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Assessing Multiple Hypotheses for Small Firm Effect in Chinese Stock Markets: Evidence from the 2007 Pre-Global Financial Crisis

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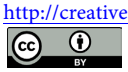

Abstract

This study delves into the behavior of the small firm anomaly within China's A-share markets, scrutinizing data from 1993 until the onset of the pre-2007 global financial crisis. Anchored in the backdrop of traditional Chinese culture, wherein substantial year-end bonuses are bestowed upon employees in honor of their diligent contributions. The culture bonus hypothesis is investigated alongside other alternative hypotheses hailing from prior research in Western contexts. The empirical findings show that the Chinese stock markets distinctly manifest a significant small firm effect exclusively during non-January months. Intriguingly, however, none of the culture bonus, tax-loss, risk mismeasurement, or different information hypotheses stand as convincing explanatory factors for the observed seasonal-size effect in the Chinese setting. Notably, this anomaly materializes in its full significance solely when the market operates within an economic expansion phase, a trend that resonates with the economic cycle hypothesis. In essence, this paper furnishes evidence underscoring a potential connection between market conditions and the behavioral patterns of investors. This underscores the intricate interplay between macroeconomic dynamics and individual decision-making within the realm of investment.

Keywords

Small Firm Effect, Culture Bonus, Risk Mismeasurement, Economic Cycle, Chinese Stock Markets

1. Introduction

The financial literature commonly observes that smaller firms tend to yield

higher returns when compared to larger firms, often referred to as the "size effect" or "small firm anomaly". Numerous research studies spanning the last forty years have consistently highlighted the linkage between the pattern of stock returns and firm size in the global capital markets. The pioneering work by Banz (1981) marked the initial empirical substantiation of the small firm effect, revealing a notably negative correlation between returns and market value in the U.S. stock market, even after adjusting for estimated betas. Following Banz's (1981) seminal work, the exploration and discussion of the size premium persisted, leaving researchers intrigued. Keim (1983) and Reinganum (1983) further illuminated that nearly fifty percent of the annual differential in returns between small and large companies manifests in January.

Despite assertions from empirical investigations that the U.S. small firm effect ceased to exist since the early 1980s (Dichev, 1988; Chan et al., 2000; Horowitz et al., 2000a, 2000b; Hirshleifer, 2001; Ang, 2018), some studies countered that pronouncing the small firm effect disappearance was premature (Van Dijk, 2011; De Moor & Sercu, 2013; Grabowski, 2018; Hou & Dijk, 2019). Hence, investigations into the small firm effect have transcended developed economy stock markets to encompass emerging markets in the Asian-Pacific region (Carroll et al., 1992; Rathinasamy & Mantripragada, 1996; Baker & Limmack, 1998; Chui & Wei, 1998; De Groot & Verschoor, 2002; Drew, 2003; Lam & Spyrou, 2003; L'Her et al., 2004; Haug & Hirschey, 2006; Huang, 1997; Chen & Chien, 2011; Duy & Phuoc, 2016; Pandey & Sehgal, 2016; Vasishth et al., 2021).

Within the context of Asian-Pacific emerging markets, the economic transformation of China gained momentum in the latter part of the 1980s, driven by a sequence of economic restructuring initiatives undertaken by the Communist Party. The establishment of the Shanghai and Shenzhen stock exchanges in the early 1990s, featuring an initial offering of A-shares exclusively to domestic investors, ushered in a period of swift expansion in the Chinese stock market. This burgeoning market has garnered substantial global investor attention due to its attractiveness. Consequently, the small firm anomaly literature has turned its focus towards the China stock market, considering the intriguing dynamics within this context.

