Full Length Article

Is the free cash flow hypothesis valid in Turkey?

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Abstract

This study tests the validity of the free cash flow hypothesis in the context of firms traded on Borsa Istanbul. The study applies a panel regression to a data set composed of 1267 observations from 227 companies during the period 2008−2014. The results reveal a significant, negative correlation between dividends per share and free cash flow. Likewise, a significant, inverse relationship is found between leverage and free cash flow. Thus, the results support the free cash flow hypothesis.
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1. Introduction

Instances of corruption and bankruptcies have brought agency theory to the forefront in recent years. Agency theory contends that conflict often exists between the interests of shareholders and those of managers. Free cash flow is one of the tools managers use to promote their personal interests, and the problem of reining it in is of equal interest to academics, regulatory bodies and companies.

Agency theory (Jensen & Meckling, 1976) serves as a theoretical basis for the free cash flow hypothesis (Jensen, 1986, 1989, 1993), which argues that managers use free cash flow to invest in projects with negative net present value (NPV) even when these investments is not at the interests of shareholders. According to the free cash flow hypothesis, managers may be reluctant to debt financing or pay out dividends, as these moves reduce free cash flow in their hands. However, that is precisely the reason these moves can stem the agency problem caused by excessive free cash flow in the hands of managers.

While definitive results have yet to be obtained, the studies of Rozeff (1982) and Easterbrook (1984), DeAngelo and DeAngelo (2000), and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) have reached conclusions supporting the free cash flow hypothesis. Denis, Denis, and Sarin (1994) have also reached similar findings. Titman, Wei, and Xie (2004) and Fairfield, Whisenant, and Yohn (2003) uncovered poor share performance among firms making extreme amounts of investment. Similarly, Dechow, Richardson, and Sloan (2008) proposed that firms with excessive amounts of free cash flow have low future performance. Lang, Ofek, and Stulz (1996) suggested that indebtedness reduced free cash flow at firms with low Tobin's Q ratios. Li and Cui (2003), Byrd (2010), Khan, Kaleem, and Nazir (2012), and Zhang (2009) also reached similar conclusions.

In Turkey, as in many developed financial markets, principals of corporate governance are being put into practice in order to reduce agency cost stemming from the agency problem. In 2003 corporate governance principals made their debut in Turkey with the "comply or explain" approach. In 2012 they became compliance rules and achieved the status of law with

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the introduction of the Capital Markets Law at the beginning 2013. Similarly, corporate governance principals are partly seen in the Turkish Commercial Code of 2012. Given the importance of corporate governance in Turkey, it should be investigated as to whether the regulations fit a theoretical framework as well as whether they achieve their goals. This study aims to shed light on the relationship between dividend distribution and free cash flow, in particular. Similarly, the effect of external financing upon free cash flow should be investigated. The results may guide to corporate governance regulations and practices in Turkey.

Even though there are many studies in Turkey related to corporate governance and firm performance or dividend policy and corporate governance or capital structure and firm performance, we couldn't find a study directly testing free cash flow hypothesis or testing relationship between free cash flow and dividend or leverage in the context of agency cost or corporate governance.

This study investigates whether the free cash flow hypothesis is valid for firms traded on Borsa Istanbul using the IFRS yearly nonconsolidated balance sheets and income statements of 227 firms for the period 2008−2014. A panel regression is used to test for a relation between free cash flow and the variables dividends per share, debt ratio and total assets.

According to the results of the panel regression, a statistically significant, negative relation exists between dividends per share and free cash flow as well as debt ratio and free cash flow. In addition, total assets and free cash flow have a significant, positive correlation. These relations are still valid, when the crisis year 2008 and 2009 excluded from the analysis. Thus, the results support the free cash flow hypothesis. As the hypothesis suggests, dividend distribution and debt financing reduce free cash flow. In other words, firms with high dividend distribution or high debt ratios have a lower amount of free cash flow in the hands of managers.

Section 2 of the study provides an overview of the relevant literature. Section 3 outlines the data and methodology while Section 4 presents the results and their implications. Finally, Section 5 summarizes the conclusions of the study.

