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The Impact of Intangible Assets on Market Value of Firms: Evidence from Pakistan's Stock Exchange

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Abstract

This study estimates the economic value of intangible assets (IAs) on the market values (MVs) of firms. The IAs play an important role in the future development and success of firms. A firm having more IAs and Research and Development (R&D) expenditures can be more innovative and competitive in the production of goods and service delivery. Therefore, this study finds the impacts of IAs on the MVs by taking a sample of 66 firms listed on Pakistan's Stock Exchange (PSX) from the period 2007 to 2014. For empirical analysis, the conventional Fixed Effect, Random Effect and Generalized Method of Moment (GMM) models are applied on annual data. The results depict that IAs have increased the MVs of firms in Pakistan. Moreover, leverage ratio and managerial efficiency have also increased the MVs while the expenditures on marketing and advertising have decreased the MVs of firms. This study suggests that firms' managers can increase investment in the accumulation of IAs for maximization of the MVs. Moreover, the investors and other market participants should also look at the level of IAs before investing in stocks as well as other determinants, especially leverage and managerial efficiency. The value relevance of leverage has also been a worthy policy recommendation for Pakistani firms. So, there is a scope for increasing the debt ratio for the shareholders' value maximization.

Keywords: Intangible assets, market value, book values, leverage, efficiency

JEL Classification: G10, G32

1. Introduction

For the past more than three decades, intangible assets (IAs) and other related knowledge accounts have become key factors for the sustainability and growth of firms. In the era of the knowledge economy, the sources of wealth creation have changed from traditional production factors (land, labor and capital) to IAs (Komnenic et al., 2010). Therefore, the level of investment in Research and Development (R&D) and other IAs have exceeded tangible assets in the recent past. Firms invest in IAs to strengthen and maintain market competitiveness and increase future profitability (Ballester et al., 2003; Crass et al., 2014; Xu & Zhang, 2021). However, the accounting rules did not follow this tendency and still account only the internally generated IAs that are recorded at acquiring a company for fair valuation. This lack of registration of IAs in the financial statements of firms are partially responsible for the loss of relevance of accounting information in assessment and projections of firms' fair value. The investors and other stakeholders' demand for information changes according to evaluation of the economy, society, skills and knowledge of the workforce and emergence of new technology that must be incorporated in the financial statements of firms. Otherwise, they can't make sound investment decisions without knowing the factors that are responsible for the gap between MVs and book values (BVs) of firms (Kramer et al., 2011; Lev & Zarowin, 1999; Marzo, 2013).

According to the efficient market hypothesis, "the market price of a share immediately incorporates all relevant information regarding assets; therefore, the current share price is the best measure of MVs of an

asset" (Fama, 1970). It means that the BVs of an asset should be close to the current MVs (share price) on the same date. However, most firms' MVs are greater than the BVs. So, there is an, "accounting fallacy" in the gap between market and book values and it should be amended on the basis of the theory of firm's value (Lev & Zarowin 1999; Marzo, 2013). This gap is related to market expectation and missing of IAs from the balance sheet due to restrictions of accounting standards (Hulten et al., 2008; Marzo, 2013; Sveiby, 1997). The IAs are the past expenditures of firms on innovation and research activities, skill development of the work force and also the expenditures on the creation of good customer relations, purchase of patents, copyrights and brand equity. As accounting conventions, investment on accumulation of IAs are considered expenses rather than amortized, therefore they are not shown in the financial statements of firms. That is why, the BVs of almost all firms are undervalued as compared to the MVs (Falato et al., 2013; Stewart, 1997; Sveiby, 1997).