Several studies documented a noteworthy small firm effect within the Chinese context, yet their analysis did not account for the influence of seasonality (Wang, 2004; Wang & Xu, 2004; Eun & Huang, 2007; Chen, 2016a). The empirical findings concerning the seasonal-size effect have yielded mixed results. Drew et al. (2003) demonstrated that the small firm effect remained statistically significant across the period from 1996 to 2000 in the Shanghai stock exchange, even when accounting for the months of January and February. Wong et al. (2006), on the other hand, noted that the small firm effect exhibited reduced significance when January was excluded, compared to its significance across all months from 1995 to 2002 in the Shanghai stock exchange. However, Wang & Iorio (2007) proposed that the small firm effect in China only maintains significance in months other than January, spanning the period from 1994 to 2002. Furthermore, in

stark contrast to the extensive body of research exploring the interplay between stock returns and firm size in the Chinese context, the exploration of the underlying causes of the seasonal-size effect remains quite limited. While the literature has offered hypotheses such as risk mismeasurement, economic cycles, different information, and tax-loss selling to explain analogous phenomena in other markets, these alternative hypotheses have yet to be systematically examined within the context of the seasonal-size effect in the Chinese stock market.

The observation that Asian cultures appear more susceptible to behavioral biases compared to Western cultures has been highlighted in certain research studies (Yates et al., 1997; Kim & Nofsinger, 2008). Despite the majority of publicly traded companies in China being state- or institution-owned entities, Hu (1999) demonstrated that individual investors, who often base their investment decisions on market rumors rather than reliable information, exert significant influence over the A-share market. Furthermore, a study by Chen & Chien (2011) expounded on the Taiwan seasonal-size effect, attributing it to the influence of mental accounting and the concept of house money. Given that China represents an emerging stock market embedded within a Chinese culture-oriented context, it offers fertile ground to explore anomalies and delve into their underlying causes. In this regard, Chinese A-share markets offer a promising avenue for investigation, affording the opportunity to uncover the mechanisms that contribute to the existence of these anomalies.

This study aims to examine the presence and underlying factors of the small firm effect within the Chinese A-share markets. It achieves this by investigating a fresh perspective that combines Chinese culture with behavioral finance, as suggested by Chen & Chien (2011). Additionally, the study explores alternative hypotheses that have been proposed in previous research for Western economies. The methodology adopted in this research involves utilizing monthly stock return data, akin to prior studies (Drew et al., 2003; Wang, 2004; Wang & Xu, 2004; Wong et al., 2006; Wang & Iorio, 2007). The research procedure is closely aligned with the approach taken by Chen & Chien (2011), employing the Fama-MacBeth regression technique for empirical analysis.

Several key findings have emerged from this analysis. Firstly, the small firm effect demonstrates significance exclusively during non-January months within the Chinese stock markets, in alignment with the observations made by Wang & Iorio (2007). Secondly, none of the proposed hypotheses, including the culture bonus hypothesis rooted in Chinese traditional culture for Taiwan, as well as other hypotheses derived from Western stock markets literature such as risk mismeasurement, different information, and tax-loss selling, could account for the observed small firm effect within the Chinese A-share markets. Nevertheless, the effect seems to be linked to the economic cycle hypothesis. This is evident by the fact that the small firm effect becomes more conspicuous primarily during market phases characterized by bullish trends or previous year's profit growth. Shifting the focus to the Chinese stock markets, as opposed to Western countries, offers the benefit of reducing data snooping biases and enhancing the ex-

ternal validity of the identified small firm effect, along with its potential explanations, within the literature. A significant contribution of this study lies in its comprehensive exploration of diverse alternative hypotheses for the small firm effect within the context of an emerging East Asian stock market that is deeply influenced by Chinese culture. This research effectively addresses the void in existing literature regarding the underlying reasons for the seasonal-size effect observed in the Chinese stock markets.

2. Literature Review

Until now, previous research has put forth various hypotheses in an effort to elucidate the small firm effect observed in January. The ensuing section presents an overview of the scholarly discourse pertaining to the origins of the seasonal-size effect.

Initially, the tax-loss selling effect is the first hypothesis to account for the observed January small firm effect. According to this hypothesis, investors opt to sell their underperforming stocks before the year's conclusion to leverage tax advantages. Consequently, this selling pressure towards the end of December subsequently gives way to buying pressure in January, particularly concentrated on smaller stocks that individuals typically favor as investments (Dyl, 1977). Nevertheless, it's worth noting that certain global evidence suggests that the anomalous stock market behavior of small firms in January cannot be entirely explained by this hypothesis (Reinganum, 1983; Brown et al., 1983; Berges et al., 1984; Kato & Schallheim, 1985).

