Peer Effect in Firms' Financial Decision Making: Evidence from Corporate Capital Structure

Muhammad Mudassar Anwar[*], Arshad Hassan[†] and Filza Hameed[‡]

Abstract

The current study investigates the impact of corporate financial decisions on peer firms' financial decisions. The current study utilized two sets of independent variables which are firm specific characteristics and peer firms' specific characteristics (profitability, market-to-book valuetangibility and firm size). In order to address correlated effects the study used two macroeconomic factors which are interest rate and stock market return. GMM model for panel regression analysis was used for encountering probable endogeneity problem in independent variable. The results of the study confirmed the impact of peers' financial decisions while determining one's own capital structure.

Key Words: Peer firms, Capital structure, Endogeneity

Introduction

A certain change in an individuals' behavior because of its peers' can be referred to as peer effect. An individuals' behavior is directly influenced by the actions of each other hence peer influence is attractive. Since human nature is to follow the paths which are made by others and advance their affairs through imitation. Strong empirical evidence too confirmed that individual behavior is influenced by those of their peers (Clark & Loheac, 2007). Hence one of the basic reasons can be that people converge their behavior as they have same information, similar problems, options and payoffs consequently make similar choices. Certainly opposite taste leads towards opposite actions even though information is same (Bikhchandani,Hirshleifer & Welch, 1998). So people imitate when they have same payoffs. Instead of relying on one's own abilities they choose to be followers.

In this context, corporate world is the most suitable domain for analyzing such peer effects as financial decisions taken by competitors' (peers) call others' to pay attention. Financial decisions are important

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[*] Muhammad Mudassar Anwar , PhD Scholar, Capital University of Science & Technology (CUST), Islamabad Email: mudassarswati@yahoo.com

[†] Dr. Arshad Hassan , Dean Faculty of Management & Social Sciences, CUST, Islamabad

[‡] Dr. Filza Hameed, Assistant Professor University of Kotli Azad Jammu and Kashmir, Kotli

seeing that it directly impact overall expansion and growth of an economy. The extant literature so far has highlighted the importance of using information and decisions of peers' while making ones' own financial decisions.For instance, a study of Moon & Bates (1993) concluded that while taking strategic decisions firms rely on financial information of their peer firms'. Consistently Guilding (1999) conducted a survey in New Zealand and found that before making strategic decisions firms critically analyze market share, sales volume as well as profit of peer firms. Simons (1990) too confirmed that peers' sales, costs, profit margins, and other financial information is utilized by the firms to deduce prevailing trends and future demands of an industry.

As evidenced from the above mentioned literature it is quite clear that peer firms have significant role in the corporate world. Yet it is difficult to recognize peer effect because of reflection problem (Manski, 1993) as because of this it is hard to deduce that either firm's actions are accredited to peer firms' actions or characteristics. Hence, to understand this appropriately three effects which are: endogenous effect, exogenous (contextual) effects and correlated effects proposed by Manski (1993) needs to be explored.   Endogenous effects are when firms' because of actions of peers also decides to do the same. Exogenous effects are when a firm adjusts its financial policy due to change in the characteristics of the financial policies of the peer firms. Lastly, correlated effects are when a change in the external environment makes it compulsory for both firm and industry to align their financial policies respectively.

Since lack of sufficient information hinders' managers' ability to analyze and determine cause and effect relationship to assess full range of possibilities (Milliken, 1987). This lead the attention of researchers' in numerous areas of economics and finance to explore the impact of peers on financial decision making. Seeing that decisions taken under uncertainty, ambiguity and time pressures can impair strategic thinking (Leder, Hausser & Mojzisch, 2013). Therefore in complex strategic situations imitation can be best available option (Apesteguia, Huck & Oechssler, 2007; Offerman, Potters & Sonnemans, 2002). Mostly business world prefers to take all those decisions taken by their peers. Hence, the current study explores the importance of peer firms' information and decisions in taking their own financial decisions. As there is dearth of literature in this perspective specifically in emerging nation Pakistan. So, this study attempts to bridge this gap in the literature by providing empirical evidence in this context.

