

THESIS OF THE DOCTORAL (Ph.D.) DISSERTATION

CORPORATE FRAUD: AN EMPIRICAL INVESTIGATION OF INTERACTION BETWEEN FRAUD COMMISSION AND DETECTION A DEVELOPING ECONOMY VIEW

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Acknowledgements and Dedication

The name of Allah Almighty Who is the most gracious and the most merciful, blessed me with knowledge and wisdom to explore and understand. I owe a deepest gratitude to the prophet Mohammad (Peace be upon him) who is the ultimate shadow of light and hope in the hour of darkness and despair.

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*I would like to dedicate my thesis to my **parents, grandparents** and my **husband**. Thanks for believing in me and my work.*

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Table of Contents

Acknowledgements and Dedication.....	II
Background of the Study.....	1
Aims of the Research	5
Research Objectives.....	6
Research Questions.....	6
Methodology	7
Scientific Findings.....	9
Univariate Analysis	9
<i>M-Score</i> Analysis	10
Bivariate Probit Analysis.....	11
Implications	13
Limitations and Directions for Future Research	15
References.....	16
List of Publications	20

Background of the Study

The beginning of the twenty-first century witnessed several high-profile corporate fraud scandals in the U.S. and around the world (e.g. Enron and WorldCom, Waste Management, Parmalat, etc.). These failures resulted in a significant amount of loss in the market value. According to a research published by Cornerstone, lawsuits cases registered in the year 2002 alone resulted into a substantial amount of loss in market capitalization; the resulted dollar loss in this year alone amount \$203 billion (Qiu, 2009).

However, it is still debatable that whether these failures depict solely the cases of failure in the corporate ethical climate or a general decay in the corporate moral value that gives firms incentive to commit fraud and manipulation. These fraud cases shocked all the market participants created an environment of disbelief by revealing the dysfunctional governance mechanism in the U.S. and got an immediate reaction from regulators (Chidambaran, Kedia, & Prabhala, 2010). The crises in investors' confidence is immediately followed by regulatory reforms and the U.S. congress passed Sarbanes-Oxley Act with an aim to regain the investors' confidence in reposting and governance mechanism of firms (Wang, 2013).

Fraud and manipulation, involves intent to deceit, or break the regulatory frameworks to harm the victims (Kassem, 2016; Wells, 2017). In this dissertation, we follow the definition of fraud and manipulation¹ given by ACFE, *'fraud is the deliberate action or falsification of the material financial facts of an entity committed by intentionally forging or omitting the facts or disclosures in the financial statements to purposefully deceive the users of financial statements'* (ACFE, 2016). ACFE categorizes fraud into a) asset misappropriation, b) corruption and c) financial statement fraud. This research is focused mainly on financial statement fraud (ACFE, 2016) for three crucial reasons. First, this type of fraud is most costly, and it caused the highest median loss of millions of dollar in the cases reported in the U.S. alone. Second, the failure of giant corporations has generated a heated debate on the quality of financial disclosure and integrity of reported statement in gaining the trust of market participants, particularly investors (Kassem, 2016). Third, the cost incurred by this type of fraud goes beyond merely the financial and monetary loss. It could lead to an overall

¹. Throughout this dissertation, the term fraud and manipulation and earning management are used interchangeably. The difference between fraud and earning management is, however, the latter term refers to 'cooking the books' within the umbrella of GAAP (Dechow et al., 2011). The former term, on the other hand, refers to manipulation out of GAAP and allegations by regulators (here SECP).

decrease in investors' confidence in the audit profession and affects the efficient allocation of resources (Kedia & Philippon, 2009). The loss of jobs and productivity would affect labour market dynamics (Rezaee & Riley, 2010).

In order to deter fraud, it is crucial to understand the causes that motivate managers to commit it. The understanding of the questions: '*what causes managers to manipulate* and '*how best can investors, regulators, analysts and auditors detect manipulation?*' is vital for efficient functionality of capital markets. There would be an increased emphasis of regulators, i.e. SEC to concentrate their investigations on the firms and the sectors that are at high risk of manipulation (Wuerges & Borba, 2010). Despite all the regulatory reforms and efforts by monitory agencies, corporate fraud and manipulation still exist in the U.S. and around the world, and it draws the attention of policymakers and academic researchers (Karpoff, Lee, Koester, & Martin, 2014). Moreover, knowing actual causes of fraud and manipulation is also crucial as there is lack of clarity in predicting that how the regulatory reforms like SOX are effective as a counter-measure strategy to deter frauds in diverse economic conditions that the firms face.

The issues discussed above are hard to address. is due to the fact that the frauds committed are not observable directly; instead, we observe the fraud that has already been detected (Chen, Firth, Gao, & Rui, 2006; Poirier, 1980). Meanwhile, the changing environmental influence on how fraud and manipulation are being committed and investigative efforts for detection of manipulation, the one-to-one correspondence between fraud commission and detection is also halted (Qiu, 2009). The vast stream of academic research is focused on the attributes of fraudulent firms. These firms are those who are convicted by enforcement bodies for the confirm manipulation or they have already accepted it publically through restatements or publically disclosed by press or whistle-blowers. (Dechow, Ge, Larson, & Sloan, 2011; Wang, Ashton, & Jaafar, 2019).