The second explanatory approach is the risk mismeasurement hypothesis, which was initially introduced by Rogalski & Tinic (1986). This hypothesis posits that the small firm effect observed in January might stem from the fact that small firm portfolios exhibit higher risk levels, particularly during this month. However, Rathinasamy & Mantripragada (1996) conducted an analysis employing the Treynor and Sharpe risk-adjusted returns measures, and still identified the anomaly, thus diverging from the expectations of the risk mismeasurement hypothesis. Chen (2016b) has suggested that the seasonal-size anomaly can be explained by this viewpoint.

The third hypothesis is rooted in the economic cycle perspective, as initially advanced by Krueger & Johnson (1991). This viewpoint suggests that small firms generally exhibit superior performance compared to large firms during economic expansion phases, but their performance tends to deteriorate during contraction phases. Despite this, various studies have demonstrated that the notable stock market behavior of small firms in January persists even when considering the influence of bull or bear market conditions. This indicates that the economic cycle hypothesis does not adequately account for this phenomenon (Bhardwaj & Brooks, 1993; Kim & Burnie, 2002; Chen & Chien, 2011).

An alternative interpretation for the January size effect is presented by the different information hypothesis, as introduced by Elfakhani & Zaher (1998).

According to this perspective, stocks of smaller firms tend to exhibit greater sensitivity to negative information compared to those of larger firms, resulting in increased volatility. Informed investors might then capitalize on abnormal returns since companies with fewer specialized analysts experience more substantial market adjustments in response to unanticipated corporate information. Nevertheless, their research did not yield compelling evidence to substantiate this explanation.

A novel perspective rooted in behavioral finance was introduced by Chen & Chien (2011). They incorporated a distinctive element of Chinese cultural tradition for Taiwan, wherein employers often grant substantial year-end bonuses to employees before the Lunar New Year, both as a recognition of their efforts in the past year and as motivation for exerting more effort in the upcoming year. In this context, they argued that these bonus gains, akin to windfall income or the concept of house money, could augment individuals' willingness to embrace higher levels of risk. This could foster a heightened demand for stocks associated with greater risk. Their study provided robust evidence that the apparent stock market behavior of small firms in January is primarily evident in small firms exhibiting higher levels of risk. This phenomenon is especially pronounced in years when the bonuses are paid in January and when the entire market performance has experienced positive growth in the previous year.

3. Methodology

3.1. Data Source and Sample Selection

Van Dijk (2011) highlighted several crucial limitations in the existing body of evidence regarding the small firm effect. These limitations encompassed the usage of non-risk-adjusted returns, limited sample sizes, and inadequate robustness analysis. Consequently, this study adopts the research approach employed by Chen & Chien (2011) and expands the sample size to investigate the small firm effect in the context of China. Monthly returns from the Taiwan Economic Journal (TEJ) database are utilized. In the Chinese equity markets, two classes of common shares are traded on the Shanghai and Shenzhen exchanges: A-shares for domestic investors and B-shares, accessible to foreign investors since 1992 and domestic investors since 2001. Given their predominant size and trading volume in the Chinese stock markets, this study concentrates on A-shares. The study's sample period spans from January 1993 to the period preceding the global financial crisis of 2007. This procedural refinement yields a total of 127,008 observations in the sample.

3.2. Regression Analysis

This study employs the empirical regression procedure introduced by Fama & MacBeth (1973) to systematically examine the small firm anomaly across different scenarios. The analytical process involves several steps. The initial step entails conducting a cross-sectional regression model defined as follows:

$$R_{it} - R_{mt} = \alpha_0 + \alpha_1 * Size_{it} + \varepsilon_t \quad (1)$$

where $R_{it} - R_{mt}$ reflects the market-adjusted excess returns of the firm, which is defined as the monthly return of firm i in month t minus the value-weighted market return in the same month. *Size* is denoted as the natural logarithm of the market value of firm i at the conclusion of the last year. Subsequently, the next stage involves computing the time series averages of the monthly regression slopes, followed by subjecting these averages to standard statistical tests to determine the presence or absence of the small firm effect.