Literature Review
Peer Effect
Peer effect can be referred to as a certain change in an individuals' behavior that is mainly because of its peers'. In the last few years, economists' utilized efforts to explore how peers' can impact financial decision making. In this line, two most compelling reasons highlighted by researchers' can induce corporate managers' to imitate their peers' which are information needs as well as competitive pressures (Lieberman & Asaba, 2006). While it is costly as well as time consuming to acquire sufficient, right and relevant information. And secondly by imitating rivals' helps in reducing competitive pressures. From social perspective, this approach is considered as irrational as well as inefficient (Scharfstein & Stein, 2000). Thus exploring and understanding this approach from the corporate world's perspective is imperative as firms constitute financial markets.

The literature so far discussed in this study highpoints the standing of peer firms in the corporate world. However, theoretically identification of peer effect can be critical due to mirror image (Manski, 1993). This may arise as it is hard to deduce either one's actions are result of actions or characteristics of its peers. So for accurate peer effect analysis three effects classified by Manski (1993) requires to be explored. These are: endogenous effect, exogenous (or contextual) effect, and correlated effect. Manski demonstrated that in the context of linear-in-means model two problems concerning identification occurs. First is the difficulty regarding distinguishing real social effects (endogenous plus exogenous effects) from those of correlated effect. Secondly, even if correlated effect does not exist mean outcome of the group and its characteristics exist in perfect collinearity because of interacting peers' synchronized behavior. Thus the identification of endogenous effect from exogenous effect hindered because of reflection problem. When two individuals' influence each other at the same time it much more difficult to segregate causal effect that they have on each other (Sacerdote, 2001). Generally the existence of exogenous peer effect entails that these characteristics affects both individuals' as well as peers' outcome.

Various empirical studies stressed on the significant role of peers' in devising corporate financial policies specifically determining their capital structure. For instance, Leary & Roberts, (2014) asserted that peer firms' usually adopt same type of financial policies. From capital structure perspective, studies confirmed peers' influence on determining firms' capital structure (Frank & Goyal, 2009; Leary & Roberts, 2014; MacKay & Phillips, 2005). These evidences advocate that

in the corporate world managers' imitate others (peers) to make best capital structure decisions.

Capital Structure

Capital structure can be referred to as a method whereby a firm uses debt, equity or combination of these two to finance its resources (Saad, 2010). The decision regarding structure of capital is very much important to handle overall functions and economic situation by utilizing different financial resources. Finance managers' always attempt to set an optimal capital structure specifically for equity traders and generally for staff, customers, lenders and society (Pandey, 2009). Modigliani & Miller's (1958) influential work on capital structure irrelevancy has pushed researchers' to develop an optimal capital structure. Miller & Modigliani (1961) argued that firms' equity itself determines its capital structure. According to them, the concepts concerning capital structure functions only in ideal situations /conditions of industry such as no taxes, lack of bankruptcy cost, perfect competition along with industry effectiveness.

MM Theorem affirmed that in ideal industry conditions firms' equity is irrelevant to the capital structure of the firm. In other words, they demonstrated that in perfect market where there are no taxes, transaction as well as bankruptcy cost and asymmetric information, firms' value is unrelated to how firm generate finance. More to the point firms' perfect surrogate to finance its investment are internal as well as external funds; therefore financing decisions are unrelated to firm's value. Their irrelevance theorem accepted as true in general. Afterward researchers' devoted much time and effort to learn these market imperfections to set optimal capital structure.

Four coremodelsof capital structure (the trade-off theory, the pecking order theory, the agency theory, and signaling theory) provide useful insights regarding the firms' financing behavior are proposed. Almost all these theories assume that optimal capital structure has to be set through conducting cost-benefit analysis of debt. The advantage of debt consists of tax advantage because interest expense is deducted from tax. Contrarily, possible costs of debt include agency- bankruptcy cost as well loss of tax shield protection on debt (Brealy et al., 2012). So, hypothetically deciding about optimal capital structure requires careful balance between associated benefits besides costs.

