha_1 Earnings_{i,t} + \sum Yeardummies + \theta_{firm} + \varepsilon_{i,t} \qquad (7)$$

where $Earnings_{i,t}$ is the net income of firm *i* in year *t*; and θ_{firm} is the firm's fixed effects.

Table 2 reports the results from the regression of future earnings on current earnings. We conduct panel OLS regression on all of eighteen sample sets of emerging markets and obtain consistent results in all of the regressions. In our regressions, we control for firm and year fixed effects. Furthermore, we cluster standard errors by firm and year to deal with heteroskedasticity and potential serial correlation issues.

From Column (1) to Column (18) of Table 2, the coefficients of EARN is positive and strongly significant at 1% level. The values of the coefficients are mostly in the range from 0.4 to 0.7, and at their lowest at 0.193 in the QSU sample, while the highest is at 0.894 in India. The lowest standard errors are in these regressions are 0.0190 (in China), 0.0196 (in QSU), and 0.0252 (in India), while the highest is 0.0809 (in Greece), 0.0900 (in Poland, and 0.121 (in Russia), respectively. The R-squared figures of our regressions are quite high, with the highest is 0.683 in the India sample, and the lowest is 0.186 in the Poland sample (see Table 2).

[Table 2]

As suggested by the literature, a significant and positive coefficient of current earnings (EARN) confirms that earnings of listed firms in that market are persistent, or in other words, they are not following a random walk. Therefore, our empirical evidence confirms that earnings are persistent in emerging markets and positively related to future earnings. The evidence shows that earnings of listed firms in the Indian market have the highest persistence compared to those in other emerging markets (coefficient of 0.894), followed by Egypt (0.804) and China (0.707). On the other end, earnings tend to be less persistence in QSU markets (Qatar, Saudi Arabia, and the United Arab Emirates) with a coefficient of 0.193 only. High R-squared values of our regressions imply high predictability of the current earnings to future earnings in emerging markets.

We further examine earnings persistence by splitting our samples into subsamples using the book value of total assets (BV), earnings, and market capitalization as the benchmarks. For each benchmark, we divide each of our market samples into three subsamples representing three levels of the benchmark, namely: low, medium, and high. We then perform panel OLS regression on the subsamples to see whether earnings persistence is different at different levels of BV, earnings, and market capitalization. Table 3 summarizes the value of EARN's coefficients and their significance levels.

[Table 3]

Our analysis indicates that earnings persistence is not the same in different levels of book value, earnings, and market capitalization. To be specified, earnings persistence is found to be statistically significant in medium and high-BV firms in all of the eighteen emerging markets. However, our empirical evidence show that in low-BV firms in Brazil, China, Malaysia, Philippines, South Africa, South Korea, Thailand, and Turkey, the coefficients of EARN are not significant at 10% level, meaning that we cannot use current earnings as an indicator to predict future earnings in these markets (see Column (1) of Table 3). In other markets, we document positive and significant coefficients of EARN in all three groups. However, the value of the coefficients varies from lower persistence (in low and medium-BV groups) to higher persistence (in high-BV groups), except for the cases of India and Peru. In these two markets, low-BV firms exhibit the highest level of earnings persistence compared to other groups. Similar patterns are found when we use earnings instead of BV as the grouping benchmark. Except for China, India, Pakistan, Peru, and Thailand, our analysis in the other thirteen market samples documents evidence of earnings persistence in medium and high-BV firms, but not in the low-BV firms as all coefficients of our variable of interest (EARN) are insignificant in these samples. In China and Peru samples, there is a negative and statistically significant relationship between current and future earnings in low-BV firms, suggesting that firms with low and decreasing current earnings in these two markets tend to perform better in the following period, and vice versa. In India and Pakistan samples, our results reveal that earnings are persistent in all earnings groups with the least earnings-persistent firms are in the medium-earnings group, and the most earnings-persistent firms are high-earnings firms (see Column (4), (5), and (6) of Table 3).

On the other hand, Thailand sample appears to be a special case where earnings persistence peaks in low earnings firms and keep lowering as market capitalization increases. In Column (7),

(8), and (9) of Table 3, we investigate earnings persistence in different market capitalization groups. Again, analysis in large-cap groups exhibits positive and significant coefficients that confirm earnings persistence presents in large firms in emerging markets. We also document earnings persistence in medium-cap firms in most of the market samples except for Brazil, Indonesia, Malaysia, and Russia. Further, our empirical evidence implies that earnings are persistent in small-cap firms in emerging markets except for Greece, India, Peru, Poland, QSU, South Korea, Thailand, and Turkey.

Generally, our results suggest that the earnings of listed firms in emerging markets are persistent. Further, larger firms and higher-earnings firms in emerging markets tend to have more persistent earnings than their counterparts. In other words, current earnings are a conveniently good indicator for future earnings, which is observable by market participants. Our findings are consistent with firms meeting market expectation have significantly higher realized earnings and earnings forecasts than those who do not (Kasznik and McNichols, 2002).

3.2. Accruals and cash flows' attribution to earnings

Following Shi and Zhang (2012), we adopt a simple regression model to evaluate the attribution of accruals and cash flows to earnings persistence. The research model is given as follows:

$$Earnings_{i,t+1} = \alpha'_0 + \alpha'_1 Accruals_{i,t} + \alpha'_2 OCF_{i,t} + \varepsilon_{i,t} \quad (8)$$

where $Earnings_{i,t+1}$ is the earnings reported in year t+1; $Accruals_t$ is the total accruals in year t; OCF is the operating cash flows in year t.

We calculate two total accruals proxies following two approaches in the literature and separately regress them in the equation (8). This design is to indicate the difference between two infamous and debatable accruals approaches in the literature and to investigate how the choice of total accruals proxies changes the results of our analysis. More importantly, we aim to examine which component of earnings is attributable more to earnings persistence in emerging markets by evaluating the significance and value of coefficients of accruals and cash flows variables.

We perform panel OLS regressions on each of the market samples which control for firm and year fixed effects, and standard errors are clustered by firm and year.

[Table 4]

Our empirical analysis conveys interesting results regarding how accruals and cash flows are attributable to earnings persistence under the BS approach and the CFS approach to accruals. Table 4 reports the results of the regressions of future earnings (FEARN) on total accruals ($TACCR_{BS}$ and $TACCR_{CF}$) and cash flows (OCF) components of earnings. The empirical results of the regressions using $TACCR_{BS}$ and OCF as the explanatory variables are reported in Panel A of Table 4. Panel B presents the results of regressions which use $TACCR_{CF}$ and OCF as the explanatory variables.

In Panel A, we document that the coefficients of OCF (α'_2) are significant and positive in most of our regressions at 1% level, not including the regression of Greece sample. Besides, the

coefficients of $TACCR_{BS}$ (α'_1) in our analysis also appear to be positively and significantly attributable to future earnings in eleven market samples, while remaining statistically insignificant in the other seven market samples including Brazil, Greece, India, Peru, Philippines, Poland, and Russia at 10% level. Following the literature, we are expecting α'_1 to be smaller than α'_2 while both of them are positive and statistically significant, which means accruals are less persistent than cash flows. However, our expectation is only realized in ten out of eighteen market samples, suggesting that accruals do not always contribute to earnings persistence. The ten markets are China, Egypt, Indonesia, Malaysia, Pakistan, South Africa, South Korea, Taiwan, Thailand, and Turkey. In most of the other eight market samples, α'_1 tends to be either positive or negative and not significant at 10% level. Under the BS approach, Greece is the only market sample where $\alpha'_1 > \alpha'_2$ and both of them are insignificant.

In Panel B, we report the regression results of future earnings on CFS-based total accruals ($TACCR_{CF}$) and OCF. The results show that the coefficients α'_1 and α'_2 are consistently positive and significant at 1% level in most of our market samples. Moreover, α'_1 is smaller than α'_2 in 17 out of 18 samples, not including the sample of Greece market. Our evidence implies that under CFS approach, both accruals and cash flows positively contribute to the persistence of earnings in emerging markets, while cash flows are more attributable as it measures the cash-basis performance of firms. This is consistent to the previous findings in the literature that cash flows have higher persistence than accruals (see, e.g., Sloan, 1996; Richardson et al., 2005; Artikis and Papanastasopoulos, 2016).

Greece sample is an exception where $\alpha'_1 > \alpha'_2$, suggesting that accruals ascribe more to future earnings of Greek firms than cash flows. Greece has been in financial crisis stage from 2008 to 2018, and our sample covers most of this period. Therefore, we suspect that the inconsistency of our evidence in Greece sample compared to other samples is credited to the influence of the Global Financial Crisis and government insolvency to the Greek economy. Hence, to address how the lasting financial crisis impacts earnings persistence in Greek firms, we again divide the Greece sample into two subsamples, which separately cover the period before and after 2008. Afterward, we perform panel OLS regression of FEARN on $TACCR_{CF}$ and OCF on these two subsamples. The regression results of earnings persistence test in the Greek market are reported in Table 5.

[Table 5]

Interestingly, α'_1 and α'_2 are statistically insignificant when we regress using Greece's pre-crisis subsample while remaining positive and significant at 1% level in the following period. Nonetheless, we find that $\alpha'_1 < \alpha'_2$ for the later period, suggesting that under the CFS approach, earnings persistence of Greek firms follows the same pattern as in other emerging markets. These findings are consistent with the adoption of Euro currency in 2001 contributes to a decline in value-relevance of accounting information in Greek financial market (Dimitropoulos, Asteriou, and Siriopoulos, 2012). As earnings quality in Greece has improved during the crisis period (Kousenidis, Ladas, and Negakis, 2013), accruals become more reliable in predicting firm performance, alongside with the adoption of IFRS in late 2007.

Concerning the application of BS and CFS measures of total accruals in studying earnings persistence in emerging markets, our empirical analysis directly points out three important findings. First, α'_1 and α'_2 are remarkably higher in Panel B than those of the corresponding regression models in Panel A. This implies that TACCR and OCF are more persistent under the CFS approach than in the BS approach. Second, the empirical results of our regressions are more consistent under the CFS approach, meaning that the CFS measures of TACCR can better express the persistence of earnings components. Third, the R-squares of panel regressions in Panel B are also noticeably higher than those of the same regressions in Panel A, insinuating that models using $TACCR_{CF}$ as the accruals proxy have better explanatory power to earnings persistence than its BS peer.

To conclude, our findings reveal that the earnings of listed firms in emerging markets are persistent and attributable by accruals and cash flows. Put it differently, accruals and cash flow components of firms in emerging markets are highly informative about future earnings. Consistent with the literature on earnings persistence in developed markets, we document that in emerging markets, cash flows tend to be more persevering than accrual components of earnings.

3.3. Market mispricing of earnings persistence

Following Sloan (1996), we perform the modified Mishkin test (hereafter MMT) to investigate the mispricing of earnings persistence in emerging markets. Fundamentally, the MMT is a two-step Feasible Generalised Nonlinear Least Square (FGNLS) regression which can handle feasible and iterative feasible variants. The MMT is modified from the original one in a way that helps researchers to control for the original Mishkin test's sensitivity to the cross-sectional correlation of residuals by clustering standard errors by year, or by both firm and year (KKP, 2016). The MMT jointly estimates a linear model forecasting earnings and a nonlinear model of market equilibrium pricing which are given as follows:

$$Earnings_{t+1} = \beta_0 + \beta_1 Earnings_t + \varepsilon_{t+1} \quad (9)$$

$$AbnormalReturn_{t+1} = \Omega(Earnings_{t+1} - \beta_0^* - \beta_1^* Earnings_t) + \varepsilon_{t+1} \quad (10)$$

The first equation system consists of equations (9) and (10), which indicate whether market rationally prices the earnings persistence. While β_1 represents the average level of earnings persistence, β_1^* reports how current earnings help predicting future stock price. Market efficiency requires the restriction that β_1 equals β_1^*. If these two coefficients are statistically different, it is the evidence that market fixate on past earnings information and misprice earnings persistence in the subsequent period. A similar mechanism is applied to the second system of equations which consists of two equations (11) and (12).

$$Earnings_{i,t+1} = \lambda_0 + \lambda_1 Accruals_{i,t} + \lambda_2 Cashflows_{i,t} + \varepsilon_{t+1} \quad (11)$$

$$AbnormalReturn_{i,t+1} = \Omega\left(Earnings_{i,t+1} - \lambda_1^* - \lambda_1^* Accruals_{i,t} - \lambda_2^* OCF_{i,t}\right) + \varepsilon_{t+1} \quad (12)$$

where $AnormalReturns_{i,\,t+1}$ is the annual size-adjusted returns of firm *i*'s stock in year *t+1*.

Sloan (1996) compares three pairs of coefficients, namely λ_1^* and λ_2^*, λ_1 and λ_1^*, λ_2 and λ_2^* to examine whether investors discriminate between accruals and cash flows information in the pricing of stocks.

Table 6 reports the results of the MMT, which examine the market mispricing of earnings persistence. We test for the difference between two parameters β_1 and β_{1s} of $EARN_t$ obtained from the regression of the system of equations (11) and (12). While β_1 represents how earnings are attributable to future earnings in our forecasting model, β_{1s} tells how investors weight the current earnings information in stock pricing. In an efficient market, these two parameters are supposed to be equals or approximate each other. If they are statistically different in a Wald test of smooth nonlinear hypothesis, then the market efficiency in earnings persistence pricing is rejected and vice versa. If we document market mispricing of earnings persistence, we will conduct further investigation on which components of earnings (including accruals and cash flows) are mispriced.

[Table 6]

The MMT estimation identifies the parameters β_1 and β_{1s} in most of our market samples except for Indonesia. In Table 6, β_1 is identified, positive, and significant at 1% level in the regression of our forecasting equation, thus confirming the findings of our linear regressions reported in Table 2 (see Section 3.1).

In our pricing equation, β_{1s} is also identified in seventeen market samples, positive and significant at 1% level in fifteen market samples, and only ends up unidentified in Indonesia sample. Further, β_{1s} is negative and insignificant in India sample, while remaining positive but insignificant in Peru sample. The results imply that despite current earnings are positively informative about future earnings, investors in Indian and Peruvian stock markets do not react accordingly in a statistical sense. Our findings suggest that the nonlinear tests of the market efficiency restrictions ($\beta_1 = \beta_{1s}$) are unable to perform in Indonesia sample. To investigate the presence of accrual anomaly in Indonesia, we will directly test for the mispricing of earnings components in all market samples, including Indonesia sample in the following section.

The results of market efficiency restrictions tests are presented in Column (7) of Table 6. Fifteen of the available p-value from our nonlinear Wald tests for the restriction ($\beta_1 = \beta_{1s}$) is smaller than 0.01, while the p-values of the other two tests (for China, Egypt, Greece, and Peru samples) are ranging from 0.015 to 0.033, meaning that market efficiency restriction is strongly rejected in seventeen out of eighteen market samples[8]. In other words, investors do not weight current earnings regarding how they are informative about future earnings. Furthermore, $\beta_1 > \beta_{1s}$ in all of our test results, indicating that the magnitude of earnings persistence mispricing ($\beta_{1s} - \beta_1$) is negative, and stock prices cannot fully reflect the information content of earnings. Therefore, we confirm that earnings persistence is underpriced in seventeen emerging market samples.

[8] Except for the case of Indonesia sample where p-value is not available.

In conclusion, our analysis reveals the mispricing of earnings persistence of listed firms in emerging markets. We then take one step further by investigating which components of earnings is mispricing in the following Section 3.4.

3.4. The mispricing of accruals and cash flows

To study the mispricing of earnings components, we conduct two-way clustering MMT, the KKP test (KKP, 2016), and nonlinear Wald tests of market efficiency restrictions on each of our eighteen market samples. Regarding the concern of the validity of BS approach to accruals raised by Hribar and Collins (2002), we separately conduct tests under both approaches using $TACCR_{BS}$ and $TACCR_{CF}$ as proxies for total accruals in two sets of identical tests. We then summarize and compare their results.

Table 7 and Table 8 report the results of two-way MMT of the system of equations (11) and (12) under the BS approach and CFS approach, respectively. Under the BS approach, the constant λ_{0s} is omitted in the test results of India, Indonesia, Pakistan, Philippines, Russia, South Korea, and Thailand market samples. Under the CFS approach, we also document the omission of λ_{0s} in those samples plus the sample of South Africa. This is the common problem of the Mishkin-type tests, which was mentioned in the work of Kraft et al. (2007). However, those omissions do not affect the tests of market efficiency restrictions as they only involve λ_1, λ_2, λ_{1s}, λ_{2s}, and Ω as long as these parameters are successfully identified (KKP, 2016).