2. Literature review

At the heart of the free cash flow hypothesis proposed by Jensen (1986, 1989, 1993) lies the agency problem (Jensen & Meckling, 1976), defined as the divergence of the interests of managers from those of shareholders. Richardson (2006) defined free cash flow as possession of cash outside that used for asset maintenance and the finance of new investments. Chen, Hope, Li, and Wang (2011) found free cash flow to be an indicator of overinvestment.

According to the free cash flow hypothesis, managers are able to manipulate free cash flow under their control. As these managers do not want to go under threat of bankrupt, they are reluctant to pay out dividends or debt financing. Similarly, they do not look favorably on using external capital, being unwilling to bear the scrutiny of lenders or shareholders.

Excessive free cash flow in the hands of managers leads to overinvestment due to investment in projects with negative net present value (Jensen, 1986; Jensen & Meckling, 1976). While this reduces profitability and company worth, it helps managers to control a greater amount of wealth or assets. According to this hypothesis, managers of firms with a high amount of free cash flow avoid market checks. These managers do not feel the need for external funds for investments or expenditures; therefore, they are not subjected to the investigation or regulation of lenders or shareholders. In the event that funds are provided by capital markets; ample, detailed information needs to be shared with market participants and more these bring more questions that have to be answered by the managers. Rubin (1990) and Lang, Stulz, and Walkling (1991) argued that managers prefer to use any free cash flow remaining after investment negative-NPV projects to continue to invest in such projects rather than pay out dividends.

Apart from using free cash flow to invest in projects with negative NPV, managers tend to make unnecessary expenditures aligned with their personal interests. Tangible or intangible assets unrelated to company operations may be purchased in the firm's name, but function purely for a manager's personal use. According to La Porta et al. (2000), overinvestment and personal expenditures are seen even in environments with stricter investor protections. Acquiring firms that are not feasible investments is also seen more frequently at firms with greater free cash flow (Opler, Pinkowitz, Stulz, & Williamson, 1999).

According to Christie and Zimmerman (1991), paying out dividends is helpful for reducing free cash flow in the hands of company managers as well as reducing agency cost. They found that, as a result, dividends help check managers and create a discipline mechanism without the direct intervention of shareholders. The reduction of free cash free cash flow in managers' control was found to reduce agency cost and raise company worth (Park & Jang, 2013). Similarly, securing outside capital was found to bring overinvestment problems under control. The payment of interest upon debts reduces the amount of free cash flow in the hands of managers.

While studies have yet to offer definitive results, the findings of Rozeff (1982) and Easterbrook (1984) support the free cash flow hypothesis. According to these researchers, paying greater dividends can reduce firms' agency costs. As firms paying high dividends are financed more often by the market, they are subject to closer scrutiny. DeAngelo and DeAngelo (2000) and La Porta et al. (2000) also reached similar conclusions. However, Denis et al. (1994) did not obtain results supporting this hypothesis.

Brush, Bromiley, and Hendrickx (2000) found that free cash flow negatively impacted growth while Titman et al. (2004) and Fairfield et al. (2003) found a much lower stock performance among firms with overinvestment problems. Similarly, Dechow et al. (2008) proposed that firms with excessive free cash flow had a lower future performance.

Lang et al. (1996) suggested that higher debt ratios reduced free cash flow at firms with low Tobin's Q ratios. Similar findings were obtained by Li and Cui (2003), Byrd (2010), Khan et al. (2012), Fatma (2011) and Zhang (2009).

Even though there are many studies in Turkey related to corporate governance and firm performance (Baykut, 2013; Çarıkçı, Kalaycı, & Gök, 2009; Dağli, Ayaydin, & Eyüboğlu, 2010; Ersoy, Bayrakdaroğlu, & Şamiloğlu, 2011; Kalmış & Yavuzaslan, 2016; Karakoç, Tayyar, & Erhan, 2016; Karamustafa, Varıcı, & Er, 2009; Taşkırmaz & Bal, 2016; İlhan, Topaloğlu, & Özyamanoğlu, 2013) or dividend policy and corporate governance (Aydin & Cavdar, 2015; Gürbüz, Aybars, & Kutlu, 2010; Mazgit, 2013; Mitton, 2004) or capital structure and firm performance (Atmaca, 2012; Bayrakdaroğlu, 2010; Doğan, 2013), we couldn't find a study directly testing free cash flow hypothesis or testing relationship between free cash flow and dividend or leverage in the context of agency cost or corporate governance.