The second critical gap identified during in-depth analysis of fraud-related literature is the fact that majority of the fraud-related research is addressing U.S. based firms (Beasley, Carcello, Hermanson, & Neal, 2010; Dechow et al., 2011; Dechow, Ge, & Schrand, 2010; Nigrini, 1996). These researchers rely on the data of Accounting and Auditing Enforcement Release (AAERs) published by SEC detailing the cases of fraud and manipulation. Most of the research stream is directed to these published AAERs firms as a source of test firms, matched to a sample of control firms related to test firms in certain set attributes (Beneish,

1997; Bonner, Palmrose, & Young, 2011; Karpoff, Koester, Lee, & Martin, 2012, 2017; Perols, 2008). Few other researchers focused on the firms listed in developed economies, where they relied on published reports and stock exchange data for obtaining relevant information about convicted firms (Ghafoor, Zainudin, & Mahdzan, 2018; Máté, Sadaf, Tarnóczy, & Fenyves, 2017; Skousen & Twedt, 2010; Suhaily Hasnan, Rashidah Abdul Rahman, & Sakthi Mahenthiran, 2014). Meanwhile, the corporate governance practices and regulatory settings vary across countries, significantly affected by the business and legal environment (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2002).

Much of the existing streams of fraud-related literature typically rely on detection and deterrence strategies of fraud for the evidence of its existence. An undue emphasis is placed on the role of corporate governance, executive compensation and internal control in deterring frauds and manipulation (Efendi, Srivastava, & Swanson, 2007; Kim & Yoon, 2008; Magnanelli, 2010; Ocansey & Ganu, 2017; Persons, 2005; Razali & Arshad, 2014; Shi, Connelly, & Hoskisson, 2017; Zhou & Kapoor, 2011). Operationalizing various dimensions of Fraud Triangle Theory, most of the studied literature incorporated discrete choice models, thus ignoring the associated phenomenon of partial observability (Calıyurt & Idowu, 2012; Church, McMillan, & Schneider, 2011; Skousen, Christopher J., Smith & Wright, 2015). There are certain frauds which go undiscovered due to either lack of proper investigative efforts or budget constraint of the regulatory agency. Thus these regulatory bodies consider only those firms which are at the high risk of manipulation or there is public disclosure of fraud (Dechow et al., 2011). A firm that did not face any litigation could be either an honest firm or an undiscovered culprit (Wang, 2013). In all such incidence, discrete choice models would create biased estimate and inferences and conclusions drawn on these results are, therefore, unreliable (Wuerges & Borba, 2010). Previous literature on corporate fraud overlooked the issue of incomplete detection. These studies addressed the frauds that had been detected. Nevertheless, frauds and manipulation include not only the detected cases but undetected frauds as well. As a consequence, these studies understated the actual extent of fraud, which, in turn, introduced farther biases in estimation (Li, 2004).

This study contributes to the literature in several ways. It involves developing a theoretical framework to characterize the consequences and firm-level determinants of fraud and manipulation. The theoretical model is built on an extensive literature review to identify the

prevalent gap in the literature. Then, the second part of this study empirically tests the prediction of the theoretical model and assumption. A database is compiled by studying enforcement release issued by Securities and Exchange Commission (SECP) of Pakistan to identify the firms alleged of the manipulation and frauds. SECP, similar to SEC in the U.S, is the regulatory body responsible for monitoring the firms listed in Pakistan Stock Exchange (PSX). Second, this study is based on the contextual contribution to analyze the misreporting firms' financial characteristics in a developing economy. As discussed above, the corporate governance mechanism and regulatory structure in developing markets are widely different from the U.S. (where the majority of fraud-related theoretical and empirical studies are based

