Retail Investors and Turnover Anomaly: Evidence from the Korean Equity Market

Sampath Kongahawatte[1]

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ABSTRACT

This study is aimed at finding the role of retail investors in the well-documented turnover anomaly in the Korean equity market. Using the stock-level investor trading data from 2004–2015, I find a robust negative relationship between the turnover and the expected stock returns. This relationship is stronger among stocks with a high retail trading proportion (RTP), indicating that the turnover anomaly could be a mispricing generated by the irrational trading of retail investors. This study has strong implications for anomalies and retail investors' literature.

1. Introduction

Turnover is one of the robust anomalies in financial markets that predicts a negative relationship between trading volume and expected stock returns (Barinov, 2014). There are different reasons for the negative relationship between turnover and stock returns; some researchers' postulate that it is a proxy for liquidity, while there is another faction researchers argue that turnover is a proxy for uncertainty (Barinov, 2014; Datar et al., 2008).

If turnover is a proxy for uncertainty, then the negative relationship between turnover and stock returns is puzzling. Barinov (2014) provides a different explanation for the negative relationship between the turnover and expected stock returns, showing firms with high growth options have highly volatile returns, which act as hedges when total volatility of the market increases.

There is another view that supports the negative relationship between turnover and expected stock returns: mispricing occurs through trading due to investor disagreement. This disagreement is mainly driven by overconfidence and dismissiveness (Hong and Stein, 2007; Barberis, 2018).

Retail investors generally display heuristics of this nature in their trading (Han and Kumar, 2013). Therefore, the trading of retail investors could drive the turnover anomaly. Although there is much evidence for the persistence of turnover anomaly and the retail investors irrational trading behaviour in developed financial markets (Han and Kumar, 2013; Barinov, 2014), such evidence is rare in emerging financial markets. In this context, I analyze whether the turnover anomaly is stronger among the stocks that are heavily traded by retail investors motivated by the increasing evidence on the role of retail investors in market anomalies

[1]Corresponding Author, Department of Finance, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Email: kongahawatte@sjp.ac.lk

(Han and Kumar, 2013; Brandt et al., 2010). I use the retail trading proportion (Han and Kumar, 2013) as the proxy for retail trading intensity. Considering the high participation of retail investors and the availability of the investor-type trading flow data (Son and Nguyen, 2019), I choose the Korean stock market for my study.

Consistent with evidence from other financial markets, I find a strong negative relationship between turnover and expected returns (Barinov, 2014). These results hold at both the portfolio level and the firm level. Further, consistent with retail investor literature, the turnover anomaly is stronger among stocks that are intensively traded by retail investors. This study shed more light on the retail investor trading literature as well as on the turnover literature. Furthermore, this study contributes to the literature on market anomalies and shows that mispricing is not limited to markets that are dominated by individualistic investors.

The paper is structured as follows. Section two presents the literature around turnover and retail investors trading behaviour. Section three presents the methodology, findings, and discussion and Section four concludes.

2. Turnover and Retail Investors Trading Behaviour

Turnover anomaly: the negative relationship between the turnover and the expected returns is a well-documented anomaly in the finance literature (Datar et al., 1998, Hodrick and Korajczyk,2000; Eckbo and Norli, 2005; Chan and Faff, 2005; Nguyen et al., 2007). Jones (2002) postulates that the turnover anomaly is related to investors' irrational trading behaviour. Pontiff and Schall (1998) find that greater investor following (reflected in high turnover volatility) is related to lower expected returns. They further stress the importance of studies on the role trading activity plays in the cross-section of expected returns and highlight the need for more precise measures as clientele proxies.

There are many non-speculative reasons why investors trade: balancing portfolios, meeting liquidity needs, and reducing tax liability (Lou et al., 2018). However, it is well documented that the above factors are not prominent reasons that generate trades. Rather, in many instances, high volumes of trading are associated with overconfident investors' disagreements (Hong and Stein, 2007). There are many reasons why investors would disagree: different prior beliefs of investors, different values of the same information could be private to a particular investor and public to another investor, and finally, one or both investors could be irrational (Hong and Stein, 2007). Barberis (2018) postulates that most of the trades occur when the investors disagree on the interpretation of information that arrives at the market. This can be more severe when they become overconfident and dismissive. Overconfidence makes them believe that they have a superior ability to interpret information, while dismissiveness makes them think the others do not have a sufficient ability to interpret the information that arrives at the market. Heuristics of that nature are more prominent among retail investors who generally trade irrationally (Han and Kumar, 2013), and hence the turnover anomaly could be entirely or partially driven by them.

