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Valuation, Pricing, and Performance of Initial Public Offerings on the Ghana Stock Exchange

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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

In recent years, the initial public offerings (IPOs) on the Ghana Stock Exchange (GSE) witnessed some level of undersubscriptions. The purpose of this research was to investigate the extent to which valuation, pricing, and performance of prior IPOs listed on the GSE contributed to this state of undersubscriptions. The research was informed by the valuation and pricing framework of Roosenboom. The research questions addressed whether IPOs on the GSE were under/overpriced and whether the projected and pre-issue financials were free from forecasting errors and earnings management. A cross-sectional, explanatory research design was employed to examine a dataset of 30 sampled IPOs. The dataset, obtained from IPO prospectuses, trading data, and financial statements, was analyzed using both logistic and multiple regressions. IPO valuation methods, first-day returns (R(1^{st} day)), absolute forecast errors (AFE), and discretionary current accruals (DCA) served as dependent variables and firm characteristics of size, age, profitability, dividends, price-to-value (P/V) ratios, owner-manager, and auditors' reputation served as independent variables. Results revealed that firm characteristics were not significant predictors of the choice of IPO valuation methods, IPOs were underpriced and their R(1^{st} day) were significantly predicted by P/V ratios, the financial projections were over forecasted and their AFE were not predicted by the independent variables, and the pre-IPO financials experienced earnings management and their DCA were significantly explained by the owner-manager variable. This research contributes to positive social change by assisting regulators, investment bankers, corporations, and institutional investors in improving their respective roles in the valuation and pricing of IPOs on the GSE, thus reducing the observed IPO undersubscriptions in the stock market.

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Dedication

This dissertation is dedicated to my wife, Sarah, and children, Pamela, Morris, and Ivan. Your support and encouragement was invaluable in the completion of my doctoral study.

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My first and ultimate appreciation goes to the Almighty God for His unmerited favour and His call of me into the grace in which I now stand. Secondly, I would like to deeply thank my godfather, Mr. John D. Abbeo, and his wife, my godmother, Mrs. Kate D. Abbeo, for the confidence they have in me, for their guidance on how I should live my life, and, above all, for their tremendous encouragement during my doctoral study. In addition, I would like to thank my dissertation committee for their assistance: Dr. Mohammad Sharifzadeh, CFA (My beloved faculty mentor, dissertation committee chair, and methodologist); Dr. Javier Fadul (dissertation committee member and content expert); and Dr. Robert Aubey (university research reviewer). My thanks also go to my late mother, Ayishat Shaban, for her realization of my enormous desire for books and for buying my first school book as a foundation that has culminated into the realization of this desire. Finally, I would like to thank my lovely and sweet wife, Sarah, for her endurance through this and my other numerous academic adventures.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

In this study, I conducted an empirical analysis of the valuation, pricing, and performance of IPOs on the GSE. My conception of this study came when, as a student accountant, I undertook a mini research project on working capital management in 2002. This mini project required a visit to the GSE. In my interactions with the head of research at the GSE, we veered into various topics in financial management including the problems of perceived mispricing of IPOs on the exchange. The need to conduct this research, however, goes beyond the problems of perceived mispricing of IPOs on the GSE because the problems of IPO mispricing are not confined to emerging markets such as the GSE. The valuation and pricing of IPOs on any capital market—developed or emerging—is not without challenges. The Facebook's IPO represented a sterling example of such valuation and pricing challenges. According to Diamond (2012), the failure of this IPO was the most important in the history of the American capital markets. Literature in this field abounds with several reasons for this failure, among which was the following three outstanding reasons.

The first of these reasons was the fraud behind Facebook's IPO. Macey (2013) pointed out that the lawsuits that followed the debacle alleged, among others, that Facebook and its directors lied about the prospects of the corporation in their Securities and Exchange Commission (SEC) filings. This lying and falsehood, Macey further noted, was specifically related to the reduction in Facebook's revenue. This reduction in revenue was as a result of increasing users of Facebook turning away from the traditional PC-based Facebook platform to the Facebook Apps platform used on mobile handsets

(Macey, 2013). This drop in revenue prospects, according to Macey, was brought to the attention of the underwriters and other institutional investors, but the wider investing public was not made aware of this prospect.

The second reason related to the distortion in the sales structure of Facebook's IPO. Various explanations, according to Diamond (2012), have been offered as to the reasons for the perpetuation of the previously noted fraud. Among these explanations were the problems that were witnessed by the NASDAQ itself in that the stock exchange opened unusually late. This delay in the opening of the exchange, Diamond further noted, resulted in the cancellation of several orders. Another important explanation is related to insider capitalism (Diamond, 2012). The insiders to Facebook prior to the IPO were its founder Mark Zuckerberg and its venture capitalists: Peter Thiel, Goldman Sachs, and a Russian investment firm called DST. These insiders sold more shares in the IPO than the company itself. The initial sales of shares to the underwriters, at the price of $38, resulted in $16 billion in sales proceeds; of this amount, $9 billion went to the insiders, with the company only retaining $6.7 billion and the underwriters gaining $176 million by way of fees (Diamond, 2012, p. 11). This distortion in the allocation of the sales proceeds of the IPO presupposed that the entrepreneur, Mark Zuckerberg, and the Facebook's venture capitalists were more concerned with cashing out rather than with continued viability of the company post issue.

The third reason related to the need for a thorough regulatory supervision over IPO activities. Macey (2013) pointed out that the Facebook's IPO was "a big black mark for regulators" (p. 21) and that the regulators were considerably embarrassed by their acts

or omissions that resulted in the failure of the IPO. According to Cervellati, Di Sandro, and Piras (2013), the IPO lacked the trio of transparency, responsibility, and accountability. In relation transparency, Cervellati et al. pointed out that the financial information that Facebook and its underwriters produced to back the IPO lacked the needed transparency. This transparency was essential if the general investing public were to be fully informed about the financial position and performance of the company in which they were putting their money. The issue of responsibility presupposed that the IPO was fraught with conflict of interest on the part of those that mattered in the issuance of the IPO. The preoccupation of Mark Zuckerberg, Peter Thiel, Goldman Sachs, DST, and the underwriters was mainly on how they could use the IPO to enrich themselves and not with using the IPO to further the prospects of Facebook itself. By way of accountability, regulators did not call upon Facebook to render proper accounts of its IPO valuation and pricing. In summary, the Facebook's IPO signals the need for intensification of regulation and supervision over IPO valuation and pricing in any market.

The mispricing of IPOs brought to the fore by the Facebook's example implies that human beings are inherently inclined to defrauding others whenever they have the opportunity to do so. In this respect, the positive social change implication of this study hinged on the identification of ways to improve the accuracy of IPO valuation and pricing on the GSE.

Background of the Study

The Role of Stock Exchange in an Economy

The primary role of a stock exchange in an economy is to ensure the efficient allocation of capital resources. Fama (1970) made this assertion in a seminal paper on the efficiency of capital markets. A stock exchange, according to Fama, is an efficient allocator of capital when prices that are assigned to the securities traded on that exchange reflect, accurately, the underlying financial assets and performance of its listed corporations. For the price of any stock to accurately reflect the underlying fundamentals of its corporation requires the valuation of that corporation's net worth (Damodaran, 2012; Fernández, 2013). This valuation had been seen as "the point at which theoretical finance hits the harsh road of reality" (Pereiro, 2002, p. vii). One aspect of such reality in corporate financial management, according to Ragupathy (2011), is that of getting a corporation listed on a capital market through an IPO of that corporation's stock to the wider investing public. According to Cogliati, Paleari, and Vismara (2011), there are two main categories of stocks' valuation methods: the direct and the relative valuation methods. In direct valuation, the value of a firm is estimated from its underlying fundamentals. In relative valuation, however, the value of the firm is estimated from the prices of its comparable firms that are already trading on the stock exchange. For direct valuation methods, examples could include discounted cash flow, dividend discounted model, residual income, and economic value added (Roosenboom, 2012). The relative valuation methods include such examples as the price to earnings, price to sales, price to cash flow, and price to book value ratios (Deloof, De Maeseneire, & Inghelbrecht, 2009).

Berkman, Bradbury, and Ferguson (2000) concluded that these two categories of valuation methods have similar accuracy and that the choice of a given valuation method depends on the market for which the valuation is being conducted.