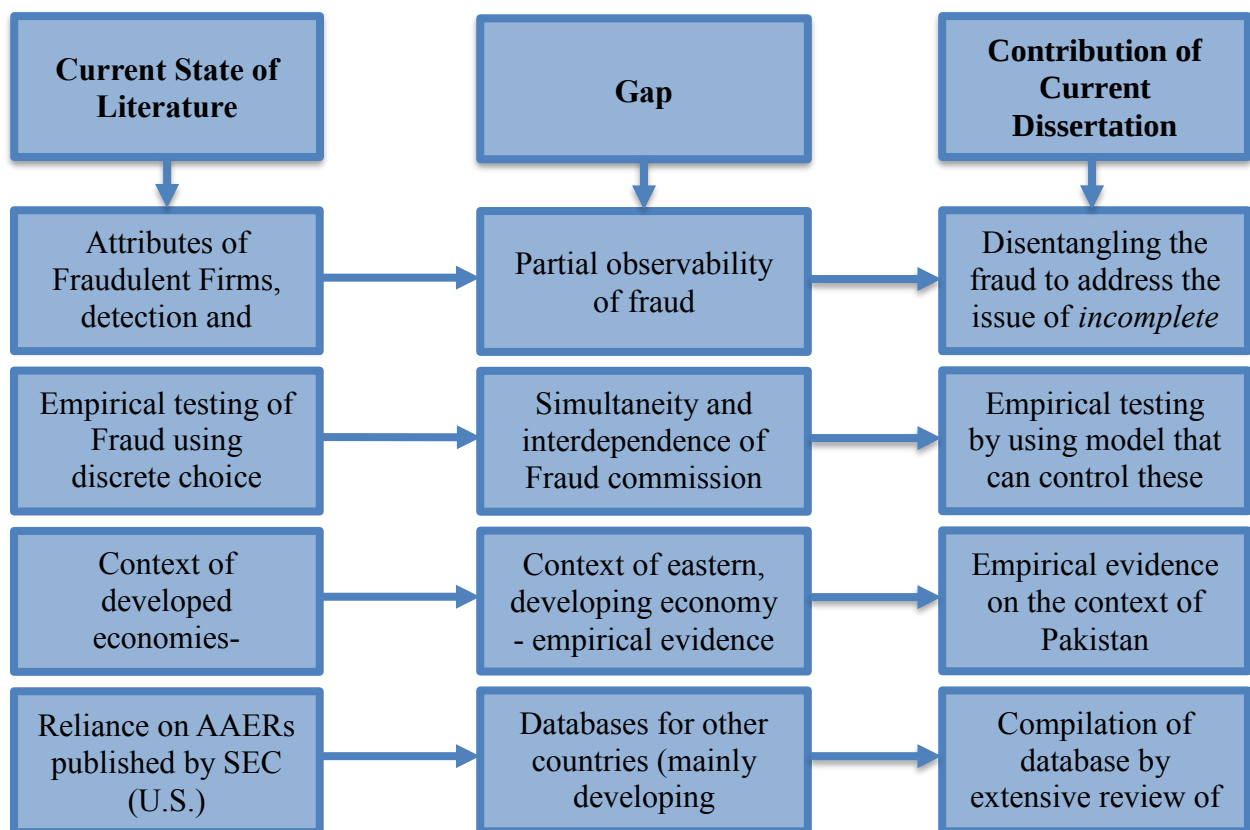


Figure 1: Gap Analysis
Source: Author's own construction

on the firms in the U.S.). The litigation role of regulators, such as SECP, is very different as compared to the U.S where the major threat of civil litigation exerts a significant impact on the behaviour of the firms. Moreover, the ownership structure and business conditions also have a varying effect depending upon the strength of corporate governance mechanism and right of minority shareholders (Chen et al., 2006). The significant contribution made by this

dissertation is methodological. It fills the existing gap in the literature by addressing the attributes of the firms alleged of manipulation by SECP and firm-level factors that contribute to the detection in manipulation. The major challenge in fraud-related research is the identification issue; we observe the cases of manipulation that have already been detected. It is evident from the discussion that probability that a firm is doing manipulation and probability of observing a firm as a manipulator can be different (Li, 2004). This issue has been addressed in this study by using a statistical model that can control this problem. In this model, the probability of detected manipulation is a product of two probabilities: the probability of fraud/manipulation *commission* and the probability of manipulation *detection* conditional on fraud occurrence. This model is backed by the econometric method to support the latent probabilities discussed in detail in chapter three (Following Wang, 2004). This approach is advantageous in two ways.

- a) First, it provides an opportunity to control for the unobserved manipulation (committed but not detected).
- b) Second, this model explicitly considers the issue of incomplete detection and the interdependence between the manipulation and detection of manipulation.

This model sets two equations of commission and detection simultaneously to capture the issue of incomplete detection. Previous literature on fraud-related research is lacking in addressing the phenomenon of simultaneity partial detection and simultaneity of manipulation commission and detection, particularly in addressing developing economies. This study fills the literature gap by considering the strategic relationship between the firms' propensity to commit fraud and determinants of manipulation using *bivariate probit estimation* technique.

Aims of the Research

The primary aim of this study is to focus on financial reporting fraud, which is one of the significant issues affecting the quality of financial reporting. This study aims to highlight the corporate frauds and manipulation in the developing economy setting. This study extends this discussion by highlighting partial observability of frauds. An extensive literature review is done to identify the prevalent gap in theoretical and empirical studies of fraud-related research. Moreover, this study comprises empirical testing of models using sophisticated statistical analyses.

Research Objectives

The primary objective of this study is to analyze firm-level factors that give the managers the incentive to manipulate the financial statements:

1. To determine the relation between M-Score indices and the firm's propensity to manipulate,
2. To examine the characteristics and significance between manipulators and control firms based on M-Score Indices,
3. To examine the firm-level characteristics affecting the firm's propensity to manipulate
4. To examine the significant factors affecting the detection of manipulation,
5. To examine significant factors disentangling the firm's *propensity to manipulate* from the probability of *detection of manipulation*.

Research Questions

The above-stated objectives of the dissertation can be translated into the following research question:

1. What is the relationship between the firm's incentive to manipulate and M-Score indices?
2. Are the manipulators and control firms significantly different from each other based on their M-Score indices?
3. What are the firm-level characteristics that affect the firm's propensity to manipulate?
4. What are the significant factors affecting the detection of manipulation?
5. What are the significant factors disentangling the firm's propensity *to manipulate* from the probability of *detection of manipulation*?