Determinants Of Capital Structure

Abundant researchers' used different ways to inspect determinants of capital structure. The current study utilized profitability, market-to-book ratio, tangibility and firm size as determinants of capital structure. The justification entailed in literature (pecking order) affirms that firms with huge *profits* also have huge amounts of retained earnings thus these firms

prefers to rely on internal source of funding thus negative connection between leverage and profitability. Contrarily, high profitable firms can attain high levels of debt as debt tax shield protection helps them in saving their profits (trade-off). So, in this case leverage and profitability are positively related. Relating to *market-to-book ratio* an extensive literature stressed book-to-market ratio as a measure of growth opportunities (Chen & Zhao, 2006). Growing firms can have different aspects to deal with. On one side growing firms may evade borrowing finance as it causes them to impart rewarding opportunities of investment (Myers, 1977). On the other hand side, growing firms may require huge capital to expand which goes beyond internal financing to fund their investments. Thus in such cases or situations they might be more likely to acquire debt instead of relying on equity as proposed in pecking order theory by Myers & Majluf (1984).

Relating to *tangibility*, it enable firms to acquire more debt at cheaper rates (trade-off). Lenders' prefers to lend money to tangible firms as these firms can provide assets as security thusleverage and tangibility are positively associated. As per pecking-order theory Harris & Raviv (1990) squabbled that firms who possess a lesser amount of tangible assets counters more problems due to information asymmetry as it would make them issue more debt as equity issuance calls them to under-price them. Whereas, firms who possess more tangible assets are large in size so they can issue equity at right price and necessitate not issuing debt to finance investments'. So, positive relationship between leverage and tangibility is suggested (pecking order). As far as firms' *size* is concerned, it reduces default risk. Trade off theory holds that larger, established as well as reputable firms have more economical debt. Divergently, bigger as well as diversified companies are well known in the market thus these firms can issue equity with no trouble as compared to companies smaller in size (pecking order). Hence, a negative connection exists. Additionally, large sized firms usually use debt financing whereas firms smaller in size are more likely to use equity financing. Aryeetey et al., (2004) confirmed that smaller firms face huge problems while dealing with credit as compared to larger sized firms. As larger firms success rates to get bank loans are comparatively high than smaller firms, thus the relation between firm size and debt is assumed to be positive.

Peer Effect & Capital Structure

In general the motivation for mimicking behavior concerning capital structure has derived from herding behavioral designs (Devenow & Welch, 1996). In this context, Zeckhauser, Patel & Hendricks (1991) asserted that managers' may engage in herding activities while setting

policies for capital structure. It has been already proven by Banerjee (1992) and many more others' that acquiring information is costly as well as time consuming (Conlisk, 1980) so managers' prefers the decisions of others for making their own. Generally, it happens when other firms' are considered as more expert in the market place (Bikhchandani, Hirshleifer & Welch (1998).

Peer effect in capital structure can be easily understood by simplifying this phenomenon let's suppose there is no prior model to determine firms' capital structure. Therefore, managers' find it difficult to choose an optimal capital structure for their firms' as no previous information was available to them. As a result, they prefer to rely on the information of their peers' in an industry. Hence gaze at peer firms' characteristics as well as actions for making their own decisions (Leary & Roberts, 2014). Thus using peer information to set one's own capital structure and/or taking other financial decisions can be referred to as peer effect.

There can be number of reasons for peer effect in capital structure. Like, Bolton & Scharfstein (1990) proposed a model wherein greater level of leverage fuels cut-throat price competition from lesser leveraged competitors. If the projected cost of this cut-throat behavior is severe then under such conditions firms' who are highly leveraged will mimic their less leveraged competitors' capital structure. Correspondingly, Chevalier & Scharfstein (1996) suggested a design wherein firms' who are highly leveraged tends to under invest in the periods of industrial depression ultimately lose market share for conventional rivals. Accordingly, this loss can trigger firms' to imitate conventional policy guidelines of their peers'.

Peer effect in capital structure was particularly explored by Leary & Roberts (2014). They recommended that financial policies including capital structure to large extent are influenced and affected by their peers' indicating these effects as more powerful as compared to other effects mentioned in the literature. They found significant impact of peer effect on firms' financial policies as well as firms' leverage by inspecting the underlying mechanism of such influence. So, on the basis of above mentioned justification it can be hypothesized that:

H_1: *Peer firms' impacts firm's capital structure.*

Methods
Population & Sample

The *population* of this study was non-financial sector of Pakistan. In this study the corporate accounting data relating to firms' leverage policies was taken from the published annual audited reports of the firms' for the

period from 2005-2015. The justification for utilizing data for the period of 10 years (2005-2015) was its availability. As certain sectors comprised only one or two firms with non-available financial data, thus excluded. There are28 sectors excluding financial sector as defined by Pakistan Standard Industrial Classification (PSIC) Revised 4, 2010 code, represented in our sample.

