

Does Free Cash Flow Anomaly Exist in an Emerging Market? Evidence from the Istanbul Stock Exchange

Özgür Arslan

Hacettepe University

Department of Business Administration

Beytepe 06800, Ankara, TURKEY

E-mail: arslan@hacettepe.edu.tr

Tel: 00 90 312 297 87 00 Ext: 129; Fax: 00 90 312 299 20 55

Mehmet Baha Karan

Hacettepe University, Department of Business Administration

Beytepe 06800, Ankara, TURKEY

E-mail: mbkaran@hacettepe.edu.tr

Tel: 00 90 312 297 87 00 Ext: 147; Fax: 00 90 312 299 20 55

Abstract

The objective of this paper is to investigate if the previously documented free cash flow anomaly can be generalised to emerging markets. Therefore we examine the performance of an investment strategy based on free cash flow using financial statement data of Turkish firms during the period 1999-2005. We identify large-capitalisation companies with positive free cash flows, low free cash flow multiples, and low financial leverage. Firstly, our results fail to provide evidence that a portfolio of these companies outperform the market index in general. However, our findings suggest that a free cash flow portfolio earns higher returns than market portfolio during market downturns. Consequently, our results present a partial support for the existence of free cash flow anomaly in Turkey.

Keywords: Free cash flow, anomaly, portfolio management, investment strategy

Jel Classification Codes: G11, G12

1. Introduction

It is previously shown by Livnat and Zarovín (1990) and Ali (1994) that cash flows have incremental information superiority over earnings for explaining the cross sectional variations in stock returns. Previous studies¹ also identify that investors can benefit a trading strategy based on information derived from the financial statement to earn abnormal returns. In accord with these findings, the studies of Hackel, Rivnat and Rai (1994, 2000) and Hackel and Livnat (1995) for U.S and Jokipii and Vahama (2006) for Finland report that an investment strategy based on free cash flows can outperform the market portfolio. Moreover, this free cash flow anomaly is found to be unrelated to the previously acknowledged cross-sectional anomalies.

¹ See; Ball (1992) for a review and Bernard, Thomas and Wahlen (1997); Penman and Zhang (2002) and Kothari (2001)

This paper analyzes the previously identified free cash flow anomaly from the perspective of an emerging market. Our main question is; does an investment strategy based on free cash flows can outperform the market portfolio in every emerging markets in the world? The purpose of this study is to discuss this question using stocks of the Istanbul Stock Exchange (ISE) as a laboratory. We examine the returns on portfolios to see whether investors in an emerging market relying on the information extracted from the developed capital markets based on the free cash flow would earn higher returns. In conclusion, this paper provides an appropriate framework to evaluate whether the empirical findings obtained for the developed markets; namely US and Finland, can be generalized.

Studies on anomalies for emerging markets and specifically on Turkey is not novel in the investment literature. There has been an intensive research on the investment anomalies in ISE during the last decade. Particularly, these studies² document the impacts of previously acknowledged factors on returns of stocks traded in ISE and generalise these impacts to other emerging markets. These factors are; day of the week effect, growth stocks versus value stocks, turn of the month effect and even the impact of cloudy days on stock returns; to name the some. Our research on the free cash flow effect as an asset pricing anomaly contributes to these previous studies generalised to emerging markets through its uniqueness and originality.

Last but not the least the empirical findings of Jokipii and Vahamaa (2006) demonstrate that free cash flow strategy is particularly attractive in declining markets. Turkey has experienced severe financial crises in November 2000 and February 2001³ which have resulted in sharp declines in ISE particularly in 2001 and 2002⁴. Therefore our analysis provides considerable verification for this finding.

Our results for the period 1999 - 2005 concerning publicly traded firms on the ISE are obtained through constructing a portfolio of large capitalization companies with free cash flows, low free cash flow multiples and low financial leverage. Our findings provide partial support for the existence of free cash flow anomaly in Turkey. A portfolio of these companies is not found to outperform the market index in general for the entire sample period. However, the results presented in this paper suggest that investors can earn abnormal returns with investment strategies based on free cash flows only in market downturns, in other words, bear markets. The last finding for Turkish firms aligns with that of Jokipii and Vahamaa (2006) for Finland firms that the impact of free cash flow anomaly is magnified in the bear markets rather than the bull markets.