3. Data and methodology

3.1. Data

This study used the IFRS yearly nonconsolidated balance sheets and income statements of 227 firms traded on Borsa Istanbul for the period 2008−2014. This data is obtained from the financial data network Finnet.

Table 1 shows the main indicator of main indicators of the companies listed in Borsa Istanbul in 2008−2014. The table also gives information about total paid cash dividend, total assets and total equity of the companies that are used in this study.

As seen from Table 1, nearly half of the listed companies are included the sample. During the period of 2008−2014 nominal capital increased by 65% and market capitalization increased by 3.43 times. According to our sample the ratio cash dividend paid out to total equity is around 4%.

The study follows company performance over a period of maximum 7 years, minimum 3 years and an average of 5.6 years. For years in which dividends were not paid out, the dividend rate per share is considered 0. The *free cash flow* (*FCF*) variable used in the regression is normalized by total assets in order to achieve comparable results.

Table 2 lists the variables used in the study as calculated using the items from company balance sheets and income statements.

Table 2
Variables used in the study.

Variables	Type	Formulation
DPS	Independent	Cash dividends paid out/number of outstanding shares
LEV	Independent	Total debt/total assets
LTLEV	Independent	Long-term debt/total debt
SIZE	Controlling independent	Ln (total assets)
FCF	Dependent	(Operating net income + depreciation expenses − corporate income tax − interest expenses − cash dividends)/total assets

Table 3 summarizes the descriptive statistics for all variables. Table 3 gives the mean, median, maximum, minimum, standard deviation, skewness and kurtosis values of the variables used in study.

In order to see the degree of the relation of the variables, a correlation matrix is reported in Table 4. As seen from Table 4, there are low correlations between variables. The highest relation is between size (in terms total assets) and dividend per share. The correlation between *DPS* and *SIZE*, 0.135, is at acceptable level.

3.2. Methodology

This study investigates whether the free cash flow hypothesis is valid in the context of Borsa Istanbul. According to the free cash flow hypothesis, high debt rations and/or high dividend payouts reduce the amount of free cash flow in the hands of managers, thus, reducing agency cost and helping to

Table 3
Descriptive statistics of variables.

	DPS	*FCF*	*SIZE*	*LEV*	*LTLEV*
Mean	17.87061	0.007971	0.432773	0.241405	18.09192
Median	0.000000	0.023275	0.392071	0.170003	18.16021
Maximum	1922.000	0.469173	14.57242	0.997912	23.42821
Minimum	0.000000	−1.314418	4.30E-05	0.000000	13.41040
Std. Dev.	99.74138	0.143423	0.562684	0.231729	1.700857
Skewness	11.33217	−3.541192	14.50943	1.086475	0.055353
Kurtosis	167.4381	26.39353	334.8442	3.386520	2.576064
Observations	1267	1267	1267	1267	1267

Table 1
Main indicator of the listed companies and sample.

Year	Main Indicators all listed firms			Main Indicators of firms used in analysis			
	No. of firms	Total nominal capital (million TL)	Market capitalization (million TL)	No. of firms	Total assets (million TL)	Total equity (million TL)	Total cash dividend paid out (million TL)
2008	326	63,300	182,025	161	36,138	17,096	826
2009	325	70,061	350,761	181	38,929	18,947	507
2010	350	80,806	472,553	195	45,175	21,698	561
2011	373	89,274	381,152	203	56,653	27,912	985
2012	395	96,634	550,051	191	59,361	30,721	1583
2013	405	103,179	503,668	174	66,134	33,219	1361
2014	401	104,540	624,369	162	66,868	32,136	1695

Sources: www.spk.gov.tr and www.borsaistanbul.com.

Table 4
Correlations between variables.