Methodology

The following diagrams illustrate the methodology used in this study for the identification of manipulator firms and control firms whereas Figure 2 explains the methodology used in the empirical analysis of the data.

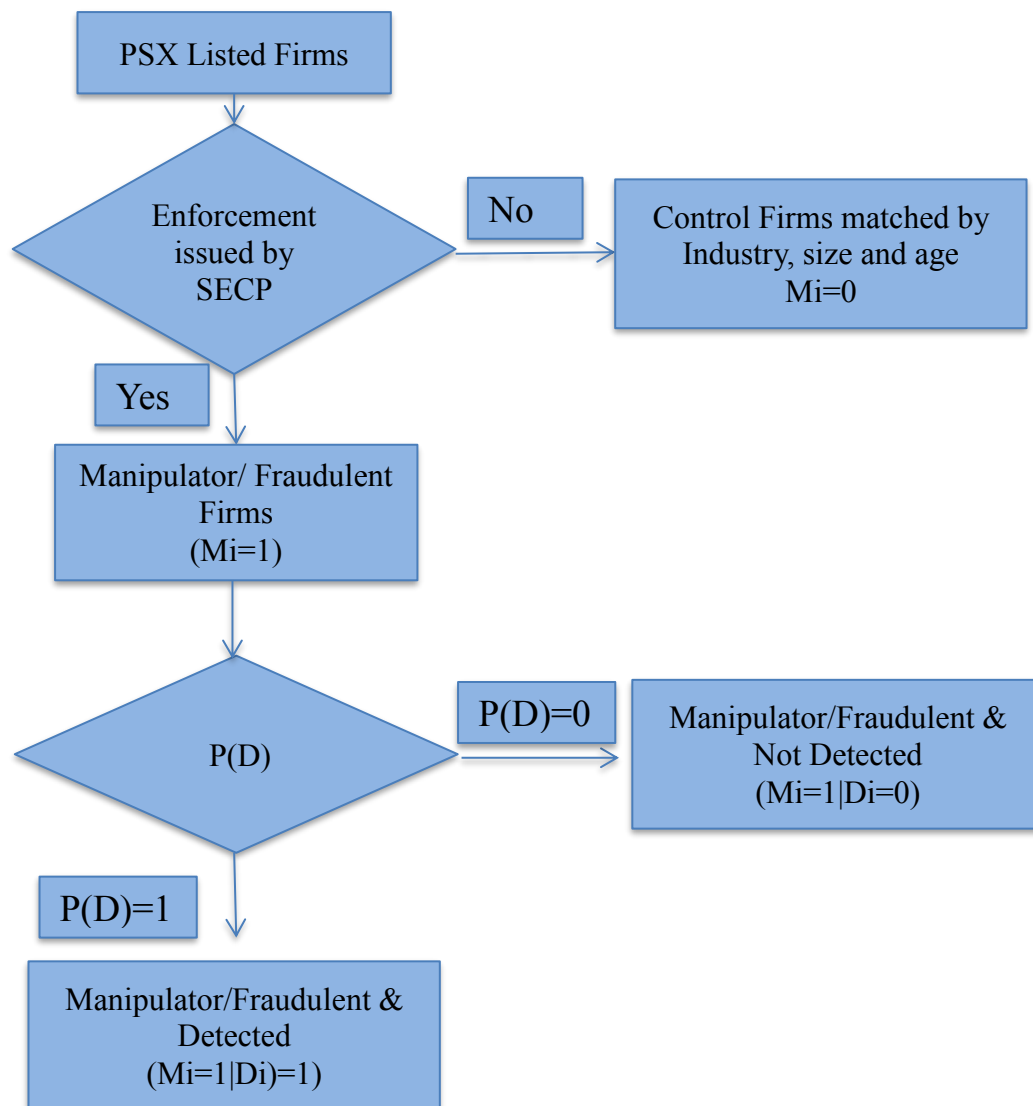


Figure 2: Flow Chart of Data and Sample Identification
Source: Author's own construction

The following diagram illustrates the research methodology used in this study for empirical testing and analysis.