Problems With IPO Valuations and Pricing

Although there exists a sizable number of studies on IPOs, such research has mainly focused on the post issue performance of IPOs with little attention paid to the valuation and pricing of those IPOs (Deloof et al., 2009). Roosenboom (2007) was emphatic about this lack of attention when noting that the literature on IPO valuation is particularly thin and that not much exists when it comes to how investment bankers value and price IPOs. The lack of attention to such research is even more pronounced in emerging markets in Africa (Hearn, 2010). Compounding the problems of this lack of research on valuation and pricing of IPOs in emerging markets is the difficulty of applying the traditional valuation methods that are usually the preserve of valuing IPOs in the developed markets (Pereiro, 2006). This difficulty is mostly because emerging markets are prone to manipulation due to their relatively small sizes and highly concentrated nature (Pereiro, 2006). It is, therefore, not surprising to read Nwude (2010), who bemoaned the lack of clear-cut methods for determining share prices on the Nigerian Stock Exchange (NSE). Nwude further noted that the appropriate methods for the valuation and pricing of securities on the NSE have remained problematic. If the NSE is beset with this lack of appropriate valuation methods in its security pricing practices, then one cannot expect the GSE, which is a neighboring West African stock market to that of NSE, to be any better.

Problem Statement

The need to take a scholarly look at the IPO valuations on the GSE was more so because, in recent times, there has been a seeming lack of investor confidence in IPO offerings on the market. The cases in point were the undersubscription by investors in the IPOs of Tallow Oil Plc, Accra Hearts of Oak Football Club, and Comet Properties Limited (Agama, 2011). The undersubscription in the case of Comet Properties Limited was so severe that the company could not meet the listing requirements of GSE and hence had to withdraw its IPO (Agama, 2011). These cases of undersubscription had led some professionals in the market to wonder whether or not the investment community does have confidence in IPO valuations of listed stocks on the Ghanaian bourse (Agama, 2011). As could be inferred from the seminal paper of Fama (1970), one of the ways a stock exchange could lose the confidence of its investing public is when there is a perceived lack of accuracy of its IPO valuations and pricing. For the GSE, one is left wondering whether the lack of accuracy in its IPO valuations and pricing could be the bane of this loss of investor confidence. In view of this perception, I sought through this study to examine the valuation methods, processes, and procedures that were employed by the investment banking firms on the GSE.

Purpose of the Study

This study was an attempt to provide a means of investigating IPO valuations, pricing, and performance on the GSE. In this study, I first considered the return characteristics of 30 sampled IPOs listed on the GSE. Secondly, I examined the role of IPO valuations and pricing in explaining the observed return characteristics of the IPOs.

Thirdly, I considered the firm-specific and emerging market factors that had influenced the choice of valuation methods used by the Ghanaian investment bankers in their valuation and pricing of those IPOs. Fourthly, I reviewed how these investment bankers combine the value estimates of those valuation methods to determine the fair value estimate and price of a given IPO. Finally, I examined the incidences of errors and the possibilities of earnings management (i.e., creative accounting or window dressing) in the earnings forecasts incorporated in the IPO prospectuses of these corporations.

Research Questions and Hypotheses

Research Questions

To make the problem statement amenable to scholarly research, I provided answers to the following three main research questions:

1. What valuation methods do underwriters in Ghana use in valuing IPOs listed on the GSE and what firm-specific and emerging-market factors influenced their choice of those valuation methods?
2. How do underwriters combine the value estimate of each valuation method to arrive at fair values of IPOs and how do they set the preliminary offer price on the basis of those fair value estimates?
3. Are the management earnings forecasts and the pre-IPO financial statements incorporated in the prospectuses of Ghanaian IPO firms free from forecasting errors and the tendencies of earnings management?

In framing Research Questions 1and 2, I followed Roosenboom (2007), who used similar questions in an empirical examination of the valuation of IPOs by investment

bankers in the French IPO market. In framing research question 3, I was inspired by the works of Jelic, Saadouni, and Briston (1998) and Lonkani and Firth (2005). These two different research works focused on assessing the accuracy of earnings forecast of IPO firms listed on (a) the Kuala Lumpur Stock Exchange during the period of 1984-1995 (Jelic et al., 1998) and (b) the Stock Exchange of Thailand for the period spanning 1991-1996 (Lonkani & Firth, 2005). In addition to these three main research questions, I intended further to provide answers to the following subsidiary research question:

4. What IPO pricing anomalies occur on the GSE and is there a cross-sectional relationships between the price-to-value ratios as determined by the investment bankers and the over/undervalued first-day returns observed on the GSE?

In framing the subsidiary research question, I was guided by the literature on IPO performance as mooted by the work of Purnanandam and Swaminathan (2004) who first asked "Are IPOs really underpriced?" and the counterwork of Zheng (2007) who asked an opposing question, "Are IPOs really overpriced?"

To reduce the research questions to testable hypotheses, I raised and tested the following hypotheses regarding (a) choice of valuation methods; (b) determination of the fair value estimates of IPOs; (c) application of price discount in the setting of preliminary offer price; (d) forecasting errors in the managerial estimates of earnings forecasts in IPO prospectuses; (e) assessment of the presence, or otherwise, of earnings management in the pre and post IPO financial statements of the IPO firms; and (f) assessment of IPO pricing anomalies, especially those of short-term under/overpricing.

Hypotheses 1: Choice of IPOs' Valuation Methods

H_0: The choice of IPO valuation methods by investment bankers in Ghana is not dependent on firm-specific factors and emerging market factors.

H_1: The choice of IPO valuation methods by investment bankers in Ghana is dependent on firm-specific factors and emerging market factors.

In Hypothesis 1, the dependent variables were the valuation methods that were used in the valuation of IPOs by the investment bankers on the GSE. The specific valuation methods that I concentrated on were those relating to multiple valuation methods (MULT), the discounted cash flow method (DCF), economic value added (EVA), and any other (OTH) valuation methods that had been used by those investment bankers. The independent variables that I used to explain the dependent variables fell under the firm-specific factors and emerging market factors categorizations. In relation to the firm-specific factors, the variables that I examined were those relating to the size of the IPO firm (SIZE), the age of the firm (AGE), the extent to which firm's assets are tangible (AIP), the profitability of the firm pre-IPO (PROF), the growth prospects of the firm in relation to sales (GROW), and the historical and expected dividend payouts of the firm (DIV). In relation to the emerging-market factors, I considered such factors as GDP (GDP), inflation rate (INF), money market interest rates (MMR), money supply (M2), size of the stock market (SZ), and the financial depth of the stock market (FD).

Hypotheses 2: Fair Value Estimates of IPOs

H_0: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO does not depend on firm-specific and emerging market factors.

H_1: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO depends on firm-specific factors and emerging market factors.

In Hypothesis 2, the dependent variables were the weightings assigned by the investment bankers to the value estimates of each of the valuation methods. In this regard, the dependent variables in this hypothesis are the same as those used in Hypothesis 1, except that the weights (W) that were attached to the value estimates of each of the valuation methods were prefixed to the variables used in the Hypotheses 1. In this respect, the dependent variables were denominated as: the multiple valuation methods (MULTW), the discounted cash flow method (DCFW), economic value added (EVAW), and other (OTHW) valuation methods. The independent variables in these hypotheses were, without any exception, the same as those used in Hypotheses 1.

Hypotheses 3: Price Discount and the Setting of Preliminary Offer Prices

H_0: The application of price discount in the setting of preliminary offer price of an IPO does not depend on firm-specific and emerging market factors.

H_1: The application of price discount in the setting of preliminary offer price of an IPO depends on firm-specific and emerging market factors.

In Hypothesis 3, the dependent variable was the IPO price discount (DISCOUNT). This price discount, according to Roosenboom (2007), could be computed as follows: "(fair value estimate - preliminary offer value)/fair value estimate" (p. 1226). In this study, I followed the same basis of measuring price discount. The independent variables in these hypotheses were, without any exception, the same as those used in Hypotheses 1 and 2.

Hypotheses 4: Forecasts Errors in IPO Prospectuses

H_0: The absolute forecasting error observed for each IPO firm is not dependent on the firm's size, retained ownership, forecasting interval, age, gearing, and auditor's reputation.

H_1: The absolute forecasting error observed for each IPO firm is dependent on the firm's size, retained ownership, forecasting interval, age, gearing, and auditor's reputation.

