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Research article

Investigating the relationship between accrual anomaly and external financing anomaly in Tehran Stock Exchange (TSE)

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Abstract
This paper investigates the relation between the external financing anomaly and the accrual anomaly in Iran capital market. The population is consisted of 87 companies listed on Tehran Stock Exchange (TSE) in a 7-year period from 2006-2012. The results show that there is external financing anomaly and accrual anomaly in Iran capital market and the hypothesis of overinvestment could justify the relationship between them. Managerial market timing hypothesis shows that the relationship between external financing anomaly and the accrual anomaly is influenced by long-term accruals and working capital accruals uniformly, but this paper rejects the managerial market timing hypothesis. Similarly, for the hypothesis about misunderstanding of earnings management we conclude that the empirical results again support an effect coming only from long-term accruals and not from both accrual components.

Keywords: Accrual anomaly, External financing anomaly, Overinvestment hypothesis, Managerial market timing hypothesis, Misunderstanding of earnings management hypothesis
JEL classification: G10, G30, M41

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1. Introduction

Describing the behavior of stock return is one of the most widespread and important topics in financial market researches. A large body of evidence refers to "external financing anomaly" which documents a negative relation between external financing activities and future stock returns (Ritter, 1991; Loughran and Ritter, 1997; Spiess and Affleck-Graves, 1999; and Billett et al., 2001). Associated with these studies, there is also a large literature referring to "accrual anomaly" and documenting a negative relation between the level of accounting accruals and future stock returns (Chan et al., 2006; Collins and Hribar, 2002; Khan, 2008; Thomas and Zhang, 2002; and Xie, 2001).

This study examined the relationship between "accrual anomaly" and "external financing anomaly" and determinants of this relationship in Iranian capital market. Recent studies provide a systematic attempt to investigate the association between these market anomalies (Cohen and Lys, 2006; Dechow et al., 2008; Hardouvelis et al., 2010; and Richardson and Sloan, 2003). These studies indicate that the external financing anomaly is mainly influenced by the effects of the anomaly on total accruals. In other words, these market anomalies are not independent and one can consider several common driving forces such as managerial market timing, opportunistic earnings management and agency-related overinvestment to capture the reason of the relationship between these two anomalies.

While the existing evidence suggests that the external financing anomaly and the anomaly on total accruals are related to asset pricing regularities, it does not imply that we yet fully understand why this may be so. The main goal of this paper is to provide additional insights into the relation between these two market anomalies.

Hence, we investigate this relation by focusing on working capital accruals and long-term accruals separately. The key innovation of our research is that we develop and test hypotheses concerning how common driving forces vary conditionally on the type of accounting accrual. The remainder of the paper is structured as follows. Section 2 summarizes the extant research on external financing and accrual-based anomalies and develops the hypotheses. Section 3 explains sample selection procedures and variable measurement. Section 4 discusses our results. Finally, Section 5 gives our summary, an interpretation of the results, and directions for future research.

2. Literature review and research design

The external financing anomaly refers to the negative relation between external financing activities and stock returns. Activities raising new capital such as initial public offerings, seasoned equity offerings, debt offerings and bank borrowings are associated with low future stock returns. Activities distributing capital such as stock repurchases, dividend initiations and debt repayments are associated with high future stock returns. Bradshaw et al. (2006) interpreted this negative relationship between net cash flows generated from external financing activities and future stock returns by using three prominent hypotheses including managerial market timing, earnings management and overinvestment. According to the market timing theory, managers try to time their financing decisions to exploit what they perceive as market mispricing. Baker & Wurgler (2002) believe that managers have the incentive to time the market because they care more about ongoing shareholders than entering and exiting ones, or because they hold equity themselves. Based on the earning management hypothesis, managers opportunistically overstate earnings by exploiting (discretionary) accruals around periods in which they raise external financing in order to increase the offering proceeds. Consequently, the market fails to understand that the earnings management transitory increases in earnings so these firms will be overvalued. Subsequently, when earnings management reverses and issuing firms record earnings declines in the post-offering period, the market is disappointed and downwardly revises its valuation (Rangan, 1998: 102).

Overinvestment theory is based on the interest conflict between managers and shareholders. According to Jensen (1986), Managers have incentives to cause their firms to grow beyond the optimal size in spite of accepting poor projects and reducing shareholders wealth in order to just increase their own power by increasing the resources under their control. When investors learn that such expenditures dissipate firm value, stock prices adjust downward.