The remainder of this paper is organized as follows. The next section presents the data used in our empirical analysis and the portfolio selection rules. The third section reports results on empirical findings about depict the performance of the free cash flow strategy. Finally the fourth section concludes our work.

2. Data

Our work is conducted on the listed firms in ISE for the period of 1999 and 2005. The financial statement data is obtained directly from the ISE web-site⁵ while the monthly investment data is gathered from *Datastream*. Having the ability of revealing the price developments of stocks listed on the ISE, *ISE-100* index is used as a benchmark portfolio in our analysis⁶.

Free cash flow is defined as the cash, which is generated by operations, can be distributed to shareholders as dividends without jeopardizing the current level of firm growth. More specifically, Jensen (1986), who has highlighted this issue in the corporate finance literature, defines the free cash flow as “cash flow in excess of that required to fund all projects that have net present values when discounted at the relevant cost of capital”. Therefore there are three alternative usage of the free cash

² See respectively; Gonenc and Karan (2003), Balaban (1995), Demirer and Karan (2001), Oguzsoy and Guven (2006), Tufan and Hamarat (2004).

³ See Ozkan (2005) for the details of the Turkey's last consecutive financial crises

⁴ See Arslan, Florackis and Ozkan (2006)

⁵ www.imkb.gov.tr

⁶ *ISE-100* is extensively used as a benchmark portfolios in studies on Turkey such as in Berument and Ince (2005) and Dogan and Yalcin (2007) to name a few

flow; it can be used to take advantage of new business opportunities, paying back debt or distributed to shareholders, providing that market value of the firm is unaffected. Free cash flow is measured as the net cash flow from operating activities minus capital expenditures. The net cash flow from operating activities is defined as the sum of net income, all non-cash charges and credits (e.g. depreciation, amortization of intangibles and deferred taxes.), net change in working capital and extraordinary items.

Following Jokipii and Vahamaa (2006), a more simplified portfolio selection criteria than those of Hackel et al. (1994 and 2000) and Hackel and Livnat (1995) are applied for this paper. Specifically, a portfolio of large capitalization companies with free cash flows, low free cash flow multiples and relatively low financial leverage is constructed. The portfolio selection criteria are described in detail below;

First Criterion: Free Cash Flow_t > \$ 0

Second Criterion: 5 < Market Value_t / Free Cash Flow_{t-1} < 30

Third Criterion: Total Debt_t / Free Cash Flow_t < 10

Fourth Criterion: Market Value_t > \$ 100 million.

Aligning with Jokipii and Vahamaa (2006), due to the limitations in ISE, we do not assume neither any growth in free cash flows nor positive four-year average free cash flows as in Hackel et al. (2000). The second criterion indicated above is called as “free cash flow multiple” and it is estimated as the market value of equity to the free cash measure in the previous year. This criterion is applied in our analyses to guarantee that relative to their free cash flow status, firms are priced at a reasonable level. Although the free cash flow multiple interval in Hackel et al. (2005) is between 5 and 20, due to the fact that free cash flow multiples are generally low or negative ISE we have adopted 30 as the upper bound of the interval as in Jokipii and Vahamaa (2006)⁷.

It would be inconvenient to select firms having high free cash flows that are highly leveraged with a disadvantageous debt capacity. Therefore we apply the third criterion called as the debt multiple which is estimated by the ratio of total debt to free cash flow.

The fourth and the last criterion is applied so as to ensure that the free cash flow portfolio is comprised by the firms that are relatively large and traded sufficiently. In accord with the previous studies⁸, we have chosen this upper bound arbitrarily so as to match up with the market capitalisation mean in ISE, which is around \$ 116 million, and in turn ensure that the portfolio contains a reasonable number of companies.

Aligning with Gonenc and Karan (2003) the beginning of July is picked in each year to form our free cash flow portfolio. In specific, after forming the portfolio we assume a 12-month buy-and-hold strategy from July 1, *t* to June 30, *t+1*.