Mostly, the literature attributes the deviation between the MVs and BVs to the absence of IAs from the balance sheet (Andriessen, 2004; Stewart, 1997; Sveiby, 1997). The role of IAs on the firm's future development and success is paramount. An increasing body of literature studied the impact of R&D expenditures on MVs of firms in different countries (Ballester et al., 2003; Jinsu & Gee-Gung, 2011; Rahko, 2014). The findings indicated that R&D expenditures have positive consequences for the firms' MVs. The investment in R&D and advertising are positively associated with the profitability of firms, return on assets and MVs. Moreover, in the recent past, the revolution in technology due to R&D investment helped firms to be more innovative and competitive in the production of goods and service delivery (Bae & Kim, 2003; Xu & Zhang, 2021). Similarly, Rahko (2013) and Bosworth and Rogers (2001) showed that the intangible capital such as brand names, trademarks, software and patent rights have significantly positive consequences for the MVs. Some researches indicated that by disclosing relevant information regard to IAs in financial statements helped investors and other market participants to make right economic and investment decisions. Moreover, it also helped the top management and directors to take advantages from the changing economic and market scenarios. Empirical studies also indicated that recognizing IAs on the balance sheet have a positive impact on the return on equity, revenue, share value and other financial variables. A company having a lot of IAs has an edge over the competitors. As the returns on tangible assets are more or less equal for all actors in the market (Aboody & Lev, 1998; Bismuth & Tojo, 2008; Volkov & Garanina, 2004).

Similarly, advertising expenditures are carried out in expectation of increasing the firm's profit as well as developing long term customer relationships. It also increases the profit of a firm but we do not know exactly the revenue generation of the intended advertising campaign. Therefore, accountants of firms do not show this expenditure as assets in the balance sheet. However, advertising expenditures might increase the demand of the firm's products and services leading to increase the firms' market capitalization (Ding et al., 2007; Joshi & Hanssen, 2009; Nizik & Nissim, 2011). Similarly, Chemberlin (2010) showed that advertising and marketing campaigns changed the consumers' taste and created brand loyalty. Consumers get utility by consuming the advertised goods in the form of social status and prestige symbols (Hockman & Luski, 1988; Nichols, 1985).

Most of the empirical studies on IAs and advertising expenditures and their contribution for the market to book value have focused on the developed countries. There are dearth of empirical studies in developing countries, especially empirical researches relating to IAs are limited in Pakistan. Therefore, this empirical study contributes to the literature by quantifying the IAs not revealed in the firms' balance sheets and their contribution for the MVs by recognizing the actual business potential when they are considered. Therefore, this study finds the impact of IAs and other factors such as advertising expenditures, leverage ratio and managerial efficiency on the market valuation of Pakistani firms.

2. Review of Literature

There has been a great interest in IAs primarily focusing on R&D and its importance for the firm's productivity and economic growth in early 1960 (Griliches, 1981; Hall et al., 1984). However, R&D expenditures are the small part of IAs that involve marketing, workforce training, work environment and ethics and the whole surrounding process of a particular firm or industry. IAs are those identifiable non-

monetary assets that are not seen, touched and (or) physically calculated. These assets are created over time by investing in human capital, research activities and sound customer relations. These non-monetary assets without tangible substances are believed to be very important for future profitability of a firm and also give a competitive edge over the competitors. They include patents, goodwill, skilled workforce, good customer relationship, computer software, copyrights, trademarks, knowledge accounts, marketing rights etc. (Marzo, 2013; Stewart, 1997; Xu & Zhang, 2021).

In conventional economic growth theory and accounting standards, IAs are not assumed to be an investment in a company's future. Therefore, marketing, worker training and other innovation related expenditures are considered as current expenses. According to the International Accounting Standard (July 1, 2009), these expenditures cannot be recorded as IAs as they contribute to the goodwill derived from the expected future earnings. However, these IAs are recorded at the time of business combination (Castro & Benetti, 2017; Cañibano et al., 2000). In case of business combination, the acquiring firm calculates, and records all assets comprising recognizable IAs and liabilities at MVs. The IAs are different from tangible and financial assets (stocks, bonds, securities) due to its specific attributes of partial excludability (limited protection, property rights) and non-marketability. There is no active market for the valuation of these IAs. Therefore, such attributes of IAs have significant implication on the valuation, measurement and financial reporting (Pastor et al., 2017).