In other words, lower stock returns of issuing firms are just a reflection of value destruction due to overinvestment. This explanation is consistent with the anecdotes concerning investor and manager hubris during 'hot issue' markets (Bradshaw et al., 2006: 83).

The other side of the relation under study is accrual anomaly. Sloan (1996) finds that the market fails to properly price the accruals component of earnings. He shows that the market erroneously overestimates the persistence of the accruals component of annual earnings while underestimating the persistence of the cash flow component. Moreover, accruals exhibit negative serial correlation or mean reversion tendencies. Consequently, the market responds as if surprised when seemingly predictable earnings reversals occur in the following year.

Existing research offers a variety of explanations to interpret the accrual anomaly. Chan et al. (2006) argue that high-accrual firms tend to be overvalued because of exaggerated expectations about future growth. Hence, they mention manipulation hypothesis as the main reason of accrual anomaly. Dechow et al. (2008) demonstrate that agency-related overinvestment hypothesis can be an interpretation of the accrual anomaly.

This paper shows a link between these two anomalies and, furthermore, tries to provide the determinants of this link. The potential relation between external financing and accruals anomaly has been first assessed by Richardson and Sloan (2003). They document that the negative drift in returns following external financing activities is strongest when net cash proceeds are used to fund growth in operating assets, suggesting that they are recorded as accruals. They believe that their findings are most consistent with misevaluation explanation and agency-related overinvestment. Cohen and Lys (2006) show that after controlling for total accruals, the negative relation between net external financing and future stock returns is decreased and not statistically significant. They believe that their findings are more consistent with overinvestment rather than market timing. Hardouvelis et al. (2010) demonstrate that firms with high (low) net external financing are characterized by high (low) accruals and exhibit poor (strong) future stock price performance which is attributable to opportunistic earnings management hypothesis.

Dechow et al. (2008) and Richardson et al. (2005, 2006) argue that most definitions of accruals employed in the existing literature focus on the change in non-cash working capital adjusted for depreciation expense. As such, they omit many accruals that relate to non-current operating assets, non-current operating liabilities, non-cash financial assets, and non-cash financial liabilities[1]. In this paper, accruals are decomposed into two major categories, including working capital accruals and long-term accruals. Working capital accruals reflect information embodied in operating activities[2], while long-term accruals relate to investing activities[3]. Since they aren't perfectly correlated, we could probably provide a more accurate picture of the rationale of the association between the external financing anomaly and the accrual anomaly.

Fairfield et al. (2003) show that the effects of diminishing marginal returns to increased investment do not differ between current and long-term net operating asset growth, which means that working capital accruals and long-term accruals do not differ in their implications for future firm performance. Fairfield et al. (2003) also find that investors overvalue working capital accruals in a similar manner to long-term accruals.

Additionally, the level of either working capital accruals or long-term accruals does not serve on its own as a measure of earnings management[4]. Thus, if managerial timing or misunderstanding of earnings management were the driving factors of the relation between external financing anomaly and accrual anomaly, then there should be no predictable stock returns following external financing activities after controlling for working capital accruals and/or

[1] see for example, Richardson et al., 2005, pp. 445-446.
[2] For example, receivables and inventories
[3] For example, investment in net long-term operating assets
[4] Healy and Wahlen (1999) define earning management as follows: "Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers.", p. 366.

long-term accruals. Dechow et al. (2008) argue that accruals measure changes in invested capital, and changes in invested capital are associated with diminishing marginal returns to new investment (and related overinvestment). In fact, long-term accruals could be recorded in higher magnitude than working capital accruals as managers use net proceeds from external financing to overinvest in poor projects in order to increase the resources under their control. Thus, if overinvestment was the driving factors of the relation between external financing anomaly and accrual anomaly, then stock returns following external financing activities should disappear or reduced substantially, after controlling for long-term accruals.

Considering the mentioned arguments, our hypotheses are as follows:

H1: External financing anomaly and the accruals anomaly exist in Iran capital market.

H2: There is a significant relationship between the external financing anomaly and the accruals anomaly.

H3: The relation of the external financing anomaly with the accruals anomaly is driven by timing-based managerial decisions.

H4: The relation of the external financing anomaly with the accruals anomaly is driven by investors' misunderstanding of earnings management.