[Table 7 and Table 8]

It is noticeable that λ_2 parameters are positive, significant at 1% level, and smaller than 1.0 in the forecasting equation of the eighteen market samples in both Tables 7 and 8. Further, the values of λ_2 in Table 8 are remarkably higher than those in Table 7. These findings are consistent with the cash flows positively relate to future earnings as pointed out in our linear regressions discussed in Section 3.2. On the other hand, the estimates of λ_1 exhibit some inconsistency between the BS and CFS approach to accruals. Under the CFS approach, λ_1 remains positive and significant at 1% level in all of eighteen market samples. The same pattern is found in the majority of the market samples under the BS approach, but not for the samples of Brazil, India, and Turkey. In these samples, while the parameter λ_1 is insignificant, it is positive in the Brazil and Turkey samples, and negative in the India sample. This is also consistent with our previous findings of the linear relation between accruals and future earnings in Section 3.2, in which that linkage is not exhibited in Brazilian and Indian firms, and statistically weak in Turkish firms (see Table 2).

In the pricing models, the parameter Ω is positive and significant at 1% level in all market samples in Table 7 except the sample of Russia. In Table 8, Ω is positive and significant at 1% level in all market samples. In the research design of Shi and Zhang (2012) and other studies following Sloan (1996), Ω captures the weight that investors use to price accruals and cash flows surprises. This setting requires a strict assumption of homogeneous pricing of accruals and cash flows surprises, which is hardly found in practice. A significant positive Ω means that investors consider upward accruals and cash flow surprises as a signal of higher future equity returns, and vice versa.

The pricing parameter of cash flows, λ_{2s}, is positive and significant at 1% and 5% in most of the emerging market samples, except Greece, Peru, Philippines, Russia, and Turkey under the BS approach (see Table 7), while the analysis using the CFS approach to accruals shows that λ_{2s} is only statistically insignificant in India and Peru samples (see Table 8). The contrast between the use of $TACCR_{BS}$ and $TACCR_{CF}$ in the MMT deepens in the regression results of λ_{1s} as the pricing parameter of accruals. In Table 7, λ_{1s} is only statistically significant in seven out of eighteen market samples, while this number is eight out of eighteen for Table 8. Two approaches only share similar results[9] of λ_{1s} in the four samples of Pakistan, Philippines, South Korea, and Taiwan. The conflicted results between two accrual approaches imply that there is a potential measurement error of the BS-based accruals proxy as argued by Hribar and Collins (2002).

Before performing the nonlinear Wald tests of market efficiency restrictions, Table 9 and Table 10 report the test results of the KKP test under two different approaches to accruals. In both tables, we document that γ_2 are positive and significant in most of the market samples except the sample of Pakistan. This means that cash flows, in general, are positively attributable to accruals persistence in emerging markets. The role of cash flows in forecasting accruals and cash flows embedded in two coefficients γ_2 and δ_2 are confirmed statistically at 1% level in both Table 9 and 10 with another minor difference in the sample of Poland under the BS approach (see Table 9). The empirical evidence of the contribution of accruals in forecasting cash flows and accruals, on the other hand, are not uniform due to the potential accrual measurement error. While the coefficients γ_1 and δ_1 are quite uniform, positive, and statistically significant under the CFS approach, our empirical results are highly divergent under the BS approach (see Column (2) and (5) in Table 9 and Table 10).

[Table 9 and 10]

Although there are conflicts between two accruals estimation approaches, we perform nonlinear Wald tests of market efficiency restrictions to evaluate the mispricing of accruals and cash flows using the results of MMT and KKP test under both BS and CFS approach. We then draw the inferences of the mispricing from each type of tests and compare them. Following the suggestion of Hribar and Collins (2002), and Shi and Zhang (2012), we will mainly use the findings from the regression of $TACCR_{CF}$ to make inferences.

Table 11 reports the p-values of the nonlinear Wald tests of market efficiency restrictions for the MMT from Table 7 and 8. There are six market efficiency restrictions which represent the rationality conditions. First, we test whether λ_1 and λ_{1s} are identical, which means whether investors weight accruals regarding how they are attributable to earnings persistence. Similarly, we test whether λ_2 equals λ_{2s} to examine the mispricing of cash flows information. The third test is to check if λ_1 equals λ_2, to re-examine whether accruals and cash flows homogeneously predict future earnings, or in other words, we test for the differential persistence of accruals and cash flows. The results of this test should be consistent with our previous findings discussed in Section 3.2. Forth, we test for the differential pricing of accruals and cash flows represented by

[9] The results of parameter λ_{1s} in these markets in Tables 7 and 8 are positive and significant at 1% level.

λ_{1s} and λ_{2s}. In the cases of relevant parameters (λ_1, λ_2, λ_{1s}, and λ_{2s}) are unable to be identified[10], we use the fifth and the sixth restriction tests are the linear combination of rationality conditions ($\Omega^*\lambda_1 - \Omega^*\lambda_{1s}$ and $\Omega^*\lambda_2 - \Omega^*\lambda_{2s}$) instead to draw inferences from our analysis.

[Table 11]

As all the relevant parameters are successfully identified in the regressions of MMT (see Table 9 and Table 10), it is possible to interpret the p-values of the market efficiency restriction tests. We use the 0.05 threshold to reject the null hypothesis that two tested coefficients are equal. In Column (1) and (7) of Table 11, we document that the null hypothesis of λ_1 equals λ_{1s} is consistently rejected (p-value < 0.05) under both BS and CFS accrual approach in the samples of Brazil, China, Indonesia, Malaysia, Peru, QSU, South Africa, and Taiwan. The p-values are higher than the 0.05 threshold in the cases of Greece, Pakistan, Philippines, Poland, Russia, South Korea, and Turkey. However, the inferences drawn from the p-value in Egypt and India market samples are not consistent under two accruals approaches. Based on the CFS approach, the results reveal that accruals are mispriced in eleven out of eighteen market samples. Again, the results of BS-based MMT suggest that investors properly price cash flows in five out of eighteen emerging market samples (Brazil, China, Egypt, Russia, and South Africa) while CFS-based MMT only indicates efficient cash flows pricing in Russia (see Column (2) and (8) of Table 11).

We find that by employing the CFS-based accruals estimate into our models, the evidence of accruals and cash flows mispricing, in a statistical sense, become more visible than when we use the BS-based accruals measure. The differences between the persistence of accruals and cash flows are shown in the columns (3) and (9) of Table 11, where the p-value is smaller than 0.05 in most of the samples. These findings, again, generally align with our evidence from linear regressions reported in Table 4 except for the case of Egypt (under CFS approach) and QSU (under BS approach). The results of the fifth and the sixth restriction tests do not add much to the discussion as the necessary parameters are all identified.

KKP test is different from the MMT in a way that it allows researchers to test market efficiency without the assumption of homogeneous pricing of accruals and cash flows surprises. Therefore, market efficiency restrictions of the KKP test also differ from the originals. Table 12 reports the p-values of five restriction tests of KKP test.

[Table 12]

All p-value in columns (6) and (7) of Table 12 are smaller than 0.01, suggesting that under CFS approach, accruals and cash flows differently contribute to accruals and cash flows persistence. This is almost consistent with our findings based on p-values from the columns (1) and (2) which are estimated in a BS-based KKP test except for Pakistan sample. A notable finding is that the null hypothesis of Ψ_1 equals Ψ_2 is rejected in China, India, Philippines, Poland under both accruals approaches, meaning that the pricing of accruals and cash flows surprises are not always

[10] These parameters are unable to be identified when the corresponding variables are either omitted, have constrained coefficients, or unable to retrieve value from the regression.

homogeneous, and the assumption of MMT is violated. Subsequently, we investigate the mispricing of accruals and cash flows by performing the Wald tests of the linear combinations of rationality conditions. The null hypotheses of the tests include:

H01: $K_{1s} = \Psi_1\gamma_1 + \Psi_2\,\delta_1$ (accruals are rationally priced)

H02: $K_{2s} = \Psi_1\gamma_2 + \Psi_2\,\delta_2$ (cash flows are rationally priced)

In columns (9) of Table 12, p-values are smaller than the threshold 0.05 in nine market samples including Brazil, China, India, Indonesia, Malaysia, Peru, QSU, Taiwan, and Thailand. This means that the null hypothesis H01 is rejected and investors in those markets do not price accruals based on how they are related to future earnings. On the other hand, the test results of the second linear combination of rationality conditions indicate that cash flows are mispriced in twelve market samples (see Column (10) of Table 12), namely: Brazil, China, Greece, India, Indonesia, Malaysia, Pakistan, Peru, QSU, Taiwan, Thailand, and Turkey (p-value < 0.05). We summarize the findings on accruals and cash flows mispricing in Table 13.

[Table 13]

The presence of the accrual anomaly is confirmed if we find: (i) evidence of accruals and cash flows mispricing; or (ii) evidence of the abnormal returns of an accrual-based trading strategy that short on high-accrual stocks and long on low-accrual stocks (Sloan, 1996). The first condition is to capture the behaviors of naïve investors that create the anomalous pricing of earnings components, while the second condition is set to cover other potential sources of the mispricing that do not come from investors. Using the evidence from the CFS-based MMT and KKP test as the main findings, we conclude that we find evidence of the accrual anomaly in nine emerging market samples including Brazil, China, India, Indonesia, Malaysia, Peru, QSU, Taiwan, and Thailand. Our empirical analysis suggests that using the accruals measures calculated from CFS items provides better insight to the mispricing of accruals and cash flows in emerging markets.

Further, the use of MMT exhibits potential Type I error. Although the test results of the MMT and the KKP test show similar inferences in Brazil, China, Greece, India, Indonesia, Malaysia, Pakistan, Peru, Russia, QSU, Taiwan, Thailand, and Turkey market samples, the concern arises from the differences documented between two tests' results in the remaining market samples. Specifically, the MMT's results infer the mispricing of accruals and cash flows in Egypt and South Africa samples, while the corresponding KKP test's results point out otherwise. Similarly, two tests clash in the Philippines and Poland samples where the MMT rejects rational pricing of cash flows while the KKP test does not. This insinuates that the two-equation Mishkin test is potentially biased and subject to Type I error.

To summarize, we document the accruals and cash flows mispricing in nine of our market samples, including Brazil, China, India, Indonesia, Malaysia, Peru, QSU, Taiwan, and Thailand. In the following section, we will examine the hedge returns of the accrual-based equity trading strategy to identify potential anomalous trading patterns in emerging markets.

3.5. Hedge returns of the accrual-based trading strategy

Following the work of Kraft et al. (2006), we perform panel OLS regressions of size-adjusted buy-and-hold equity returns (SizeRet) on a set of dummy variables represent accrual portfolios. We use total accruals and discretionary accrual quality (Francis et al., 2005) as the portfolio benchmarks. For each of the benchmarks, we divide each market sample into ten decile portfolios. We then regress the equation (16) as follows:

$$SizeRet_{i,t+1} = \alpha_0 + \alpha_1 Low_{it} + \alpha_2 Decile2_{it} + \alpha_3 Decile3_{it} + \alpha_4 Decile4_{it} + \alpha_5 Decile7_{it} + \alpha_6 Decile8_{it} + \alpha_7 Decile9_{it} + \alpha_8 High_{it} + \varepsilon_{it} \quad (16)$$

In equation (16), the dummy variables represent middle accrual deciles are excluded to mitigate the multicollinearity problem arising from the research design. The coefficients α_1 and α_8 capture the mean of size-adjusted returns in the lowest and the highest accruals decile portfolios, respectively. The hedge returns of the ABTS is then calculated as (α_1 - α_8) for each of the market samples. By design, the hedge return is statistically meaningful only if α_1 is positive, and α_8 is negative while both of the coefficients are statistically significant.

Table 14 reports the regression results of size-adjusted buy-and-hold returns on different accrual decile portfolios. Panel A shows the returns of the accrual-based trading strategy using total accruals as the portfolio benchmark. Panel B reports the returns of the ABTS using discretionary accrual quality as the benchmark for portfolio allocation.

[Table 14]

In Panel A of Table 14, it is noticeable that the either or both of α_1 and α_8 remain insignificant at 10% level in all eighteen market samples. The results imply that although there are nine markets where investors misprice accruals and cash flows (see Section 3.4), it does not necessarily mean that we can find anomalous return patterns. Our evidence indicates that portfolio allocation using $TACCR_{BS}$ and $TACCR_{CF}$ as the benchmarks does not generate statistically meaningful returns for the ABTS, let alone positive abnormal returns.

As total accruals contain not only information on the managerial discretion, but also the fundamental performance of the firm (Wu, Zhang, and Zhang, 2012), it provides a good channel to evaluate whether investors rationally price earnings components. However, if investors rationally price the earnings information provided by the firms, does the stock returns fully reflect the intrinsic value of the firms? Are there factors other than investors rationality that cause the mispricing of accruals and the positive ABTS returns? We find the answers to these questions in Panel B of Table 14.

In Table 14, while most market samples exhibit either or both α_1 and α_8 insignificant, these coefficients show us statistically abnormal ABTS returns in the samples of China and South Korea. In the regression results of equation (10) in the China market sample, α_1 is 0.278 and significant at 1% level, while α_8 is -0.1614 and significant at 5% level under the CFS approach to DAQ, thus resulting in a hedge return of (α_1 - α_8) which equals 43.94 percent annually. In the case of South Korea, α_1 account for a value of 0.01 and significant at 5% level, while α_8 is -

0.2294 and significant at 1% level under the same CFS approach, so the hedge returns of the ABTS in this market is 23.94 percent annually. These hedge returns might be considered as the highest-ever-recorded size-adjusted hedge returns of the ABTS in the literature[11]. Thus, using the cash-based DAQ (Francis et al., 2005) as the measurement of managerial discretion over accruals, we document the abnormally high returns of the ABTS in China, which might be driven by managerial discretion and investor naivety.

Our findings on the abnormal returns of the ABTS in the South Korea market provide another insight into the mispricing of accruals from a managerial perspective. From the KKP test's results, investors in South Korea equity market seem to be able to interpret the information content of accruals and cash flows, and rationally price earnings components. This is consistent with South Korean market being the emerging market that is closest to developed markets in MSCI Emerging Market Index, given South Korean market only lacks derivative investment instruments offered by an exchange outside of Korea based on certain indexes[12] (MSCI, 2018). Therefore, investors in South Korea stock market are more sophisticated than in other emerging markets where accruals and/or cash flows are mispriced. This suggests that the anomalous ABTS returns pattern in South Korea equity market might be driven by managerial incentives.

We also document another positive return pattern in the market sample of QSU. However, both α_1 and α_8 are negative (-0.2989 and -0.3442, respectively) in spite of them being statistically significant at 5% level. Hence, the hedge is not effective, and there is no gain arbitraging on such two accruals portfolios whose returns are so identical.

Overall, our analysis reveals that only in China and South Korea, the ABTS generates effective and positive hedge returns using cash flows-based discretionary accruals quality as the portfolio benchmark. On the other hand, the ABTS hedge returns using total accruals proxies as portfolio benchmarks are not statistically meaningful. This means that the previous findings in the literature about positive hedge returns of the ABTS in emerging markets might not apply to the current period. In practice, such profitable opportunities might be arbitraged away, and the abnormal returns gradually diminish after the return pattern becomes popular to the mass of investors. A potential reason for this disappearance is that investors can learn about the mispricing of accounting information from academic publications (Mclean and Pontiff, 2016), and exploiting the mispricing in real trading. In the long term, increasing risk-arbitrage activity (e.g., predatory trading) lowers returns (Dash and Blitzer, 2004), and thus also lowering returns predictability in not only developed markets but also emerging markets.

[11] Previous studies in the literature documented high ABTS hedge returns which are 18.07% in South Korea (Kim, Kim, Kwon, and Lee, 2015), 18.05% in Indonesia (Ghofar and Aunilah, 2016), 15.81% in Turkey (Ozkan and Kayaki, 2015), 15.72% in Thailand, and 14.88% in Poland equity market (Fan and Yu, 2013). All returns are annual or annualised from monthly hedge returns. The highest ABTS hedge returns which was previously documented in China equity market was 8.88% (Fan and Yu, 2013) while the hedge returns reported in Sloan (1996)'s study is 10.4% in the United States stock market. Most of these studies use total accruals proxies as the portfolio benchmark and their studied periods are from 2010 backwards.

[12] The MSCI Market Classification Framework consists of four criteria: size and liquidity, sustainability of economic development, and market accessibility. Availability of investment instruments is one of the important criteria of market accessibility which MSCI has proposed for changes in May 2018 (MSCI, 2018).

4. Drivers of the accrual anomaly

Our empirical results thus far reveal that earnings persistence and earnings components (e.g., total accruals and cash flows) are mispriced in emerging markets, namely: Brazil, China, India, Indonesia, Malaysia, Peru, QSU, Taiwan, and Thailand (see Table 13). Although we cannot find evidence of abnormal ABTS hedge returns in these market samples except China, our findings imply market inefficiency in the pricing of accruals and cash flows information in these markets. This section is to further investigate the drivers of the anomaly and discuss the potential mechanism of how the accruals are mispriced. We focus on two channels via which mispricing is created: the investor naivety channel and the managerial incentives channel.