Thirteen (13) non-financial sectors' listed on Karachi Stock Exchange from the period of 2005-2015 were study *sample*. Outliers' effect was mitigated by winsorizing top and bottom 2.5% of the variables. Concerning *sampling technique* the study utilized non-probability sampling method to select sample. Serving this purpose, convenient sampling technique was carried out.

Econometric Model

For examining the impact of corporate leverage policies we utilized GMM model for panel regression. For encountering probable endogeneity problem in independent variable GMM model was employed. In order to select between GMM random effect or GMM fixed effect we used **Hausman Test**to test below mentioned hypothesis:

H_0: *Random effects are consistent and efficient.*

H_1: *Random effects are inconsistence.*

Use of random effects model or fixed effect model completely depend upon the p-value. In current study the p-value became significant so our null hypothesis rejected thus we moved towards analyzing data utilizing fixed effect model.

Macro-Economic Factors To Address Correlated Effects

Moreover, there are certain macro-economic factors which impacts corporate financial decision making. Numerous past studies confirmed vital role of macro-economic factors in determining firms' capital structure (Bas, Muradoglu & Phylaktis, 2009; Eldomiaty & Tarek, 2007). Among several macro-economic factors, two key indicators which have been chosen are: Interest rate and Stock market performance. Results aforementioned studies found significant relationship between above stated macro-economic factors and financial policies of the firms. Hence, these macro-economic factors will be considered.

Baseline Empirical Model Peer Effect On Leverage

The following model of capital structure (Leary & Roberts, 2014) was used to investigate the impact of peer firms on corporate capital structure.

Leverage ij$t$= β0+ β1PLev -ijt+ β2Firm Specific Factors ijt-1 + β3Peer Firm Factors-ijt-1+ β4SM-1+ β5IR-1+Error Term

Where, leverage ijt is firm leverage, measured as the ratio of total debt to total book assets and subscripts *ijt* correspond to firm, industry and year, respectively. PLev –ijt is the average of peer firms' leverage, excluding firm *i*, from industry *j*, at year *t*. Firm Specific Factors ijt-1 are firm-specific characteristics of previous years. Peer Firm Factors-ijt-1 areprevious year average peer firms' factors, excluding firm *i*, from industry *j*, at year *t*. *SM-1*is stock market index of the previous year. *IR-1*is theinterest Rate of the previous year.

Results & Discussion
Descriptive Statistics
Table: 1

Variable	N	Mean	SD	Min	Max
Lev	1510	0.640666	0.321610	0.095686	2.970117
PLev	1510	0.048407	0.279588	-1.125036	0.681345
Firm-specific characteristics					
MBR	1510	2.142513	5.412647	0.157582	128.9775
PROFIT	1510	0.039877	0.105249	-0.278790	0.378761
TANG	1510	0.442997	0.217163	0.034651	0.908708
SIZE	1510	15.17959	1.691825	10.88380	19.05109
Peer firm-specific characteristics					
MBR	1510	0.238759	1.024216	-5.226391	3.531522
PROFIT	1510	0.003768	0.090845	-0.216824	0.266309
TANG	1510	0.002130	0.160905	-0.360894	0.341333
SIZE	1510	14.012788	1.230467	9.009315	18.184058
Macroeconomic Variables					
SM	1510	0.049149	0.071847	-0.059616	0.167027
IR	1510	0.078926	0.019556	0.048000	0.108000

Lev=Leverage, PLev = Peer firm leverage, MBR= Market to book ratio, PROFIT= Profitability, TANG= Tangibility, SM= Stock market return and IR= Interest rate
Correlation analysis
Table: 2