H5: The relation of the external financing anomaly with the accruals anomaly is driven by investors' misunderstanding of managers overinvestment.

3. Sample selection and variable definition

3.1. Sample selection

The present study is based on applied objective and its data are collected by ex-post factor approach (through the past information) and the method of data collection is descriptive-correlative. The study sample includes companies listed in Tehran Stock Exchange for a period of seven years (2006-2012). We exclude financial, investment institutions, banks, insurance firms, leasing and holding companies because accruals in the financial services industry are not comparable with accruals in other industries and there is also an ambiguity as to what constitutes operating and financing activities for these kinds of firms. Furthermore, the samples studied in this research have been selected by screening method and according to the following criteria:

1- In order to increase comparability the end of companies' fiscal year should be on March 19. 2- The companies should not have changed their financial year during the study period. 3- Complete information of all studied companies should exist during two years prior to time domain of the present.

These criteria yield final sample sizes of 78 firm-year observations with non-missing financial statement and stock return data.

3.2. Variable definition

We measure the net amount of cash flow received from external financing activities (ΔXFIN) as:

$$\Delta XFIN = \Delta EQUITY + \Delta DEBT$$

ΔEQUITY represents net cash received from the sale (and/or purchase) of common and preferred stock less cash dividends paid. ΔDEBT represents net cash received from the issuance (and/or reduction) of debt. Additionally, due to the different predictive power of short-term and long-term debt financing activities for future stock returns, ΔDEBT will be also decomposed into net cash flows generated from short-term debt financing activities (ΔSDEBT) and long-term debt financing activities (ΔLDEBT). ΔSDEBT (ΔLDEBT) is defined as the difference between cash flows received from short (long) term debt issues and cash flows distributed for short (long) term debt repayments.

Much of the accounting literature has employed a balance sheet approach to calculate the accrual component of earnings. The first measure of accruals we use is total accruals (TACC) defined as the change in non-cash assets less the change in non-debt liabilities. We use this extended measure of total accruals given the evidence and discussions

in Dechow et al. (2008) and Richardson et al. (2005, 2006). In particular, the above studies argue that most definitions of accruals employed in the existing literature focus on the change in non-cash working capital adjusted for depreciation expense. As such, they omit many accruals that relate to non-current operating assets, non-current operating liabilities, non-cash financial assets, and non-cash financial liabilities. Therefore, total accruals (TACC) are equal to the sum of working capital accruals and long-term accruals.

$TACC_t = CACC_t + NCACC_t$

Working capital accruals (CACC) are defined as growth in non-cash working capital and long-term accruals and long-term accruals (NCACC) as growth in net long-term operating assets.

Following Dechow et al. (2008), we use balance sheet data to compute external financing and accrual measures as follows:

$\Delta EQUITY = \Delta(TA_t + TL_t) - NI_t$

Where:

TA_t: Total assets

TL_t: Total liabilities

NI_t: Net income

$\Delta SDEBT = \Delta(STD_t) \quad \& \quad \Delta LDEBT = \Delta(LTD_t)$

STD_t: Short-term debt

LTD_t: Long-term debt

$CACC_t = \Delta(CA_t - C_t) - \Delta(CL_t - STD_t)$

$NCACC_t = \Delta(TA_t - CA_t) - \Delta(TL_t - CL_t - LTD_t)$

CA_t: Current assets

C_t: Cash and cash equivalents

CL_t: Current liabilities

Consistent with previous research, all variables are deflated by average total assets. We also consider market capitalization (MV) and the book to market ratio (BV/MV). Market capitalization is measured as price per share times shares outstanding at the beginning of the return cumulation period. Book to market ratio is calculated as book value of equity scaled by market value of equity.

RET_{t+1} is 15-month return ending three months after the end of fiscal year (t) to ensure that investors have financial statement data prior to forming portfolios. Then, the size-adjusted return $SRET_{t+1}$ for a firm is computed as the difference between RET_{t+1} and the annual buy-hold return of all other firms in the same market capitalization-based portfolio decile to which the firm belongs.