The average number of companies fulfilling the criteria on average is 13 which represent 5% of the companies publicly traded in ISE. The percentage of the companies in the free cash flow portfolio in the previous studies is %10 and %1 of the publicly traded companies in Jokipii and Vahama (2006) for Finnish firms and Hackel et al. (2000) for US firms respectively. Compared with those in the previous studies, the number of companies included in the portfolio may be considered moderate relative to the number of publicly traded firms in the ISE, which totals to 300 on average⁹. The number of companies in the free cash flow portfolio is 12, 14, 6, 7, 13, 17 and 19 for the years 1999, 2000, 2001, 2002, 2003, 2004 and 2005 respectively. As expected, number of firms in the portfolio decrease dramatically during the crises period, namely the years 2001 and 2002.

Table 1 presents the descriptive statistics of the selection criteria for the free cash flow portfolio where median market values (in million dollars) and the free cash flow and debt multiples for the companies selected in the free cash flow portfolio and the corresponding medians for all listed

⁷ We have also assigned 20 as the upper limit of the interval as in Hackel et al. (2000) however number of firms staying in the interval was too low for our analyses

⁸ Hackel et al. (2000) and Jokipii and Vahamaa (2006).

⁹ As indicated in Jokipii and Vahama (2006) on account of the low number of eligible companies in the portfolio, an investment strategy based on free cash flow portfolio is anticipated to have a superior advantage for foreign investors who wish to invest in some stocks in the ISE rather than domestic investors who aim to form a well-diversified portfolio

companies on the *ISE-100*, for the years between 1999 and 2005. The median market values of the companies in the free cash flow portfolio are lower than those of the market portfolio except for the crisis period, namely the years 2001 and 2002. During the crisis period market capitalisations of free cash flow portfolio exceed those of market portfolio. Consequently, the companies in the constructed portfolio may not be regarded as large capitalization firms relative to the market, except for the crisis period. The results in the table on the median free cash flow multiple for the both free cash flow portfolio and the *ISE-100* show that the median values of this variable display an identical co-movement in accord with the recession and expansion in the economy. The median value of free cash flow multiple is negative for the market portfolio while decreases almost 40 percent during the crisis period. The similar co-movement pattern in both the free cash flow portfolio and the *ISE-100* is also observed for the debt multiple. The table reports that the debt multiple of the free cash flow portfolio is always above than that of the *ISE-100* however they all decrease during the crisis period but rise again right after. Finally Table 1 shows beta coefficients for the free cash flow portfolio. The reported betas are estimated through employing the market model with monthly returns for the previous 36 months and using the *ISE-100* index as a proxy portfolio for the market return. The betas of the free cash flow portfolio range from 0.52 to 0.80 reflecting that companies in the portfolio may be considered to have relatively low systematic risk¹⁰.

Table 1: Descriptive Statistics

Year	Market Value		FCF Multiple		Debt Multiple		Beta
	FCF	ISE100	FCF	ISE100	FCF	ISE 100	FCF
1999	133,543	164,362	10.53	1.43	4.41	2.08	0.58
2000	228,435	301,432	11.84	2.94	5.26	1.43	0.80
2001	105,320	94,241	6.22	-2.54	1.81	-1.65	0.52
2002	116,582	106,843	7.31	-1.94	1.54	-0.87	0.61
2003	137,760	154,876	10.26	-0.03	3.42	0.21	0.69
2004	149,873	273,421	14.59	4.72	4.81	2.51	0.74
2005	164,931	295,321	17.43	6.43	6.05	3.21	0.59

Notes: This table reports medians of the free cash flow (FCF) portfolio selection criteria and the corresponding medians for all companies listed on the *ISE100*. The free cash flow multiple is represented as the *FCF Multiple* and estimated as the ratio of market value of equity to free cash flow. The *Debt Multiple* is the ratio of total debt to free cash flow. The market values are reported in million dollars. *Beta* is estimated using the market model with monthly returns from the previous 36 months. The *ISE100* portfolio index is used as a proxy for the market return