4.1. Investor naivety

Investors naivety is considered as the primary explanation to accrual anomaly, which was first introduced by Sloan (1996) and supported by an enormous number of follow-up studies. Sloan proposed the fixation hypothesis as the explanation to the mispricing of accruals. The author posits that investors naïvely fixate on earnings and cannot cognitively capture the transitory nature of accruals. Despite earnings persistence relates to accruals is normally lower than that relates to cash flows (see Table 3), the differential persistence in those relations is not reflected in market prices. Investors tend to be over-optimistic about accruals persistence and thus lead to overvaluation (Kothari et al., 2006). To be specific, firms with high levels of accruals relative to cash flows tend to be considered overvalued. Hence, firms with low levels of accruals in comparison to cash flows are likely to be undervalued. As high accruals reverse, corporate earnings decline, and thus, investors realize the overvaluation.

In Column (7) and (8) of Table 13, the results of the KKP tests show that investors irrationally misprice both accruals and cash flows in nine difference emerging market samples, namely: Brazil, China, India, Indonesia, Malaysia, Peru, QSU, Taiwan, and Thailand. This is the most convincing evidence for investor naivety that plays a role as one of the drivers of the accrual anomaly. However, we still document a highly positive hedge return of the ABTS in the South Korea market despite the fact that investors in this market do not misprice accruals and cash flows. This implies that the fixation hypothesis (Sloan, 1996) cannot fully explain the occurrence of the accrual anomaly in the case of the South Korea market. In other words, even under the presence of sophisticated investors, other forms and sources of market efficiency persist. Our findings suggest that further investigation is necessary to find alternative explanations to the accrual anomaly.

4.2. Mechanism tests

4.2.1. Managerial incentives channel

Kothari et al. (2006) suggest that managers of overvalued firms actively attempt to prolong market overvaluation using aggressive and distorted investment-financing decisions as signal investors about the firms' "prospect" regardless of their fundamental performance. Investors absorb the information and interpret it as a positive signal about the future growth of the firm and thus create a conditional expectation for the stock price. Taking advantage of undisclosed

information, corporate managers can realize when the market overprices their stocks. Papanastasopoulos, Thomakos, and Wang (2011) also indicate a significant relationship between external financing and the accrual hedge portfolios' returns. The authors conclude that investors fail to recognize agency-related overinvestment and the extent of earnings management (Papanastasopoulos et al., 2011). However, the overvaluation is not sustainable over the long run, and the price reversals are expected for high accrual firms (Kothari et al., 2006). As corporate managers see a stock price correction coming, they manipulate earnings to maintain overvaluation (Jensen, 2005) temporarily. Such manipulation is usually concealed by extensive use of accrual accounting so that even sophisticated investors cannot see through the opacity of the financial reporting quality. Consequently, they might rationally price the given accounting information, but also underestimate the discretionary accruals driven by managerial incentives. In another scenario, investors who do not rationally price earnings persistence also misprice the signal from intensive investment-financing activities of the firms and end up being misled by corporate managers. Either way, the level of investment-financing activities plays an important role as a sensible channel in studying the mechanism of the accruals mispricing. Our research model for investigating the relation between future accruals and overvaluation is presented as follows:

$$DAQ_{t+1} = \beta_0 + \beta_1 SizeRet_t + \varepsilon_t \quad (17)$$

Following the concern of returns might be informative about future earnings which consists of accruals and cash flows (Kothari et al., 2006) which results in reversed causality, we regress equation (17) using Two-Stage Least Square/Instrumental variable regression (2SLS/IVs regression) with firm size and investment-financing actions resulted in accounting figures as the instrumental variables (hereafter IVs). Our IVs include: (a) Growth of capital expenditure and changes in the growth of capital expenditure as a fraction of total assets; (b) Equity issuance and changes in equity issuance as a fraction of total assets; (c) Debt issuance and changes in debt issuance scaled by total assets; and (d) Book value of total assets, market capitalization and changes in market capitalization in natural logarithmic form[13]. These IVs are likely to relate to overvaluation proxied by size-adjusted returns and allow us to examine the causal relationship between future discretionary accruals and overvaluation, and how managerial decisions moderate this relationship. The variable definitions and calculation are presented in Appendix 2.

As our dataset consists of ten different market samples, we do not pool them together and perform 2SLS/IVs routine on each market sample separately with certain IVs from the list above. Table 15 reports the regression results, and Table 16 specifies IV sets for each regression.

[Table 15 and Table 16]

Table 15 presents the regression results of the first and second stage of the 2SLS/IVs regression on ten market samples. The first stage regressions show that all IV sets are statistically related to

[13] We design these IVs using their levels and differences for the better statistical power. The IVs are confirmed to be related to SizeRet and pass all diagnostic tests including the under-identification test, the weak identification test, and Hansen-J test of overidentification.

the instrumented variable SizeRet and pass all the diagnostic tests reported in the second stage regressions. This means that the IVs are suitable to be the instruments in our analysis. The coefficients of the IVs that represent the managerial investment-financing decisions in each IV set are positive in Brazil, India, Indonesia, Malaysia, and Thailand market samples, while they are negative in China, Peru, QSU, South Korea, and Taiwan market samples. The coefficients of the market capitalization proxies remain positive and significant at 1% level in all of the first stage regressions.

In the second stage regressions, all coefficients of the instrumented variable SizeRet are significant, mostly at 1% level except in India sample (at 10% level) and Peru sample (at 5% level). Further, they have the same sign as the sign of IVs that represent the managerial investment-financing decisions in the first stage regressions. Our empirical evidence reveals that the past investment-financing decisions of corporate managers have the relation between current overvaluation and future discretionary accruals, and indirectly influence future discretionary accruals to maintain overvaluation. To be specific, our IVs are lags and differences of the proxies for investment-financing activities which serve as the potential causes of the overvaluation (see Table 16). These findings confirm the causal relationship between overvaluation and future discretionary accruals. As managers know that their stocks are overvalued, they might attempt to sustain such mispricing by earnings management. Their behaviors might be driven by personal interest or contracting incentive in which managers are compensated mainly based on the accounting earnings and the level of innate accruals quality[14] (Peng, 2011). By making increasing investment-financing decisions, managers might boost short-term performance and thus temporarily enhance innate accruals quality to appeal compensation committee. As short-term performance is improving, so is the mispricing of earnings persistence, accruals components of earnings, and discretionary accruals. In general, managers are capable of recognizing when their firms' stock price exceeds its underlying value and attempts to drag out the overvaluation by accruals management in the following period. Using a schematic depiction of our 2SLS/IVs regression adopted from Becker (2016), we illustrate the process as follows:

[Figure 2]

To summarize, our analysis confirms that managerial incentives are a channel that helps explain the mispricing of accruals and the accrual anomaly from a management perspective. Our inferences are consistent with managers consciously contribute to the manipulation and information asymmetry that feed the overvaluation (Jensen, 2005) and then cover it by further earnings management.

[14] The term "innate accruals quality" mentioned in the work of Peng (2011) was introduced by Francis et al. (2005) to address the accruals representing the economic fundamentals of the firm. Innate accruals quality is actually the fitted value in the second equation of Francis et al. (2005)'s accruals model (see Model 5), while DAQ is the residuals from the same equation.

4.2.2. Insider trading channel

Researchers have indicated that there is a significant relationship between managerial discretion and insider[15] trading (Beneish and Vargus, 2002; Chowdhury, Mollah, and Farooque, 2018). According to Sawicki and Shrestha (2008, 2014), managers of overvalued firms are inclined to prolong overvaluation via the use of income-increasing earnings management and engage in insider selling of their shares. Moreover, the authors find extensive evidence of managers of both overvalued and undervalued firms managing earnings downward (upward) to benefit themselves in buying (selling). Jensen (2005) posits that under performance pressure, corporate managers are likely to manage earnings to meet market expectation. They have the incentive to abuse accrual items and take part in insider trades before financial reports are publicly released (Sawicki and Shrestha, 2012; Tang, Chen and Chang, 2013).

As corporate insiders can predict stock returns (Lakonishok and Lee, 2001), they can naturally interpret the intrinsic value of their firm and promptly detect temporary mispricing. Insiders can exploit the temporary mispricing while managing accruals to mislead the market, thus creating stock mispricing by themselves. Moreover, Ke, Huddart, and Petroni (2003), and suggest that insider selling increases two years prior to a break in consecutive increases in earnings. Shin and Wang (2012) substantiate Ke et al. (2003)'s argument by positing that insiders trade upon their superior information advantage, manipulate accruals, and elude legal scrutiny by halting sale after disclosing bad news to the public. This dynamic relation between insider trading and managerial discretion might provide another channel to investigate the mispricing of discretionary accruals in emerging markets. Hence, we introduce the following model to investigate the dynamic relationship between managerial discretion and insider trading:

$$DAQ\_CF_{i,t+1} = \theta_0 + \sum_{n=1}^{2} \theta_n \, InsiderTrading_{i,t} + \sum_{m=3}^{4} \theta_m \, InsiderTrading_{i,t-1} + \sum_{p=5}^{7} \theta_p \, Controls_{i,t} + \eta_{i,t} \quad (18)$$

where $DAQ\_CF_{i,t+1}$ is the proxy of discretionary accruals quality used in our previous analysis, measured for firm *i* in year *t+1*; *InsiderTrading* are the proxies measuring the levels of insider selling and buying, including *Net Share Traded (NST)* and its quadratic specification (*NSTS*) of firm *i* in year *t* and year *t-1* as suggested by Beneish and Vargus (2002) ; $Controls_{i,t}$ stands for control variables including market capitalization (*MarketSize*), financial leverage (*Leverage*), and cash flows[16] (*Cashflows*); the error term is denoted as $\eta_{i,t}$. The variable definitions and calculation are presented in Appendix 2.

[15] Following the literature on insider trading, we define insider trading is the trading activities exercised by insiders who have access to private and undisclosed information of the firms. Therefore, insiders include Chairman of the board, CEO, COO, CFO, other directors and officers. This definition alone does not imply that insiders use private information in trading their shares. We use insider trading data collected from Bloomberg Terminal where the concept of insider is similar to the definition above.

[16] The control variables in Equation (18) is adopted from the studies of Kothari et al. (2006), and Sawicki and Shrestha (2012). The research design is adopted from Ke et al. (2003), and Sawicki and Shrestha (2012). The dependent variable DAQ is calculated under the CFS approach to accruals.

Following the literature, we expect the coefficients of NSTS (θ_3 and θ_4) to be negative, meaning that net insider buying negatively associates with future discretionary accruals quality. In other words, net insider selling is positively related to future discretionary accruals quality, implying that insider trading is informative about incoming manipulation that affects accruals quality. Considering the dynamics of the managerial discretion-insider trading relationship, we perform the two-step System Generalized Method of Moments (two-step SGMM) on each of the emerging market samples where we found accruals mispricing. We exclude three market samples in which insider trading activities are prohibited (Peru, QSU, and Taiwan). Our data samples hence consist of seven emerging markets and cover the period from 2010 to 2016[17]. The results of the two-step SGMM regressions of future discretionary accruals quality on insider trading is reported in Table 18[18].

[Table 18]

Our analysis generates interesting results. We found negative and significant coefficients of NSTS in Brazil, China, South Korea, and Thailand at 5%, 5%, 10%, and 5% level respectively. Specifically, NSTS is negative and significant in both current year (t) and the past year (t-1) in the results from Brazil sample while only exhibiting statistical significance in year current year in other three samples. The evidence implies that the dynamic relation between discretionary accruals quality and insiders' net selling follows a U-shaped curve consistent with the findings of Sawicki and Shrestha (2012). As the insider selling in the previous years (year t and year t-1) end, insiders manipulate earnings to cover for their opportunistic trades, lead to an increasing level of DAQ in the subsequent year (year t+1), thus reducing accrual quality. Considering the reversing nature of accruals, the accruals quality will also reverse after reducing to a certain level that is out of control of the insiders. As insiders see the stock price correction following accrual reversal, they cease We suggest that in Brazil, China, South Korea, and Thailand markets, inside selling are informative about the future discretionary accruals quality and can be used as the ex-ante indicator to assess the future quality of accounting information as proposed by Beneish and Vargus (2002).

In market other than Brazil, China, South Korea, and Thailand, we find mixed results in the coefficients of insider trading proxies. In India sample, the coefficients of NST and NSTS are positive but insignificant at 10% level, while NSTS's coefficients are positive and significant in the regression of Indonesia and Malaysia samples (see Column (3), (4), and (5) of Table 18). The positive coefficients of NSTS imply that higher insider buying associates with higher discretionary accruals quality in the following periods, which means the positive association between insider trades and future discretionary accruals quality due to factors other than speculative incentives.

[17] Bloomberg Terminal only provide insider trading data starting from 2010 onward.

[18] We include one-year lag of dependent variable into the regression model as an endogenous regressor and instrument it with other regressors using their levels and differences. We include different levels of lags for instrument variables at minimum of 2 and maximum of 5, and a set of time dummies. The IVs pass all the diagnostic tests in all regressions shown in Table 18, thus confirming the validity of our IV sets.

A potential explanation for this relation might emerge from the characteristics of legal systems and ethic values in these markets[19]. There is a common characteristic between the legal systems of India, Indonesia, and Malaysia: the lasting influence of the Islamic Law. India has a common law system whose infrastructure bears the weight of British common law, Hindu law, and Islamic law. Indonesian legal system is based on Germanic code law with a strong influence of Islamic Law in which Islamic courts even extend to criminal justice. Further, Malaysia has a dual justice system which is based on common law and Islamic Law. Generally, the use of asymmetric information is strictly prohibited in Islamic ethics and Islamic Law's basic principles. In the spirit of Islam ethics, any type of transactions that take advantage of insider information is considered as serious crimes (Tatiana, Igor, and Liliya, 2015). Thus, insider trading, by our definition, is not banned in these markets, but speculative trading using private and undisclosed information is not tolerated and under tight control due to the influence of Islamic Law in India, Indonesia, and Malaysia. This conjecture is consistent with Shariah[20]-compliant firms having significantly higher financial transparency than non-Shariah-compliant firms due to their religious status and subjecting to greater scrutiny by both authorities and institutional investors (Ismail, Kamarudin, and Sarman, 2015). Therefore, we suggest that the mechanism of accruals mispricing through insider trading channel is not likely to apply in Islamic and Islamic-influenced emerging markets.

Generally, our empirical evidence is attributable to the mechanism of discretionary accruals mispricing via insider trading channel in Brazil, China, South Korea, and Thailand. Our findings insinuate that under information asymmetry and weak investor-protection regimes, corporate insiders take advantage of not only their information superiority but also managerial discretion over accruals to be benefited in insider trades.

5. Conclusion

In this study, we examine the occurrence and drivers of accrual anomaly in emerging markets. Using data from twenty emerging markets from 2000 to 2016, we seek to address two important research questions: Do accrual anomaly present in emerging markets? If yes, what are the factors that drive the anomaly in those markets? First, we investigate the mispricing of accruals and cash flows components of earnings in twenty emerging markets including Brazil, China, Egypt, Greece, India, Indonesia, Malaysia, Pakistan, Peru, Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, the United Arab Emirates, and Turkey. Second, we propose behavior-related channels through which accrual anomaly is created.

We signify six main findings from our empirical results. First, we find the evidence of accrual anomaly in twelve emerging markets including Brazil, China, India, Indonesia, Malaysia, Peru,

[19] India, Indonesia, and Malaysia are the countries where Islam is one of the most professed religions. Muslim account for 87.2 percent of Indonesian population, which was approximately 227.2 million people. This figure is about 189 million in India, consists of 14.2 percent of Indian population. The Muslim adherents are of approximately 61 percent of Malaysian population, which is about 19.2 million. Data is collected from https://www.worldatlas.com/articles/countries-with-the-largest-muslim-populations.html

[20] Islamic Law specification in Malaysia.

South Korea, Taiwan, Thailand, and a pooled sample of Arabian markets (Qatar, Saudi Arabia, and the UAE). Second, using a modification of Francis et al. (2005)'s discretionary accruals quality as a portfolio benchmark of the accrual-based trading strategy, we report remarkably high hedge returns in China and South Korea markets which exceed those have ever been reported in the literature. Our results also insinuate that mispricing of accruals and cash flows do not always associate with statistically significant hedge returns. Third, investor naivety partially contributes to the mispricing of earnings persistence, accruals, and cash flows, but cannot well explain the accrual anomaly. Therefore, our fourth main finding is that managerial incentives such as contracting incentive and speculative insider trading incentive drive the accrual anomaly by raising the level of information asymmetry between insiders and outsiders of firms, and thus substantiate the mispricing. Fifth, the BS-based accruals measures might contaminate the results and inferences of market efficiency tests, we hence recommend the use of CFS-based accruals measures as they can better explain the concept of accruals. Sixth, our empirical results indicate that the two-equation Mishkin test might falsely reject rational pricing in certain emerging markets and thus subject to Type I error. This signifies the necessarity of revisiting previous studies in the accrual anomaly literature that use the original Mishkin test as the market efficiency test.