4. Empirical results

4.1. Descriptive statistics

Table 1 presents descriptive statistics and correlations for the external financing and accrual measures. Panel A provides univariate statistics (mean, standard deviation, minimum, median, maximum). The mean values of ΔXFIN, ΔEQUITY, ΔDEBT, ΔSDEBT and ΔLDEBT are -0.007, -0.044, 0.038, 0.028 and 0.009, respectively. These values indicate that firms increase their debt financing activities and decrease their equity financing activities over our sample period. The mean values of TACC, CACC and NCACC are 0.049, 0.026 and 0.023, respectively. The median values of TACC, CACC and NCACC are 0.041, 0.02 and 0.0001, respectively. These positive mean and median values indicate that firms grew their asset bases during our sample periods. The standard deviations of ΔXFIN, ΔEQUITY and ΔDEBT are 0.147, 0.122 and 0.102, respectively, suggest that variation is greater in net equity financing relative to net debt financing. The standard deviations of ΔSDEBT and ΔLDEBT are 0.07 and 0.101, respectively, indicating that variation is greatest in net long-term debt financing. Turning to accrual measures, we see that the standard deviations of TACC, CACC and NCACC are 0.157, 0.127 and 0.131, respectively,

indicating that variation is greater in long-term accruals than working capital accruals. In general, the descriptive statistics related to the various measures of accruals and external financing are similar and consistent with those reported in prior related research.

Panel B in Table 1 reports Pearson and Spearman correlation among our main variables of interest. Several of the correlations are noteworthy. In particular, there is a strong positive correlation between ΔXFIN and TACC (Pearson: 0.668, Spearman: 0.536). ΔXFIN is more correlated with NCACC (Pearson: 0.490, Spearman: 0.304) than with CACC (Pearson: 0.373, Spearman: 0.254). As in prior related studies, there is a negative correlation between ΔEQUITY and ΔDEBT (Pearson: -0.038, Spearman: -0.002) and its components (ΔSDEBT and ΔLDEBT) are also found negatively correlated with ΔEQUITY although they aren't statistically significant.

Table 1: Univariate statistics and pair-wise correlations for the external financing and accrual measures (2006-2012)

Panel A: Univariate statistics, 2006-2012

	Mean	**St. dev**	**Min**	**Median**	**Max**
ΔXFIN	-0.007	0.147	-0.714	-0.009	0.572
ΔEQUITY	-0.044	0.122	-0.741	-0.035	0.528
ΔDEBT	0.038	0.102	-0.4	0.022	0.543
ΔSDEBT	0.028	0. 07	-0.412	0.021	0.399
ΔLDEBT	0.009	0.101	-0.270	0	0.446
ΔTACC	0.049	0.157	-0.715	0.041	0.848
ΔCACC	0.026	0.127	-0.44	0.02	0.612
ΔNCACC	0.023	0.131	-0.64	0.0001	0.622

Panel B: Pair-wise correlations- Spearman (above diagonal) and Pearson (below diagonal), 2006-2012

	ΔXFIN	**ΔEQUITY**	**ΔDEBT**	**ΔSDEBT**	**ΔLDEBT**	**ΔTACC**	**ΔCACC**	**ΔNCACC**
ΔXFIN	-	0.581**	0.738**	0.604**	0.141**	0.536**	0.254**	0.304**
ΔEQUITY	0.677**	-	-0.002	-0.009	-0.054	0.214**	0.240**	-0.061
ΔDEBT	0.710**	-0.038	-	0.825**	0.277**	0.471**	0.219**	0.302**
ΔSDEBT	0.551**	-0.024	0.770**	-	-0.167**	0.412**	0.341**	0.117*
ΔLDEBT	0.326**	-0.026	0.467**	-0.204**	-	0.094	-0.146**	0.227**
ΔTACC	0.668**	0.439**	0.486**	0.374**	0.227**	-	0.669**	0.419**
ΔCACC	0.373**	0.273**	0.245**	0.383**	-0.156**	0.653**	-	-0.255**
ΔNCACC	0.490**	0.295**	0.383**	0.097*	0.453**	0.638**	-0.167**	-

Notes: *Significant at 0.01 level; **significant at 0.05 level; ΔXFIN is net external financing, calculated as the sum of net equity financing (ΔEQUITY) and net debt financing (ΔDEBT). ΔEQUITY is measured as the difference between the change in total equity and net income. ΔDEBT is calculated as the sum of net short-term debt financing (ΔSDEBT) and net long-term debt financing (ΔLDEBT). ΔSDEBT is measured as the change in short-term debt. ΔLDEBT is measured as the change in long-term debt. TACC is total accruals, calculated as the sum of working capital accruals (CACC) and long-term accruals (NCACC). CACC is measured as the difference between the change in current operating assets and the change in current operating liabilities. NCACC is measured as the difference between the change in non-current operating assets and the change in non-current operating liabilities. All variables are deflated by average total assets.