	DPS	LEV	UVLEV	SIZE
DPS	1	−0.036318	−0.025810	0.13505
LEV	−0.03631	1	−0.021134	0.08606
LTLEV	−0.02581	−0.021134	1	0.09032
SIZE	0.13505	0.086067	0.09032	1

discipline managers or aligning interest of manager and shareholders. This study tests whether a significant, negative correlation exists between free cash flow and debt ratios as well as free cash flow and dividend payouts in Borsa Istanbul. Assuming that free cash flow leads to overinvestment as per the hypothesis, the study also investigates whether a positive correlation exists between free cash flow and total assets in the same context.

This study uses the undistributed cash flow method to calculate free cash flow. This method was also used by Lehn and Poulsen (1989), Lang et al. (1991), Wells, Cox, and Gaver (1995), Gul and Tsui (1997), Chu (2011), Wu (2004), Wang (2010), Hong, Shuting, and Meng (2012), and Al-Azzawi and Zararee (2014). Some studies have normalized free cash flow with sales while others have done so using total assets. This study uses the total asset for normalizing free cash flow.

The relationship between free cash flow and dividends per share, debt ratios, long-term debt ratios and total assets is investigated in the context of the free cash flow hypothesis. The equation below is applied using a panel regression to the data of 227 firms traded on Borsa Istanbul for the period 2008–2014. Sarayloo and Sarafi (2016), Khan et al. (2012), Wells et al. (1995), Kargar and Ahmadi (2013) used similar forms of the equation below to test the variables listed above in varying combinations.

$$FCF_i = \alpha + \beta_1 DPS_i + \beta_2 LEV_i + \beta_3 LTLEV_i + \beta_4 SIZE_i + \varepsilon_i$$

The values of the variables in the equation above are as follows:

- *FCF*: Free cash flow/total assets
- *DPS*: Dividends per share
- *LEV*: Total debt/total assets
- *LTLEV*: Long-term debt/total debt
- *SIZE*: Total asset logarithm

This study uses the following hypotheses to test the free cash flow hypothesis:

- H1: Dividend payout ratio has negative, significant effect on free cash flow
- H2: Firm's leverage has negative, significant influence on free cash flow
- H3: Firm's long-term leverage has negative, significant influence on free cash flow
- H4: Positive correlation between free cash flow and total assets

Table 5
Results of unit root tests.

		Levin, Lin & Chu t	Im, Pesaran and Shin w-stat	ADF − Fisher chi-square
FCF	Stat	−55.33	−26.66	871.027
	Prob.	0.00	0.00	0.00
DPS	Stat	−68.37	−11.47	151.375
	Prob.	0.00	0.00	0.00
D(SIZE)	Stat	−60.65	−16.29	644.98
	Prob.	0.00	0.00	0.00
LEV	Stat	−67.45	−13.13	576.45
	Prob.	0.00	0.00	0.00
LTLEV	Stat	−28.87	−5.70	466.21
	Prob.	0.00	0.00	0.00

Notes: The variable SIZE has unit root at the level. We took the first difference to remove unit root. D shows the first difference.

4. Results

Studies based on time series data assume that the underlying time series are stationary. However, time series in finance are typically non-stationary or, in other terms, they contain a unit root. Some researchers argue that using non-stationary data may result in a highly autocorrelated residuals with low Durbin−Watson statistics and a non-constant mean over time (Kutty, 2010).

All variables are tested for unit roots using the Levin, Lin, and Chu (2002), Im, Pesaran, and Shin (2003) and Augmented Dickey and Fuller (1979) tests for the individual intercept equation. The results indicate that all variables are free of unit roots. Table 5 outlines the selected results.

Table 5 indicates that the probability values of the results of all tests have a statistical significance of 1%. Thus, no unit roots are present in the variables used in this study.

This study aims to test the free cash flow hypothesis proposed by Jensen (1986, 1993, 1989). According to this hypothesis, paying out dividends to shareholders and/or raising data ratios may reduce the agency cost arising from free cash flow. Therefore, a negative correlation is anticipated between *FCF* and the variables of *LEV* and *DPS*. In addition, a positive correlation between *FCF* and *SIZE* is expected due to the problem of overinvestment which result in increase in assets.