There are various approaches to measure the IAs. One is the approach of Corrado et al. (2009), that finds the relationship between market to book value ratio of a firm over the time. It indicates what a firm invested and what the market values that investment. The difference or the market to book value gap is the measure of IAs. Therefore, in early 2001, companies were asked to fill this gap by as much as possible with a specific line of items for fair valuation when acquiring the company. Another way to measure the IAs is the recommendations of the Financial Accounting Standard Board (FASB) for companies acquiring IAs. It involves forecasting the cash flows associated with various intangible capitals such as copyrights, brand names, trademarks and so forth (Kiley, 2007). The third approach to measure the IAs is the valuing the cost of inputs occurred like other tangible assets. When an asset or an automobile is acquired, the value of that investment is recorded on the basis of how much is paid on that transaction. Applying this logic, Nakamura (2010) has measured the intangible investment. However, due to conceptual differences between tangible and IAs such as they are not fixed cost but continuous inputs to production, no market transactions and difficult to measure the depreciation cost, present measurement implications. Therefore, accountants are generally reluctant to capitalize such kinds of expenditures (Corrado et al., 2009; Hulten, 2008).

R&D expenditures are considered investments in IAs that are beneficial for future earnings and growth of firms (Ocak & Findik, 2019). Earlier empirical studies of Collen and Morel (2005) and Johnson and Newman (1968) showed no significant effects of R&D investment on the profitability and market valuation of firms. Similarly, Abbody and Lev (1998) indicated that capitalization of expenditures on software development had negligible impacts on the MVs. Similarly, Berzkalne and Zelgalve (2013) empirically examined the effect of IAs on the MVs of Baltic States' firms. Latvia and Lithuanian firms indicated a positive relationship between MVs and IAs while in the rest of the countries, the results had shown insignificant effect of IAs on the MVs. These odd results are attributed to the poor research design, quality of R&D data and small sample sizes.

However, there is enough empirical evidence that supports the notion of increasing MVs of firms due to the accumulation of IAs through investment. According to Castro and Benniti (2013), the market price of stocks or equity incorporates all relevant information including IAs and financial plus non-financial information regarding to assets of firms, therefore it is considered a suitable measure of firms' MVs. This study also found a positive relationship between corporate MVs of Brazilian firms and the IAs shown in the financial statement. Similarly, Bubik and Susak (2015) studied the impact of IAs on the financial performance of Croatian firms. The results depicted that accumulation of IAs had positive consequences for the firm's financial performance such as return on equity, gross and net profit margin. Choi et al. (2000) estimated the effect of reporting IAs in the financial statements on the MVs of a firm's equity. The findings revealed that the financial market gave positive signals to recognizing the IAs in the financial statements.

Laitner and Stolyarov (2003), Soler et al. (2007), and Sveiby (1998) attributed the whole variation between corporate MVs and BVs to the absence of IAs from the balance sheets. The positive impact of the IAs on a firm's MVs supports the argument of amortization and capitalizations of R&D investment over the time rather than direct expense being a suitable accounting rule (Griliches, 1981; Herschey & Waygandt, 1985). Similarly, Ivanov and Mayorova (2015) also showed that accumulation and sound management of intangible capital help to increase competitiveness as compared to their counterpart firms in the Russian market. Sougiannis (1994) studied the impact of accumulation of IAs through R&D on MVs and profit of US firms. The results indicated that one percent increase in R&D investment leads to five percent increase in the MVs and two percent in the profit of the firms.

Similarly, Bae and Kim (2003) and Boswork and Rogers (2001) have studied the R&D investment carried out by the US, Germany, Japan and Australia firms. The findings indicated that expenditures on R&D had a positive impact on MVs of firms in all three countries. Chu and Chung (2001) also estimated the impact of R&D expenditures on the MVs of Korean firms. The results indicated that 1 won (Korean currency) of R&D expenditures generates on average 1.25 won earnings over the following two to four years. The results also indicated that the capitalized portion of the R&D has longer impacts on the earning as compared to the expense portion. So, the brief literature review indicated that investment in IAs in the form of R&D expenditure have a positive impact on the MVs of firms and also give a competitive edge over the competitors. Moreover, advancement in technology also helps firms to be more innovative and competitive in the production of goods and service delivery.