Our inferences have implications for equity investment and corporate governance in emerging markets. This is the first study to investigate the accrual anomaly in the context of emerging markets across the globe. Our findings enrich the literature and offer insights into the occurrences and causes of one of the most striking anomalies in the context of emerging markets.

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TABLES

Table 1
Descriptive statistics of total accruals proxies, Operating cash flows, earnings, and size-adjusted returns.

Market	N	$TACCR_{BS}$			$TACCR_{CF}$			OCF			EARN			SizeRet		
		Mean	Median	Std.dev.	Mean	Median	Std.dev.	Mean	Median	Std.dev.	Mean	Median	Std.dev.	Mean	Median	Std.dev.
Brazil	3,088	-182.9	-13.8	995.3	-399.7	-38.8	1,244.4	681.5	77.8	2,057.2	269.9	28.4	1,023	2.384	0.259	8.667
China	28,070	-134.0	-11.0	1,102.1	-97.9	-11.1	715.3	310.5	65.7	1,064.4	224.9	64.5	615.8	2.800	2.691	1.902
Egypt	1,632	-62.8	-4.1	363.8	-74.3	-4.1	323.6	215.0	23.2	583.2	145.1	20.0	408.7	0.836	0.495	1.216
Greece	2,832	-14.5	-1.9	75.3	-20.7	-1.6	100.5	29.8	1.7	130.3	10.2	0.6	55.8	0.100	-0.002	0.729
India	14,757	-171.7	-9.2	8,412	-517.1	-15.0	4981	1,278.5	49.7	5,979	818.6	41.5	3462	2.992	-0.020	12.032
Indonesia	4,442	-129,567	-85	781,621	-133,450	-355	690,179	344,920	9,697	1,203,416	225,954	6,399	862,985	0.536	0.296	1.098
Malaysia	9,780	-30.3	-3.1	185.6	-32.6	-3.6	170.4	87.5	8.8	330.4	54.8	7.1	194.3	0.486	0.308	0.734
Pakistan	2,515	-379.0	-70.4	3,609.9	-676.9	-45.6	3,782.0	1,846.7	292.0	5,983.2	1,234.5	281.7	4,054.6	0.612	0.415	0.914
Peru	1,776	-55.6	-10.2	191.2	-69.0	-11.5	212.2	149.8	31.3	309.7	81.4	17.7	177.6	0.826	0.305	1.459
Philippines	2,180	-1,036.5	-41.5	4,899.8	-1,258.3	-51.8	4,573.4	2,682.4	112.9	7,647.2	1,497.7	56.0	4,312.1	0.685	0.267	1.482
Poland	2,643	-67.4	-3.6	312.8	-99.9	-4.6	463.3	166.0	10.1	694.9	67.0	6.0	308.1	0.908	0.607	1.335
QSU	2,158	-284.7	-19.2	1,243.2	-467.9	-28.5	1,976.7	901.5	124.9	2,934.8	452.2	95.3	1,378.7	1.429	1.208	1.319
Russia	1,998	-7602	-536	28,513	-9,119	-423	34,781	20,034	880	72,315	11,391	337	46,474	4.902	0.145	56.698
South Africa	2,698	-319.1	-22.5	1,170.1	-382.5	-24.8	1,601.8	1,071.9	146.2	3,052.7	722.5	102.1	2,037.1	0.556	0.482	0.762
South Korea	16,583	-35,623	-2,850.2	206,840	-42,797	-4,018	206,240	72,793	6,969	303,030	29,813	3,789	132,217	0.377	0.215	0.728
Taiwan	17,677	-464.3	-60.3	2,272.9	-547.2	-76.1	2,229.9	1,113.1	184.5	3,817.7	571.5	110.8	2,046.6	1.416	1.122	1.319
Thailand	6,338	-476.2	-59.6	2,402.0	-518.5	-61.9	2,380.9	1,209.9	154.9	4,218.1	757.9	108.3	2,724.1	0.473	0.236	0.933
Turkey	3,768	-36.5	-2.1	221.7	-42.1	-2.1	204.0	117.2	8.3	381.9	62.1	5.7	215.3	0.652	0.505	0.837

Table 2

Panel regression results of future earnings on current earnings with the inclusion of firm fixed effects and year fixed effects. The standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

	Brazil	China	Egypt	Greece	India	Indonesia	Malaysia	Pakistan	Peru	Philippines	Poland	QSU	Russia	South Africa	South Korea	Taiwan	Thailand	Turkey
VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EARN	0.546***	0.707***	0.804***	0.436***	0.894***	0.635***	0.496***	0.737***	0.558***	0.660***	0.401***	0.193***	0.390***	0.509***	0.506***	0.418***	0.427***	0.597***
	(0.077)	(0.0190)	(0.0649)	(0.0809)	(0.0252)	(0.0500)	(0.0369)	(0.0614)	(0.0681)	(0.0593)	(0.0900)	(0.0196)	(0.121)	(0.0645)	(0.0374)	(0.0349)	(0.0509)	(0.0646)
Constant	138.3***	92.22***	10.96	8.688***	11.79	101,807***	20.86***	444.68	3.83	348.3**	-6.59	22.51	-30,798*	315.2***	2,451.9	12.62	430.2***	-3.75
	(41.11)	(4.479)	(20.73)	(2.57)	(151.49)	(11,510)	(1.996)	(68.73)	(14.21)	(149.73)	(24.15)	(27.84)	(17,467)	(92.18)	(4,853.6)	(75.85)	(95.57)	(9.36)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway	Twoway
Obs	2,866	28,055	1,626	2,653	13,028	4,122	9,752	2,208	1,652	2,040	2,640	1,995	1,737	2,517	14,932	17,380	5,904	3,501
Number of firms	210	2,346	147	168	2,177	320	702	223	121	139	298	160	220	173	1,504	1,481	434	258
R-squared	0.308	0.444	0.542	0.223	0.683	0.407	0.273	0.519	0.411	0.500	0.186	0.538	0.255	0.279	0.245	0.205	0.221	0.365

Table 3

Panel regression results of future earnings on current earnings in different subsamples representing different levels of book value of assets, earnings, and capitalization. In the model, we include firm fixed effects and year fixed effects. The standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively.

Markets	**Low-BV firms**	**Medium-BV firms**	**High-BV firms**	**Low earnings firms**	**Medium-earnings firms**	**High-earnings firms**	**Low-capitalisation firms**	**Meidum-capitalisation firms**	**High-capitalisation firms**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Brazil	-0.032	0.622***	0.556***	0.060	0.743***	0.536***	0.355***	-0.395**	0.571***
China	-0.039	0.231***	0.694***	-0.162***	0.950***	0.782***	0.161*	0.421***	0.700***
Egypt	0.572***	0.864***	0.788***	-0.212	0.836***	0.757***	0.434***	0.555***	0.814***
Greece	0.312***	0.290***	0.408***	-0.063	0.692***	0.521***	0.121	0.510***	0.440***
India	0.914***	0.872***	0.867***	0.522***	0.380**	0.900***	0.085	0.393***	0.850***
Indonesia	0.140***	0.156*	0.614***	0.266	1.007***	0.682***	0.403***	-0.012	0.655***
Malaysia	0.084	0.180**	0.471***	0.086	0.543***	0.496***	0.133*	0.059	0.480***
Pakistan	0.649***	0.696***	0.718***	0.461**	0.331**	0.622***	0.468*	0.397***	0.712***
Peru	0.843***	0.369***	0.444***	-0.382*	0.561***	0.623***	0.092	0.474***	0.466***
Philippines	0.055	0.194**	0.595***	0.175	0.725***	0.599***	0.401***	0.167**	0.574***
Poland	0.126**	0.173**	0.390***	0.192	-0.100	0.613***	-0.445**	0.235**	0.395***
QSU	0.093***	0.116***	0.188***	-0.002	0.183***	0.188***	0.019	0.143***	0.190***
Russia	0.117*	0.204**	0.263**	0.301	0.607***	0.261*	0.365**	-0.082	0.253**
South Africa	0.068	0.438***	0.478***	-0.093	0.712***	0.421***	0.278**	0.273***	0.476***
South Korea	0.095	0.138*	0.496***	-0.024	0.553***	0.541***	0.011	0.136**	0.500***
Taiwan	0.361***	0.301***	0.400***	0.119	0.481***	0.385***	0.244***	0.197***	0.399***
Thailand	0.045	0.222***	0.398***	0.538*	0.553***	0.460***	0.360	0.485**	0.403***
Turkey	0.070	0.568***	0.568***	0.170	0.123	0.609***	0.185	0.346***	0.573***

Table 4

Panel regression results of future earnings on current accruals and current cash flows with the inclusion of firm fixed effects and year fixed effects. Panel A reports the results of regression using BS-based total accruals in the RHS of the model. Panel B reports the results of the regressions using CFS-based total accruals in the RHS of the model. The standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

Panel A

BS approach

	Brazil	China	Egypt	Greece	India	Indonesia	Malaysia	Pakistan	Peru	Philippines	Poland	QSU	Russia	South Africa	South Korea	Taiwan	Thailand	Turkey
VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
$TACCR_{BS}$	0.058	0.072***	0.237***	0.061	-0.0131	0.113***	0.063***	0.178***	-0.0274	0.0267	0.0906	0.0206**	-0.0132	0.181***	0.0389***	0.084***	0.107***	0.087*
	(0.0476)	(0.0067)	(0.0436)	(0.06)	(0.0086)	(0.0279)	(0.0197)	(0.0376)	(0.0524)	(0.0304)	(0.0698)	(0.0094)	(0.0884)	(0.0648)	(0.0138)	(0.0152)	(0.0294)	(0.0493)
OCF	0.277***	0.289***	0.529***	-0.018	0.176***	0.440***	0.312***	0.419***	0.467***	0.333***	0.314***	0.062***	0.464***	0.514***	0.163***	0.227***	0.370***	0.256***
	(0.0473)	(0.0112)	(0.062)	(0.081)	(0.023)	(0.0398)	(0.0295)	(0.0414)	(0.0490)	(0.0345)	(0.0531)	(0.0113)	(0.0732)	(0.0578)	(0.0208)	(0.0202)	(0.0372)	(0.0444)
Constant	209.8***	144.6***	83.56***	12.33*	918.5**	80,182*	25.10***	448.2***	-17.09	474.63***	-11.45	38.10	5,634.4	465.4***	-904.4	274.7***	403.6***	-162***
	(60.96)	(15.33)	(40.93)	(6.983)	(370.0)	(48,324.9)	(7.143)	(438.45)	(15.38)	(165.07)	(22.66)	(58.24)	(9,157.6)	(102.3)	(7,956)	(75.32)	(144.98)	(61.58)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way
Obs	2,561	28,055	1,626	2,177	13,028	4,071	9,752	2,208	1,608	1,961	2,640	1,779	1,101	2,458	13,796	17,380	5,880	2,513
Number of firms	201	2,346	147	167	2,177	319	702	223	120	137	298	156	193	170	1,497	1,481	434	257
R-squared	0.147	0.262	0.351	0.062	0.084	0.304	0.210	0.313	0.403	0.370	0.204	0.287	0.248	0.292	0.097	0.162	0.200	0.219

Panel B

CFS approach

	Brazil	China	Egypt	Greece	India	Indonesia	Malaysia	Pakistan	Peru	Philippines	Poland	QSU	Russia	South Africa	South Korea	Taiwan	Thailand	Turkey
VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
$TACCR_{CF}$	0.274**	0.375***	0.528***	0.307***	0.654***	0.382***	0.270***	0.448***	0.459***	0.538***	0.157**	0.068***	0.197*	0.310***	0.172***	0.224***	0.247***	0.419***
	(0.105)	(0.0235)	(0.0927)	(0.0696)	(0.0413)	(0.0515)	(0.0326)	(0.0552)	(0.0567)	(0.0706)	(0.0705)	(0.022)	(0.110)	(0.0650)	(0.0301)	(0.0298)	(0.0484)	(0.071)
OCF	0.421***	0.483***	0.704***	0.228**	0.736***	0.576***	0.44***	0.561***	0.659***	0.683***	0.370***	0.109***	0.419***	0.584***	0.252***	0.308***	0.448***	0.486***
	(0.0677)	(0.0200)	(0.0803)	(0.104)	(0.041)	(0.0414)	(0.0344)	(0.0468)	(0.042)	(0.0505)	(0.0536)	(0.0196)	(0.114)	(0.0552)	(0.0282)	(0.0253)	(0.0474)	(0.058)
Constant	131.4***	55.84***	24.60	11.33***	380.7*	90,672**	19.43***	357.2***	-12.73	228.36	-14.89	8.51	-29,554*	296.4***	-525.7	-43.07	405.6***	-10.72
	(48.28)	(9.933)	(23.35)	(4.265)	(221.7)	(36,709)	(6.386)	(323.36)	(13.44)	(143.79)	(20.21)	(47.37)	(17,226)	(86.35)	(6,898.1)	(59.30)	(97.56)	(7.86)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way	Two-way
Obs	2,861	28,055	1,626	2,211	13,208	4,117	9,752	2,208	1,652	2,039	2,640	1,967	1,717	2,517	14,615	17,380	5,904	2,995
Number of firms	210	2,346	147	168	2,177	320	702	223	121	139	298	160	218	173	1,504	1,481	434	258
R-squared	0.186	0.341	0.433	0.176	0.416	0.384	0.264	0.445	0.500	0.521	0.224	0.368	0.312	0.322	0.133	0.196	0.228	0.315

Table 5
Panel regression results of future earnings on current accruals and current cash flows of Greek firms in different periods. In the regression, we include firm fixed effects and year fixed effects. The standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

VARIABLES	Pre-crisis	In-crisis and post-crisis
$TACCR_{CF}$	0.126	0.197***
	(0.119)	(0.0724)
OCF	-0.00493	0.260***
	(0.170)	(0.0958)
Constant	26.90***	3.474
	(7.434)	(3.965)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Clustered SE	Two-way	Two-way
Observations	879	1,332
R-squared	0.072	0.123
Number of firms	161	168

Table 6

Test of rational pricing of earnings persistence using one-way clustering Mishkin test. Standard errors are clustered by year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

MARKETS	β_0	β_1	θ_1	β_{0s}	β_{1s}	**Obs**	**Market efficiency restriction test (Prob>Chi-sq)**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Brazil	54.52***	0.832***	0.000666***	-3,392	0.597***	2,443	0.000
	(15.71)	(0.0528)	(4.47e-05)	(0)	(0.0825)		
China	34.90***	0.985***	0.00123***	-2,178	0.863***	27,929	0.020
	(9.446)	(0.0225)	(6.44e-05)	(0)	(0.0529)		
Egypt	8.358*	0.988***	0.00112***	-744.5***	0.750***	1,632	0.015
	(5.077)	(0.0411)	(0.000311)	(190.6)	(0.0895)		
Greece	1.808**	0.797***	0.00203***	-56.59	0.491***	2,664	0.020
	(0.771)	(0.0438)	(0.000372)	(44.20)	(0.137)		
India	71.41***	1.026***	0.000424***	0	-0.514	12,785	0.000
	(24.00)	(0.0366)	(0.000137)	(0)	(0.448)		
Indonesia	31,384	0.952***	2.77e-07***	0	0	4,122	N/A
	(0)	(0.0259)	(3.31e-08)	(0)	(0)		
Malaysia	4.814***	0.965***	0.00136***	-335.3***	0.340***	9,743	0.000
	(1.001)	(0.0284)	(0.000151)	(58.22)	(0.0652)		
Pakistan	194.3***	0.977***	0.000105***	0	0.483***	2,493	0.000
	(50.87)	(0.0282)	(1.45e-05)	(0)	(0.0529)		
Peru	16.05***	0.849***	0.00291***	-216.4***	0.193	1,612	0.002
	(4.096)	(0.0600)	(0.000665)	(46.85)	(0.221)		
Philippines	250.3***	0.960***	0.000178***	0	0.539***	2,041	0.000
	(54.86)	(0.0238)	(2.52e-05)	(0)	(0.0594)		
Poland	16.24***	0.832***	0.000737***	-1,190	0.555***	2,624	0.033
	(4.201)	(0.0711)	(7.34e-05)	(0)	(0.133)		
QSU	4.687*	0.275***	0.00155***	-883.9***	0.205***	1,998	0.004
	(2.770)	(0.00579)	(0.000379)	(211.5)	(0.0261)		
Russia	1,532	0.951***	4.48e-06***	0	0.422***	1,736	0.000
	(0)	(0.0497)	(7.10e-07)	(0)	(0.121)		
South Africa	151.0***	0.887***	0.000133***	0	0.449***	2,518	0.000
	(25.60)	(0.0317)	(1.74e-05)	(0)	(0.0652)		
South Korea	5,288	0.920***	1.54e-06***	0	0.467***	15,078	0.000
	(0)	(0.0300)	(1.70e-07)	(0)	(0.0437)		
Taiwan	75.40***	0.914***	0.000387***	-3,389	0.692***	17,670	0.000
	(23.05)	(0.0277)	(2.80e-05)	(0)	(0.0436)		
Thailand	140.5***	0.913***	0.000139***	0	0.391***	5,885	0.000
	(24.56)	(0.0253)	(1.66e-05)	(0)	(0.0306)		
Turkey	12.00***	0.922***	0.00109***	-585.5***	0.624***	3,505	0.001
	(3.590)	(0.0218)	(0.000167)	(135.1)	(0.0895)		