The role of retail investors in generating market mispricing is a much-studied area in the finance literature (Foucault et al., 2011; Han and Kumar, 2013; Brandt et al., 2010; Barber et al., 2009a and 2009b). Hvidkjaer (2006) connects retail trading, turnover, sentiment, and returns. He argues that turnover is a sentiment indicator. Accordingly, positive investor sentiment induces high turnover deriving from the buying activity of individual investors, driving overpricing. Hvidkjaer (2008) shows that retail investors are actively pushing prices away from fundamentals, and subsequent price movements occur over time while prices revert to fundamental values. Barber et al. (2009) use the RTP (retail trading proportion) measure to find the retail investor's trading intensity for a particular stock. Moreover, Han and Kumar (2013) show that stocks with a high RTP possess strong speculative characteristics and attract retail investors.

Although there is some evidence from developed markets on the persistence of turnover anomaly and retail investor's role in mispricing, evidence from developing markets is hardly found (Barber et al., 2009a and 2009b; Brandt et al., 2010; Foucault et al., 2011; Han and Kumar, 2013). This study recognizes the role retail investors trading plays in asset mispricing and examines whether retail

investors trading is directly related to the turnover anomaly, an area that still lacks solid empirical evidence, specifically from developing markets.

3. Methodology, Findings and Discussion

3.1 Data and Descriptive statistics

Table 1
Summary Statistics
This table reports the summary statistics used in the analysis. Turn is the turnover calculated by dividing the total trading volume in KRW by the market value of shares. Size is the natural log of the market capitalization in million KRW; BM is the natural log of the book-to-market ratio at the end of the year t-1; Beta is the market beta estimated from a regression between daily stock returns and market returns over a period of one year; Ivol is the idiosyncratic volatility estimated using daily stock returns over a month and the Fama French three-factor model; MOM12 is the monthly returns from time t-2 to t-12; Max is the maximum daily return in month t-1. Skew is the skewness of monthly returns over the past 5 years; Illiq is the illiquidity calculated following Ammihud (2002); RTP is the retail trading proportion calculated by dividing the retail investors trading volume by total trading volume; and Casket is the coskewness estimated from the past 5 years monthly returns following Harvey and Siddique (2000). The sample period is from January 2004 to June 2015. The t-statistics are in parentheses, and *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Mean	Minimum	Maximum	skewness	kurtosis
Turn	0.43	0.00	32.75	9.16	12.33
Size	11.67	2.36	17.42	-0.58	3.69
BM	0.11	-4.56	3.51	0.04	4.41
Beta	0.59	-0.86	2.04	0.32	2.63
MOM12	0.04	-3.93	2.97	-0.61	8.48
Illiq	0.00	0.00	0.25	14.91	36.97
RTP	0.71	0.00	0.98	3.23	4.56
Ivol	0.12	0.00	1.13	2.12	10.62
Coskew	-0.86	-17.18	24.70	0.23	7.06
Skew	0.13	-4.70	2.94	-0.68	5.91
Max	0.05	0.00	0.36	0.93	3.34

The population contains all the listed companies on the KRX. The sample consists of all the companies for which trading data are available from January 2004 to June 2015. Foreign companies, real estate investment trusts (REITs), exchange-traded funds (ETFs), and pooled investment funds are excluded from the analysis. To counter survivorship bias, companies that are delisted during the period are also included in the analysis. In total, 1016 firms are identified as having issued common equity, and stocks are matched with investor-type trading flow data. To ensure the results are not driven by non-trading stocks, I keep only the firms with a minimum of 200 trading days in a calendar year, and I drop stocks priced below KRW5000 from the analysis, consistent with Son and Nguyen (2019).