In Hypothesis 4, the dependent variable that was the absolute forecast error (AFE). According to Gounopoulos (2011), AFE measures the overall accuracy of any earnings forecasts. In helping to predict the magnitude of such forecast errors in IPO prospectuses of the GSE listed firms, I examined the following six independent variables: the IPO firm' size (SIZE), proportion of shares retained by the pre-IPO owners of the firm (OWN), forecast horizon (HOR) of the IPO firm's earnings forecasts, the pre-IPO operating history of the IPO firm as measured by age (AGE), the level of IPO firm's gearing/leverage post issue (LEV), and the reputation of the IPO firm's auditors (AUD) pre-issue.

Hypotheses 5: Earnings Management in IPO Prospectuses

H_0: Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years.

H_1: Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years.

In Hypothesis 5, the dependent variable was the discretionary current accrual (DCA). The presence of this type of accruals in the pre- and post-issue financials of an IPO firm is considered by scholars in this field to represent the extent of earnings management in that firm's prospectus. To predict the existence of earning management in the IPO prospectuses of GSE listed firms, I relied on such independent variables as the decision of IPO firms to comply with international accounting standards (IAS), the extent to which the firm's board of directors consist of non-executive (EB), the quality firm's auditor (AUD), the ownership structure of the firm's shares post-issue (OWN), and the post-issue levels of shares ownership retained by the pre-IPO owners (ROWN).

Hypotheses 6: IPO Pricing Anomalies on the Ghana Stock Exchange

H_0: There is no significant cross-sectional relationship between price-to-value ratios (P/V) and over/undervalued first-day returns observed on the GSE.

H_1: There is a significant cross-sectional relationship between price-to-value (P/V) ratios and over/undervalued first-day returns observed on the GSE.

In Hypothesis 6, the dependent variable was the first-day return on the trading of the IPO firm's stock post-issue (R(1st Day)). According to Purnanandam and Swaminathan (2004), this first-day return has traditionally been defined in IPO

performance literature as the difference between the offer price and the first trading-day market price. The independent variables that I used to predict the over/underpricing of the first day returns of the stocks of IPO firms listed on the GSE were the price-to-value ratio of the IPO firm's stocks (PV), book-to-market value of the IPO firm's equity (BTMV), the level of accruals in the IPO firm's earnings post-issue (ACCURALS), the consensus analysts' earnings growth rate for the IPO firm's stock post issue (GROWTHAIP), and the post- issue ratio of IPO firm's EBITDA to sales (EBITDA).

Operationalization of Hypothesized Variables

I set forth the operational definitions and the basis for the empirical measurement of each of the variables in each of the six hypothesis in both the literature review section (Chapter 2) as well as the methodology sections (Chapter 3) of this study. By way of empirical testing, I tested Hypothesis 1 using logistic regression analysis whilst the remaining Hypotheses were tested using ordinary least squares (OLS) regression analysis.

Nature of the Study

From the above research questions and the related hypotheses, I determined this study could best be conducted using a quantitatively led nonexperimental research design. The study is nonexperimental research because the independent variables of the study cannot be subjected to any form of experimental manipulation–true experimentation or quasi-experimentation. Using Johnson (2001)'s categorization of nonexperimental research, which was done along the lines of 'time' and 'objective' dimensions, the study fell within the ambit of being 'cross-sectional' by way of time and

'explanatory' by way of objective. It is cross-sectional because I collected data for each of the variables in each of the six hypotheses at a time in which those data occurred. The study was also 'explanatory' because I sought to explain the processes and procedures of IPO valuations on the GSE as well as to explain the 'how' and 'why' those valuations were carried out.

Conceptual Framework for the Study

The ideas from literature on which I grounded this research were those ideas and concepts of IPO valuation, pricing, and performance that were espoused by Roosenboom (2007, 2012) and Deloof et al. (2009). Roosenboom (2007)'s research work, on the valuation of IPOs by underwriters in the French IPO Markets, is the foundational basis for the conduct of this study. The key ideas and concepts espoused by Roosenboom were further conceptualized in 2012 in diagrammatic form as shown in Figure 1. From this conceptual framework, it could be noted that in determining the eventual prices of IPOs, underwriters first have to decide on the valuation method(s) that could assist them in coming out with a fair value estimate of the corporate stock. Following the estimation of the fair market value of the corporate stock, the investment bankers deliberately introduce a price discount to come out with a preliminary offer price. In the case of underwriting in France, Roosenboom (2012) pointed out that the investment bankers advertise this price discount through their reports (i.e., analysts' reports) to the investing public.

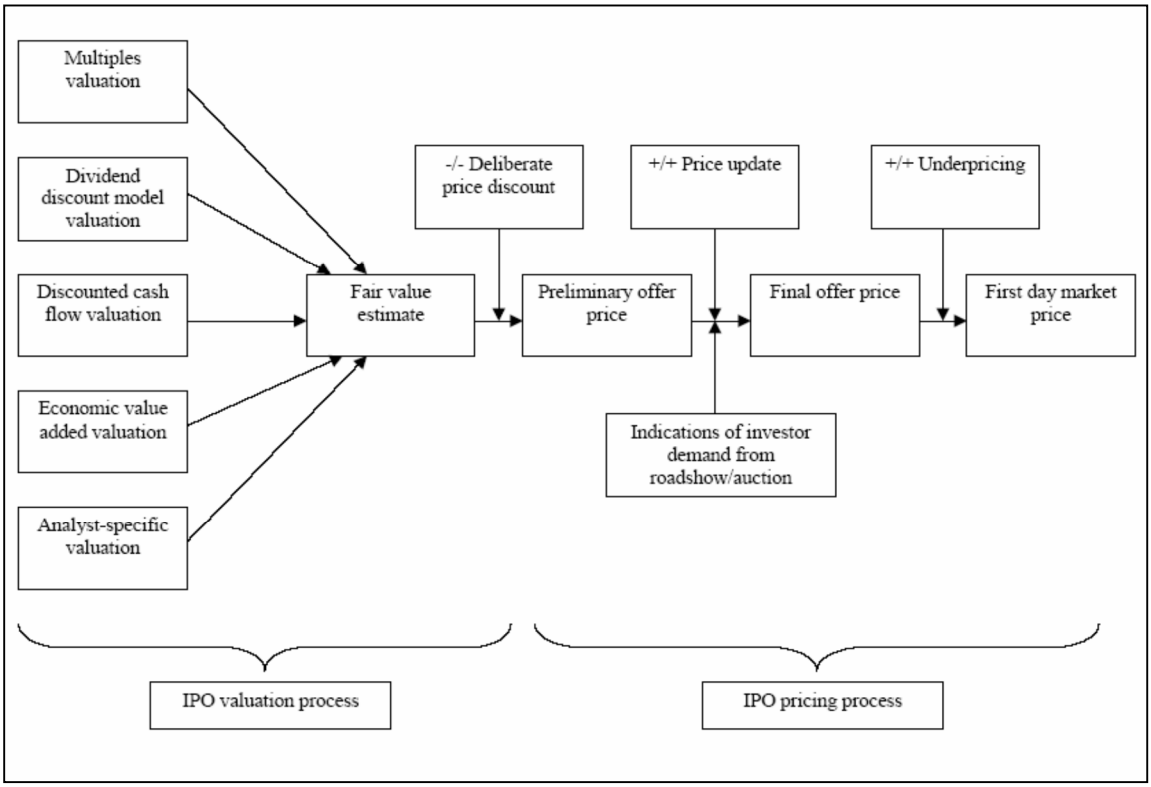

Figure 1. IPO valuation and pricing. From "Valuing and pricing IPOs," by P. Roosenboom, 2012, *Journal of Banking & Finance, 36(6)*, p. 1656.

Following these advertisements, the investment bankers will then be in a position to gauge investor sentiments and investor demands for the impending IPO. The investment bankers use this information to adjust the preliminary price to arrive at the final offer price.

Deloof et al. (2009), in building upon the work of Roosenboom (2007), extended their data collection and analysis beyond quantitative analysis of Roosenboom to a qualitative assessment of how investment bankers in Belgium perceived the accuracy of the IPOs they championed on the Euronext Brussels.

Definition of Terms

Absolute forecast error: A metric that measures the relative deviation of actual earnings from forecast earnings and provides an indication of how close the forecasts were to actual profits in absolute terms (Gounopoulos, 2011).

Accruals: Accrual accounting arises when the recognition of transaction and/or events in the financial statements are made by managers in periods that do not match with the periods in which the related cash flows of those transactions/events occur (Roosenboom, van der Goot, &Mertens, 2003).

Comparable firm: In valuing a giving firm's IPO using accounting-based comparable multiples, one will need a comparable firm, which is a firm similar to the firm whose IPO is being valued in terms of underlying characteristics in risk, growth, and cash flow patterns (Damodaran, 2011).