Table 7

Test of rational pricing of accruals and cash flows using two-way clustering Mishkin test. Total accruals are calculated under the BS approach to accruals. Standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

MARKETS	λ_0	λ_1	λ_2	Ω	λ_{0s}	λ_{1s}	λ_{2s}	**Obs**
Brazil	22.64*	0.0817	0.400***	0.000710***	-3,559	-0.383**	0.379***	2,195
	(12.25)	(0.0764)	(0.0453)	(9.18e-05)	(0)	(0.154)	(0.0599)	
China	107.1***	0.106***	0.521***	0.00116***	-2,257	-0.00259	0.464***	27,929
	(15.19)	(0.0302)	(0.0242)	(5.93e-05)	(0)	(0.0203)	(0.0331)	
Egypt	17.01*	0.306***	0.716***	0.000765***	-1,100***	0.00132	0.439**	1,632
	(8.721)	(0.0900)	(0.0582)	(0.000281)	(395.3)	(0.208)	(0.188)	
Greece	1.795	0.221**	0.365***	0.00146***	-97.91	-0.0200	0.0314	2,183
	(2.103)	(0.108)	(0.0841)	(0.000449)	(75.64)	(0.173)	(0.154)	
India	414.7***	-0.0181	0.399***	0.000454***	0	-0.0157	-0.453***	12,785
	(107.7)	(0.0325)	(0.0363)	(8.04e-05)	(0)	(0.0580)	(0.169)	
Indonesia	36,119	0.308**	0.731***	3.46e-07***	0	0.0242	0.149**	4,076
	(0)	(0.123)	(0.0628)	(5.30e-08)	(0)	(0.114)	(0.0732)	
Malaysia	9.891***	0.114***	0.586***	0.00141***	-322.7***	-0.0835**	0.201***	9,743
	(1.702)	(0.0386)	(0.0262)	(0.000197)	(60.54)	(0.0390)	(0.0428)	
Pakistan	497.2***	0.384***	0.602***	0.000103***	0	0.408***	0.287***	2,493
	(105.9)	(0.0464)	(0.0431)	(1.30e-05)	(0)	(0.0804)	(0.0576)	
Peru	18.77***	0.310**	0.576***	0.00299***	-213.7***	-0.0725	0.123	1,568
	(6.618)	(0.136)	(0.123)	(0.000541)	(46.90)	(0.155)	(0.124)	
Philippines	319.9***	0.0931**	0.555***	0.000101***	0	0.322***	0.135	1,961
	(84.11)	(0.0445)	(0.0279)	(2.62e-05)	(0)	(0.115)	(0.135)	
Poland	10.65***	0.167**	0.437***	0.000941***	-942.5***	-0.168	0.266***	2,624
	(2.657)	(0.0798)	(0.0351)	(0.000253)	(271.0)	(0.189)	(0.0773)	
QSU	31.75***	0.0824***	0.136***	0.00153***	-890.2***	0.0158	0.110***	1,781
	(9.166)	(0.0241)	(0.0118)	(0.000245)	(160.7)	(0.0193)	(0.0102)	
Russia	-364.4	0.226**	0.655***	1.71e-06	0	-0.593	-0.572	1,101
	(0)	(0.0941)	(0.0364)	(1.15e-06)	(0)	(0.913)	(0.925)	
South Africa	142.6***	0.258***	0.657***	0.000182***	-2,960	-0.0270	0.699***	2,458
	(35.79)	(0.0699)	(0.0194)	(1.64e-05)	(0)	(0.157)	(0.0547)	
South Korea	7,040	0.114***	0.410***	1.17e-06***	0	0.0449*	0.115**	13,935
	(0)	(0.0343)	(0.0240)	(1.34e-07)	(0)	(0.0269)	(0.0494)	
Taiwan	102.8***	0.232***	0.541***	0.000337***	-3,998	0.0945***	0.404***	17,670
	(19.30)	(0.0442)	(0.0275)	(2.38e-05)	(0)	(0.0345)	(0.0288)	
Thailand	140.5***	0.205***	0.652***	0.000141***	0	0.208***	0.326***	5,861
	(30.40)	(0.0636)	(0.0356)	(1.89e-05)	(0)	(0.0684)	(0.0441)	
Turkey	21.15***	0.170	0.564***	0.000620***	-1,030	0.0820	0.157	2,513
	(5.621)	(0.117)	(0.0505)	(9.52e-05)	(0)	(0.111)	(0.105)	

Table 8

Test of rational pricing of accruals and cash flows using two-way clustering Mishkin test. Total accruals are calculated under the CFS approach to accruals. Standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

MARKETS	λ_0	λ_1	λ_2	Ω	λ_{0s}	λ_{1s}	λ_{2s}	**Obs**
Brazil	37.26***	0.382***	0.577***	0.000696***	-3,397	-0.259	0.292**	2,438
	(10.39)	(0.0706)	(0.0555)	(8.86e-05)	(0)	(0.194)	(0.146)	
China	68.36***	0.596***	0.790***	0.00118***	-2,241	0.280***	0.619***	27,929
	(12.37)	(0.0479)	(0.0322)	(6.19e-05)	(0)	(0.0771)	(0.0580)	
Egypt	9.161	0.760***	0.925***	0.000863***	-976.9***	0.224	0.551***	1,632
	(6.307)	(0.110)	(0.0363)	(0.000264)	(290.8)	(0.203)	(0.191)	
Greece	1.662	0.459***	0.588***	0.00162***	-88.37	0.247	0.302**	2,217
	(1.489)	(0.0995)	(0.0817)	(0.000367)	(65.84)	(0.172)	(0.125)	
India	132.6**	0.752***	0.919***	0.000340***	0	-0.207	-0.883	12,785
	(57.07)	(0.0830)	(0.0604)	(0.000102)	(0)	(0.368)	(0.563)	
Indonesia	30,164	0.635***	0.878***	3.55e-07***	0	0.185	0.225**	4,122
	(0)	(0.0972)	(0.0439)	(6.53e-08)	(0)	(0.163)	(0.108)	
Malaysia	7.906***	0.470***	0.745***	0.00151***	-300.5***	0.107**	0.297***	9,743
	(1.286)	(0.0583)	(0.0327)	(0.000207)	(55.92)	(0.0520)	(0.0449)	
Pakistan	449.9***	0.610***	0.763***	0.000131***	0	0.565***	0.501***	2,493
	(90.28)	(0.0652)	(0.0328)	(1.69e-05)	(0)	(0.0484)	(0.0429)	
Peru	10.39***	0.708***	0.829***	0.00324***	-199.7***	0.0675	0.220	1,612
	(3.279)	(0.0766)	(0.0418)	(0.000942)	(56.30)	(0.287)	(0.247)	
Philippines	157.3***	0.726***	0.911***	0.000132***	0	0.753***	0.537***	2,040
	(53.81)	(0.0756)	(0.0500)	(2.71e-05)	(0)	(0.192)	(0.121)	
Poland	9.848***	0.243***	0.519***	0.000968***	-915.0***	0.00152	0.329***	2,624
	(2.370)	(0.0715)	(0.0498)	(0.000252)	(255.0)	(0.139)	(0.0898)	
QSU	14.59***	0.158***	0.211***	0.00154***	-895.6***	0.0167	0.117***	1,970
	(4.988)	(0.0398)	(0.0187)	(0.000249)	(160.1)	(0.0274)	(0.0206)	
Russia	928.4	0.496***	0.801***	3.55e-06***	0	0.866*	0.467***	1,716
	(0)	(0.101)	(0.0527)	(7.30e-07)	(0)	(0.447)	(0.132)	
South Africa	127.3***	0.521***	0.803***	0.000139***	0	0.0526	0.357***	2,518
	(21.59)	(0.0977)	(0.0414)	(1.85e-05)	(0)	(0.198)	(0.0841)	
South Korea	6,976	0.335***	0.554***	1.37e-06***	0	0.320***	0.318***	14,758
	(0)	(0.0407)	(0.0259)	(1.73e-07)	(0)	(0.0595)	(0.0502)	
Taiwan	98.28***	0.454***	0.671***	0.000347***	-3,883	0.185***	0.459***	17,670
	(18.95)	(0.0430)	(0.0282)	(2.51e-05)	(0)	(0.0631)	(0.0430)	
Thailand	111.0***	0.437***	0.782***	0.000132***	0	0.119	0.284***	5,885
	(28.77)	(0.0808)	(0.0441)	(2.03e-05)	(0)	(0.0846)	(0.0515)	
Turkey	15.30***	0.660***	0.795***	0.000903***	-690.2***	0.707***	0.545***	2,995
	(3.918)	(0.0739)	(0.0372)	(0.000152)	(189.8)	(0.139)	(0.110)	

Table 9

Regression results of the KKP test (3-equation and 2-way-clustering Mishkin test). Total accruals are calculated under the BS approach to accruals. Standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

VARIABLES	γ_0	γ_1	γ_2	δ_0	δ_1	δ_2	Ψ_1	Ψ_2	K_{0s}	K_{1s}	K_{2s}	Obs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Brazil	-25.02	-0.0876	-0.231***	44.45***	0.0939**	1.026***	0.00019**	0.00013	-2.544***	-0.00033***	7.22e-05	2,195
	(29.60)	(0.0573)	(0.0229)	(16.80)	(0.0458)	(0.0257)	(7.96e-05)	(0.00016)	(0.342)	(0.000105)	(0.000164)	
China	13.99	0.111**	-0.335***	78.92***	-0.00717	0.866***	0.00023***	0.00014***	-2.775***	-0.0001***	-1.33e-05	25,582
	(15.72)	(0.0446)	(0.0361)	(12.31)	(0.0213)	(0.0302)	(2.99e-05)	(5.42e-05)	(0.153)	(2.80e-05)	(2.96e-05)	
Egypt	-5.617	0.149	-0.181***	27.92***	0.148**	0.957***	0.00053***	0.0007***	-0.838***	-5.11e-05	0.000367*	1,632
	(8.306)	(0.108)	(0.0532)	(9.235)	(0.0636)	(0.0488)	(0.000140)	(0.00023)	(0.0973)	(0.000122)	(0.000218)	
Greece	-4.612***	0.119	-0.391***	3.279**	0.0239	0.915***	0.0008***	0.00063**	-0.147*	-0.000243	-0.000224	2,183
	(1.396)	(0.0940)	(0.0883)	(1.330)	(0.0146)	(0.0570)	(0.000249)	(0.00025)	(0.0893)	(0.000239)	(0.000153)	
India	-166.0	0.436***	0.0773**	230.3***	0.0421***	0.973***	3.79e-05	0.00016***	-2.913***	2.50e-05	-0.00015***	10,705
	(0)	(0.0614)	(0.0382)	(41.17)	(0.0151)	(0.0282)	(2.63e-05)	(4.54e-05)	(0.247)	(2.22e-05)	(5.62e-05)	
Indonesia	-3,747	0.220**	-0.265***	37,762	0.0631***	1.005***	8.96e-08***	1.21e-07***	-0.534***	-6.20e-08**	1.71e-08	4,076
	(0)	(0.0977)	(0.0598)	(0)	(0.0181)	(0.0137)	(3.01e-08)	(4.35e-08)	(0.0840)	(2.64e-08)	(3.24e-08)	
Malaysia	-1.749	-0.0418	-0.310***	6.469***	0.0238	1.001***	0.00053***	0.00056***	-0.454***	-0.0003***	-0.000164**	9,045
	(2.046)	(0.0280)	(0.0272)	(1.805)	(0.0431)	(0.0250)	(0.0001)	(7.48e-05)	(0.0556)	(8.43e-05)	(6.89e-05)	
Pakistan	-340.2	0.109	-0.0164	520.5	0.287***	0.863***	2.01e-05***	1.9e-05***	-0.572***	5.40e-06	7.79e-06	2,493
	(0)	(0.100)	(0.0680)	(0)	(0.0586)	(0.0527)	(5.74e-06)	(6.12e-06)	(0.117)	(6.37e-06)	(5.16e-06)	
Peru	2.971	0.233*	-0.333***	13.46**	0.0993	1.010***	0.00219***	0.00305***	-0.647***	-0.00033	0.00100	1,568
	(6.982)	(0.133)	(0.0857)	(5.414)	(0.0802)	(0.0378)	(0.00032)	(0.00057)	(0.122)	(0.000281)	(0.000671)	
Philippines	-62.31	0.145	-0.298***	373.6	0.0305	0.972***	-1.66e-05*	1.62e-05	-0.642***	2.18e-05***	4.13e-06	1,961
	(0)	(0.101)	(0.0587)	(0)	(0.0418)	(0.0272)	(1.00e-05)	(1.05e-05)	(0.0987)	(7.55e-06)	(8.95e-06)	
Poland	-10.28**	0.189*	-0.273***	14.63***	0.0927	0.997	0.0007***	0.00043***	-0.898***	-0.000143	7.37e-05	2,624
	(4.759)	(0.103)	(0.0570)	(5.133)	(0.0582)	-	(0.00017)	(0.0001)	(0.105)	(0.000167)	(0.000102)	
QSU	-9.059***	0.0932***	-0.046***	13.81**	0.0124	0.278***	0.00057***	0.000353**	-1.414***	-4.41e-05	3.20e-05	1,781
	(2.503)	(0.0150)	(0.0102)	(5.415)	(0.0142)	(0.00363)	(0.00011)	(0.00018)	(0.107)	(4.26e-05)	(5.05e-05)	
Russia	-810.9	0.0928	-0.329***	337.5	0.0851**	1.116***	3.12e-06***	-6.45e-07	-0.360***	-2.31e-06*	-2.90e-06**	1,101
	(0)	(0.117)	(0.0305)	(0)	(0.0346)	(0.0373)	(1.08e-06)	(1.31e-06)	(0.103)	(1.27e-06)	(1.47e-06)	
South Africa	-34.04	0.162**	-0.212***	72.26***	0.0190	0.997***	-6.22e-07	3.56e-05**	-0.598***	-5.33e-05***	4.65e-05***	2,458
	(21.56)	(0.0774)	(0.0291)	(13.61)	(0.0802)	(0.0426)	(2.50e-05)	(1.68e-05)	(0.0560)	(1.77e-05)	(1.31e-05)	
South Korea	-4,097	0.108*	-0.360***	8,781	0.0109	0.935***	1.79e-07***	3.1e-07***	-0.378***	-7.86e-08***	1.45e-07**	13,935
	(0)	(0.0592)	(0.0460)	(0)	(0.0277)	(0.0291)	(5.85e-08)	(5.84e-08)	(0.0683)	(2.34e-08)	(5.85e-08)	
Taiwan	-76.49***	0.187***	-0.266***	146.5***	0.103***	0.967***	0.0001***	9.18e-05***	-1.384***	-1.73e-05*	1.66e-05***	16,190
	(27.92)	(0.0624)	(0.0353)	(24.22)	(0.0359)	(0.0232)	(1.17e-05)	(7.33e-06)	(0.119)	(9.51e-06)	(4.72e-06)	
Thailand	-49.33	0.176**	-0.273***	104.6	0.101*	1.043***	4.21e-05***	4.8e-05***	-0.460***	8.95e-06*	1.93e-05*	5,861
	(0)	(0.0784)	(0.0319)	(0)	(0.0545)	(0.0343)	(6.51e-06)	(1.10e-05)	(0.0858)	(4.78e-06)	(1.04e-05)	
Turkey	-5.156	-0.0818	-0.276***	28.45***	0.206	0.964***	7.98e-05	0.00038***	-0.641***	1.69e-05	9.04e-05	2,513
	(4.299)	(0.0751)	(0.0496)	(8.513)	(0.143)	(0.0736)	(0.00011)	(5.75e-05)	(0.109)	(6.93e-05)	-	

Table 10

Regression results of the KKP test (3-equation and 2-way-clustering Mishkin test). Total accruals are calculated under the CFS approach to accruals. Standard errors are clustered by firm and year. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