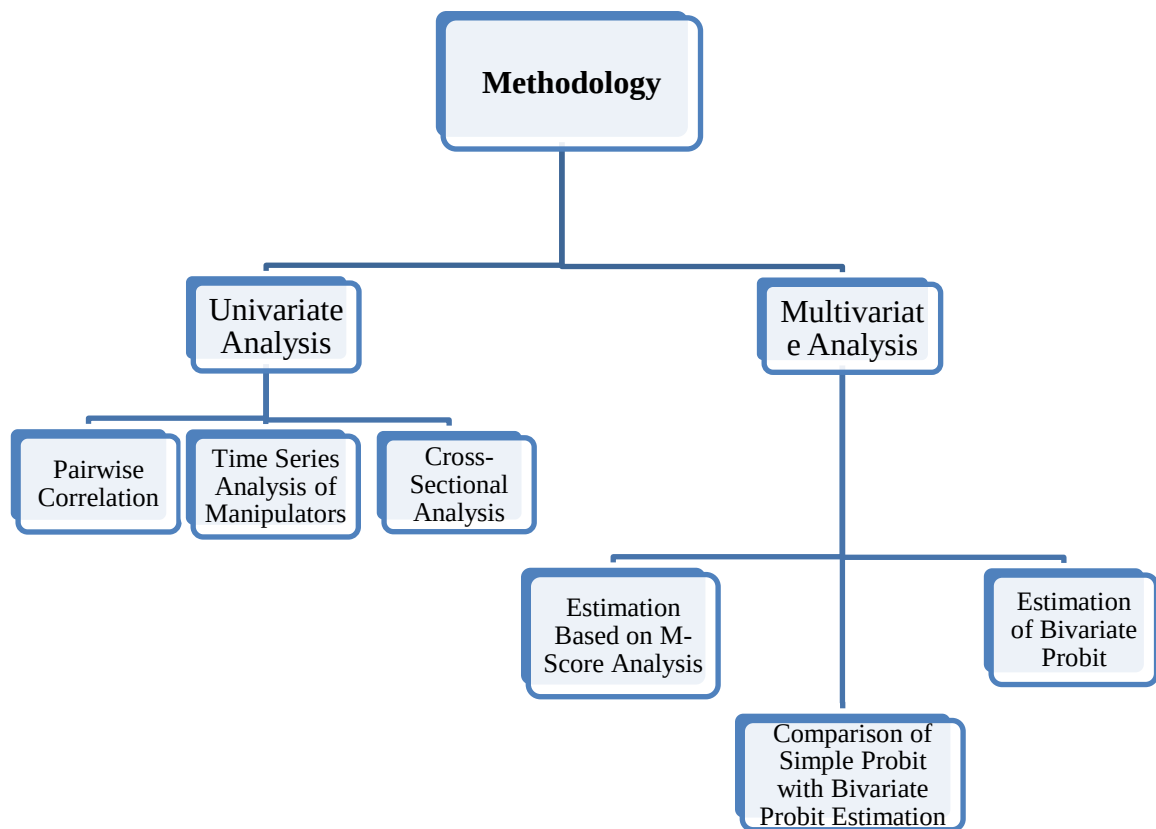


Figure 3: Research Methodology of the Study

Source: Author's own construction

Scientific Findings

The primary goal of this study is to concentrate on financial reporting fraud, which is one of the significant concerns affecting the quality of financial reporting. These types of frauds involve a deliberate intent to fabricate the facts or omit the material information purposefully to deceive the investors and other stakeholders. The magnitude of the harm caused by financial statement frauds makes them one of the most hazardous types of corporate unethical behaviors (Rezaee, 2002). This study extends this discussion by highlighting partial observability of frauds. An extensive literature review is conducted to ascertain the prevalent research gap by encompassing both theoretical and empirical studies of fraud-related research. Moreover, this study comprises the empirical testing of models using sophisticated statistical analyses.

A rigorous effort is directed to identify the firms alleged of manipulation by the Securities and Exchange Commission of Pakistan (SECP). The identity of companies is kept anonymous since revealing the names of firms is out of the scope of this study. The data for alleged firms is collected using annuals reports and Balance Sheet Analysis (A database published by State Bank of Pakistan). For analysis, a matched sample of firms, called control firms, is collected based on the industry classification, size and age with test firms.

Univariate Analysis

For analysis, this study employed a combination of univariate and multivariate analyses techniques to validate the empirical confirmation of proposed hypotheses. Univariate analysis is conducted to identify the general characteristics of manipulators and control firms by incorporating descriptive statistics (mean value, standard deviation, etc.), *T-test*, Wilcoxon Z test and *Median test*. The overall characteristics of manipulators show that they are high growth firms. They have deteriorating fundamentals, especially gross margin index. The difference between age and size of manipulators and control firms is insignificant. The average age of manipulators is marginally higher than control firms. The comparison of M-Score indices of manipulators and control firms lead us to conclude that both groups are significantly different from each other based on their *Aqu_I*, *Sgr_I*, *Dep_I* and *Grm_I* indices. The remaining indices depict no significant difference between the groups. From these results, it is concluded that sub-hypotheses i.e., *H1a*, *H1b*, *H1d*, *H1f* are fully supported. However, *H1c*, *H1e*, *H1g* and *H1h* are not supported based on results ($p > 0.1$ for *Sgae_I*, *Dsr_I*, *Lev_I* and *TATA*). Hence, we can partially accept H1 hypothesis (*Manipulators and control firms are different from each other based on M-Score variables*).

M-Score Analysis

The multivariate analysis comprises of three stages: 1) in the initial stage, the M-Score baseline model is analyzed by comparing the sample of manipulators and control firms. 2) In the second stage of multivariate analysis, a bivariate probit model is tested, capturing the firms' propensity to manipulate and a conditional probability of detection of manipulation in a simultaneous-setting. 3) In the third stage, the results of the bivariate probit model are compared with simple probit regression to validate the suitability of the model.