3. Results

Equally weighted average of returns for the individual stocks included in the portfolio is calculated for the buy-and-hold return for the free cash flow portfolio. We use two different measures of abnormal returns (M_1 and M_2) in order to compare the performance of the free cash flow investment strategy to the *ISE-100* index. The first measure, M_1 , is the conventional market adjusted return and it is defined as;

$$M_1 = R_{FCF} - R_{ISE100} \quad (1)$$

In equation 1, R_{FCF} denotes the return on the portfolio of free cash flow whereas R_{ISE100} is the return on the *ISE-100* index. Following Gonenc and Karan (2003) and Jokipii and Vahamaa (2006) we employ Fama and French (1993)¹¹ three-factor model adjusted return as the next measure in our analyses, M_2 . Fama and French (1996) state that this three-factor asset pricing model, defined in the equation (2), has ability to explain most cross-sectional anomalies in the finance literature.

$$M_2 = R_{FCF} - R_F - \beta (R_{ISE100} - R_F) - \phi SMB - \eta HML \quad (2)$$

In equation 2, R_F represents the risk free rate, *SMB* is the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks, and *HML* is the difference

¹⁰ This finding aligns with that of Jokipii and Vahama (2006) for the Finnish portfolio however contradicts with that of Hackel et al. (1994, 2000) who find for the US companies that the betas for the portfolio are around 1

¹¹ Henceforth this will be called as the Fama-French three-factor model

between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

Through using monthly stock returns for the previous 36-month period, parameters for both the market model and the Fama-French three-factor model are estimated. We apply conventional *t*-tests to test if the calculated abnormal returns are statistically significant.

3. a. Performance of the Free Cash Flow Investment Strategy

Table 2 demonstrates the comparison of the annual buy-and-hold returns for the free cash flow portfolio with the returns for the *ISE-100* index. Firstly, judging into the both mean (median) annual free cash flow portfolio and the *ISE-100* index returns, which are 27.4% (30.9%) and 18.8 (31.2%) respectively, it is unclear to verify which portfolio outperforms the other. On the one hand, the free cash flow portfolio yields positive returns for five periods whereas the annual return for the *ISE-100* portfolio is positive for only four periods. On the other hand *ISE-100* portfolio outperforms the free cash flow portfolio in four out of six periods. These four periods includes the years which are characterised as bull markets and this result aligns with that of Jokipii and Vahamaa (2006). It should be noted that during the period involving the years 2001 and 2002, in which economic crisis reflect its impact on the Turkish stock market, the free cash flow portfolio considerably outperforms the *ISE-100* index.

Table 2: Annual Returns

	FCF	ISE100	M ₁	M ₂
7/99 - 6/00	0.573	0.632	-0.059	0.401
7/00 - 6/01	0.385	-0.362	0.747	0.206
7/01 - 6/02	0.342	-0.134	0.476	0.143
7/02 - 6/03	0.123	0.275	-0.152	-0.109
7/03 - 6/04	-0.054	0.365	-0.419	-0.221
7/04 - 6/05	0.276	0.349	-0.073	0.076
Mean	0.274	0.188	0.087	0.083
<i>p</i> -value	(0.071)	(0.142)	(0.097)	(0.052)
Median	0.309	0.312	-0.066	0.110
Minimum	-0.054	-0.362	-0.419	-0.221
Maximum	0.573	0.632	0.747	0.401
Number of positive periods	5	4	2	4
Number of observations	6	6	6	6

Notes: The table reports 12-month buy-and-hold returns for the free cash flow portfolio (FCF) and for the *ISE100* index. The buy-and-hold returns are calculated as the equally weighted average of returns for the individual stocks in the portfolio. M_1 is the market adjusted return, calculated as $M_1 = R_{FCF} - R_{ISE100}$ where R_{FCF} denotes the return on the free cash flow portfolio and R_{ISE100} is the return on the *ISE100* index. M_2 is the Fama and French (1993) adjusted return, calculated as $M_2 = R_{FCF} - R_F - \beta (R_{ISE100} - R_F) - \phi SMB - \eta HML$, R_F where is the risk free return, SMB is the difference between the return on a small stocks and the return on a portfolio of large stocks, and HML is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks. The parameters for the market model and for the Fama-French three-factor model are estimated with monthly returns for the previous 36 months. The *p*-value for the null hypothesis of zero mean is based on a conventional *t*-test.