VARIABLES	γ_0 (1)	γ_1 (2)	γ_2 (3)	δ_0 (4)	δ_1 (5)	δ_2 (6)	Ψ_1 (7)	Ψ_2 (8)	K_{0s} (9)	K_{1s} (10)	K_{2s} (11)	Obs (12)
Brazil	-68.84***	0.316***	-0.356***	56.31***	0.314***	1.164***	0.000265***	0.000237*	-2.395***	-0.000288***	-1.57e-05	2,438
	(23.01)	(0.0985)	(0.0506)	(19.41)	(0.0529)	(0.0232)	(8.40e-05)	(0.000125)	(0.308)	(0.000101)	(0.000145)	
China	-11.58	0.342***	-0.227***	59.90***	0.286***	1.025***	0.000627***	0.000423***	-2.750***	-2.47e-05	0.000103	25,582
	(12.50)	(0.0640)	(0.0407)	(12.88)	(0.0933)	(0.0525)	(0.000103)	(9.58e-05)	(0.153)	(9.57e-05)	(7.74e-05)	
Egypt	-15.82**	0.406***	-0.135**	23.37**	0.415***	1.079***	0.000754***	0.000929***	-0.841***	0.000230	0.000578**	1,632
	(8.014)	(0.139)	(0.0559)	(9.289)	(0.0890)	(0.0493)	(0.000258)	(0.000269)	(0.0975)	(0.000228)	(0.000269)	
Greece	-3.433**	0.533***	-0.243**	3.311***	0.0949***	0.980***	0.00120**	0.00122***	-0.146	0.000413	0.000438***	2,217
	(1.497)	(0.0667)	(0.0989)	(1.218)	(0.0286)	(0.0583)	(0.000485)	(0.000361)	(0.0890)	(0.000345)	(0.000147)	
India	-40.46	0.590***	-0.224***	150.8***	0.162**	1.083***	0.000179***	0.000288***	-2.552***	-6.33e-05	-0.000180**	12,784
	(35.11)	(0.0809)	(0.0592)	(23.25)	(0.0660)	(0.0557)	(5.49e-05)	(5.40e-05)	(0.237)	(6.61e-05)	(7.09e-05)	
Indonesia	-12,554	0.561***	-0.167***	36,253	0.161***	1.048***	2.62e-07***	2.32e-07***	-0.533***	5.19e-08	9.64e-08*	4,122
	(0)	(0.0646)	(0.0380)	(0)	(0.0481)	(0.0214)	(6.74e-08)	(7.25e-08)	(0.0832)	(5.51e-08)	(5.52e-08)	
Malaysia	-2.450	0.320***	-0.252***	5.128***	0.288***	1.113***	0.00124***	0.00110***	-0.452***	0.000153*	0.000217**	9,045
	(1.809)	(0.0674)	(0.0376)	(1.766)	(0.0323)	(0.0164)	(0.000211)	(0.000164)	(0.0553)	(8.60e-05)	(0.000104)	
Pakistan	-365.1	0.471***	-0.0264	491.5	0.369***	0.952***	3.28e-05***	3.41e-05***	-0.570***	2.14e-05**	2.13e-05***	2,493
	(0)	(0.152)	(0.0785)	(0)	(0.0922)	(0.0457)	(9.70e-06)	(1.08e-05)	(0.116)	(8.88e-06)	(7.25e-06)	
Peru	-5.530	0.684***	-0.143**	13.36**	0.0943	1.018***	0.00285***	0.00368***	-0.647***	0.000222	0.00137	1,612
	(5.261)	(0.101)	(0.0644)	(5.582)	(0.0741)	(0.0505)	(0.000827)	(0.000764)	(0.122)	(0.000825)	(0.000962)	
Philippines	-129.1	0.187	-0.380***	269.7	0.544***	1.260***	7.20e-05**	8.57e-05***	-0.640***	9.11e-05***	7.26e-05***	2,040
	(0)	(0.147)	(0.0706)	(0)	(0.167)	(0.0821)	(3.24e-05)	(3.01e-05)	(0.0962)	(2.37e-05)	(2.52e-05)	
Poland	-9.403*	0.385***	-0.328***	14.14***	0.105**	1.025***	0.000775***	0.000624***	-0.894***	0.000131	0.000202*	2,624
	(5.623)	(0.136)	(0.108)	(4.925)	(0.0500)	(0.0316)	(0.000159)	(0.000116)	(0.103)	(0.000139)	(0.000103)	
QSU	3.007	0.150***	-0.0785***	9.467**	0.0349**	0.296***	0.000853***	0.000656***	-1.394***	-6.69e-05	-1.78e-05	1,970
	(5.194)	(0.0226)	(0.0190)	(4.671)	(0.0153)	(0.0110)	(0.000234)	(0.000229)	(0.116)	(4.29e-05)	(5.70e-05)	
Russia	-798.6	0.479***	-0.257***	580.0	0.121*	1.147***	3.58e-06***	1.08e-06	-0.379***	2.08e-06*	2.97e-08	1,716
	(0)	(0.0748)	(0.0240)	(0)	(0.0636)	(0.0360)	(8.08e-07)	(1.10e-06)	(0.128)	(1.21e-06)	(9.13e-07)	
South Africa	-6.445	0.531***	-0.193***	68.31***	0.0588	1.015***	6.88e-05***	6.97e-05***	-0.589***	2.37e-05	7.40e-05***	2,518
	(26.72)	(0.105)	(0.0454)	(17.55)	(0.0428)	(0.0422)	(2.37e-05)	(2.21e-05)	(0.0562)	(1.87e-05)	(2.23e-05)	
South Korea	-6,044	0.511***	-0.221***	8,425	0.0215	0.943***	5.15e-07***	5.71e-07***	-0.379***	2.24e-07**	3.62e-07***	14,758
	(0)	(0.0656)	(0.0478)	(0)	(0.0451)	(0.0320)	(1.03e-07)	(9.38e-08)	(0.0686)	(9.49e-08)	(9.84e-08)	
Taiwan	-93.93***	0.430***	-0.231***	143.9***	0.173***	1.012***	0.000150***	0.000129***	-1.384***	-7.21e-06	2.29e-05*	16,190
	(29.44)	(0.0595)	(0.0344)	(22.97)	(0.0434)	(0.0250)	(2.12e-05)	(1.47e-05)	(0.119)	(2.07e-05)	(1.24e-05)	
Thailand	-35.53***	0.377***	-0.262***	95.27	0.118	1.061***	9.66e-05***	8.47e-05***	-0.459***	1.50e-05	3.20e-05**	5,885
	(12.23)	(0.0918)	(0.0414)	(0)	(0.0903)	(0.0529)	(1.83e-05)	(1.83e-05)	(0.0861)	(9.23e-06)	(1.51e-05)	
Turkey	-12.14**	0.205*	-0.218***	22.94***	0.385***	1.062***	0.000585***	0.000735***	-0.627***	0.000445***	0.000427***	2,995
	(5.208)	(0.108)	(0.0661)	(6.574)	(0.122)	(0.0655)	(0.000176)	(0.000132)	(0.110)	(0.000130)	(0.000129)	

Table 11

Results of the market efficiency restriction tests of the Modified Mishkin Test (2-equation and 2-way-clustering Mishkin test). We report p-value of each market efficiency restriction test. The rejection threshold is set at 0.05. All p-values that exceed 0.05 is in bold.

Markets	BS approach						CFS approach					
	$\lambda_1 - \lambda_{1s}$ (1)	$\lambda_2 - \lambda_{2s}$ (2)	$\lambda_1 - \lambda_2$ (3)	$\lambda_{1s} - \lambda_{2s}$ (4)	$\Omega^*\lambda_1 - \Omega^*\lambda_{1s}$ (5)	$\Omega^*\lambda_2 - \Omega^*\lambda_{2s}$ (6)	$\lambda_1 - \lambda_{1s}$ (7)	$\lambda_2 - \lambda_{2s}$ (8)	$\lambda_1 - \lambda_2$ (9)	$\lambda_{1s} - \lambda_{2s}$ (10)	$\Omega^*\lambda_1 - \Omega^*\lambda_{1s}$ (11)	$\Omega^*\lambda_2 - \Omega^*\lambda_{2s}$ (12)
Brazil	0.0005	**0.7316**	0.0000	0.0000	0.0016	**0.7289**	0.0002	0.0164	0.0000	0.0000	0.0012	0.0192
China	0.0001	**0.0838**	0.0000	0.0000	0.0001	**0.0737**	0.0000	0.0009	0.0000	0.0000	0.0000	0.0002
Egypt	**0.0923**	**0.0997**	0.0004	0.0352	0.0476	**0.1597**	0.0181	0.0385	**0.1105**	**0.0556**	**0.0599**	**0.1100**
Greece	**0.1685**	0.0431	0.0031	**0.6255**	**0.1452**	0.0083	**0.1441**	0.0020	0.0000	**0.6034**	0.2271	0.0141
India	**0.9748**	0.0000	0.0000	0.0069	0.0239	0.0000	0.0137	0.0020	0.0000	0.0188	0.0010	0.0000
Indonesia	0.0176	0.0000	0.0004	**0.3268**	0.0000	0.0239	0.0023	0.0000	0.0248	**0.7430**	0.0009	0.0000
Malaysia	0.0002	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Pakistan	**0.7215**	0.0000	0.0014	**0.1463**	**0.7210**	0.0000	**0.5265**	0.0000	0.0098	**0.1798**	**0.5275**	0.0001
Peru	0.0018	0.0000	0.0003	0.0448	0.0013	0.0006	0.0305	0.0104	0.0191	**0.0625**	0.0006	0.0000
Philippines	**0.0643**	0.0020	0.0000	**0.3310**	0.0107	0.0001	**0.8927**	0.0008	0.0000	**0.1297**	**0.8918**	0.0020
Poland	**0.0504**	0.0171	0.0001	0.0024	0.0468	0.0263	**0.0875**	0.0419	0.0000	0.0001	**0.1105**	**0.0732**
QSU	0.0349	0.0259	**0.0893**	0.0000	0.0211	0.0290	0.0004	0.0002	0.0434	0.0000	0.0000	0.0000
Russia	**0.3737**	**0.1822**	0.0000	**0.9790**	**0.3743**	0.0371	**0.4502**	**0.0611**	0.0000	**0.3198**	**0.4471**	**0.0616**
South Africa	0.0100	**0.3763**	0.0000	0.0000	0.0123	**0.3839**	0.0072	0.0000	0.0000	0.0376	0.0067	0.0000
South Korea	**0.0671**	0.0000	0.0000	**0.0808**	**0.0671**	0.0000	**0.7983**	0.0000	0.0000	**0.9678**	**0.7944**	0.0000
Taiwan	0.0010	0.0000	0.0000	0.0000	0.0004	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Thailand	**0.9740**	0.0000	0.0000	**0.1647**	**0.9740**	0.0000	0.0028	0.0000	0.0000	**0.0584**	0.0017	0.0000
Turkey	**0.5329**	0.0002	0.0000	**0.6330**	**0.5486**	0.0000	**0.7559**	0.0154	0.0120	0.0064	**0.7603**	0.0078

Table 12

Results of the market efficiency restriction tests of the KKP test (3-equation and 2-way-clustering Mishkin test). We report p-value of each market efficiency restriction test. The rejection threshold is set at 0.05. All p-values that exceed 0.05 is bold.

Markets	BS approach					CFS approach				
	γ_1- γ_2	δ_1- δ_2	Ψ_1- Ψ_2	Linear combination #1 of rationality condition	Linear combination #2 of rationality condition	γ_1- γ_2	δ_1- δ_2	Ψ_1- Ψ_2	Linear combination #1 of rationality condition	Linear combination #2 of rationality condition
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Brazil	0.0021	0.0000	**0.6816**	0.0015	**0.7376**	0.0000	0.0000	**0.8579**	0.0013	0.0237
China	0.0000	0.0000	0.0154	0.0002	**0.1511**	0.0000	0.0000	0.0000	0.0000	0.0018
Egypt	0.0090	0.0000	**0.3935**	0.0482	**0.1604**	0.0000	0.0000	**0.4145**	**0.0605**	**0.1105**
Greece	0.0000	0.0000	**0.4680**	**0.1458**	0.0084	0.0000	0.0000	**0.9514**	**0.2277**	0.0143
India	0.0001	0.0000	0.0435	**0.9437**	0.0000	0.0000	0.0000	0.0150	0.0188	0.0000
Indonesia	0.0000	0.0000	**0.3917**	0.0018	0.0005	0.0000	0.0000	**0.4347**	0.0003	0.0001
Malaysia	0.0000	0.0000	**0.7561**	0.0012	0.0000	0.0000	0.0000	**0.1128**	0.0002	0.0000
Pakistan	**0.2402**	0.0000	**0.8708**	**0.7138**	0.0373	0.0003	0.0000	**0.8518**	**0.2125**	0.0141
Peru	0.0000	0.0000	**0.1416**	0.0013	0.0007	0.0000	0.0000	**0.1473**	0.0006	0.0000
Philippines	0.0002	0.0000	0.0000	0.0043	**0.0684**	0.0000	0.0000	0.0127	**0.1744**	**0.5530**
Poland	0.0000	0.0000	0.0241	0.0471	0.0265	0.0000	0.0000	0.0367	**0.1111**	**0.0736**
QSU	0.0000	0.0000	**0.1157**	0.0210	0.0290	0.0000	0.0000	**0.1291**	0.0000	0.0000
Russia	0.0321	0.0000	0.0000	**0.0654**	**0.0628**	0.0000	0.0000	**0.0605**	**0.8587**	**0.5992**
South Africa	0.0000	0.0000	**0.1247**	0.0067	**0.2217**	0.0000	0.0000	**0.9638**	**0.4004**	**0.1477**
South Korea	0.0000	0.0000	**0.1102**	0.0000	0.0498	0.0000	0.0000	**0.3672**	**0.4689**	**0.2561**
Taiwan	0.0000	0.0000	**0.2390**	0.0008	0.0000	0.0000	0.0000	0.0156	0.0000	0.0000
Thailand	0.0000	0.0000	**0.6611**	**0.5770**	0.0000	0.0000	0.0000	**0.3152**	0.0009	0.0000
Turkey	0.0049	0.0000	0.0096	**0.5032**	0.0000	0.0000	0.0000	**0.2090**	**0.7605**	0.0079

Table 13
Interpretations of the Modified Mishkin test and KKP test results for accruals and cash flows mispricing

Market	BS approach				CFS approach			
	MMT		KKP test		MMT		KKP test	
	TACCR mispricing (1)	OCF mispricing (2)	TACCR mispricing (3)	OCF mispricing (4)	TACCR mispricing (5)	OCF mispricing (6)	TACCR mispricing (7)	OCF mispricing (8)
Brazil	X	-	X	-	**X**	**X**	**X**	**X**
China	X	-	X	-	**X**	**X**	**X**	**X**
Egypt	-	-	X	-	X	X	-	-
Greece	-	X	-	X	-	X	-	X
India	-	X	-	X	**X**	**X**	**X**	**X**
Indonesia	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Malaysia	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Pakistan	-	X	-	X	-	X	-	X
Peru	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Philippines	-	X	X	-	-	X	-	-
Poland	-	X	X	X	-	X	-	-
QSU	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Russia	-	-	-	-	-	-	-	-
South Africa	X	-	X	-	X	X	-	-
South Korea	-	X	X	X	-	X	-	-
Taiwan	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Thailand	-	X	-	X	**X**	**X**	**X**	**X**
Turkey	-	X	-	X	-	X	-	X

Table 14

Returns of the accrual-based trading strategy using total accruals and discretionary accrual quality as portfolio benchmarks which are calculated in both BS approach and CFS approach. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. The rows with bold figures represent statistically significant hedge returns of the ABTS.