	Firm-specific characteristics					Peer firm-specific characteristics					Macro-economic factors	
	LEV(-1)	MBR	SIZE	TANG	PROFIT	PLEV	PMBR	PSIZE	PTANG	PPROFIT	SM	IR
LEV(-1)	1.000											
MBR	-0.289	1.000										
SIZE	-0.101	0.154	1.000									
TANG	0.220	-0.194	-0.116	1.000								
PROFIT	-0.393	0.457	0.213	-0.336	1.000							
PLEV	-0.622	0.118	0.001	-0.077	0.310	1.000						
PMBR	0.151	-0.399	-0.228	0.076	-0.259	-0.152	1.000					
PSIZE	0.042	-0.054	-0.735	0.059	-0.152	-0.124	0.106	1.000				
PTANG	-0.203	0.025	0.111	-0.692	0.244	0.172	-0.167	-0.132	1.000			
PPROFIT	0.273	-0.246	-0.142	0.232	-0.764	-0.406	0.306	0.164	-0.275	1.000		
SM	-0.054	0.022	0.012	0.095	0.019	0.001	0.046	0.017	0.062	0.078	1.000	
IR	-0.011	-0.347	0.104	-0.041	-0.073	-0.154	-0.142	0.041	-0.061	-0.023	0.045	1.0

Lev=Leverage, PLev = Peer firm leverage, MBR= Market to book ratio, PROFIT= Profitability, TANG= Tangibility, SM= Stock market return and IR= Interest rate

Table 1 shows descriptive statistics. There are two distinct categories: firm-specific characteristics and peer-firm specific characteristics. The mean of corporate leverage policy is 0.640 and mean of peer firm leverage policy is 0.048 respectively. Relating to firm-specific characteristics, the mean of market to book ratio (MBR) is 2.142, profitability (PROFIT) is 0.039, tangibility (TANG) is 0.442 and size is 15.179. Relating to peer firm-specific characteristics the mean of market to book ratio (MBR) is 0.238, profitability (PROFIT) is 0.003, tangibility (TANG) is 0.002 and size is 14.012. The means of macro-economic variables stock market return (SM) and interest rate (IR) used in the study are 0.049 and 0.078 respectively.

Table 2 depicts correlation analysis. Relating to firm specific factors, the correlation coefficient of lag value of leverage with market to book ratio (MBR) and size is negatively correlated which is -0.289 and -0.101. The correlation coefficient of lag value of leverage with tangibility is positively correlated which is 0.220 and negatively correlated with profitability that is -0.393. Relating to peer firm-specific characteristics the lag value of leverage with peer market to book ratio (MBR) and peer size is negatively correlated which is -0.152 and -0.124. The correlation coefficient of lag value of leverage with peer tangibility is positively correlated which is 0.172 and negatively correlated with peer profitability that is -0.406. Relating to macro-economic factors the correlation of stock market return (SM) with lag value of leverage is negatively correlated (-0.054) whereas positively correlated with market to book ratio (MBR), size, tangibility (TANG) and profitability (PROFIT) which is: 0.022, 0.012, 0.095 and 0.019 respectively (firm-specific characteristics). The correlation of stock market return (SM) is positively correlated with the lag value of peer leverage, market to book ratio (MBR), size, tangibility (TANG) and profitability (PROFIT) which are 0.001, 0.046, 0.017, 0.062 and 0.078 respectively (peer firm-specific characteristics). The correlation of interest rate (IR) with the lag value of peer leverage, market to book ratio (MBR), tangibility (TANG) and profitability (PROFIT) is negatively correlated which is -0.011, -0.347, -0.041 and -0.073 respectively and positively correlated (0.104) with size (firm-specific characteristics). The correlation of interest rate (IR) with the lag value of peer leverage, market to book ratio (MBR), tangibility (TANG) and profitability (PROFIT) is negatively correlated which is -0.154, -0.142, -0.061 and -0.023 and positively correlated (0.041) with size (peer firm-specific characteristics).