In order to see the bigger picture we refer to the results for the annual market adjusted returns and that of the Fama-French three-factor model. Firstly, value of the mean (median) annual market adjusted return is 8.7% (9.7%), and the mean (median) Fama-French adjusted return is 8.3% (5.2%). Furthermore, judging into the returns for the intervals for both July 2000 – June 2001 and July 2001 and June 2002, which are overlapped by the crises period, the returns of the both market adjusted and the Fama-French models are positive. The results from both of these latter models reinforce the idea that free cash flow portfolio has beaten the market portfolio during the financial crises period.

To be more specific, we report summary statistics of the monthly returns for the free cash flow portfolio and for the *ISE-100* portfolio in Table 3. The table shows that the mean (median) monthly return for the free cash flow portfolio is 0.7% (0.9%), while the mean (median) monthly return for the *ISE* portfolio index is 0.8% (0.8%). However, the mean monthly return of the market index is statistically insignificant. Moreover, minimum and maximum returns for the both portfolios do not

present an obvious result, since the maximum return of the free cash flow portfolio is higher than that of the *ISE-100* portfolio while the minimum return of the portfolio is lower than that of the *ISE-100* portfolio. Standard deviation of the monthly returns for the free cash flow portfolio is somewhat below than that of the *ISE-100* index as in Jokipii and Vahama (2006). The authors comment for this result by suggesting that the free cash flow portfolio opposes the fundamental mean-variance theorem. Nonetheless, the return for the free cash flow portfolio was positive for 47 out of 72 months while the return for the *ISE-100* portfolio was positive for only 38 months.

Table 3: Monthly Returns

	FCF	ISE100	M1	M2
<i>Mean</i>	0.007	0.008	-0.001	0.005
<i>p-value</i>	(0.000)	(0.106)	(0.000)	(0.000)
<i>Median</i>	0.009	0.008	-0.001	0.001
<i>Minimum</i>	-0.287	-0.321	-0.202	-0.197
<i>Maximum</i>	0.372	0.316	0.287	0.265
<i>Standard deviation</i>	0.069	0.071	0.010	0.005
<i>Number of positive periods</i>	47	38	35	37
<i>Number of observations</i>	72	72	72	72

Notes: The table reports monthly returns for the free cash flow portfolio (FCF) and for the *ISE100* index. The buy-and-hold returns are calculated as the equally weighted average of returns for the individual stocks in the portfolio. M_1 is the market adjusted return, calculated as $M_1 = R_{FCF} - R_{ISE100}$ where R_{FCF} denotes the return on the free cash flow portfolio and R_{ISE100} is the return on the *ISE100* index. M_2 is the Fama and French (1993) adjusted return, calculated as $M_2 = R_{FCF} - R_F - \beta (R_{ISE100} - R_F) - \phi SMB - \eta HML$, R_F where is the risk free return, SMB is the difference between the return on a small stocks and the return on a portfolio of large stocks, and HML is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks. The parameters for the market model and for the Fama-French three-factor model are estimated with monthly returns for the previous 36 months. The *p-value* for the null hypothesis of zero mean is based on a conventional *t*-test.

The results in Table 2 and Table 3, which report the annual and monthly returns of the both free cash flow strategy and the market index respectively, do not provide an evidence on the outperformance of the free cash flow strategy over the market portfolio. However the results on Table 2 specify a clue that a free cash flow portfolio is a better investment strategy during the crisis period over the market portfolio. The objective of our further analysis is to substantiate evidence if investors can earn abnormal returns with investment strategies based on free cash flows during bear markets.

Table 4 reports the performance of free cash flow portfolio when the *ISE-100* portfolio fell by more than 5%. 14 months are identified that fulfil the stipulation and they are called as the “market downturns”. Majority of these months coincide with the crisis period in Turkey. Firstly all the mean return values of the models are statistically significant except for the Fama-French adjusted returns, which are indistinguishable from zero. The most striking result from the table is that, mean (median) value of returns belonging to the free cash flow portfolio is around 1% (0%), while the mean (median) value of the market portfolio is around -11% (-0.9%). This result clearly suggests that free cash flow portfolio outperforms the market portfolio during market downturns. Furthermore, the maximum (minimum) values of returns of these portfolios, which are around 0.4% (-0.8%) and 0.3% (-1%) respectively, is considerably higher (lower) than maximum (minimum) value of the *ISE-100* portfolio, which are around -0.5% (-4%). Finally while the returns from the market portfolio are negative during the selected 23 months, the returns for the free cash flow portfolio and the market adjusted models are positive for nine and four periods respectively. Lakonishok, Shleifer and Vishny (1994) suggest that unknown risk factors are more strongly pronounced during the periods of market downturns. The results from Table 4 suggest that the superior performance of the free cash flow strategy may be attributed to unknown risk factors that are generally highlighted during market downturns. Therefore free cash flow investment strategy is advantageous over market portfolio during bear markets.