Panel A **Returns of the ABTS using total accruals as portfolio benchmark.**						
Market	**BS approach**			**CFS approach**		
	α_1	α_8	$\alpha_1 - \alpha_8$	α_1	α_8	$\alpha_1 - \alpha_8$
Brazil	0.2146	1.2173	-	0.2311	1.3065*	-
China	-0.0025	0.2183***	-	0.0473	0.2226***	-
Egypt	0.2636*	0.0954	-	0.2727	0.0720	-
Greece	0.0289	-0.1008**	-	0.0974	0.0369	-
India	0.3943	0.6070	-	0.5460	0.6069	-
Indonesia	-0.1052	-0.0544	-	-0.1580**	0.0075	-
Malaysia	0.0011	0.0685**	-	-0.0109	0.0594*	-
Pakistan	-0.0890	-0.1519**	-	0.0008	-0.0563	-
Peru	0.1833	0.0204	-	-0.0379	-0.0265	-
Philippines	0.0257	-0.1938	-	0.2868*	-0.1097	-
Poland	0.0781	0.1124	-	-0.0075	0.0449	-
QSU	-0.0946	-0.0460	-	0.0268	0.0984	-
Russia	-0.1318	-0.1183	-	-0.1069	-0.1247	-
South Africa	-0.0034	0.0517	-	0.0871	-0.0284	-
South Korea	0.0065	-0.0418*	-	-0.0057	-0.0146	-
Taiwan	-0.0233	0.0926**	-	0.0027	0.1149***	-
Thailand	-0.0313	-0.0631	-	-0.0328	-0.0383	-
Turkey	0.0635	0.0003	-	0.0002	-0.0340	-
Panel B **Returns of the ABTS using discretionary accrual quality as portfolio benchmark.**						
Market	**BS approach**			**CFS approach**		
	α_1	α_8	$\alpha_1 - \alpha_8$	α_1	α_8	$\alpha_1 - \alpha_8$
Brazil	-1.5918***	-0.2039	-	-0.0599	0.1332	-
China	0.3521***	-0.0563	-	**0.2780*** **	**-0.1614** **	**0.4394**
Egypt	0.3471*	-0.2067	-	0.1664	-0.2739**	-
Greece	0.0360	0.0200	-	0.0605	-0.0421	-
India	-0.3434	-1.1200	-	-0.5504	-1.3997	-
Indonesia	0.0728	-0.0179	-	0.0461	-0.0528	-
Malaysia	0.0076	0.1044**	-	0.1848***	0.0005	-
Pakistan	-0.0866	-0.2591***	-	-0.0672	-0.1452	-
Peru	0.1317	-0.2017**	-	-0.0472	0.0725	-
Philippines	0.3875	0.1587	-	0.3026	0.2323	-
Poland	-0.0019	-0.3265*	-	0.0464	-0.3663**	-
QSU	0.0732	-0.3361**	-	**-0.2989** **	**-0.3442** **	**0.0453**
Russia	0.2825	0.0846	-	-0.1272	0.1500	-
South Africa	0.0035	-0.0907	-	0.0337	-0.1420**	-
South Korea	-0.0272	0.0653*	-	**0.0100** **	**-0.2294*** **	**0.2394**
Taiwan	-0.1200**	0.0270	-	-0.1250**	0.0885	-
Thailand	-0.2387***	-0.1002	-	0.0460	-0.3334***	-
Turkey	-0.0573	-0.1287*	-	0.0285	-0.1033	-

Table 15

Mechanism test. 2SLS/IV regression to test the causal effect of managerial discretion on stock overvaluation via manipulating earnings quality channel. Earnings quality measures using the CFS approach. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

				First stage regression						
Variables	Brazil	China	India	Indonesia	Malaysia	Peru	QSU	South Korea	Taiwan	Thailand
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IV1	0.012**	-0.058***	0.572***	0.209*	0.229*	-0.846***	-0.170***	-0.005***	-0.003***	0.006**
	(0.005)	(0.017)	(0.212)	(0.116)	(0.133)	(0.277)	(0.032)	(0.002)	(0.0005)	(0.0025)
IV2	1.202***	-0.727***		0.360***	0..545***	0.583***	1.444***	-0.171***	1.304***	0.391***
	(0.317)	(0.231)		(0.039)	(0.016)	(0.062)	(0.098)	(0.025)	(0.025)	(0.025)
IV3		0.955***								
		(0.019)								
SW Chi-sq. p-value	0.0001	0.0000	0.007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
				Second stage (IV) regression						
Variables	Brazil	China	India	Indonesia	Malaysia	Peru	QSU	South Korea	Taiwan	Thailand
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SizeRet	0.079***	-0.015***	0.274*	1311.91***	0.213***	-0.180**	-0.05***	-5.370***	-0.125***	0.277***
	(0.027)	(0.003)	(0.146)	(320.02)	(0.020)	(0.080)	(0.065)	(1.586)	(0.011)	(0.030)
Underid. test p-value	0.0002	0.0000	0.0090	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Weak id. test statistics	9.549	827.603	7.293	47.289	572.396	45.753	109.445	25.247	1352.064	127.116
Hansen-J test statistics	2.552	1.493	0.000	0.000	0.995	3.531	1.187	3.372	1.379	1.701
Hansen-j test p-value	0.1101	0.4739	-	0.9949	0.3185	0.0602	0.2759	0.0663	0.2403	0.1921
DWH test p-value	0.0000	0.0000	0.0085	0.0000	0.0000	0.1121	0.0119	0.0000	0.0000	0.0000
Observations	1453	15879	2773	2555	6145	1103	1028	7697	8968	3832

Table 16

Instrumental variables used in 2SLS/IVs regressions for each market sample in Section 4.2.1.

Market samples	IV1	IV2	IV3
Brazil	4-year lag of first-difference of Debt_Change	MarketSize	-
China	3-year lag of first-difference of Capex_Growth	EQ_Issuance	MarketSize
India	First difference of MarketSize	-	-
Indonesia	3-year lag of first-difference of EQ_Issuance	MarketSize	-
Malaysia	One-year lag of Capex_Growth	MarketSize	-
Peru	2-year lag of first-difference of Capex_Growth	MarketSize	-
QSU	2-year lag of first-difference of Capex_Growth	MarketSize	-
South Korea	One-year lag of the second-difference of Capex_Growth	Size	-
Taiwan	4-year lag of first-difference of Capex_Growth	MarketSize	-
Thailand	3-year lag of first-difference of Capex_Growth	MarketSize	-

Table 17
Descriptive statistics of insider trading activities and number of shares outstanding.

Market	Insider buying			Insider selling			Number of shares outstanding (in millions)		
	Mean	Median	Std.dev.	Mean	Median	Std.dev.	Mean	Median	Std.dev.
Brazil	134,549.8	0	2,024,090	184,569.9	0	2,329,863	319.58	54.30	995.40
China	65,804.28	0	1,040,383	38,321.35	0	964,283.8	1,167.87	544.85	4,865.48
India	23,414.48	0	285,636.3	40,425.23	0	1,299,327	122.54	14.70	539.49
Indonesia	6,334,862	0	8.12e+07	2,284,972	0	7.14e+07	5,810.64	1,924.09	12,440.92
Malaysia	1,066,408	0	9,171,849	1,468,381	0	1.27e+07	518.35	210.996	1,040.64
Peru	0	0	0	0	0	0	282.92	54.21	548.84
QSU	0	0	0	0	0	0	512.03	97.9	1,225.31
South Korea	9,223.907	0	96,840.41	20,018.9	0	197,135.5	38.08	15.8	246.87
Taiwan	0	0	0	0	0	0	377.29	107.07	1,272.86
Thailand	3,830,489	0	6.24e+07	3,412,024	0	4.34e+07	1,756.50	490	7,840.86

Table 18

Mechanism test. Regression of future discretionary accrual quality on insider trading. *, **, and *** denote significance level of 10%, 5%, and 1%, respectively. Standard errors are reported in parentheses.

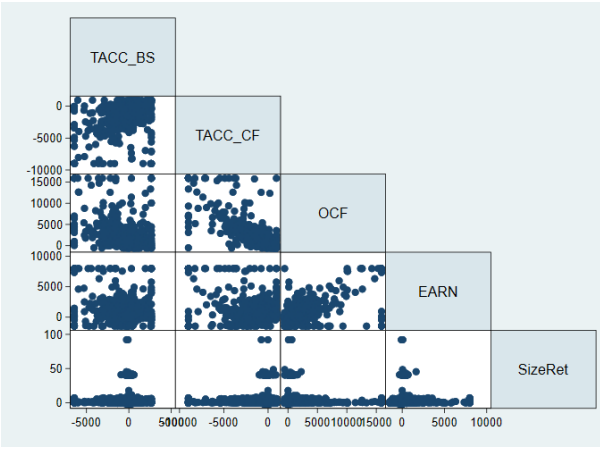
VARIABLES	Brazil DAQ_CF_{t+1} (1)	China DAQ_CF_{t+1} (2)	India DAQ_CF_{t+1} (3)	Indonesia DAQ_CF_{t+1} (4)	Malaysia DAQ_CF_{t+1} (5)	South Korea DAQ_CF_{t+1} (6)	Thailand DAQ_CF_{t+1} (7)
DAQ_CF_t	0.860***	0.522***	0.770***	0.157***	0. 523***	0.772***	0.813***
	(0.138)	(0.0584)	(0.0784)	(0.0523)	(0.180)	(0.0617)	(0.0569)
NST_t	-0.0404	0.322*	-0.202	-4,266.5	0.239	-0.052	0.355*
	(0.0276)	(0.190)	(0.501)	(4,044.7))	(0.200)	(0.126)	(0.196)
NST_{t-1}	-0.0300	0.212	0.0045	-17,283***	0.441**	-0.132	0.099
	(0.0190)	(0.175)	(0.263)	(4,775.8)	(0.185)	(0.0952)	(0.132)
$NSTS_t$	-0.0113**	-3.899**	0.155	21,544.5	0.316**	-0.085*	-1.369**
	(0.00444)	(1.516)	(0.2311)	(19,400.7)	(0.137)	(0.0498)	(0.6932)
$L.NSTS_{t-1}$	-0.0073**	-2.264	0.0002	151,231***	0.080**	-0.0103	0.462
	(0.00315)	(1.941)	(0.0098)	(38,761)	(0.0333)	(0.0084)	(0.355)
MarketSize	0.0404**	0.00792***	0.236**	39.334***	0.0643***	0.0514***	0.022**
	(0.0159)	(0.000968)	(0.100)	(14.004)	(0.0245)	(0.0136)	(0.0088)
Leverage	-0.0234	0.0352***	0.366	-96.15	0.0613	0.120	-0.011***
	(0.0153)	(0.00645)	(0.370)	(180.6)	(0.0620)	(0.0868)	(0.0078)
Cashflows	-0.153	0.00920	-0.161***	187.82	-0.0436***	0.899*	-0.180***
	(0.111)	(0.0296)	(0.0301)	(150.51)	(0.0047)	(0.5083)	(0.0493)
Constant	20.64*	0.314	-90.80**	8,348.08	0.4654	2.331	4.545*
	(12.024)	(0.857)	(44.94)	(9,478.98)	(4.9531)	(12.263)	(2.353)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,013	10,687	1,532	1,484	2,867	1,805	2,065
Number of unit_id	199	2,343	533	313	624	418	414
AR(2) test's p-value	0.717	0.905	0.274	0. 821	0.862	0.973	0.321
Hansen test of overid. Restriction	0.454	0.238	0.519	0. 229	0.177	0.616	0.366

FIGURES

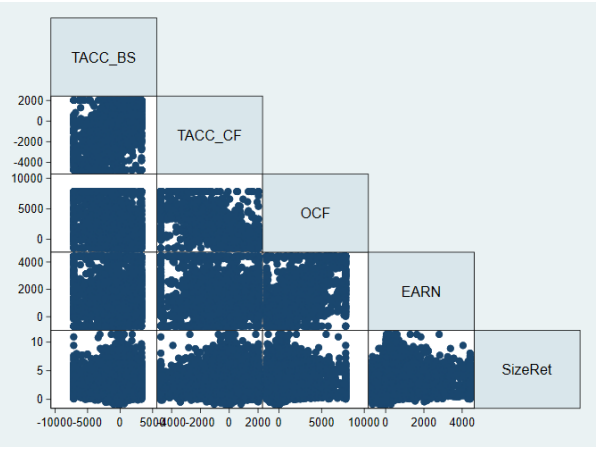
Figure 1

Twoway scatter plot graphs of $TACCR_{BS}$, $TACCR_{CF}$, OCF, EARN, and SizeRet in each emerging market.

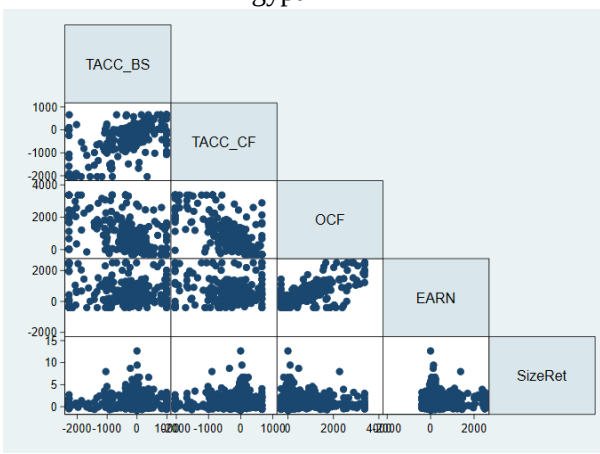
Brazil



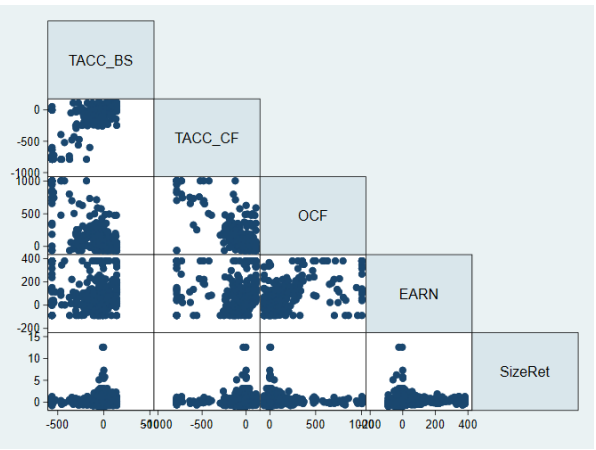
China



Egypt



Greece



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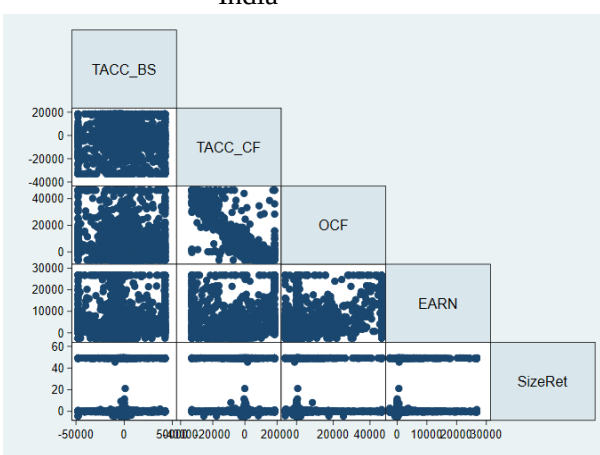

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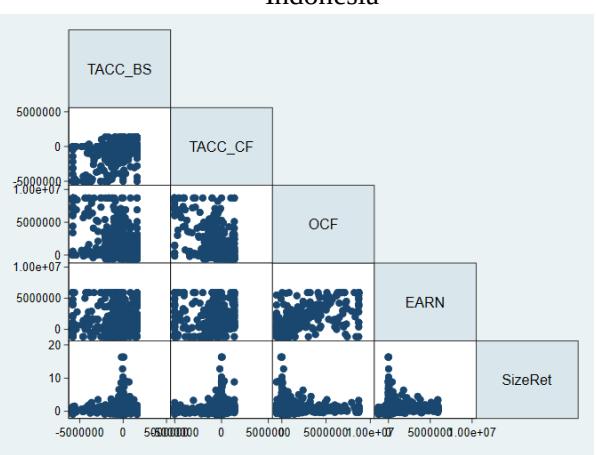

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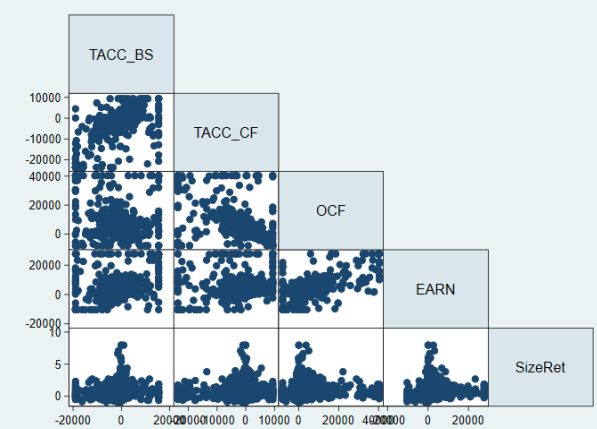

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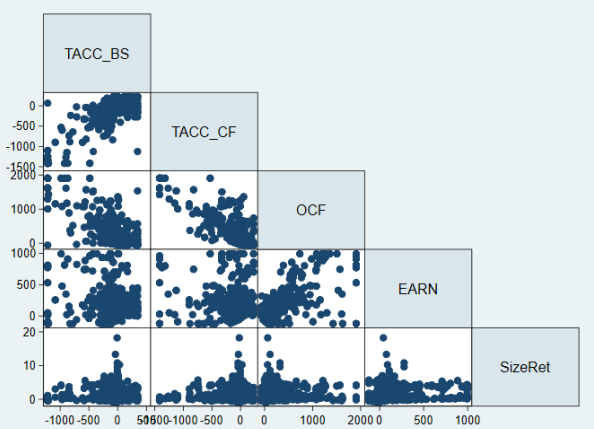
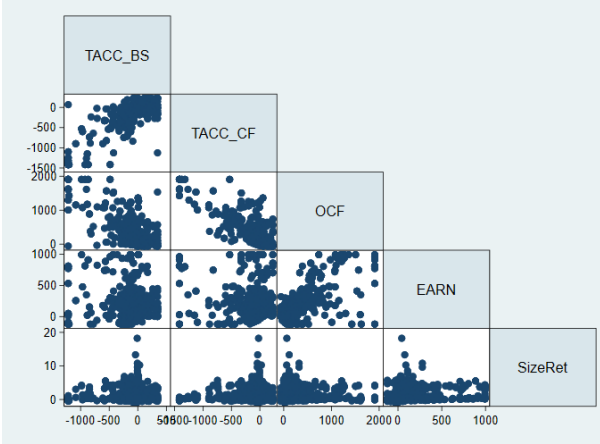