4. Empirical Results

4.1. Small Firm Effect

Table 1 displays the outcomes derived from the regression analysis, which assess the relationship between excess returns and firm size for the time span extending from 1993 up to the period just before the global financial crisis of 2007. The results indicate a noticeable small firm effect in the Chinese stock markets, particularly during non-January months (with the coefficient of −0.512 by a t-statistic of −2.71). Interestingly, unlike the US or Taiwan stock markets, no statistically significant small firm effect is evident in the context of January. The coefficient of size was −0.828 by a t-statistic of −2.12 in January for Taiwan stock market in the period from 1972 to 2006 (Chen & Chien, 2011). In the market of NYSE and AMEX, a monthly size effect of 15% was implied in January in contrast to the implied excess of return of 2.5% average over all months and all years (Keim, 1983).

Given the absence of both capital gains tax on security trading and a comprehensive analysts' information system in China, it becomes less likely that the tax

Table 1. Estimated results of the regression model. This table indicates the impact of firm size on excess monthly stock returns.

Variables	Coefficient	t statistic	*p* value
Panel A: January-December			
Intercept	3.3401	2.27	0.0243**
Size	−0.4380	−2.45	0.0153**
Panel B: January			
Intercept	−2.7060	−0.68	0.5079
Size	0.3794	0.75	0.4672
Panel C: Non-January			
Intercept	3.8898	2.50	0.0136**
Size	−0.5120	−2.71	0.0074***

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

loss-selling effect or different corporate information could comprehensively account for the observed anomalous stock market behavior of small firms in non-January months within the Chinese stock markets.

4.2. The Relationship between Small Firm Effect and Risk Mismeasurement

Table 2 shows the empirical outcomes concerning risk mismeasurement explanation. If solely small firms with elevated risk are driving the observed seasonal-size effect, then this anomaly's significance in non-January months would be diminished when individual risk-adjusted stock returns were employed. The risk-adjusted stock return is evaluated using the Sharpe measure (Rathinasamy & Mantripragada, 1996). The coefficient for firm size registers at −0.165 in January and −0.361 in non-January months. However, its significance persists only in non-January months, maintaining statistical significance at the one percent level.

Building upon the approach adopted by Chen & Chien (2011), this study further divides the sample into five sub-portfolios based on the securities' risk level last year. The sub-portfolios, ranging from RISK1 (the bottom twenty percent standard deviation of daily stock returns) to RISK5 (the top twenty percent standard deviation of daily stock returns), represent varying degrees of volatility. Table 3 presents the findings that the anomalous stock market behavior of small firms continues to persist in months other than January across all five risk-based sub-portfolios. In other words, the coefficients of size are only significantly negative for the five risk sub-portfolios during non-January months (α_1 is −0.3452, −0.2973, −0.3914, −0.2843, −0.3695, respectively). This notably underscores the incapability of the risk mismeasurement hypothesis to elucidate the reasons behind the presence of the small firm anomaly for the Chinese stock markets.

4.3. The Relationship between Small Firm Effect and Economic Cycle

Table 4 reports the findings regarding whether the seasonal-size anomaly is influenced by the economic cycle hypothesis, positing that small firms exhibit accelerated growth during expansion phases. This study refers to Kim & Burnie (2002), market conditions are categorized as bullish or bearish in the month based on whether the market return surpasses or falls below the median return

Table 2. Estimated results of the regression model. This table shows the impact of firm size on risk-adjusted monthly stock returns by the Sharpe measure.

Variables	January			Non-January		
	Coefficient	t statistic	*p* value	Coefficient	t statistic	*p* value
Intercept	−0.3440	−0.21	0.8373	0.4980	0.70	0.4841
Size	−0.1650	−0.86	0.4095	−0.3610	−4.36	0.0001***

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

Table 3. Estimated results of the regression model. This table shows the impact of firm size on risk-adjusted monthly stock returns by the Sharpe measure for five risk sub-portfolios based on securities' risk level.