3.2 Descriptive analysis

According to Table 1, turnover is 43.75%, which indicates high level of liquidity in Korean equity market. Further, retail trading proportion is nearly 70%, indicating the dominance of retail investors in trading activities in the Korean equity market.

3.3 Main Results and Discussion

3.3.1 Turnover Anomaly in the Korean Equity Market

Initially, it is necessary to show that the turnover anomaly holds in the Korean equity market. I use univariate portfolio analysis as the first test method. Stocks are sorted into deciles based on turnover each month, and the arbitrage portfolio longs (shorts) low (high) turnover stocks. The portfolios are held over periods ranging from one month to six months. Univariate decile sort

portfolio analysis is presented in Table 2. I document a strong negative relationship between turnover and stock returns. The arbitrage portfolio return is above 2% for all the investment horizons, and the returns survive Fama and French's (1993) risk factors. It seems that the negative returns are mainly concentrated in the high turnover decile.

The Fama Macbeth regression analysis estimates the model in Equation (1) to test the firm-level relationship between turnover and the expected stock returns in the cross-section of stock returns. All the variables are obtained following Barberis et al. (2016), Son and Nguyen (2019), and Do Nascimento Junior et al. (2021).

Table 2

Turnover Anomaly in the Korean Equity Market: A Portfolio Analysis

The table reports the average raw returns, CAPM-Alphas, and FF3-Alphas of the portfolios sorted by turnover in the Korean equity market. Portfolios are sorted into deciles based on the turnover at the beginning of each month. The arbitrage portfolio longs (shorts) bottom (top) turnover decile. The sample period is from January 2004 to June 2015. The t-statistics are in parentheses, and *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively

	Holding Period		
Portfolio	t+1	t+1, t+3	t+1, t+6
Low	0.0030	0.0048	0.0059
	(0.57)	(0.94)	(1.30)
2	0.0074	0.0086	0.0096*
	(1.28)	(1.59)	(1.98)
3	0.0109*	0.0107*	0.0101**
	(1.69)	(1.86)	(1.98)
4	0.0105*	0.0099*	0.0098*
	(1.78)	(1.80)	(1.90)
5	0.0097	0.0089	0.0091*
	(1.55)	(1.54)	(1.74)
6	0.0097	0.0092	0.0084
	(1.55)	(1.53)	(1.54)
7	0.0095	0.0079	0.0069
	(1.34)	(1.21)	(1.17)
8	0.0088	0.0069	0.0056
	(1.24)	(1.02)	(0.93)
9	0.0046	0.0027	0.0019
	(0.61)	(0.39)	(0.31)
10	-0.0208**	-0.0182**	-0.0160**
	(-2.51)	(-2.39)	(-2.37)
Low-High	0.0238***	0.0229***	0.0220***
	(4.29)	(4.80)	(5.23)
CAPM Alpha	0.0249***	0.0244***	0.0233***
	(4.91)	(5.49)	(5.88)
3-Factor Alpha	0.0257***	0.0218***	0.0224***
	(4.96)	(4.45)	(4.69)

These results are consistent with many other research findings in developed and developing financial markets (Barinov, 2014; Datar et al., 2008).

$$r_{i,t+1} = \beta_0 + \beta_1 Turn_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{i,t-1} + \varepsilon_{i,t+1} \quad (1)$$

Where, $r_{i,t+1}$ is the stock return at time *t+1*. Turn is the turnover value, and $X_{i,t-1}$ refers to the control variables: size is the natural log of market capitalization in million KRW, BM is the natural log of the book-to-market ratio at the end of the year t-1, beta is the market beta estimated from a regression between daily stock returns and market returns over a period of one year, Ivol is the idiosyncratic volatility estimated using daily stock returns over a month and the Fama French three-factor model, MOM12 is the monthly returns from time t-2 to t-12, Max is the maximum daily return in month t-1, Skew is the skewness of monthly returns over the past 5 years; Illiq is the illiquidity calculated following Ammihud (2002); RTP is the retail trading proportion calculated by dividing the retail investors trading volume by total trading volume: and Coskew is the coskewness estimated from the past 5 years monthly returns following Harvey and Siddique (2000).