Discounted cash flow (DCF) method: A method for estimating the value of firm's equity stock by discounting its future free cash flows to the present value using an appropriate discount rate (Clayman, Fridson, & Troughton, 2012).

Discounted dividend method (DDM): A method for valuing a firm's equity stock by discounting the firm's future dividend payments to the present value using an appropriate discount rate (Cupertino, Da Costa, Coelho, & Menezes, 2013).

Discount rate: A rate that is used to find the present value (i.e., the value today) of the firm's future cash flows or dividends (Hitchner, 2011).

Dividend payout ratio: A measure of total dividend payment by a given IPO firm's shareholders divided by the firm's earnings as disclosed in the firm's IPO prospectus (Fattoum & Delmar, 2013).

Dividend yield: A return made to a stockholder by a given IPO firm in relation to the price at which the shares of that firm was purchased by the stockholder (Guo, 2011).

Earnings management: Earnings management in financial reporting occurs when management structure transactions in such way that the financial reports mislead users about the underlying economic performance of the company (Lee & Masulis, 2011). Other terms used for earnings management include *creative accounting* or *window-dressing*.

EBITDA: A measure of an IPO firm's earnings before interest, taxes, and depreciation, and amortization (Chemmanur & Krishnan, 2012).

Economic value added (EVA): A method for valuing a firm's equity stock that is computed as the net operating profit after taxes minus the cost of capital. EVA is a proprietary valuation framework developed by the consulting firm Stern Stewart that is a derivative of the traditional residual income model distinguished from the latter principally by the accounting adjustments to profits and capital specified by Stern Stewart (Silverman, 2010).

Emerging/frontier markets: A stock market located in a country whose economy reflects numerous market imperfections (e.g., barriers to entry, government regulations, political risks, high agency costs, less developed private financial markets, poor access to

financing, concentrated ownership structures, and low institutional ownership, etc.) that create both risk and opportunity for the investor (Claessens & Yurtoglu, 2013).

Enterprise value: A total market value of the firm's equity and debt, less the value of its cash and marketable securities/investments. Enterprise value per share, according to Rhodes and Ligon (2013), could be calculated as (market value of equity + book value of debt – cash)/ (shares outstanding after the offering).

Fair value: This is the amount at which an asset (or liability) could be exchanged between a willing buyer and a willing seller when the former is not under any compulsion to buy, and the latter is not under any compulsion to sell (Pinto, Henry, Robinson & Stowe, 2012).

Forecast error: This is the difference between the actual earnings and the forecast earnings and then divided by the absolute value of the actual earnings (Bulut & Er, 2011).

Initial public offering (IPO): A process of selling stocks to the public for the first time. An IPO of equity represents a critical stage of development, which is often referred to as the "re-birth" or "re-start" of the organization (Moore, Bell, Filatotchev, & Rasheed, 2012).

Investment banking firm: A firm that manages a security issuance and designs the structure of its issue. Beyond securities' issuance, such a firm could also be providing such services as underwriting equity offerings, underwriting debt offerings, advising on mergers and acquisitions, providing analyst research-services, and providing market-making services (Fernando, May, & Megginson, 2012).

Price-to-book-value ratio: A valuation ratio calculated as the price per share divided by book value per share. This ratio, in comparison with other value multiples, is better suited for the valuation of financial service firms (Damodaran, 2011).

Price-to-cash flow: A valuation ratio calculated as the price per share divided by cash flow per share. This ratio, as a valuation multiple, provides a better idea of the amount of money available to management for further research and development, marketing support, debt reductions, dividends, share repurchases, and so on (Fávero & Belfiore, 2011).

Price-earnings multiple: A valuation ratio calculated as the price per share divided by earnings per share. The ratio is an indicator of how much value the market places on each currency unit of firms' earnings (Taliento, 2013).

Price-to-sales ratio: A valuation ratio calculated as the price per share divided by sales per share. This ratio is less susceptible to accounting distortions than the price-to-book and price-to-earnings ratios. Whilst transitory items such as the differences between accounting and economic depreciation, and accounting rules requiring firms to expense immediately intangible investments such as R&D, employee training, and advertising can distort price-to-book and price-to-earnings ratios (Danielson& Lipton, 2012).

Price-to-value: A ratio of the eventual offer price of an IPO and the average fair value estimate of that IPO computed from the various valuation methods. The P/V ratio has been empirically proven to be a good predictor that is capable of explaining more than 70%of the cross-sectional variations in stock returns (Badertscher, 2011).

Residual income method (RIM): A model of stock valuation that views intrinsic value of stock as the sum of book value per share plus the present value of the stocks' expected future residual income per share (Beynon & Clatworthy, 2013).

Assumptions

I underpinned this study on several fundamental assumptions. These assumptions were aspects of the study that I believed cannot be demonstrated to be true but were assumed to hold for the purposes of conducting this research. The first of these assumptions was that only firm-specific and emerging market factors influenced the choice of valuation methods by investment bankers in Ghana. In this regard, I assumed that other factors such as industry-related factors and stock-market specific factors did not influence the choice of those valuation methods by investment bankers. The second was my presumption that the discount rates the investment bankers used in the valuation of each IPO-firm's stock were accurate and, therefore, those discount rates were taken as given in the IPO prospectuses. I also assumed that the determination of the systematic and unsystematic risks facing the valuation of each of those IPO stocks was done to precision by the investment bankers and the management of IPO firms.

Scope and Delimitations

Although this study is about an empirical analysis of IPO valuation, pricing, and performance in emerging markets, the study was geographically confined to the examination of IPO processes and procedures of the GSE as a stock exchange that is located in an emerging market. This study could have been extended to cover all stock exchanges in either the West African sub-region or the entire African continent but time

and resources could not allow for such an extension. The study could have also considered the accuracy of the costs of capital (discount rate) that have been used by the investment bankers in Ghana in their valuation of corporate stocks of IPO firms; such consideration was, however, not made in this study. The study could have also considered the impact of other factors (i.e., industry-related factors and stock-market specific factors) on the choice of valuation methods by investment bankers in Ghana; such considerations were also not made. In spite of these delimitations, however, I considered the choice of valuation methods by investment bankers in Ghana in relation to the influence of firm-specific and emerging-market variables. Secondly, I considered how investment bankers in Ghana assigned weights to the value estimates of each valuation methods. Thirdly, I examined how the preliminary offer prices of the IPOs listed on the GSE were transformed into the eventual offer prices through the use of price discounts by the investment bankers. Fourthly, I considered the accuracy of management earnings forecasts in IPO prospectuses by examining the extent of forecasting errors as well as the tendencies of earnings management in the pre-IPO financial statements incorporated in the IPO prospectuses. Finally, I considered the short-term over/underpricing of those IPOs' prices post-issue.

Limitations

The key limitation of this study boarded on the limited number of IPO listings on the GSE, which as of 2012 stood at only 35 IPOs. This number is insignificant when compared with the 228 sampled IPOs that Roosenboom (2007) studied in the French market. In spite of this assertion, however, the use of such a small number of IPOs in a

study is not out of place, because Deloof et al. (2009) in their conduct of a similar study only dealt with 45 sampled IPOs listed on the Euronext Brussels. Similarly, Berkman et al.'s (2000) study on the accuracy of various valuation methods in the New Zealand Stock Exchange also covered only 45 sampled IPOs. Finally, Bulut and Er (2011) in their study of forecast errors on the Istanbul Stock Exchange studied only 30 IPOs.

Significance of the Study

Filling the Gaps in the Current IPO Literature

From the gaps in the literature enumerated in the background section of this chapter, I noted that these gaps related to (a) the IPO literature being bereft of literature on pricing and valuation of IPOs in both the developed and emerging markets; (b) the difficulty in applying traditional valuation methods in emerging markets; (c) the recent increase in the number of undersubscriptions in the IPO listings on the GSE; and (d) the loss of investor confidence as a consequence of these undersubscriptions. The potential contribution of this study is to provide a means of filling these gaps. My study filled the gap relating to the scholarly contributions on IPO valuation and pricing by bringing together all the relevant scholarly articles penned so far in this field of financial economics. Through this contribution, the literature review aspect of this study is a compendium on the IPO valuation, pricing, and performance. In filling the gap relating to the applicability of the traditional valuation methods in emerging markets, this study focused on application of these methods on the GSE. Choosing the GSE as the context of the study means that the valuation and pricing of IPOs were examined from the perspective of a purely emerging/frontier market. Moreover, the location of this

emerging/frontier market as a stock exchange within the sub-Saharan Africa provided a further opportunity of studying the valuation and pricing of IPOs from the perspective of emerging market located in an economically emerging continent.