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4.2. Returns and arbitrage opportunities of portfolios on external financing and accrual measures

We investigate the relation between external financing and future stock returns by ranking the sample into 10 deciles based on the magnitude of external financing. Then we report time-series averages of the future raw and size-adjusted stock returns (and t-statistics) for each portfolio and also for hedge portfolios.

In Panel A of Table 2, we report raw returns for portfolios based on the magnitude of external financing measures. We can see that firms in the lowest external financing decile have the highest future raw return (0.333). By increasing the amount of external financing in each portfolio, future raw return decreases to the extent that the highest external financing decile produce the lowest raw return, which is 0.073. The hedge portfolio on ΔXFIN generates a raw return of about 0.26. All components of external financing have the same condition. For example, ΔEQUITY, ΔDEBT, ΔSDEBT and ΔLDEBT hedge portfolios generate raw returns of about 0.276, 0.242, 0.26 and 0.253, respectively. Panel B of Table 2 presents size-adjusted returns for portfolios based on the magnitude of external financing measures. We can see that firms in the lowest external financing decile have the highest size-adjusted return (0.084). By increasing the amount of external financing in each portfolio, future raw return decreases to the extent that the highest external financing decile produce the lowest raw return, which is 0.021. The hedge portfolio on ΔXFIN generates a raw return of about 0.063. All components of external financing have the same condition. For example, ΔEQUITY, ΔDEBT, ΔSDEBT and ΔLDEBT hedge portfolios generate raw returns of about 0.049, 0.034, 0.165 and 0.094, respectively.

Table 2: Returns for portfolios sorted by external financing measures

	1(low)	2	3	4	5	6	7	8	9	10(high)	hedge
Panel A: Raw returns of decile portfolios on external financing measures											
ΔXFIN	0.333	0.321	0.319	0.299	0.269	0.247	0.218	0.176	0.117	0.073	0.26
	4.396**	3.501**	3.226**	3.317**	2.455**	2.442**	1.233*	1.728**	1.894*	1.625*	2.483**
ΔEQUITY	0.332	0.318	0.306	0.283	0.259	0.232	0.193	0.167	0.106	0.056	0.276
	4.253**	2.899**	2.457**	2.170**	2.486**	1.856*	1.599*	2.084**	1.305*	3.052**	1.349*
ΔDEBT	0.326	0.325	0.315	0.294	0.268	0.244	0.221	0.182	0.116	0.084	0.242
	2.816**	1.955**	3.975**	2.465**	2.157**	3.145**	1.871*	2.440**	1.632*	1.512*	2.650**
ΔSDEBT	0.323	0.316	0.309	0.285	0.263	0.235	0.197	0.179	0.108	0.063	0.26
	3.309**	1.170**	2.707**	2.551**	1.758**	3.507**	3.165**	1.772**	1.871**	0.686	2.658**
ΔLDEBT	0.314	0.313	0.310	0.287	0.261	0.236	0.195	0.177	0.105	0.061	0.253
	2.396**	2.508**	2.727**	2.541**	1.945**	1.024**	2.806**	3.407**	1.301**	0.309**	1.491**
Panel B: Size-adjusted returns of decile portfolios on external financing measures											
ΔXFIN	0.084	0.078	0.083	0.072	0.069	0.043	0.042	0.047	0.033	0.021	0.063
	3.453**	1.97*	6.64**	4.83**	2.932**	3.902**	0.008	2.33**	1.22	0.59	2.724**
ΔEQUITY	0.086	0.064	0.069	0.062	0.074	0.063	0.051	0.048	0.045	0.037	0.049
	4.93**	4.44**	0.013	0.271	1.013	0.709	0.005	3.42**	4.92**	1.206	2.729**
ΔDEBT	0.087	0.075	0.067	0.079	0.063	0.061	0.064	0.059	0.057	0.053	0.034
	3.293**	1.045	0.056	1.112	3.452**	3.441**	2.810**	1.076	0.202	0.006	3.458**
ΔSDEBT	0.081	0.064	0.059	0.053	0.048	0.044	0.036	0.035	0.021	-0.084	0.165
	1.747*	1.901*	1.421*	0.343	3.701**	0.004	0.112	1.219	4.263**	2.181**	2.928**
ΔLDEBT	0.083	0.073	0.061	0.044	0.028	0.019	0.007	-0.004	-0.024	-0.011	0.094
	4.405**	0.002	0.011	3.107**	2.916**	1.11	0.003	1.091	0.104	0.009	3.514**