In the first stage, M-Score analysis is conducted in order to test the following hypothesis (H2); *'M-Score variables have a positive relationship with the firm's propensity to manipulate'*. In this model, the dependent variable is represented by letter M, which is a binary variable representing 1 for the group of manipulators and zero for control firms, matched to manipulators based on size, age and industry classification. The result of M-Score analysis shows that the coefficient of assets quality index, *Aqu_I* though positive, gives insignificant relation. Sales growth index gives a positive and significant relationship with the firms' propensity to manipulate. It is consistent with the fact that growing companies have a higher likelihood of manipulation and fraud.

Similarly, the result of *Dsr_I* suggests that manipulator firms revise their receivable upward disproportionately, and have a higher probability of sales revenue manipulation (Beneish, 1999). Consistently, a significant and positive coefficient of *Dep_I* elucidates that manipulating firms have higher depreciation that is achieved by either changing method or increasing assets' useful life. Results of *Grm_I* depict worsening performance of manipulators. Consequently, they have greater incentive to manipulate. The positive and significant relationship of accrual coefficient confirms that manipulators have less cash profit than their accounting profit figures; accounting profits figures are not supported by the magnitude of the cash profit. The remaining indices, *Sgae_I* and *Lev_I* show no significant relation with firm's propensity to manipulate. The results support a partial acceptance of hypothesis H2. *M-Score variables have a positive relationship with the firm's propensity to manipulate*. In terms of sub-hypotheses, results supported *H2b*, *H2c*, *H2d*, *H2f* and *H2h* (significant and positive relation in case of *Sgr_I*, *Dsr_I*, *Dep_I*, *Grm_I* and TATA respectively). Contrarily, the results didn't support sub-hypotheses *H2a*, *H2e* and *H2g* (insignificant *Aqu_I*, *Sgae_I* and *Lev_I*). Summing up, the results supported a partial acceptance of *H2*.

Bivariate Probit Analysis

This study incorporated *the bivariate probit model*; a model that can generate testable implications for the determinants of cross-sectional differences between firms' propensities to manipulate and detection of manipulation. The literature on financial fraud and manipulation predicts that fraudulent firms tend to have higher growth prospects and experience adverse profitability shocks. The risk of litigation is clustered in certain types of industries during a specific period. The theory on corporate manipulation also suggests that firm's that are fraudulent tend to overinvest. This overinvestment supports them to betray the investors and analysts as it can reduce the certainty of future cash flow prediction. Consequently, the likelihood of detection of manipulation is reduced.

In the second stage of multivariate analysis, the determinants of the firm's probability to manipulate and the probability of detection of manipulation are investigated using the sample of firms alleged of manipulation by SECP and a matching sample of control firms.

Table 1: Summary of Model Specification

Variables	Applied Methodology			Results
	<i>Probit Model</i>	<i>Bivariate Probit</i>		
	<i>M</i>	<i>M_i</i>	<i>D_i</i>	
<i>Asset Quality Index</i>	+			<i>H2a</i> is not supported
<i>Sales Growth Index</i>	+	+		<i>H2b</i> and <i>H3a</i> are supported
<i>Days' Sales in Receivables Index</i>	+			<i>H2c</i> is supported
<i>Depreciation Index</i>	+			<i>H2d</i> is supported
<i>Selling, General And Administrative Index</i>	+			<i>H2e</i> is not supported
<i>Profitability (Gross Margin Index)</i>	+	+		<i>H2f</i> and <i>H4a</i> are supported
<i>Leverage Index</i>	+			<i>H2g</i> is not supported
<i>Total Accruals To Total Assets</i>	+			<i>H2h</i> is supported
<i>Investment Intensity</i>		+	-	<i>H5a</i> and <i>H5b</i> are supported
<i>(Profitability) Unexpected Performance Shock</i>			-	<i>H4b</i> is supported
<i>Growth</i>		+	+	<i>H3a</i> and <i>H3b</i> are supported
<i>Working Capital Accruals</i>			+	-
<i>Change in Inventory to Change in Sale</i>			+	-
<i>Control Variables Size, Age, Industry</i>				-

Source: Author's construction (2019)

The econometric model is used to control the probability of undetected manipulation and disentangle the effect of a factor on the firm's probability to manipulate and the likelihood of detection of manipulation. The result of the analysis indicates that estimates of growth and profitability significantly affect the firms' propensity to manipulate. Growth, measured by Sgr_I is positively related to the firms' propensity to manipulate. For the second half of the equation, growth is proxied by a change in sales volume over time. The coefficients of growth are positive and significant for M_i and D_i (Both subhypotheses $H3a$ and $H3b$ are supported). Consequently, the results lead to the acceptance of third hypothesis $H3$ (*Sales growth of the firm is positively related to the firm's propensity to manipulate and the probability of detection of manipulation*).

The other indices showing a significant and positive relationship with the firm's propensity to manipulate include Dsr_I, Dep_I, sgae_I and TATA. The result of profitability in the first equation, M_i , gives mixed results. The manipulating firms were hypothesized to have deteriorating performance. The other measure of performance, on the other hand, gives a partial positive relation with the firms' propensity to manipulate ($H4a$). The ex-post measure of unexpected performance shock, measured by CROA, gave a negative and significant result with the probability of detection of manipulation D_i ($H4b$). Hence the overall results lead us to the partial acceptance of proposed $H4$. *Profitability of the firm is negatively related to the firm's propensity to manipulate and the probability of detection of manipulation*.