3. Data and Methodology

3.1 Theoretical Framework

The determinants of equity valuation is the core question in finance literature. The traditional method of valuation focuses on the historical figures such as balance sheet, income or cash flow or forecasting and weighted average cost of capital (Falthem & Ohlson, 1995; Fama & French 1985). However, some other studies employ the Tobin's q (1969) approaches for firm's valuation (Bae & Kim, 2003; Jin & Jorion, 2006). The Tobin's q is defined as the market capitalization of a firm divided by the replacement cost of its assets (Lewellen & Badrinath 1997; Wernerfelt & Montgomery, 1998). However, due to complexity of theoretical Tobin's q and unavailability of data on the replacement cost of Pakistani firms, we cannot calculate the conventional Tobin's q. Therefore, this study follows the methodology adopted by Bae and Kim (2003), Bhagat and Welch (1995) and Jin and Jorion (2006) for the measurement of MVs and BVs. So, the Tobin's q is equal to MVs of firms' equity divided by the BVs of firms' assets. Besides IAs, there are a host of other variables that also affect the MVs. The inclusion of control variables are based on the previous empirical research on determinants of MVs of firms. Advertising and marketing campaign, leverage ratio and managerial effectiveness are included as control variables that have also effects on MVs of firms (Al-Fayoumi & Abuzayed, 2009; Brealy et al., 2001; Dumay, 2012). So, the econometric model is developed as follows.

$$MBV_{it} = \alpha_0 + \alpha_1 IA_{it} + \alpha_2 AE_{it} + \alpha_3 LEV_{it} + \alpha_4 ME_{it} + \alpha_5 D_{it} + \mu_{it} \dots\dots\dots (1)$$

In the above equation (1), MBV, IA, AE, LEV and ME show the ratio of market to book value, ratio of intangible assets (IAs) to book values (BVs), ratio of advertising expenditures to BVs, leverage ratio, and managerial efficiency calculated by net sale over the total assets respectively. While, D is a dummy variable introduced for the financial crisis of 2007-08. α_0 is the intercept while, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$, and α_5 are coefficients or slopes while μ_{it} is the error terms.

3.2 Data and Variable Construction

Ratio of market to book value (MBV) is our dependent variable. It measures firms' efficiency and future growth. A higher value of MBV shows that the market gives more value to the additional investment in the net assets as compared to the replacement cost (Chung & Pruitt, 1994; Wernerfelt & Mongomery, 1988). So, the MVs equal to the product of the price of common shares/stocks plus the BVs of preferred shares while the

BVs is the original costs of all the assets of a firm less the depreciation cost (Bae & Kim, 2003; Brealy et al., 2001).

IAs are our main independent variable. It is an accumulation of past expenditures on the R&D and human capital such as training and skill development of the workforce, patents, copyrights, trademarks, brand names, software etc. (Faleto et al., 2012; Stewart, 1997). The literature indicates that IAs help firms to be more innovative and competitive in the production of goods and service delivery leading to competitive edge over the competitors. Similarly, the advertising expenditure is our second independent variable. Due to unavailability of advertising data, selling, distribution and marketing expenditures are employed as a proxy for advertising expenditures. It is expected to spur demand for the firm's products by creating a sound relationship with customers. The expected impact of advertising on the MBV is dubious. Successful advertising campaign can increase the MBV and future earnings while ill perceived and unsuccessful advertising can have negative consequences for the profitability (Bublitz & Ettredge 1989; Han & Manry, 2004).