Notes: *Significant at 0.01 level; **significant at 0.05 level; External financing measures are defined in the note to Table 1. Raw annual return (RET) for a firm is measured using compounded 15-month return ending three months after the end of fiscal year (t). Size-adjusted annual return (SRET) for a firm is computed as the difference between the raw annual return

and the buy-hold annual return of all other firms in the same market capitalization (measured as price per share times shares outstanding) – based portfolio decile to which the firm belongs.

Panel A of Table 3 presents raw returns for portfolios based on the magnitude of accrual measures. The raw return for the portfolio ranked lowest by TACC is 0.323 compared to 0.086 for the highest-ranked portfolio, and it is equal to 0.237 for hedge portfolio. Both components of accrual experience the same pattern. Firms on the lowest CACC decile yield raw returns of 0.332, while firms on the highest CACC decile yield raw returns of 0.066, leading to a difference (i.e. hedge return) of 0.266. The raw return for the bottom NCACC portfolio is 0.326, for the top NCACC portfolio is 0.074 and for the hedge NCACC portfolio is 0.252.

In Panel B of Table 3 we report results for size-adjusted returns for portfolios based on the magnitude of accrual measures. The size-adjusted returns for the portfolio ranked lowest by TACC, CACC and NCACC are 0.101, 0.096 and 0.087 compared to -0.031, -0.047 and -0.053 for the highest-ranked portfolio, for a difference of 0.132, 0.143 and 0.14, respectively. Our findings are in consistent with prior researches that focus on entire, equity and debt external financing activities and also on total accruals and its components. For example, Hardouvelis et al. (2010) show that size-adjusted returns on net external financing, net equity financing and net debt financing hedge portfolios are 0.116, 0.092 and 0.066, respectively (US firms) and Richardson et al. (2005) report hedge size-adjusted returns of 0.128, 0.165 and 0.133 for working capital accruals, long-term accruals and total accruals, respectively (US firms).

In general, our findings support the first hypothesis. Hence, we can understand that the accrual anomaly and the external financing anomaly exist in Iran capital market.

Table 3: Returns for portfolios sorted by accrual measures

	1(low)	2	3	4	5	6	7	8	9	10(high)	hedge
Panel A: Raw returns of decile portfolios on accrual measures											
TACC	0.323	0.314	0.303	0.278	0.255	0.233	0.204	0.183	0.128	0.086	0.237
	2.277**	2.114**	3.207**	3.570**	2.396**	2.209**	2.637**	2.145**	2.177**	2.607**	3.177**
CACC	0.332	0.321	0.307	0.283	0.271	0.242	0.193	0.179	0.117	0.066	0.266
	3.279**	2.854**	1.789**	2.804**	3.205**	3.85**	2.97*	2.443**	2.122**	1.897*	3.518**
NCACC	0.326	0.329	0.315	0.286	0.268	0.247	0.198	0.172	0.126	0.074	0.252
	3.639**	2.265**	1.488*	3.793**	3.449**	2.639**	2.073*	1.748*	1.630*	2.645**	2.612**
Panel B: Size-adjusted returns of decile portfolios on accrual measures											
TACC	0.101	0.088	0.061	0.049	0.053	0.021	0.011	-0.007	-0.023	-0.031	0.132
	3.444**	1.908*	4.156**	0.079	5.161**	0.533	4.808**	1.211	0.473	3.305**	3.498**
CACC	0.096	0.074	0.075	0.052	0.034	0.023	0.001	0.003	-0.035	-0.047	0.143
	3.825**	3.24**	3.194**	4.653**	0.109	1.681*	1.422*	0.491	0.810	4.327**	2.271**
NCACC	0.087	0.065	0.067	0.058	0.047	0.037	0.009	-0.005	-0.017	-0.053	0.14
	4.479**	1.161	0.122	0.017	3.854**	0.129	1.863*	0.092	1.516*	1.433*	4.468**

Notes: *Significant at 0.01 level; **significant at 0.05 level; accrual measures are defined in the note to Table 1. Raw annual return (RET) for a firm is measured using compounded 15-month return ending three months after the end of fiscal year (t). Size-adjusted annual return (SRET) for a firm is computed as the difference between the raw annual return and the buy-hold annual return of all other firms in the same market capitalization (measured as price per share times shares outstanding) – based portfolio decile to which the firm belongs.