Implications of the Study for Social Change

A scholarly look at the IPO valuation, pricing, and performance in this study presupposed that there is a need for transparency, responsibility, and accountability in IPO listings on stock exchanges. This need, as I pointed out in a prior section, is typified by the Facebook's IPO debacle. The IPO was priced at $38 per share and at this price, the lead underwriter, Morgan Stanley, and 32 other underwriters bought their stakes. These underwriters and their big clients sold their stakes in the IPO at a starting trading price of $42.05 resulting in an instant profit of $4.05 per share. Four days after the IPO, Facebook and its underwriters were sued for fraud (Marcy, 2013). The problems that confronted Facebook's IPO, according to Cervellati et al. (2013), could be summed up as resulting from the lack of supervision that is required to ensure transparent financial statements and to protect investors. This lack of transparency, wrong corporate culture, and conflicts of interest, according to Cervellati et al., had the potential of provoking stock crashes and damage to the investors' confidence in the overall financial system. Another explanation for the Facebook's IPO debacle, Cervellati et al. further noted, was due to distortions in analyst valuations caused by conflicts of interest and behavioral biases on the part of these valuation analysts. From this narrative of the Facebook's IPO, it is obvious that as humans we are inherently inclined to defrauding others whenever given the opportunity to do so.

For Whom Is the Study Important?

In view of the social change issues associated with IPO valuations, pricing, performance, this study will be important to the following:

1. *The Ghana Stock Exchange*. This is because, for the exchange to increase the ratio of listed companies to the number of companies within the economy, the way it values and prices IPOs should be aboveboard and in this way the GSE could engender investor confidence in its operations.
2. *The investment bankers*. These professionals are the ones who undertake the valuations and pricing of corporate stocks. Putting together a scholarly perspective on how they have performed so far will improve the accuracy of those valuations and pricing. In the end, they stand to benefit as investors and corporate perceptions of their professional services increase through improved and more accurate IPO valuations and pricing practices.
3. *Corporations wishing to get listed*. If this study ends up achieving its set goal of improving the valuation and pricing accuracy of IPOs; then more and more corporations will begin to consider the listing of their stocks on the GSE as one of the most preferred options available to them for raising capital.
4. *The regulatory/supervisory authorities*. When valuation and pricing of stocks goes wrong as was the case with the Facebook's IPO; the bodies that come up for blame are those charged with regulatory and/or supervisory authority over the issuance of those shares. In the case of capital markets in Ghana, the Securities and Exchange Commission of Ghana has the responsibility of

ensuring that investors are not shortchanged by the IPO offerings of corporations in Ghana. In this regard, such a policy maker should be interested in scholarly work whose aim was to bring to the fore the accuracy of the stocks, the issuance of which they have so far superintended.

5. *The investing public*. Investors who are the eventual target of every IPO should be interested in an academic paper geared towards increasing their level of understanding on how those IPOs, in which they participated and put their hard earned currency into, were valued and priced.

Summary and Transition

In this introductory chapter, I have introduced my readers to the beginning and end of my doctoral research. The introduction section to this chapter provided my readers with an understanding of how I came by the topic of the study as well as the reasons why there was a need to subject the topic to a scholarly review. In the background section of the study, I provided a brief summary of the literature in financial economics that related to the scope of the study. In this brief summary, I considered the role of a stock exchange in an economy as well as the role stock valuation plays in corporate financial management. I also examined the gaps that existed in the literature regarding IPO valuation and pricing as well as the problems that are faced by investment bankers when it comes to the valuation and pricing of IPOs.

Following this background to the study, I then went on to consider other sections of the chapter such as (a) the problem statement around which the entire study revolves; (b) why the study was being conducted; (c) the research questions and hypotheses of the

study that allowed me to reduce the problem statement into an academic research; (e) the nature of the study by way of its methodological underpinnings; (f) the conceptual framework for the study, which was drawn from literature and gave a mental picture of the processes and procedures that are used by investment bankers in the valuation and pricing of IPOs; (g) the definition of the technical terms that were used in the study; (h) the assumptions, scope, limitations, and delimitations; and (g) the significance and the positive social change implications of the study.

In the rest of the study, I extended this introductory chapter by presenting the detailed review of literature in chapter 2. In chapter 3, I set forth the methodology used in conducting the research by considering in detail the operational definition of variables in each of the six hypotheses, the research design that scoped and delimited the research method, the sampling and sampling procedures used in the study, the procedures for data collection and analysis. In chapter 4, I presented the results of the data analysis by setting out both the descriptive statistics of each of the hypothesized variables and the overall testing of each of the six hypotheses. In chapter 5, I discussed the findings of the analyzed data in relation to providing answers to each of the four research questions on which this study revolves. I also presented in chapter 5 the implications of the research findings for each of the major stakeholders on the GSE and gave recommendations for action, social change, and further research.

Chapter 2: Literature Review

Introduction

Organization of the Literature Review

In the conduct of this literature review, I reviewed prior research and literature that related to the problem statement, the purpose statement, the research questions, and the hypotheses that were set forth in Chapter 1. I then encapsulated the content of this literature review in a literature review map. The review map, as set forth in Figure 2, is divided into three main titles within which I conducted the entirety of the literature review. From the map, it can be noted that the first of these titles covers the research on the valuation of IPOs. The second title covers the research on IPO pricing, and the third and final title covers the research on the post issue return performance of IPOs. These three main titles I further divided into subtitles. Under the IPO valuation main title, for example, the three main subtitles relate to IPO valuation methods and their accuracy, choice of valuation methods, and management earnings forecasts in IPO prospectuses. Each of these three subtitles I further divided into sub-sub-titles. Under the IPO valuation methods and their accuracy, for example, I considered literature that related to the various valuation methods that abound in both theory and practice on IPO valuations.