Table 3 shows impact of peer firms' on corporate capital structure. The coefficient of PLev is 0.3916 significant at 1% level with the t-value of 20.075 which depicts that firms' corporate capital structure policy is significantly influenced by those of its peers. Furthermore, this result confirms endogenous effects. Relating to peer firm-specific characteristics, significance of peer firm characteristics shows that individual firms also adjust their capital structure in the response of change in the characteristics of their peer group. For instance, the market to book ratio (MBR) and profitability (PROFIT) of peer firms significantly (1% level) negatively impacts firm's capital structure with the values of -0.0189 and -0.3268. Moreover, coefficient of tangibility (TANG) of the peer firm is 0.0602 significant at 10% level and size is -0.0082 significant at 10% level. To address correlated effects stock market return (SM) and interest rate (IR) were used which further affirms the existence of correlated effects as the coefficient of stock market return is 0.0939 significant at 5% level and the coefficient of interest rate (IR) is -1.1793 significant at 1% level. The results of the study confirm the impact of peers' while determining capital structure of the firm. Thus, H_1 accepted.

Regression Model
Table: 3

	Coefficient	t-value
PLev	0.391622***	20.07514
Firm-specific characteristics		
MBR	-0.008605**	-2.126603
PROFIT	-0.300528***	-4.558351
TANG	0.043519*	1.725368
SIZE	-0.002896	-0.865000
Peer firm-specific characteristics		
MBR	-0.018974***	-3.887705
PROFIT	-0.326897***	-10.33580
TANG	0.060247*	1.995487
SIZE	-0.008250*	-1.975931
Macroeconomic Variables		
SM	0.093983**	1.989011
IR	-1.179388***	-5.856153
R-squared	0.841911	
J-statistic	546.5104	
Prob(J-statistic)		0.100000

*Note: Lev=Leverage, PLev = Peer firm leverage, MBR= Market to book ratio, PROFIT= Profitability, TANG= Tangibility, SM= Stock market return and IR= Interest rate. Moreover, * significance at a 10% level (two-tailed test), ** significance at a 5% level (two-tailed test), and *** significance at a 1% level (two-tailed test).*

Discussion& Conclusion
The results of the study confirmed peers' as a significantfactor for devising firm's capital structure. The peer firm leverage ratio coefficient (0.3916 significant at 1% level) is greater than any other firm specific or industry specific coefficients of factors. This concludes that behavior of peers' significantly impacts more as compared to any firm or industry specific factors. Furthermore, firms do not devise policies in separation; they consider financial information and decisions of their peers' in order to make their own financial decisions (Clark & Loheac, 2007; Guilding, 1999).These results are consistent with the previous study conducted by Leary & Roberts (2014).The results of the study also confirmShleifer & Vishny (1992) argument relating to industry equilibrium.

Moreover, the results of our study too confirmed that the coefficients of peer firm-specific characteristics (market to book ratio, profitability, tangibility, and size) are greater than the coefficients of firm-specific factors (table 3) which reveals that while setting the firm's leverage policy more attention is given on the averages of the peer firm characteristics. In this regard, Mackay & Phillips (2005) too confirmed that characteristics of peer firms are more relevant for a firm to set its financial policies. This can be because of similarity in the characteristics of the product as well as the target market which compel the firms' to imitate the financial policies of each other. As per Bolton & Scharfstein (1992)model where the expected cost of debt can be severe, more levered firms' imitate the capital structure of their less levered rivals. Furthermore, free-riding benefit relating to acquisition of information as well relative evaluation of performance may attract managers' to engage in mimicking behavior while determining policies relating to capital structure.

Finally it can be apparently seen from study results that stock market return as well interest rate (macro-economic factors) impacts all the firms' in the group indicating significant influence of correlated effects on firm's leverage policy. Positive market behavior encourages firm to get the finance by generating debt whereas, increase in interest rates holds them back towards issuing equity. These results are consistent with previous studies (Bas, Muradoglu & Phylaktis, 2009; Eldomiaty &

Tarek, 2007) that macro-economic factors play significant role in determining capital structure of the firm.

Limitations & Future Directions

Despite fruitful findings of the study there exist few limitations as well. First is issue of generalizability. The results of the study could not be generalized for financial sector of Pakistan as study utilized data relating to non-financial sector of Pakistani firms. This study has used 13 sectors to check peer effect, for better understanding and for comprehensive analysis rest of all sectors needs to be utilized which lefts a room for future researchers' to conduct studies in this perspective. For future studies financial sector of Pakistan needs to be considered as it may have different mechanism, findings as well as managerial implications.

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