In the cross-section of stock returns, I confirm the existence of the turnover effect at the firm level. Similar to the previous analysis of the same market, I find a strong BM effect and a strong idiosyncratic volatility effect (Son and Nguyen, 2019). The Max effect is present since the Min value is not included in the analysis; earlier analysis reveals that the significance of the Max effect becomes redundant with the inclusion of the Min effect. Based on the above analysis presented in Table 2, there is a strong negative relationship between turnover and expected stock returns. It is evident by the negative coefficient of turnover. The original relationship

Table 3

Turnover Anomaly in the Korean Equity Market: A Firm- Level Analysis

The below table presents the results of the Fama-Macbeth cross-sectional regression $r_{i,t+1} = \beta_0 + \beta_1 Turn_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{i,t-1} + \varepsilon_{i,t+1}$. $r_{i,t+1}$ is the stock return at time *t+1*. Turn is the turnover value, and $X_{i,t-1}$ refers to the control variables: Size is the natural log of the market capitalization in million KRW; BM is the natural log of the book-to-market ratio at the end of the year t-1; Beta is the market beta estimated from a regression between daily stock returns and market returns over a period of one year; Ivol is the idiosyncratic volatility estimated using daily stock returns over a month; and the Fama French three-factor model; MOM12 is the monthly returns from time t-2 to t-12; Max is the maximum daily return in month t-1; Skew is the skewness of monthly returns over the past 5 years; Illiq is the illiquidity calculated following Ammihud (2002); RTP is the retail trading proportion calculated by dividing the retail investor's trading volume by total trading volume, and Coskew is the coskewness estimated from the past 5 years monthly returns following Harvey and Siddique (2000). The sample period is from January 2004 to June 2015. The t-statistics are in parentheses, and *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	(1)	(2)
Turnover	-0.0118***	-0.0094***
	(-4.07)	(-2.94)
Size		-0.0010
		(-1.04)
BM		0.0036**
		(2.53)
Beta		-0.0010
		(-0.26)
MOM12		0.0154***
		(4.42)
Illiq		1.700
		(1.38)
Ivol		-0.0557**
		(-2.46)
Coskew		0.0006*
		(1.74)
Skew		-0.0015*
		(-1.82)
Max		-0.0989***
		(-3.58)
Cons	0.0092	0.0301**
	(1.48)	(2.03)

remains unaltered even after incorporating different control variables, indicating that turnover anomaly is quite persistent in the Korean equity market at the firm level.

3.3.2 Retail investors and the Turnover Anomaly

To find whether the turnover anomaly is concentrated among the stocks that are heavily traded by retail investors, I use the following bivariate portfolio strategy: The stocks are initially sorted into two quantiles on RTP, and then each RTP quantile is further sorted into deciles on turnover. The arbitrage portfolio longs (shorts) the lowest (highest) turnover stocks. Next, I test the difference between the arbitrage portfolio returns of high and low RTP subsamples to determine if RTP has a significant impact on the return among the portfolios (Bali et al., 2016).[2]

Table 4 reports the return of the turnover portfolios, double-sorted on RTP and stock returns. Irrespective of the holding period, I find that the difference in turnover arbitrage portfolio returns between large and small RTP groups is statistically significant, indicating that the turnover effect is stronger among stocks intensively traded by retail investors. Irrespective of the holding period this difference is nearly 3% per month. Further, the common risk factors are unable to capture the relationship between turnover and stock returns in RTP subsamples.

Table 5 reports the Fama-Macbeth (1973) cross-sectional regression results that test the effect of retail investors trading on turnover anomaly. The results are consistent with the portfolio analysis

Table 4

Retail Trading and Turnover Anomaly in the Korean Equity Market: A Portfolio Analysis