The leverage ratio (LEV) or debt to equity ratio measures the financial health of a firm. It shows the proportion of debt and equity in the firm's assets. It is the sum of total short term and long-term debts of the firm to the BVs of the firm. The leverage ratio has also an effect on the firm's MVs. But in theoretical and empirical literatures, there is no unanimity on the effect of leverage ratio on the MVs**.** Modigliani and Miller (1958) opine that the capital structures have no significant role on the market valuation. But in their 1963 study, they revised their original views by incorporating the tax advantages of leverage ratio on the market capitalization of firms. Most of the empirical studies show that there is an optimal level of debt and beyond that level, increase in the leverage ratio decreases the MVs of firms due to high risk of insolvency (Antwi & Zhao, 2012; Bhandhary, 1988; Krause & Litzenbergr, 1973).

Our last independent variable is the managerial efficiency (ME). The assets turnover ratio is used as a proxy of ME. This ratio gives a clue to investors and creditors that how a company utilizes its assets to produce products and sell. So, a higher ratio has a favorable effect on MVs of firms. The ME is expected to increase the firms' productivity and MVs by using the scarce sources efficiently and optimally (Al-Fayoumi & Abuzayed 2009; Fiordelisi & Molyneux, 2010).

The data on BVs, IAs, ME and LEV are acquired from the Balance Sheet Analysis of Non-Financial Firms by the State Bank of Pakistan (SBP) from 2007 to 2014. Moreover, the monthly data on the stock's prices are obtained from the PSX data portal. The monthly closing shares' prices are then converted into year by talking monthly average. We used the selling, distribution and advertising expenditures as a proxy variable, due to unavailability of data on the advertising and marketing expenditures. Our sample consists of 66 non-financial firms listed on Pakistan Stock Exchange (PSX). As most of the firms do not mention the investment on R&D and related IAs in their balance sheet, therefore, the sample includes those firms which have data on IAs during the sample period. The selected firms from various sectors are given in table 1. It shows that oil refinery, exploration and energy, textiles, auto assemblers, automobile parts, pharmaceuticals and chemicals are the major sectors in our sample that invest in research and innovation and other related knowledge accounts. While only 3% of cement, fertilizer and food and personal care sectors' firms in our sample invest in R&D and other related IAs. It shows that cement, fertilizer, food and personal care sectors are the least research-intensive sectors in Pakistan. The majority of these firms are in private ownership and the private sector is more reluctant to invest in R&D and other related IAs.

Table 1: List of Selected Firms for each Sector

S/NO	Sector	No of Companies	% in Sample
1	Auto assemblers and Automobile Parts	8	12.1
2	Cables and electrical appliances	3	4.5

3	Cements	2	3
4	Engineering	6	9
5	Fertilizers	2	3
6	Food and Personal Care	2	3
7	Oil refinery, Gas exploration and energy	12	18.1
8	Paper and Board	3	4.5
9	Pharmaceutical and Chemicals	6	11
10	Sugar	6	8
11	Technology	4	5
12	Textiles	12	18.1
Total		**66**	**100**

Source: Balance Sheet Analysis of Non-Financial Firms by SBP

3.3 Econometric Techniques

This study finds the impacts of IAs on the MBV by taking a sample of 66 firms listed on PSX from the period 2007 to 2014. Due to micro- panel data (8 years), the fixed effect (FE) and random effect models are the suitable econometric techniques for empirical analysis (Arellano & Honoré, 2001). The FE model examines the relationship between the dependent variable and independent variables that change over the passage of time within a firm. While in the RE model, it is assumed that there is no correlation between the independent variables and the error terms (Arellano & Honoré, 2001). So, in the case of RE, we assume that the error terms (both the individual's time invariant effects and other remaining error terms) are independent and identically distributed within an entity or firm. However, the decision between RE and FE are decided on the basis of the Hausman (1978) Test. It examines whether firm's time invariant specific effects are correlated with the included independent variables or not? So in this case, the null hypothesis (H0) indicates that the entity or firm's specific effect is not correlated with the independent variables, while the alternative hypothesis (H1) shows that the entity specific effect is correlated with the included independent variables. The rejection of H0 is the acceptance of the FE model and vice versa.