Table 6 outlines the results of the equation used to test the abovementioned relationships. Since the data period covers the

Table 6
Results of fixed-effects panel regression for all period and non-crisis period.

Variable	Whole Period (2008−2014)		Non-Crisis Period (2010−2014)	
	Coefficient	T-statistics	Coefficient	T-statistics
Constant	0.044011	5.72*	0.076109	7.63*
DPS	−0.000158	−3.17*	−0.000109	−2.16**
LEV	−0.051383	−4.54*	−0.145482	−7.68*
LTLEV	−0.032645	−1.65**	−0.020373	−1.046
D(SIZE)	0.046269	5.47*	0.042405	5.19*
F-statistics	4.52*		4.73*	
Adj R²	0.44		0.49	

Notes: * indicates a statistical significance of 1% and ** indicates a statistical significance of 1%. As the data are unbalanced, the two-way random-effects model could not be run due to missing data. In the one-way random-effects model, Hausman test favors the fixed effects model.

recent global financial crisis years, the estimation is repeated by excluding crises year from the sample. By doing so, it is possible to see whether crisis has impact on estimation.

According to the model, covered whole period, outlined in Table 6 and, 44% of *FCF* variability can be explained with variability in *DPS*, *LEV* and *SIZE* (the control variable). The *F-statistic*, which shows the overall statistical significance level of the predicted model, has a significance of 1%. If the period of the model is shorten by excluding crisis years, adjusted R^2 increases up to 0.49 and *F-statistics* is still significant at 1%.

Table 6 also indicates a negative correlation between the standardized *FCF* and the *DPS* and *SIZE* at the 1% significance level in period of 2008−2014 and at the 5% significance level in period of 2010−2014. According to the free cash flow hypothesis, paying out dividends is a way to reduce the agency cost of conflict of interest between shareholders and company managers. The negative correlation between dividend payouts and the amount of free cash flow under the control of managers confirms the hypothesis in the Turkish context.

A negative correlation with a statistical significance of 1% is found between *FCF* and *LEV* in both period of 2008−2014 and 2010−2014. This relationship is present between *LEV* and *FCF* as well as *LTLEV* and *FCF* in whole period. The results support the contention that free cash flow may cause managers to invest in projects with negative NPV and this practice can be mitigated with increased debt ratios in the Turkish context.

As expected, a positive correlation with a statistical significance of 1% exists between *FCF* and *SIZE* in both period of 2008−2014 and 2010−2014. According to the hypothesis, managers make decisions in favor of increasing assets for their own gain. At the same time, managers with their own interests in mind expand assets by investing in projects with negative NPV. For this reason, the significant positive correlation found between free cash flow and total assets supports the free cash flow hypothesis.

5. Conclusion

The free cash flow hypothesis argues that debt financing and dividend payouts are necessary to keep free cash flow under control and thus, align the interests of managers with those of shareholders.

This study investigates whether the free cash flow hypothesis is valid for companies traded on Borsa Istanbul using the IFRS yearly nonconsolidated balance sheets and income statements of 227 firms for the period 2008−2014. A panel regression is used to test for a correlation between free cash flow and the variables dividends per share, debt ratios and total assets.

According to the results of the fixed effects panel regression, a statistically significant, negative, correlation exists between free cash flow and debt ratio as well as free cash flow and dividends per share. In addition, a significant positive correlation is identified between total assets and free cash flow. Even the crisis year 2008 and 2009 are excluded from our sample, the results did not change significantly. The results support the free cash flow hypothesis. As the hypothesis

suggests, the distribution of dividends and debt financing reduce free cash flow. In other words, firms with high dividend distribution and high debt ratios have a lower amount of free cash flow under the control of managers.

The results of this study may also shed light on the practices of regulatory bodies. The free cash flow hypothesis suggests that dividend distribution and external financing reduce the amount of free cash flow at the disposal of managers. Therefore, regulatory bodies may encourage dividend distribution in an effort to align the interests of managers with those of shareholders, thereby reducing agency cost.

Future studies may investigate whether asignificant relationship exists between free cash flow and company performance and/or company value.

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