Investment intensity also affects the firm's propensity to manipulate and the likelihood of the detection of manipulation. The results indicate that a higher level of ex-ante investment by the manipulators is done in order to deceive the external monitoring agencies and regulators. It limits the efficiency of the prediction of accurate cash flow estimation of the firms. As a consequence, the ex-post probability of detection of the manipulation is lowered. Therefore, we can conclude that both sub-hypotheses i.e., $H5a$ and $H5b$ are fully supported. Summing up, *hypothesis 5 is accepted (Investment intensity has a positive effect of the firm's propensity to manipulate and negative effect on the probability of detection of manipulation)*.

Table 2: Summary of Quantitative Study Results

Sr. No.	Hypotheses	Expected Sign			Statistical Support
		M	Mi	Di	
H1:	Manipulators and control firms are different from each other based on M-Score variables				Partially supported
H2:	M-Score variables have a positive relationship with the firm's propensity to manipulate.	+			Partially supported
H3:	Sales growth of the firm is positively related to the firm's propensity to manipulate and the probability of detection of manipulation		+	+	Supported
H4:	The profitability of the firm is negatively related to the firm's propensity to manipulate and the probability of detection of manipulation		-	-	Partially supported
H5:	Investment intensity has a positive effect on the firm's propensity to manipulate and has a negative effect on the probability of detection of manipulation		+	-	Supported

Source: Author's own construction (2019)

Implications

Financial frauds imposed a considerable burden on the financial markets. Shareholders of alleged firms may lose millions of dollars on the public announcement of corporate accounting irregularities. The bankruptcy of Enron put an unprecedented emphasis on the accounting profession and its role in the regulatory mechanism of the financial reporting process. In addition to the wealth loss faced by the investors, the issue of fraudulent financial reporting also contributes to an enormous welfare cost, especially when resources are misdirected from their most effective use (Beneish, Lee, & Nichols, 2012). These accounting manipulations and misrepresentation of facts place a surge in the eroding investor's confidence and integrity of capital markets. These accounting manipulations are followed by the number of regulatory reforms (often very costly) and structural changes in the regulations of firms and the markets. Enhanced diligence on the part of investors and auditors was observed for scrutiny of financial information (Chan, Chou, & Lin, 2016).

This study has vital implications, especially for the firms, policymakers and academicians. Corporate accounting frauds and manipulations have severe financial and non-financial consequences for the firms. Organizations, which try to prevent frauds and manipulations, usually do so by working on one of the essential elements of fraud triangle: opportunity (Morales, Gendron, & Guénin-Paracini, 2014). This study has shed light on various firms-

related factors that can serve as potential opportunities for the managers and accountant to commit and conceal manipulation. These opportunities might serve as incentives and motivations for fraudulent acts. These opportunities can be eliminated by incorporating proper internal controls and then directing all the efforts to implement those control measures and ensuring strict adherence to them. Having an effective control environment is one of the most important steps that organizations can take to avoid manipulations and frauds. An appropriate control environment includes management's role and examples (ACFE, 2016). Numerous fraud incidences studied here usually involved SECP enforcement for employees' fraud, which in turn was a learned behaviour from dishonest managerial practices. So, an appropriate tone at the top must be ensured to avoid the huge costs that the firms have to endure in the aftermath of frauds or other dishonest acts. Developing economies are characterized by weak corporate governance practices and the monitoring mechanism of the firms (Ghafoor et al., 2018). One of the major implications for firms is to put all the energies to build an appropriate corporate governance and 'tone at the top'. Meanwhile, this tone at the top should be communicated well throughout the organization to maintain a 'zero tolerance' culture for manipulation and unethical behaviour. Such culture will help the firms to develop a well-designed control system that reduces the opportunities for the frauds and enhance the probability of quick detection of frauds.

The result of this study also suggests that manipulators tend to overinvest. While, the empirical and theoretical studies also suggest that investment has a spill-over effect between manipulators and other firms (Wang, 2013). The overinvestments made by manipulators tend to crowd out investment by non-manipulators firms. It has implications for the capital market in the form of a real loss of value, while this loss is borne not only by the manipulators but other firms too that have no intention to manipulate their earnings.

This study also offers implications for regulators and standard setters who are endeavouring to reinforce the monitoring oversight in the financial markets. The firm-specific factors highlighted in this study can help the regulators and standard setters to focus on these specific factors to curb the firm's fraud intention and accelerate the process of detection. The disentangling of fraud commission and detection addressed in this study can support the regulators to put augmented efforts to identify the undetected cases. Combating accounting fraud and manipulation requires regulatory initiatives, strict monitoring and control mechanisms by SECP, PSX and other regulators. The accounting and security market regulators can curb these frauds through legislation, enforcement actions and by taking severe actions against perpetrators.

This study also has implications for potential investors, shareholders and the general public at large, which are relying on the financial information published by companies to make investment decisions and evaluate the companies' prospects. The empirical results offered by this study question the reliability of financial information since firms are managing their earning for showing better-than-actual performance. The indices of Beneish M-Score also offered partial evidence that manipulators and non-manipulators firms are different from each other. Investors, therefore, should analyze the institutional settings of the firms, its past reputation, industry type and corporate governance mechanisms.