4.3. Regressions on net external financing and accrual measures

In this section we investigate our hypothesis concerning what originates the relation between external financing and accrual anomalies by considering Fama-MacBeth (1973) regressions of one-year ahead abnormal (size-adjusted)

returns on accrual measures, after controlling the natural logarithm of market capitalization (SIZE) and the natural logarithm of book to market ration (BVMV), and report the time-series averages of the resulting parameter coefficients. All explanatory variables (i.e., SIZE, BM, TACC, CACC and NCACC) are expressed as scaled decile ranks: we rank the values of each measure into deciles (0 to 9) each year and divide the decile number by 9 so that each firm-year observation related to each measure takes a value ranging between 0 and 1. Desai et al. (2004) mentioned two main advantages of estimation of regressions using scaled decile ranks. First, the slope coefficient can be interpreted as the abnormal return to a zero-investment strategy that takes a long (short) position on firms with high (low) levels of the respective measure. Second, scaled decile ranks control for potential non-linearities and ensure that results are not driven from extreme observations. The test of the remaining hypothesis of the paper involves the estimation of three models that take the following forms:

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta XFIN_t + \gamma_4 TACC_t + \vartheta_{t+1} \qquad (M1)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta DEBT_t + \gamma_5 TACC_t + \vartheta_{t+1} \qquad (M2)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta SDEBT_t + \gamma_5 \Delta LDEBT_t + \gamma_6 TACC_t + \vartheta_{t+1} \qquad (M3)$$

To investigate the consequences of accrual components on the external financing anomaly, we estimate similar models by replacing total accruals with either working capital accruals or long-term accruals. In Table 3, we report results from regressions of size-adjusted returns on external financing measures, after controlling accrual measures. In all models, Consistent with prior research (for example, Hardouvelis et al., 2010), the coefficient on BVMV is positive but it isn't statistically significant. The results also confirm that the external financing anomaly mainly captures the effects of the anomaly on total accruals. Panel A, presents results from regressions of size-adjusted returns on ΔXFIN, after controlling total accruals. We can see that ΔXFIN, ΔEQUITY and ΔDEBT and also ΔSDEBT and ΔLDEBT are not significant, which shows that all external financing measures do not have predictive power for future returns, after controlling total accruals. Consistent with Cohen and Lys (2006), once we control total accruals, the external financing coefficients are not statistically significant at conventional levels. Panel B, presents results from regressions of size-adjusted returns on ΔXFIN, after controlling working capital accruals. Once we control working capital accruals, the coefficients of all components of external financing remain both negative and significant, which indicates that all external financing measures still predict future returns, after controlling working capital accruals. Panel C, presents results from regressions of size-adjusted returns on ΔXFIN, after controlling long-term accruals. When we control working capital accruals, the coefficients of all components of external financing remain both negative and significant, but its significance is less than the time we consider CACC as control measure.

Table 4: Fama and MacBeth (1973) regressions of one-year ahead abnormal annual returns on accrual measures, after controlling size (natural logarithm of market capitalization) and book to market (natural logarithm of book to market ratio). All independent variables are expressed as scaled-decile ranks (ranging from 0 to 1). we estimate annual cross-sectional regressions and report the time-series averages of the parameter coefficients. Panels A, B and C present results from regressions on external financing measures after controlling total accruals, working capital accruals and long-term accruals, respectively.

Panel A: Regressions of size-adjusted returns on external financing measures after controlling total accruals

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta XFIN_t + \gamma_4 TACC_t + \vartheta_{t+1} \qquad (M1)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta DEBT_t + \gamma_5 TACC_t + \vartheta_{t+1} \qquad (M2)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta SDEBT_t + \gamma_5 \Delta LDEBT_t + \gamma_6 TACC_t + \vartheta_{t+1} \qquad (M3)$$

	Model 1	Model2	Model3
Intercept	0.104**	0.091**	0.116**
SIZE	-0.091	-0.078	-0.072
BVMV	0.028	0.029	0.029
ΔXFIN	-0.101		
ΔEQUITY		-0.050	-0.048