Besides, many economic and financial variables are interdependent and dynamic in nature. In order to tackle this issue, the Generalized Method of Moment (GMM) model is also applied. Due to correlation between the exogenous variables and error terms, the estimated parameter obtained through conventional FE and RE models become biased and the variances are also underestimated. In such cases, the GMM model produces unbiased and efficient results (Baltagi, 2008; Ebbes et al., 2004; Kim & Frees, 2006). For the short dynamic panel data, Arellano and Bond (1991) and Blundell and Bond (1998) have developed a model that produces efficient and unbiased estimates. Moreover, it also controls the endogeneity of all independent variables and also the inclusion of lag dependent variables as an instrument account for unobserved firms' specific effects (Arellano & Honoré, 2001; Woolridge, 2010). Finally, in order to incorporate the global financial crisis of 2007-2008, we also introduced a dummy variable.

4. Results and Discussions

4.1 Descriptive Statistics

The table 2 indicates the descriptive statistics of all the variables involved in our sample. The mean values of MVB and IA are 2.72 and 0.20 respectively. It indicates that the MVs of the firms involved in our sample are

greater than the BVs. It means that Pakistani firms are investing in knowledge accounts and other intangible capital and knowledge accounts, but the variation in the investment on related IAs is not too high. That is, the Pakistani firms consistently invest in R&D and other related soft assets. Similarly, the average advertising expenditure is 1.05. It also indicates that Pakistani firms are also investing in advertising for value creation but the variation in advertising expenditures is very high. Similarly, the mean value of leverage and managerial efficiency are 3.29 and 1.34 respectively showing that on average the Pakistani firms are using more debt as compared to equity.

Table 2: Summary Statistics

Symbol	Mean	Minimum	Maximum	Standard deviation
MBV	2.72	-9.68	225	11.6
IA	0.20	-3.93	19.35	0.96
AE	1.05	-29.19	73.79	4.47
LEV	3.29	-292.32	795.7	49.9
ME	1.34	0	6.91	0.99

4.2 Main Results and Discussion

Table 3 shows the results of FE, RE and GMM models. It shows that the accumulation of IAs have significantly positive effects on the MBV revealing the value relevance of IAs for market valuation. This result indicates that 1% increase in investment on IAs leads to 3.51% increase in the MBV on average. Investors and other market participants consider R&D investment and other IAs as positive signals for market capitalization. The market participants regard investment in R&D and other IAs as positive net present- value investment suggesting that capitalization of R&D expenditure rather than expensing is an appropriate accounting procedure. This result is aligned to many empirical studies such as Berzkalne and Zelgalve (2013), Rehman et al. (2012) and Bae and Kim (2003).

Table 3: Results of FEM, REM and GMM

Variables	FE	RE	GMM
MVB_{it-1}			-0.02* (0.00)
IA	3.51* (0.49)	3.17* (0.58)	6.40* (0.00)
AE	-3.49* (0.29)	-3.22 (0.47)	-5.73* (0.00)
LEV	0.45* (0.02)	0.43 (0.04)	0.56* (0.00)
ME	0.55*** (0.32)	1.04 (0.52)	0.61* (0.00)
D	0.26 (0.38)	0.23 (0.39)	0.97* (0.01)
Constant	1.61* (0.38)	0.92* (0.50)	1.36* (0.12)
R Square	0.73	0.74	
Hausman Test (P value)	0.000		
Sargan Test			48.33
Observations	528	528	396

Note:, **, ***are statistically significant at 1%, 5% and 10%, respectively. Robust Standard errors are in parenthesis.*