This study also has valuable implications for theorists and academicians. The results offer deep insight to segregate the phenomena of fraud commission and detection by questioning the existing literature based solely on the notion of perfect detection of fraud and manipulation (Poirier, 1980). Besides, this study offers greater insight into the researchers focusing on developing economies.

Limitations and Directions for Future Research

This study has several limitations, so enhanced care must be exercised before generalizing the results. First, this study considers only those forms of fraud and manipulation, which are affecting the integrity of financial information published by the firms. The other forms of corporate fraud and misconduct such as bribery, corruption, theft by employees and other deviant workplace behaviour are out of the scope of this study. Second, this study considers firm-level factors affecting the firm's incentive to manipulate and ex-post detection of fraud. There are several factors that were beyond the scope of this study, such as management style and corporate culture and 'tone at the top' that could have obvious effects on the firm's incentive to manipulate. Third, though due care was taken while choosing the manipulators and control sample firms, yet there are still margins of error since some of the firms included in the control sample might be an undiscovered manipulators. The difficulty in the process of detection process might be a result of budget deficiency of regulatory and monitoring bodies, i.e. SECP. Forth, while dealing with a troubled firm, the main challenge is to find published financial information, especially in the case of bankruptcy. It limits the size of the alleged firms chosen in the sample. Moreover, the element of unanimity is kept since disclosing the firms is out of the scope of this study. Manipulation and frauds have snowball effects, one leading to others. Though a due care is exercised in identifying year fraud was discovered, in many cases, the underlying issue is the detection of fraud when the effects of fraud are too significant to ignore.

This study identified gaps in the literature and has more significant future research potential. For instance, this study focused on the firm-related factors affecting the firm's propensity to manipulate. The firms do not operate in a vacuum. The macro-environment and institutional factors affect the firm's behaviour. Macro-sociological view of financial fraud incorporates broader economic, social and political theories, while micro view presents the interaction of the individual with corporate culture and environment (Holtfreter, 2005). Hence this study calls for further research to incorporate institutional factors affecting the firm's choice of manipulating financial information.

Within firm-related factors affecting frauds, this study focused only on the financial incentive that can cause pressure on the firms for fraudulent behaviour. Future researches might incorporate the behavioural elements to grasp a better understanding of the diverse nature of motives of perpetrator and mechanism opted for rationalizing the act. To the best of knowledge, this study is pioneering in addressing the issue of partial observability of corporate frauds in the developing economy. It has further research potential to compare the developing and developed economies. Further researches can replicate this idea in another context by applying sophisticated techniques of probability and advanced artificial intelligence methods (i.e., machine learning). Moreover, the role of external auditors in assessing the fraud risk factors can be analyzed in-depth by enhancing the guidance offered by the current study.

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List of Publications



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Doctoral School: Károly Ihrig Doctoral School of Management and Business

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List of publications related to the dissertation

Articles, studies (5)

1. Máté, D., **Sadaf, R.**, Oláh, J., Popp, J., Szűcs, E.: The effects of accountability, governance capital, and legal origin on reported frauds.
Technological and Economic Development of Economy. 25 (6), 1213-1231, 2019. ISSN: 2029-4913.
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IF: 4.344 (2018)
2. **Sadaf, R.**, Oláh, J., Popp, J., Máté, D.: An Investigation of the Influence of the Worldwide Governance and Competitiveness on Accounting Fraud Cases: A Cross-Country Perspective.
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DOI: <http://dx.doi.org/10.3390/su10030588>
IF: 2.592
3. **Sadaf, R.**: Advanced statistical techniques for testing Benford's law.
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4. Máté, D., **Sadaf, R.**, Tarnóczy, T., Fenyves, V.: Fraud detection by testing the conformity to benford's law in the case of wholesale enterprises.
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DOI: <http://dx.doi.org/10.17512/pjms.2017.16.1.10>
5. **Sadaf, R.**: Benford's law in the case of Hungarian whole-sale trade sector.
SEA-Practical Application of Science. 4 (3), 561-566, 2016. ISSN: 2360-2554



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List of other publications

Articles, studies (5)

6. Zulfiqar, S., **Sadaf, R.**, Popp, J., Vveinhardt, J., Máté, D.: An Examination of Corporate Social Responsibility and Employee Behavior: the Case of Pakistan.
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9. **Sadaf, R.**, Aqeel, Y.: Investor Psychology and Decision Making; based on Overconfidence and Self Attribution Bias: Evidence from Islamabad Stock Exchange (ISE).
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10. **Sadaf, R.**, Andleeb, S.: Islamic Capital Asset Pricing Model (ICAPM).
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In: New Trends in Management and Production Engineering - Regional, Cross-border and Global Perspectives : 6th International Scientific Conference New Trends in Management and Production Engineering - Regional, Cross-border and Global Perspectives : Book of Abstracts, WSB University, Brenna, 8, 2019.

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The Candidate's publication data submitted to the iDEa Tudóstér have been validated by DEENK on the basis of the Journal Citation Report (Impact Factor) database.



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