ΔDEBT		-0.110	
ΔSDEBT			-0.084
ΔLDEBT			-0.098
TACC	-0.035**	-0.032**	-0.032**

Panel B: Regressions of size-adjusted returns on external financing measures after controlling working capital accruals

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta XFIN_t + \gamma_4 CACC_t + \vartheta_{t+1} \quad (M1)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta DEBT_t + \gamma_5 CACC_t + \vartheta_{t+1} \quad (M2)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta SDEBT_t + \gamma_5 \Delta LDEBT_t + \gamma_6 CACC_t + \vartheta_{t+1} \quad (M3)$$

	Model 1	Model2	Model3
Intercept	0.134**	0.099**	0.079**
SIZE	-0.089	-0.076	-0.074*
BVMV	0.030	0.029	0.030
ΔXFIN	-0.097**		
ΔEQUITY		-0.041**	-0.040*
ΔDEBT		-0.116**	
ΔSDEBT			-0.1**
ΔLDEBT			-0.082**
CACC	-0.019**	-0.021**	-0.020**

Panel C: Regressions of size-adjusted returns on external financing measures after controlling long-term accruals

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta XFIN_t + \gamma_4 NCACC_t + \vartheta_{t+1} \quad (M1)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta DEBT_t + \gamma_5 NCACC_t + \vartheta_{t+1} \quad (M2)$$

$$SRET_{t+1} = \gamma_0 + \gamma_1 SIZE_t + \gamma_2 BVMV_t + \gamma_3 \Delta EQUITY_t + \gamma_4 \Delta SDEBT_t + \gamma_5 \Delta LDEBT_t + \gamma_6 NCACC_t + \vartheta_{t+1} \quad (M3)$$

	Model 1	Model2	Model3
Intercept	0.113**	0.144**	0.154**
SIZE	-0.048*	-0.041	-0.043
BVMV	0.032	0.032	0.032
ΔXFIN	-0.070*		
ΔEQUITY		-0.039*	-0.040*
ΔDEBT		-0.065*	
ΔSDEBT			-0.070*
ΔLDEBT			-0.016*
NCACC	-0.012**	-0.007**	-0.005**

Notes: *Significant at 0.1 level; **significant at 0.05 level (2-tailed). External financing and accrual measures are defined in Table 1, while size-adjusted returns and market capitalization in the note to Table 2.

The results from these cross-sectional regressions confirm the ability of working capital accruals and long-term accruals and inability of total accruals in prediction of stock returns associated with external financing activities. Nevertheless, the predictive power of net external financing and net debt financing is reduced, when we control long-term accruals compared to working capital accruals. Furthermore, the results indicate that the relationship between the external financing anomaly and the accrual anomaly is more likely to be driven from long-term accruals. Hence, the overinvestment hypothesis rather than Managerial market timing and misunderstanding of earnings management hypothesis can be the most consistent explanation for this relationship.

5. Conclusion and future research

This study examined the relationship between "accrual anomaly" and "external financing anomaly" and determinants of this relationship in Iranian capital market. Such a relation could arise from several underlying driving forces such as managerial market timing, earnings management and overinvestment. In this paper, we investigate the relation of these market anomalies by focusing separately on working capital accruals and long-term accruals. Our findings can be summarized as follows.

Hedge portfolios on measures of net external financing (entire, equity, debt, short-term debt and long-term debt) and on accrual measures (total accruals, working capital accruals, long-term accruals) earn positive raw and size-adjusted returns. It implies that the accrual anomaly and the external financing anomaly exist in Iran capital market and the external financing anomaly mainly captures the effects of the anomaly on total accruals.

The results from cross-sectional regressions confirm the ability of working capital accruals and long-term accruals in prediction of stock returns associated with external financing activities. Nevertheless, in the presence of long-term accruals the predictive power of the measures of net external financing for future returns is reduced substantially. Since the relationship between the external financing anomaly and the accrual anomaly is more likely to be driven from long-term accruals, we provide the overinvestment hypothesis rather than Managerial market timing and misunderstanding of earnings management hypothesis as the most consistent explanation for this relationship.

According to our findings, we suggest the investors to consider both market anomalies simultaneously in order to improve their business profitability. A challenge for future research is to investigate the influence of all categories of long-term accruals on the external financing anomaly and to enhance the sample and methodology to increase the reliability and validity of the results.

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