The table reports the average raw returns, CAPM-Alphas, and FF3-Alphas of the portfolios sorted by RTP and turnover in the Korean equity market. Stocks are initially sorted into two portfolios based on the RTP each month. Then each RTP quantile is sorted into deciles based on the turnover at the beginning of each month. The arbitrage portfolio longs (shorts) bottom (top) turnover decile. High RTP (Low RTP) denotes the turnover arbitrage portfolio returns of the high RTP (low RTP) sub-samples. The sample period is from January 2004 to June 2015. The t-statistics are in parentheses, and *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Holding Period		
	t+1	t+1, t+3	t+1, t+6
High_RTP	0.0424***	0.0376***	0.0336***
	(4.59)	(5.67)	(6.98)
Low_RTP	-0.0012	0.0013	0.0037
	(-0.26)	(0.40)	(1.50)
High_RTP-Low_RTP	0.0436***	0.0363***	0.0299***
	(4.87)	(6.00)	(6.60)
FF-alpha	0.0434***	0.0352***	0.0304***
	(5.39)	(6.01)	(5.83)

predictability of turnover. It must be noted that dependent sorting is used to ensure an adequate number of stocks remain in the analysis. This is because when an independent sorting is applied, the number of stocks may not be equally distributed

presented in Table 4. The negative coefficient for RTPxTurn, which is statistically significant, indicates that the turnover effect is stronger among stocks, which are intensively traded by retail investors.

[2] Equal number of stocks will not be allocated to portfolios in independent sorting due to cross correlation between variables and dependent sorting is preferred.

Table 5

Retail Investors and the Turnover Anomaly in the Korean Equity Market: A Firm Level Analysis

Below table presents the results of the Fama-Macbeth cross sectional regression $r_{i,t+1} = \beta_0 + \beta_1 TURN_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{i,t-1} + \beta_k TURN_{i,t-1} xRTP_{i,t-1} + \varepsilon_{i,t+1}$. $r_{i,t+1}$ is the stock return at time *t+1*. Turn is the turnover value, and Xt-1 refers to the control variables: Size is the natural log of the market capitalization in million KRW, BM is the natural log of the book-to-market ratio at the end of the year t-1, Beta is the market beta estimated from a regression between daily stock returns and market returns over a period of one year; Ivol is the idiosyncratic volatility estimated using daily stock returns over a month and the Fama French three-factor model; MOM12 is the monthly returns from time t-2 to t-12; and Max is the maximum daily return in month t-1. Skew is the skewness of monthly returns over the past 5 years; Illiq is the illiquidity calculated following Ammihud (2002); RTP is the retail trading proportion calculated by dividing the retail investors trading volume by total trading volume; and Coskew is the coskewness estimated from the past 5 years monthly returns following Harvey and Siddique (2000). The sample period is from January 2004 to June 2015. The t-statistics are in parentheses, and *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	t+1	t+1
Turnover	-0.0065***	0.0422**
	(-3.74)	(2.52)
Size	-0.0018*	-0.0022**
	(-1.81)	(-2.28)
BM	0.0037**	0.0040***
	(2.61)	(2.76)
Beta	-0.0008	-0.0028
	(-0.21)	(-0.77)
MOM12	0.0154***	0.0150***
	(4.33)	(4.27)
Illiq	1.9704	1.9170
	(1.55)	(1.54)
Ivol	-0.0639***	-0.0681***
	(-3.17)	(-3.37)
Coskew	0.0005	0.0004
	(1.53)	(1.41)
Skew	-0.0013	-0.0009
	(-1.51)	(-1.04)
Max	-0.1008***	-0.0995***
	(-3.67)	(-3.67)
RTP	-0.0087*	-0.0040
	(-1.66)	(-0.69)
RTPxTurn		-0.0497***
		(-2.81)
Constant	0.0461***	0.0477***
	(2.97)	(3.10)

4. Conclusion

The turnover anomaly is one of the most robust anomalies in the financial economics literature. Even though much evidence on this anomaly is available, a clear reason for this persistent market anomaly is absent. This study is motivated by the gap in the existing literature on the role of retail investors in generating turnover anomaly in emerging markets. The presence of a strong retail investor trading impact on turnover qualifies the turnover anomaly to be considered a market

mispricing. Consistent with the evidence from the developed and developing markets, I find a strong negative relationship between turnover and stock returns at both the portfolio level and the firm level. Further, providing strong evidence for market mispricing, the turnover effect is stronger among the stocks intensively traded by retail investors. This study has strong implications for anomalies literature and retail investor trading literature.

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