Variables	January			Non-January		
	Coefficient	t statistic	*p* value	Coefficient	t statistic	*p* value
Panel A: The risk sub-portfolio with RISK1						
Intercept	0.0012	0.00	0.9994	0.2823	0.36	0.7168
Size	−0.2928	−1.36	0.2009	−0.3452	−3.72	0.0003***
Panel B: The risk sub-portfolio with RISK2						
Intercept	0.6784	0.35	0.7310	0.0595	0.08	0.9383
Size	−0.3026	−1.57	0.1457	−0.2973	−3.31	0.0012***
Panel C: The risk sub-portfolio with RISK3						
Intercept	−0.7672	−0.50	0.6247	0.7100	0.89	0.3744
Size	−0.1007	−0.36	0.7272	−0.3914	−4.15	0.0001***
Panel D: The risk sub-portfolio with RISK4						
Intercept	−1.4953	−0.69	0.5060	0.0508	0.06	0.9486
Size	0.0380	0.14	0.8890	−0.2843	−3.01	0.0030***
Panel E: The risk sub-portfolio with RISK5						
Intercept	2.0148	0.42	0.6851	0.5438	0.67	0.5013
Size	−0.3881	−0.80	0.4398	−0.3695	−3.87	0.0002***

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

Table 4. Estimated results of the regression model. This table indicates the impact of firm size on excess monthly stock returns for the bullish or bearish market.

Variables	January			Non-January		
	Coefficient	t statistic	*p* value	Coefficient	t statistic	*p* value
Panel A: The bullish market						
Intercept	−0.2412	−0.04	0.9729	5.3439	2.02	0.0471**
Size	0.1693	0.19	0.8573	−0.6793	−2.04	0.0445**
Panel B: The bearish market						
Intercept	−5.1709	−1.16	0.2916	0.9107	0.51	0.6093
Size	0.5895	1.11	0.3111	−0.1285	−0.59	0.5544

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

across all years. The results reveal that firm size remains statistically insignificant for January. However, for non-January months, Panel A indicates a coefficient of −0.6793 during a bullish market, while Panel B displays a coefficient of −0.1285 during a bearish one. Notably, the significant coefficient in non-January months is observed only under a bullish market condition, with statistical significance at the five percent level. Moreover, Table 5 demonstrates that even when accounting

Table 5. Estimated results of the regression model. This table indicates the impact of firm size on excess monthly stock returns for five risk sub-portfolios based on securities' risk level in the bullish or bearish market.

Variables	January			Non-January		
	Coefficient	t statistic	*p* value	Coefficient	t statistic	*p* value
Panel A: The bullish market						
Panel A1: The risk sub-portfolio with RISK1						
Intercept	−0.5507	−0.12	0.9065	5.3593	1.80	0.0763*
Size	−0.1266	−0.27	0.7944	−0.7012	−1.77	0.0807*
Panel A2: The risk sub-portfolio with RISK2						
Intercept	1.7836	0.24	0.8158	5.4419	2.02	0.0472**
Size	−0.1628	−0.18	0.8666	−0.6972	−2.06	0.0429**
Panel A3: The risk sub-portfolio with RISK3						
Intercept	1.9237	0.27	0.7996	5.5008	1.76	0.0831*
Size	−0.0274	−0.03	0.9778	−0.7070	−1.75	0.0835*
Panel A4: The risk sub-portfolio with RISK4						
Intercept	−3.7816	−0.37	0.7224	7.4464	2.51	0.0140**
Size	0.7527	0.55	0.6004	−0.9789	−2.66	0.0095***
Panel A5: The risk sub-portfolio with RISK5						
Intercept	−11.2442	−1.19	0.2808	7.0571	2.40	0.0185**
Size	1.8650	1.32	0.2340	−0.9296	−2.51	0.0141**
Panel B: The bearish market						
Panel B1: The risk sub-portfolio with RISK1						
Intercept	−5.6190	−1.19	0.2783	−0.6678	−0.35	0.7287
Size	0.6374	0.99	0.3591	0.1195	0.51	0.6117
Panel B2: The risk sub-portfolio with RISK2						
Intercept	−1.5838	−0.30	0.7738	1.2150	0.63	0.5307
Size	0.1389	0.22	0.8339	−0.1520	−0.63	0.5276
Panel B3: The risk sub-portfolio with RISK3						
Intercept	−0.0895	−0.02	0.9871	1.7211	0.87	0.3883
Size	−0.1486	−0.23	0.8273	−0.2540	−1.02	0.3123
Panel B4: The risk sub-portfolio with RISK4						
Intercept	−4.3524	−0.68	0.5237	1.3335	0.68	0.5001
Size	0.4735	0.59	0.5766	−0.2059	−0.84	0.4056
Panel B5: The risk sub-portfolio with RISK5						
Intercept	−3.3381	−0.53	0.6139	0.8958	0.46	0.6480
Size	0.3461	0.40	0.7003	−0.1551	−0.64	0.5210