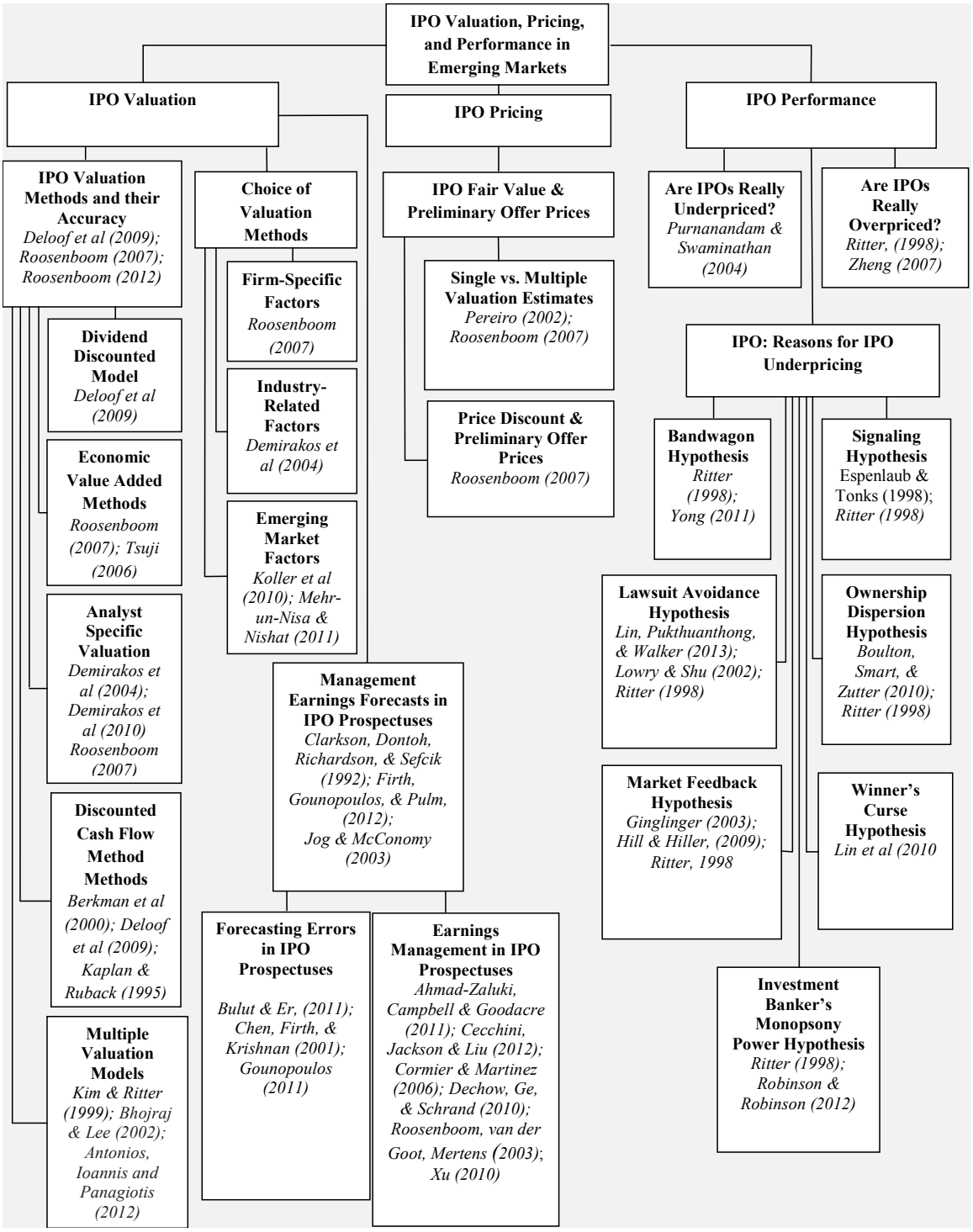

Figure 2. Literature review map on IPO valuation, pricing, and performance.

Strategies Used for Searching the Literature

Building literature through course works. The literature review map depicted in Figure 1 and its related literature reviews were put together at the various stages of my doctoral course work at Walden University.

Libraries, databases, and search engines, and search terms used. In my conceptualization of the research topic and putting together of the literature review map, I mainly relied on Walden University's library. The databases I searched included, but were not limited to, Business Source Complete/Premier, ABI/INFORM Complete, Emerald Management Journals, SAGE Premier, and Accounting & Tax (from ProQuest). Each of these databases contained thousands of full-text academic journals in business, management and finance that were crucial to my retrieval of the pertinent journal articles that formed part of my literature review map depicted in Figure 2. In addition to the library and databases, Google Scholar as a search engine played an important role in the initial search for the journal articles that related to a given area of my research. The ability to link the searches on Google Scholar to Walden University's library was equally important in ensuring the ease of access and retrieval of the needed journal articles. The key terms I used in searching for literature included IPOs' valuation, pricing, forecasting errors, earning management, GSE, underpricing, and overpricing.

Scope of the Literature Reviewed

Years searched. The journal articles used in this study were mainly published between 2009-2013. This 5-year expanse stands in consonance with the requirement by Walden University for its doctoral students to ensure that at least 85% of their search for

journal articles and other referencing sources is within the preceding 5 years of their doctoral dissertation. In spite of my desire to accord with this requirement of Walden University, my referencing list now stands at 72% of the 5-year expanse requirement. The 85% requirement was difficult for me to accord with because (a) as noted in Chapter 1, literature in this area of IPO research is particularly thin and hence a 13% shortfall (i.e., 85%-72%) may be justifiable; and (b) some of the literature I considered as being seminal in nature and so their deployment in this study cannot be considered out of place even though they fell outside the 5-year preceding boundary.

Types of literature reviewed. The seminal papers in financial economics literature that I used in this study were those relating to the scholarly works of Fama (1970) and Ritter (1998). For the current peer-reviewed literature that fall within the 5-year ambit of this study, the research works that were cited included, but were not limited to those of Ahmad-Zaluki et al. (2011); Cecchini et al. (2012); Dechow et al. (2010); Deloof et al. (2009); Gounopoulos (2011); Lin et al. (2010); Robinson and Robinson (2012); Roosenboom (2012); Xu (2010); and Yong (2011). The other peer-reviewed literatures that were neither seminal nor falling within the 5-year ambit were considered in this study because without their incorporation into the literature review, this study cannot represent a compendium of literature on IPO valuation, pricing, and performance. Such literature included, but was not limited to the research works of Demirakos et al. (2004); Jelic et al. (1998); Lonkani and Firth (2005); Purnanandam and Swaminathan (2004), Roosenboom (2007); and Zheng (2007).

IPO Valuation: The Roles of Three Key Stakeholders

The Role of Investment Bankers in IPO Valuation and Pricing

A corporation before going public ought to have its stocks valued. Through this valuation, a determination could be made of the price range within which the firm's IPO will be offered to the public. Fernández (2013) concurred with this assertion when he remarked that a valuation is the means by which investment bankers determine the offer prices of IPOs. Investment bankers are usually given the responsibility by the management of the IPO firm to determine the offer price. This delegation of the pricing decision, according to Roosenboom (2007), is because investment bankers are valuation experts whose certification of the offer price is of absolute necessity if the market is to take the IPO firm serious. The primary role of these investment bankers in the valuation of corporate IPOs, Roosenboom further noted, is necessitated by the problem of price discovery that confronts both the issuing firm, on one hand, and the market participants, on the other. This problem of price discovery together with the roles of all three parties– the issuing firm, the stock market participants, and the investment bankers–are conceptualized in Figure 3. I conceptualized this diagram from the work of Roosenboom

(2007).

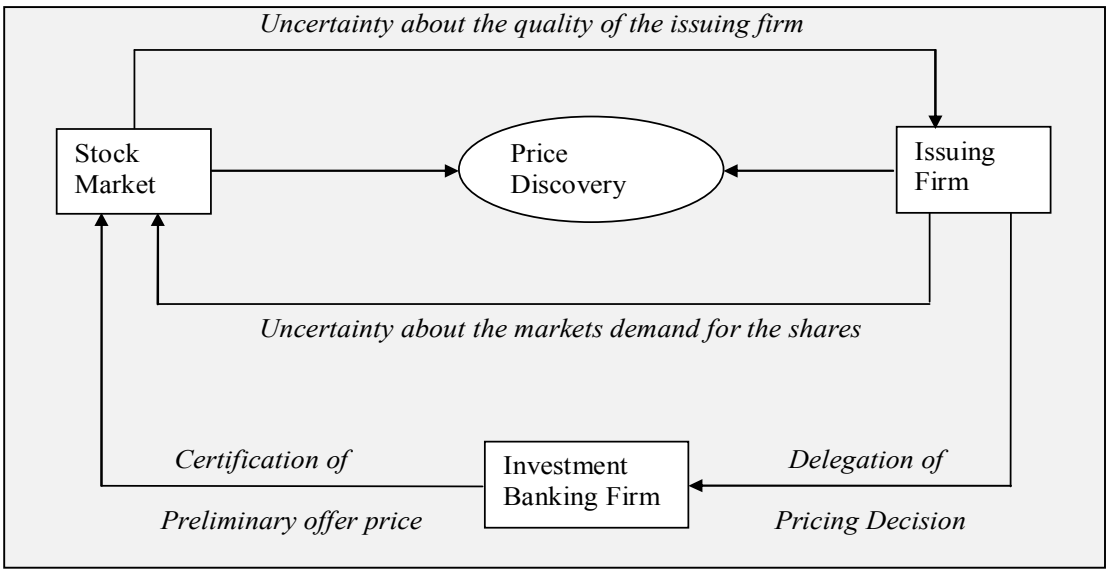

*Figure 3.*Conceptual map on the role of investment bankers in IPO valuation.

The Role of Issuing Firm's Managers in IPO Valuation and Pricing

In spite of their delegation of the pricing decision to the investment bankers, the management of the IPO's issuing firm is ultimately responsible for the entire IPO decision-making process. Brau and Fawcett (2006), in a survey of 336 chief financial officers (CFOs) in the United States, noted that the role of the issuing firm's managers straddles such issues as their (a) motivation to get their firms listed, (b) decision on the timing of their IPOs, and (c) decision on the choice of a lead underwriter. In relation to the motivation for going public, the survey results revealed that IPOs provide the issuing firms with the public shares that the firm could use as consideration in future mergers and acquisitions. This finding, according to Brau and Fawcett, stands contrary to a widely held belief in academic theory that firms conduct IPOs when external equity will minimize their cost of capital. This minimization of cost of capital proposition, according

to Brau and Fawcett, was further heightened by the 1984 pecking order financing theory of Myers and Majluf that argued that firms seek funding in the order of internal equity, debt financing, and then external equity. In relation to the decision-making factors that influence the corporate managers' timing of their IPOs, the survey results of Brau and Fawcett revealed that the overall stock market conditions are the most important factor that influenced the IPO timing-decisions of issuing firms' managers. This factor stood out as the most important in comparison with such other IPO timing-decision factors as industry conditions, first-day stock performance of recent IPOs, the fact of having other comparable firms getting listed, and the need to raise capital to enhance growth of their companies. For the issuing firms' managers' role in having to select investment bankers to champion the issuance of their IPOs, the survey results pointed out that the most important variable that influenced managerial decision-making is the ability of the investment banking firm to provide the needed expertise that will ensure a successful IPO issuance. The results debunked the notion that the fee structure of underwriters was a matter of concern in such a selection exercise.