Peru



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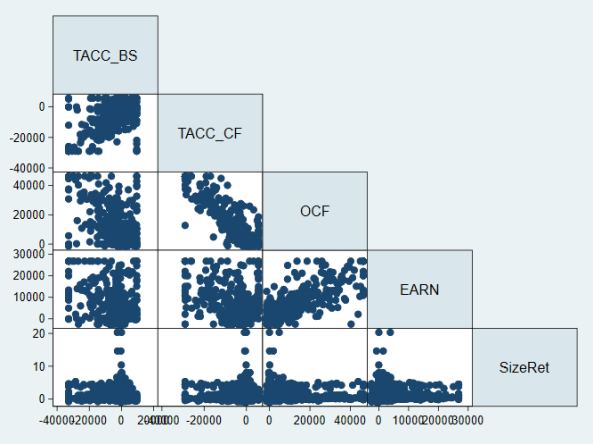

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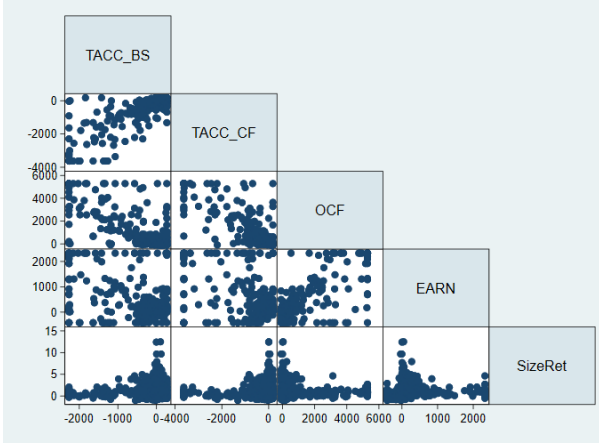

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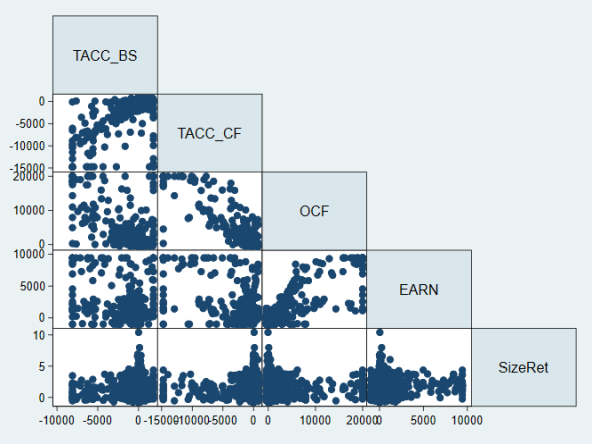
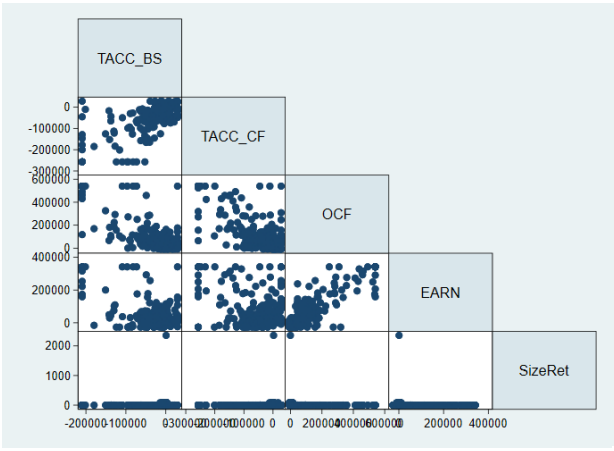


Russia



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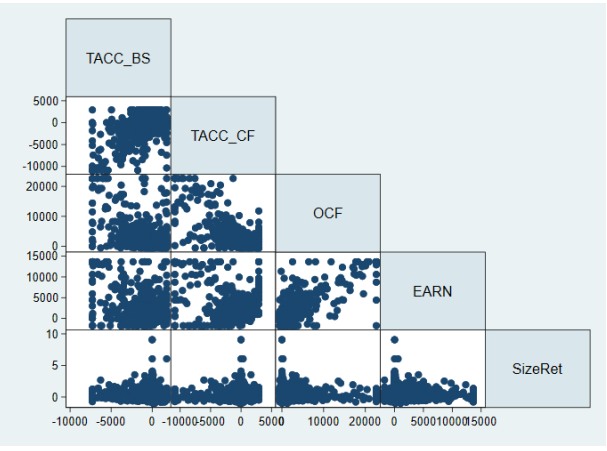
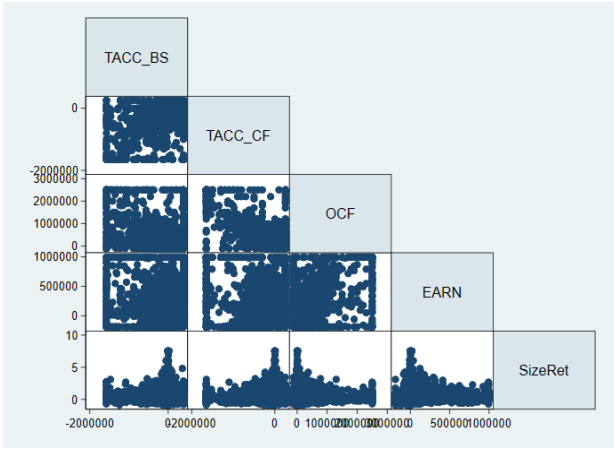
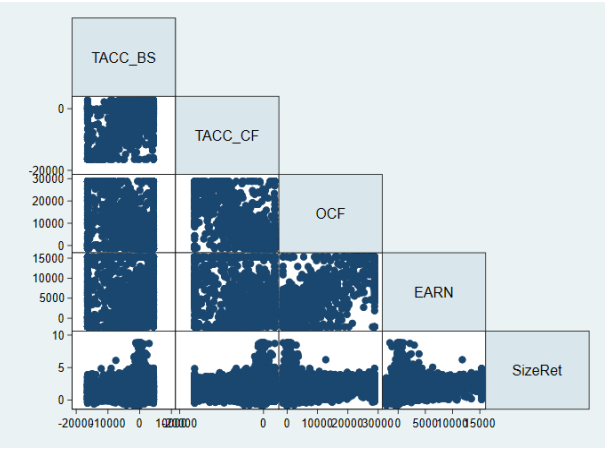


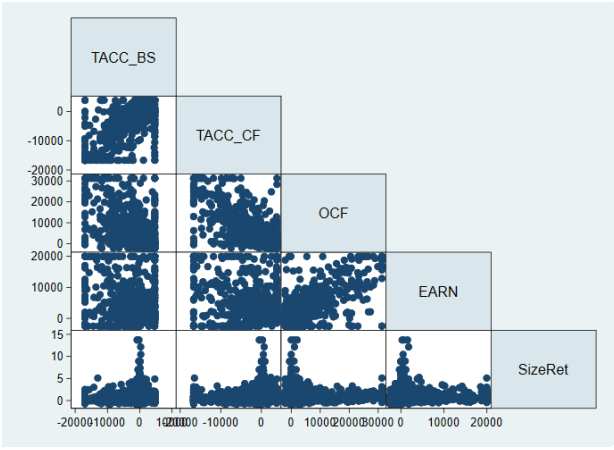
South Korea



Taiwan



Thailand



Turkey

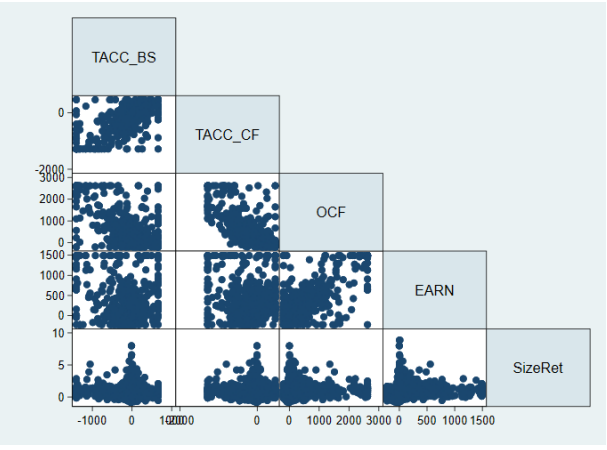
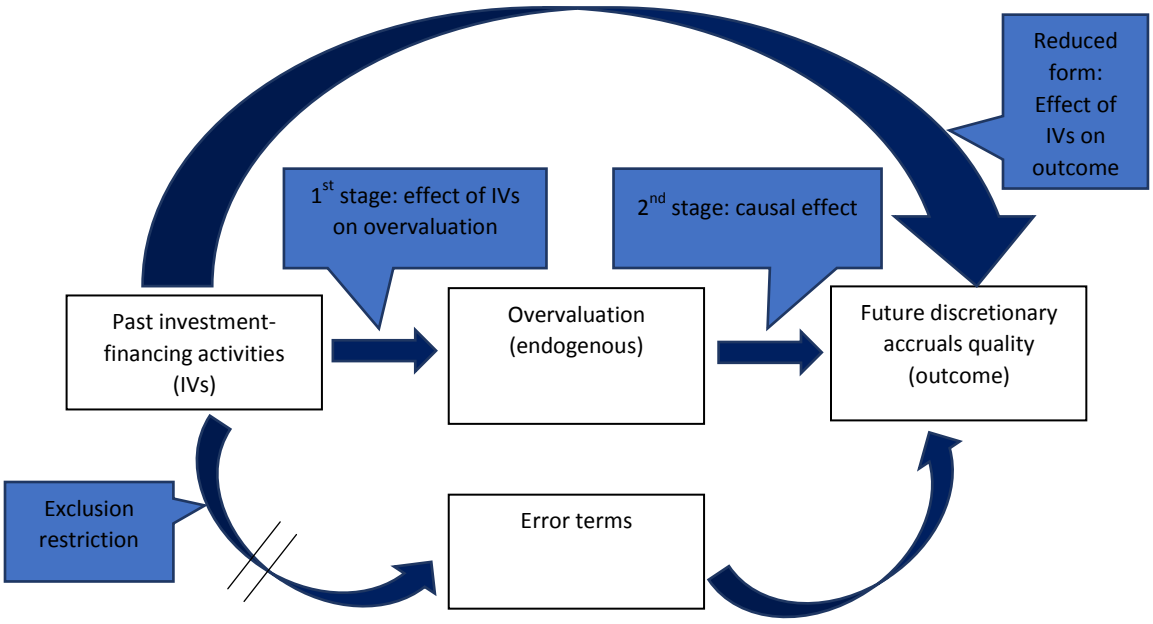


Figure 2

Schematic depiction of 2SLS/IVs regression – Effect of overvaluation on future discretionary accruals quality via managerial incentives channel. Graph adopted from Becker (2016).



APENDIXES

Appendix 1

Literature review on the presence of the accrual anomaly in emerging markets.

No.	Markets	Studies	Period of study	Presence of the accrual anomaly
1	Brazil	Cupertino, Matinez and Costa (2012)	1990-2008	**N**
		Filho & Machado (2013)	1995-2011	**N**
2	China	Li, Niu, Zhang & Largay (2011)	1998-2002	**Y**
		Zeng, Ou and Li (2013)	2001-2010	**Y**
		Fan and Yu (2013)	1989-2009	**Y**
3	Chile	Fan and Yu (2013)	1989-2009	**N**
4	Columbia	N/A		
5	Czech Republic	Zaremba and Czapkiewicz (2017)	1997-2015	**Y (*)**
6	Egypt	Fan and Yu (2013)	1989-2009	**Y**
7	Greece	Leippold and Lohre (2010)	1994-2008	**N**
		Fan and Yu (2013)	1989-2009	**Y**
		Papanastasopoulos (2016)	1988-2009	**N**
8	Hungary	Fan and Yu (2013)	1989-2009	**N**
		Zaremba and Czapkiewicz (2017)	1997-2015	**Y (*)**
9	India	Pincus, Rajpopal and Venkatachalam (2007)	1994-2002	**N**
		Leippold and Lohre (2010)	1994-2008	**N**
		Sehgal, Subramaniam and Deisting (2012)	1997-2010	**Y**
		Fan and Yu (2013)	1989-2009	**Y**
10	Indonesia	Pincus, Rajpopal and Venkatachalam (2007)	1994-2002	**N**
		Leippold and Lohre (2010)	1994-2008	**N**
		Fan and Yu (2013)	1989-2009	**N**
		Ghofar and Aunilah (2016)	2002-2007	**Y**
11	Korea	Kho and Kim (2007)	1987-2005	**Y**
		Leippold and Lohre (2010)	1994-2008	**Y**
		Fan and Yu (2013)	1989-2009	**N**
		Kim et al. (2015)	1994-2010	**Y**
12	Malaysia	Pincus, Rajpopal and Venkatachalam (2007)	1994-2002	**Y**
		Leippold and Lohre (2010)	1994-2008	**N**
		Fan and Yu (2013)	1989-2009	**N**
13	Mexico	Fan and Yu (2013)	1989-2009	**N**
14	Pakistan	Fan and Yu (2013)	1989-2009	**N**
		Mohammad and Javid (2015)	1998-2011	**Y**
		Sheraz (2017)	2001-2014	**N**

15	Peru	Fan and Yu (2013)	1989-2009	**N**
16	Philippines	Fan and Yu (2013)	1989-2009	**N**
17	Poland	Fan and Yu (2013)	1989-2009	**Y**
		Zaremba and Czapkiewicz (2017)	1997-2015	**Y (*)**
18	Qatar	N/A		
19	Russia	Zaremba and Czapkiewicz (2017)	1997-2015	**Y (*)**
20	Saudi Arabia	N/A		
21	South Africa	Fan and Yu (2013)	1989-2009	**Y**
22	Taiwan	Pincus, Rajpopal and Venkatachalam (2007)	1994-2002	**N**
		Leippold and Lohre (2010)	1994-2008	**N**
		Fan and Yu (2013)	1989-2009	**N**
		Lee and Lee (2015)	2006-2010	**Y**
23	Thailand	Pincus, Rajpopal and Venkatachalam (2007)	1994-2002	**Y**
		Leippold and Lohre (2010)	1994-2008	**Y**
		Fan and Yu (2013)	1989-2009	**Y**
24	The United Arab Emirates	N/A		
25	Turkey	Fan and Yu (2013)	1989-2009	**N**
		Ozkan and Kayali (2015)	2005-2010	**Y**
		Zaremba and Czapkiewicz (2017)	1997-2015	**Y (*)**

Market classification based on Morgan Stanley Capital International's Emerging Market Index, last updated on 15th November 2018.

(*): Zaremba and Czapkiewicz (2017) aggregated data of five markets into a big data sample. Their findings were made on that sample, not on individual markets.

Appendix 2

Definitions of the variables used in the regression models in Section 3 and Section 4.

Variables	Definition
SizeRet	Size-adjusted buy-and-holder returns which is discussed in Section 3.1.3.
OCF	Operating Cash flows in the Cash flows Statement.
EARN	Net income of the firm.
$TACCR_{BS}$	Total accruals calculated from Balance Sheet items.
$TACCR_{CF}$	Total accruals calculated from Cash flows Statement items.
DAQ	Discretionary accruals quality which represent managerial choices in accruals management (see Section 3.1.2).
Capex_Growth	Changes in capital expenditure divided by total assets.
EQ_Issuance	Increase in capital stocks as a fraction of total assets.
Debt_Change	Changes in total debt scaled by total assets
MarketSize	Natural log of year-end market capitalization.
Size	Natural log of year-end book value of assets.
Leverage	Financial leverage of the firm, equals total debts scaled by total assets.
Cashflows	Operating cash flows as a fraction of total assets.
ΔRevenues	Changes in total revenues.
PPE	Property, Plant, and Equipment.
OperatingCycle	Operating Cycle of the firm, which equals Days Inventory Outstanding (DIO) plus Days Sales Outstanding (DSO) minus Days Payable Outstanding (DPO)
NegEarn	Number of consecutive fiscal years that the firm reports net losses
ΔCA	Changes in current assets
ΔCL	Changes in current liabilities
ΔCash	Changes in cash and cash equivalents.
ΔSTD	Changes in short term debt of the firm.
Dep	Total depreciation shown in the Balance Sheet.