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

for security risk, the substantial stock market behavior of small firms in months other than January persists only within a bullish market context. In other words, the coefficients of size are only significantly negative for the five risk sub-portfolios during non-January months within a bullish market (a_1 is −0.7012, −0.6972, −0.707, −0.9789, −0.9296, respectively).

4.4. The Relationship between Small Firm Effect and Culture Bonus

On the other hand, this study also delves into the viability of the culture bonus perspective in exploring the relationship between the seasonal-size anomaly and the culture bonus in China. The culture bonus hypothesis postulates that the apparent stock market behavior of small firms in January is driven by small firms exhibiting higher risk, particularly during years when bonus payments are scheduled for January. Adhering to the approach of Chen & Chien (2011), this study divides the sample into two sub-periods: those featuring bonus payments in January and those with bonus payments in non-January.

The empirical results in Table 6 and Table 7 show that the coefficients are insignificant in January. However, in months other than January, the coefficients tend to consistently exhibit negative and statistically significant values, regardless of the month in which the bonuses are paid, or the varying volatility portfolios considered. According to Table 6, the coefficients of size during non-January months are −0.421 and −0.74 for the bonus payments in January and non-January, both are significant at the 10% level. Panel A in Table 7 indicates that when the bonus payments are in January, the coefficients of −0.695 and −0.611 are significant for the sub-portfolio with RISK3 and RISK5 in non-January months, respectively. Moreover, the panel B in Table 7 indicates that when the bonus payments are in non-January months, the coefficients of −0.915, −0.978 and −0.689 are significant for the sub-portfolio with RISK2, RISK4 and RISK5 in non-January

Table 6. Estimated results of the regression model. This table indicates the impact of firm size on excess monthly stock returns in the sub-period with whether the bonuses are paid in January or Non-January.

Variables	January			Non-January		
	Coefficient	t statistic	*p* value	Coefficient	t statistic	*p* value
Panel A: A sub-period with bonus payments in January						
Intercept	1.0279	0.25	0.8045	3.2355	1.75	0.0823*
Size	−0.0970	−0.19	0.8534	−0.4210	−1.91	0.0584*
Panel B: A sub-period with bonus payments in Non-January						
Intercept	−12.0400	−1.37	0.2637	5.5253	1.89	0.0653*
Size	1.5704	1.39	0.2589	−0.7400	−2.01	0.0503*

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

Table 7. Estimated results of the regression model. This table indicates the impact of firm size on excess monthly stock returns for five risk sub-portfolios based on securities' risk level in the sub-period with whether the bonuses are paid in January or Non-January.