The Role of Institutional Investors in IPO Valuation and Pricing

The role of institutional investors in any IPO processes is so important because, according to Jenkinson and Jones (2009), institutional investors are, more often than not, able to produce price-relevant information that does assist the investment bankers in their IPO's price discovery. This information-revealing-role of institutional investors is because in most countries such investors do engage in pre-bookbuilding meetings with the investment bankers. This pre-bookbuilding do usually require the institutional

investors having to put together research reports that give them an indication of a possible price range of a pending IPO (Jenkinson & Jones 2009). These research reports do, in most cases, provide information on the valuation models that were used by the investors in arriving at a given IPO's price range. In addition to their pre-bookbuilding activities, institutional investors do reveal pricing information of a pending IPO through the bids they submit during the bookbuilding stage itself. The final stage in the IPO processes, in which the provision of valuable information to the investment bankers by institutional investors, is taken notice of in the eventual allocation of IPO shares. The allocation of such shares by the investment bankers, according to Jenkinson and Jones, is usually done in such a way that it will reflect the information production and revelation efforts of a given institutional investor.

IPO Valuation: How Do Investment Bankers Value and Price IPOs?

IPO Valuation Methods and Their Accuracy

There are several methods of IPO valuation opened to these investment bankers. For ease of categorization, Roosenboom (2007) distinguished between five valuation methods – the peer group multiples, the dividend discounted model, the discounted cash flow model, the economic value added method and underwriter-specific valuation methods. Deloof et al. (2009) in their conduct of somewhat similar research on IPO valuations in Belgium rather spoke of the discounted free cash flow model (DFDC), the dividend discounted model (DDM), and the multiples approach to valuation. In relation to the multiples approach, Deloof et al. spoke of such sub-categories as Price to earnings (P/E), Price to cash flow (P/CF), Enterprise value to EBITDA (EV/EBITDA), Enterprise

value to sales (EV/S), Price to book (P/B), dividend yield, and P/E-to-growth. The accuracy of each of these valuation approaches put forward by Roosenboom are considered in turn.

Multiples (MULT) valuation. One of the most important studies on the assessment of valuation accuracy of accounting-based market multiples is the research work of Kim and Ritter (1999). The IPOs market in the United States, the authors further noted, was largely dominated by young companies and that for these companies; the effort of putting forecasted future cash flows together is a difficult, if not impossible, task to undertake. Giving these difficulties, the use of DCF techniques are, therefore, bedeviled with grievous errors that render the IPO values from these techniques imprecise and, therefore, result in IPO mispricing. In this regard, the use of accounting-based market multiples in conjunction with comparable firm multiples, according to Kim and Ritter, is widely recommended for valuing IPOs. Bhojraj and Lee (2002), in adding their voice to this debate noted that the proponents of DCF valuation methods, more often than not, do resorts to use of market multiples when estimating terminal values that they incorporate into their DCF valuation. In spite of this popularity in the use of accounting-based market multiples, Kim and Ritter noted the lack of systematic study on the usefulness of this approach to IPO valuations. Bhojraj and Lee, on their part, noted the lack of theory to guide the application of these multiples in IPO valuation and pricing. Antonios, Ioannis, and Panagiotis (2012) spoke of mixed and biased valuation results in the use of multiples. This is because their empirical instigation of 3,572 sampled United States' listed firms, revealed that whilst the multiples valuations of these firms provided,

on one hand, negatively biased '*means*'; the '*medians*,' on the other hand, were rather positively biased. In this regard, the research work of Kim and Ritter revealed that the use of P/E ratio and other comparable firm multiples lacked precision especially when those multiples are underpinned by historical accounting data. Using forecasted accounting information, according to Kim and Ritter, could substantially improve the valuation accuracy of these market multiples.

Dividend discounted model (DDM) valuation. The accuracy or otherwise of DDM was given a wider coverage in the work of Deloof et al. (2009). The quantitative findings of Deloof et al. revealed that investment bankers in Belgium rely on several valuation models in their computation of IPO prices. In spite of the usage of various models, however, Deloof et al. remarkably found out that the eventual IPO prices are rather closer to the estimates that are derived using DDM. This closeness of the offer price to DDM estimates, according to Deloof et al., is a matter of mere coincidence and is not because investment bankers primarily rely on the DDM estimates. The fact of the matter, Deloof et al. further noted, is that DDM tends to produce lower valuations when compared with other valuation techniques, but the eventual offer prices tend to be closer to the DDM estimates because of the price discounts that the investment bankers attach to the higher valuations derived from other valuation techniques. DDM, according to Deloof et al., is considered by investment bankers in Belgium to be too conservative and hence most of those bankers are less reliant on it. The use of DDM by investment bankers, Deloof et al. further noted is only for the purposes of serving as a control for checking the values that were derived using other valuation techniques such as DCF.

Discounted cash flow (DCF) valuation. DCF valuation technique had been touted as the most important valuation method by almost all the investment bankers in Belgium, (Deloof et al., 2009). This superiority of DCF valuation techniques is also widely acclaimed in theory by such academic and scholarly writings of Berk, DeMarzo, and Harford (2012); Brahmana and Hooy (2011); Gleason, Johnson, and Li (2013); Hoffmann, (2013); Imam, Chan, and Shah (2013); Ionaşcu and Ionaşcu (2012); Nel (2010); Panda (2013); Panda (2013); Pandey (2012); Perek and Perek (2012); Reddy, Rajat, and Nangia (2013); Reis and Augusto, (2013); and Schnaidt and Sebastian, (2012). In comparison with other valuation methods, Deloof et al. further noted that those bankers considered DDM as being conservative, whilst the multiples valuation techniques were considered to be driven by market sentiments and hence is prone to providing higher or lower valuations in hot or cold markets. In spite of this positive light in which Deloof et al. painted the DCF technique, a study by Berkman et al. (2000) on IPO valuation of 45 firms in New Zealand concluded that there was not much difference in the accuracy of valuation estimates that were derived from the DCF and P/E comparable methods. This result, according to Berkman et al., was in conformity with the results obtained earlier by Kaplan and Ruback in 1995; which indicated that, for a sample of large leveraged buy-outs, both DCF and P/E methods provided reasonable estimates of value. These empirical findings presupposed that none of the valuation techniques is superior and hence investment bankers in the valuation of a given firm's IPO do resort to the use of several (instead of single) valuation methods.

Economic value added (EVA) valuation. The use of EVA as a valuation technique for pricing IPOs, according Roosenboom (2007), is not widespread. This less widespread usage of EVA in IPO valuations could be explained by the research work of Tsuji (2006). According to Tsuji, the claims and counterclaims in favor and out of favor with the use of EVA as a method for corporate valuation had largely been informed by prior research works conducted in the United States. Tsuji, therefore, evaluated the effectiveness of EVA as a valuation measure in Japan by comparing EVA with several other common valuation measures such as cash flow and operating incomes. The empirical findings of Tsuji revealed, among others that (a) EVA had a weaker relationship with the levels of corporate values than accounting measures such as operating income and profit after tax; (b) EVA, is limited, in its ability to effectively capture the levels and dynamics of the corporate market expectations; and (c) EVA could be increased by arbitrary increasing profit and/or arbitrary decreasing investment capital. These weaknesses and the possibility of manipulations tend to make EVA a less robust measure of corporate value when compared with those valuation methods that deploy cash flows. In spite of these weaknesses claims, however, scholars such as Abdeen and Haight (2011); Kumar and Tamilselvan (2013); Sharma and Kumar (2010); Silverman (2010); and van der Poll, Booyse, Pienaar, Büchner, and Foot (2011) do see EVA as one of the best performance and valuation measurement metric in financial economics.