The advertising expenses (AE) are negatively associated with the MBV contrary to many empirical studies. The results indicate that 1% increase in AE leads to 3.49% reduction in the MBV on average. It means that market participants and investors perceive that the economic benefits of advertising expire in the current's years just like other expenses. This finding is consistent with some other empirical studies such as Han and Manry (2004) and Bublitz and Ettredge (1989). Secondly, the negative relationship between advertising expenditures and MBV may be due to poor proxy of selling, distribution and marketing expenses. The selling and distribution expenses include shipping, transportation and marketing expenses as well. If they dominate and advertising expenditures are only a small fraction of them, then their negative coefficient is not surprising. The leverage ratio (LEV) has also significantly positive impacts on the MBV. The results show that 1% increase in the LEV ratio leads to 0.49% increase in the MBV on average. So, this finding shows that increasing the debt widens the gap between market and book value. It suggests that Pakistani firms can increase the leverage ratio to take benefits from the tax benefit of debt financing and there is a possibility of increasing the debt ratio in order to increase the market valuation. These findings support the Modigliani and Miller's (1963) view of capital structure for increasing the MVs of firms. This result is supported by many empirical studies such as Antwi and Zhoa (2012) Bhandari (1988) and Chowdhury and Chowdhury (2010) in other countries.

Managerial efficiency (ME) too has significantly positive impacts on the MBV. The results show that 1% improvement in ME leads to 0.55% increase in the MBV on average. If the firm's manager uses the scarce resources efficiently, then it enhances the firms 'productivity and profitability. Moreover, it also gives a positive signal to the investors and other agents leading to increase the MVs of firms (Al-Fayoumi & Abuzayed 2009; Fiordelisi & Molyneux, 2010).

Table 3 also shows the results of GMM by the Arrelano and Bond (1991) technique. Qualitatively the results of FE, RE and GMM models are same i.e., the sign of the parameters are same for all three models, but the magnitude of the coefficients are greater than the formers. However, in the case of GMM, the dummy variable introduced for the financial crisis of 2007-08 becomes significant. It shows the global financial crisis has positive consequences for the MBV. So, the financial crisis has also increased the MVs of the firms of Pakistan.

5. Conclusions and Policy Implications

This study investigates the value relevance of IAs disclosure by the Pakistani firms listed on the PSX from 2007-2014. The absence of IAs and other knowledge accounts in the balance sheet of firms are the major contributors for the wedge between market and book values. The investors take the information on the IAs and other knowledge accounts for investment decisions. Using the FE, RE and GMM models, we find that IAs are in general positive associated with MBV. It indicates that investors and other market participants consider R&D investment and other IAs as positive signals for market capitalization. Similarly, the advertising and marketing expenditures have negative consequences for the MBV of firms. It shows that investors believe that the economic benefit of advertising expenditure expires in the current period like other expenditures. This finding reveals that advertising expenditures, like other expenses, are not believed to represent future economic benefit.

Moreover, the leverage has also a significantly positive impact on the MBV. It suggests that Pakistani firms can increase the leverage ratio to take benefits from the tax benefit of debt financing and there is a possibility of increasing the debt ratio in order to increase the MBV. Similarly, Managerial efficiency too has a positive impact on the MBV. If the firm's manager uses the scarce resources efficiently, then it can enhance the firms 'productivity leading to increase the firms' profitability and market capitalization.

This study has some policy implications. As IAs are in general positively associated with the MBV. Therefore, firms' managers can increase investment on the accumulation of IAs for maximization of the MVs. Moreover, the investors and other market participants should also look at the level of IAs before investing in stocks as well as other determinants, especially leverage and managerial efficiency. Moreover, the value relevance of leverage has also a worthy policy recommendation for the Pakistani firms. There is a scope of increasing the debt ratio for the shareholders' value maximization.

This study has some limitations. Firstly, the data on IAs is too old and recent data on firms' IAs and other knowledge accounts will give more policy-oriented results. Secondly, due to unavailability of advertising data, we employ, selling, distribution and marketing expenditures as a proxy for advertising expenditures. Future study can be done by employing firm's level advertising data for estimating the impact of advertising expenditures on the firms' MVs.

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

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