Variables	January			Non-January		
	Coefficient	t statistic	*p* value	Coefficient	t statistic	*p* value
Panel A: A sub-period with bonus payments in January						
Panel A1: The risk sub-portfolio with RISK1						
Intercept	−1.3540	−0.41	0.6880	3.0672	1.57	0.1185
Size	0.0753	0.18	0.8607	−0.3840	−1.57	0.1184
Panel A2: The risk sub-portfolio with RISK2						
Intercept	4.1311	1.26	0.2394	2.5110	1.34	0.1832
Size	−0.4650	−1.13	0.2894	−0.3110	−1.36	0.1762
Panel A3: The risk sub-portfolio with RISK3						
Intercept	4.3340	0.83	0.4259	5.1407	2.41	0.0175**
Size	−0.4520	−0.66	0.5251	−0.6950	−2.64	0.0096***
Panel A4: The risk sub-portfolio with RISK4						
Intercept	−1.8390	−0.27	0.7970	2.8487	1.41	0.1624
Size	0.3258	0.35	0.7316	−0.3790	−1.54	0.1255
Panel A5: The risk sub-portfolio with RISK5						
Intercept	−3.4320	−0.49	0.6339	4.6439	2.23	0.0275**
Size	0.4839	0.49	0.6376	−0.6110	−2.41	0.0174**
Panel B: A sub-period with bonus payments in Non-January						
Panel B1: The risk sub-portfolio with RISK1						
Intercept	−7.4120	−0.90	0.4333	4.5232	1.20	0.2353
Size	0.7057	0.72	0.5255	−0.5620	−1.10	0.2769
Panel B2: The risk sub-portfolio with RISK2						
Intercept	−9.9780	−0.79	0.4881	6.8104	2.19	0.0339**
Size	1.1215	0.70	0.5348	−0.9150	−2.35	0.0234**
Panel B3: The risk sub-portfolio with RISK3						
Intercept	−7.6250	−1.10	0.3498	4.1927	1.23	0.2249
Size	0.8223	0.97	0.4023	−0.5960	−1.35	0.1833
Panel B4: The risk sub-portfolio with RISK4						
Intercept	−9.6370	−0.84	0.4603	7.7107	2.04	0.0472**
Size	1.3314	0.90	0.4325	−0.9780	−2.03	0.0490**
Panel B5: The risk sub-portfolio with RISK5						
Intercept	−16.9400	−2.11	0.1248	4.5945	1.43	0.1595
Size	2.6598	2.05	0.1324	−0.6890	−1.70	0.0970*

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. All data are collected from the TEJ database.

months, respectively. This pattern emerges in contrast to the expectations set by the culture bonus perspective. In essence, the Chinese cultural bonus does not provide a satisfactory explanation for the small firm effect observed in China.

5. Conclusion

Since Banz's seminal work in 1981, the investigations into whether smaller firms consistently yield better stock returns than their larger counterparts have garnered extensive attention. However, limited research has been dedicated to elucidating the underlying reasons for the presence of seasonal-size anomaly within the context of China's rapidly growing and Chinese culturally oriented emerging stock market. This study aims to bridge this gap by exploring a spectrum of multiple hypotheses rooted in both traditional and behavioral finance paradigms.

Notably, this study considers the differences in taxation systems and information acquisition between China and Western countries, and excludes the tax-loss selling and different information explanations for the seasonal-size anomaly in the Chinese stock market. Moreover, this study employs the Fama-MacBeth regression method to test the relationship between seasonal-size anomaly and risk mismeasurement, economic cycle, and culture bonus, respectively.

The empirical findings divulge a remarkable pattern: the small firm effect prominently emerges in months other than January, yet remains absent in January within Chinese stock markets. Subsequent examination of the relationships between the apparent stock market behavior of small firms in non-January months and risk mismeasurement or culture bonus explanations yields inconsistent results, effectively discounting their explanatory power. Furthermore, the obvious stock market behavior of small firms in months other than January seems to materialize primarily when the economic condition is favorable. These findings lend support to an interplay between the small firm effect and the economic cycle in Chinese stock markets. Specifically, the non-January small firm effect appears to correlate with the expansion phase of the economic cycle while being notably absent in the contraction phase. The findings of this study are distinctive from prior research on seasonal-size anomalies in the stock markets of Taiwan and Hong Kong, both with Chinese cultural characteristics.

The primary contribution of this study lies in its comprehensive examination of existing hypotheses from both traditional and behavioral finance viewpoints to dissect the occurrence and driving forces behind the small firm effect within Chinese stock markets. This serves to enrich the literature pertaining to the size effect causes in Asian stock markets. Moreover, the study carries significant behavioral implications for investors, particularly foreign institutional investors, who are keenly attuned to the dynamics of Chinese equity market.

In the future, it is necessary to conduct in-depth research on whether the size effect persists in the literature and the underlying influencing factors. These factors may vary across industries and markets. Additionally, the time frame of this study is limited to before the global financial crisis of 2007. However, the size ef-

fect may appear in certain years, disappear in others, or undergo changes in the post-financial crisis period. Hence, future research can focus on annual analyses rather than specific periods to delve deeper into the study of seasonal-size effects. Finally, from a practical perspective, research findings on the size effect have already spurred the development of many small-cap indices and actively managed funds. Future research can also focus on large-cap and small-cap indices to explore the issue of seasonal-size effects.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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