Table 4: Monthly Returns During Market Downturns

	FCF	ISE100	M1	M2
Mean	0.001	-0.107	0.108	0.000
p-value	(0.021)	(0.034)	(0.088)	(0.271)
Median	0.000	-0.094	-0.000	0.000
Minimum	-0.075	-0.381	-0.096	-0.062
Maximum	0.041	-0.051	0.078	0.062
Standard deviation	0.036	0.029	0.016	0.011
Number of positive periods	9	0	5	6
Number of observations	14	14	14	14

Notes: The table reports monthly returns for the free cash flow portfolio (FCF) and for the ISE100 index. The buy-and-hold returns are calculated as the equally weighted average of returns for the individual stocks in the portfolio. M_1 is the market adjusted return, calculated as $M_1 = R_{FCF} - R_{ISE100}$ where R_{FCF} denotes the return on the free cash flow portfolio and R_{ISE100} is the return on the ISE100 index. M_2 is the Fama and French (1993) adjusted return, calculated as $M_2 = R_{FCF} - R_F - \beta (R_{ISE100} - R_F) - \phi SMB - \eta HML$, R_F where is the risk free return, SMB is the difference between the return on a small stocks and the return on a portfolio of large stocks, and HML is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks. The parameters for the market model and for the Fama-French three-factor model are estimated with monthly returns for the previous 36 months. The p -value for the null hypothesis of zero mean is based on a conventional t -test.

4. Conclusion

Empirical findings on free cash flow investment anomaly was previously reported by Hackel et al (1994, 2000), Hackel and Livnat (1995) for US companies and Jokipii and Vahamaa (2006) for Finnish companies. This paper investigates if the free cash flow investment anomaly can be generalised to emerging markets through examining the Turkish firms. Therefore, we use annual financial statement data of Turkish companies to identify large-capitalization companies with positive free cash flows, low free cash flow multiples, and low financial leverage.

We firstly compare annual and monthly returns of the free cash flow portfolio and those of the market portfolio. We also include market adjusted and Fama and French (1993) adjusted returns of the free cash flow portfolio for the comparison. Our results do not provide sufficient evidence that a portfolio of large capitalization companies with positive free cash flows, low free cash flow multiples and low financial leverage outperforms the market portfolio. Therefore our findings differ from those of the previous work on this anomaly. Nonetheless, after receiving some clue from the annual returns we refer to monthly returns during market downturns to verify if the free cash flow investment strategy is more beneficial than investment in market portfolio during bear markets. Jokipii and Vahamaa (2006) report for Finland firms that free cash flow anomaly is more pronounced in the bull markets rather than the bear markets. Our findings aligns with the finding of the authors in this sense since it is suggested that investors can earn abnormal returns with investment strategies based on free cash flows only in the market downturns. Thus, our findings provide partial support for the existence of free cash flow anomaly in Turkey.

Our suggestion for further research is firstly portioning firms according to their industry groups while forming a free cash flow portfolio. Murray (2005) underlines that nature of the business can influence the amount of free cash flow firms can generate since different businesses have different capital expenditure requirements. In other words, capital intensive businesses tend to generate lower amounts of free cash flow relative to businesses operating with high level of intellectual capital. Due to the low number of companies listed on ISE, our sample size do not allow for the industry based partition. Furthermore, testing the free cash flow anomaly for other emerging market countries, which were subject to severe economic crisis during the last decade, not only enables a generalisation for the performance of the free cash flow portfolio but also verifies if the anomaly is more pronounced during crisis period.

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