Analyst specific (AS) valuation. Like EVA, analyst specific valuation methods were found by Roosenboom (2007) to be less wide-spread in usage. This analyst specific valuation label of Roosenboom, however, begs the question: what are analyst specific

valuation methods? To best explain what Roosenboom (2007, 2013) meant by this label, one could turn to the empirical works of Demirakos, Strong, and Walker (2004, 2010). In their earlier work, Demirakos et al. (2004) were concerned with the identification of the valuation methods that were used by investment analysts. In this respect, Demirakos et al. undertook a content analysis of 104 analysts' reports produced by the various investment bankers of 26 large UK-listed companies. The results of this content analysis, according to Demirakos et al. (2004), revealed that financial analysts tend to use the industry circumstances of a giving firm as a barometer for choosing a suitable valuation method. In their second paper, Demirakos et al. (2010) examined the extent to which valuation model choices affect the accuracy of the target price. In this paper, Demirakos et al. noted that the 'sell-side analysts' deployed earnings and other variables forecasts in producing target prices for the stocks they cover. In analyzing the predictive accuracy of this target prices, Demirakos et al. (2010) concluded that analysts use DCF models instead of the P/E models when it comes to the justification of bolder target prices. Demirakos et al. (2010), also came to the conclusion that analysts are more likely, than not, to use P/E models in a bull market and DCF models in a bear market. From these two empirical research works of Demirakos et al., it could be concluded that no valuation method(s) can be labeled as analyst specific valuation and; therefore, Roosenboom (2007) by this label could be alluding to the selection of one valuation method by investment analyst, over the other.

Choice of IPO Valuation Methods: Firm-Specific Factors

Determinants of firm-specific factors. Roosenboom (2007) in his formulation of the cross-sectional determinants of the choice of valuation methods by investment bankers in France spoke of several firm-specific factors. According to him, the firm-specific factors that influenced the choice of valuation methods by investment bankers, in their valuation and pricing of IPOs included the size of the IPO firm, the age of the firm, the extent to which firm's assets are tangible, the profitability of the firm pre-IPO, the growth prospects of the firm in relation to sales, and the historical and/or expected dividend payouts of the firm.

Firm's size (SIZE). In relation to the size of the IPO firm, Roosenboom (2007) pointed out from prior research, that larger firms are easier to value than smaller firms. This is because such firms have more stable and easier to forecast cash flows and dividends. For such firms, therefore, Roosenboom concluded that investment bankers are more likely to use direct valuation methods such as DDM and DCF in their valuation of these firms' IPOs. The measurement of an IPO firm's size, according to Roosenboom, could be done using the natural logarithm of total assets (LnSIZE). The total assets, Roosenboom further pointed out, could be the total assets reported on the balance sheet of the IPO firm and that this balance sheet could also be that of the most recent financial year prior to the firm going public.

Firm's age (AGE). In relation to the age of the IPO firm, Roosenboom (2007) argued, from prior research that the greater the age of a given IPO firm, the less risky the firm could be presumed to be. The implication of this argument is that if the IPO firm is

in existence long before its IPO listing intentions, then the firm should be capable of producing the data required for the purposes of accurately forecasting the firm's future cash flows or dividends. This argument, according to Roosenboom, supports the notion that the greater the age of an IPO firm the more likely it is for investment bankers to value that firm using direct valuation methods such as DDM and DCF. The age of an IPO firm, Roosenboom further pointed out could be measured using the natural logarithm of one plus firm age (Ln(1+AGE)). This measurement basis could serve as an ex ante proxy for the measurement of a given IPO firm's risk (Roosenboom, 2007). In summary, the greater the age of a given IPO firm, the lower the degree of risk that the firm can be assumed to have.

Tangibility of firm's assets (AIP). Tangibility of an IPO firm's assets is the extent to which the firm's total assets are represented by tangible assets. Roosenboom (2007) argued from prior research that accounting data tend to be more reliable when it comes to the measurement of tangible assets than the measurement of intangible assets. In this regard, the higher the tangibility of a given firms assets, the more likely it is that the investment bankers will be valuing that company using accounting-based market multiples such as P/E, P/S, P/EBITDA and so on. EVA, according to Roosenboom, could also be a valuation method that investment bankers are likely to deploy when an IPO firm's assets are highly tangible. In relation to the measurement of an IPO firm's tangibility (AIP), Roosenboom posited that such a measurement can be the ratio of PPE (i.e., plant, property, and equipment) to the total assets of the firm at the end of the financial year preceding the IPO.

Firm's profitability(PROF). In relation to the profitability of an IPO firm, Roosenboom (2007) hypothesized that investment bankers are more likely to use peer group multiples when an IPO firm is relatively more profitable. This assertion, according to Roosenboom, is because the use of such peer group multiples may not be a possibility if the IPO firm is less profitable. This is more so because the use of such multiples could result in such absurdities as low or negative multiples valuations.

Firm's growth (GROW). In relation to the growth potential of a given IPO firm, the hypothesis put forward by Roosenboom (2007) was that for rapidly growing firms, short-term free cash flows tend to be negative. In this regard, investment bankers are likely to employ multiples valuation methods as a basis for the valuation and pricing of such firms' IPOs. In measuring the growth of an IPO firm, Roosenboom employed forecasted sales growth during the IPO year (GROW) as a proxy for growth opportunities.

Firm's dividend payout (DIV). Finally, in relation to the dividend payout ratios of IPO firms, Roosenboom (2007) argued that investment bankers are more likely to employ DDM in the valuation of IPO firms that have high historical or high expected future dividend payout ratios. The measurement of this payout ratio, according to Roosenboom could be inferred from the expected dividend payouts as stated in the prospectuses of the IPO firm.

Empirical findings on firm-specific factors. In relation to each of the firm-specific factors noted above, Roosenboom (2007) in his examination of the IPO valuation reports of 228 investment banks that ply their trade on the French Premier and Nouveau

Marchés, came to five main empirical findings. The first of these findings was that investment bankers are likely to employ multiples methods (MULT) when an IPO firm is forecasted to be relatively profitable (PROF) and/or when valuing firms with high growth (GROW) potential. The second was that investment bankers are more likely to use (DDM) when valuing firms that are deemed to be less risky as proxied by (Ln(1 + AGE)) and/or when a firm is forecast to pay a substantial portion of its future earnings as dividends (DIV). The third was that there was no evidence to support his conjecture that discounted cash flow (DCF) method was popular with investment bankers when valuing larger (LnSIZE), older companies (Ln(l + AGE)) with lower growth rates (GROW). The fourth was a finding that was contrary to expectation that (EVA) as a valuation method will be one of the obvious choices when an IPO firm's assets are more tangible (AIP). The fifth and final finding of Roosenboom was that statically the use of analyst specific (*AS*) valuation techniques by investment bankers as a valuation method was not significant.

Choice of IPO Valuation Methods: Emerging-Market Factors

Determinants of emerging-market factors. The macroeconomic uncertainties facing businesses that ply their trade in emerging economies included, but were not limited to, illiquid capital markets, controls on the flow of capital, weak accounting practices, and high levels of political risk (Koller, Goedhart, & Wessels, 2010). Valuations in such economies, according to Koller et al., are influenced by the need to adjust for such macroeconomic factors as foreign exchange rate fluctuations, high levels of inflation, high levels of interest rate, and high levels of country-risk premium. Mehr-

un-Nisa and Nishat (2011) contributed to research in this field by empirically examining the determinants of stock price movements of 221 firms listed on the Karachi Stock Exchange (KSE) in Pakistan over the period of 1995-2006. Their research was conducted using the Generalized Method of Moments (GGM) on the data of those stock prices. Mehr-un-Nisa and Nishat pointed out that the observed behaviors of the stock prices of these firms were influenced by variables that fall under the categorizations of corporate fundamentals (i.e., firm-specific factors) or under macroeconomic factors. Mehr-un-Nisa and Nishat considered these firms' specific-factors to be internal to the firm whilst the macroeconomic factors were said to be external to the firm. In relation to the variables falling under the microeconomic factors categorization, Mehr-un-Nisa and Nishat spoke of such variables as the growth rate of GDP, an inflation rate (INF), money market interest rates (MMR), money supply (M2), size of the stock market (SZ), and the financial depth of the stock market (FD).

Empirical findings on emerging-market factors. The research work of Mehr-un-Nisa and Nishat (2011) brought to the fore various empirical findings on each of the macroeconomic variables that were considered. The first of these findings was that the stock prices of the firms listed on the KSE increased by 0.870 percentage points whenever there is one percentage point growth in the real gross domestic product (GDP) of the Pakistani economy. This result, according to Mehr-un-Nisa and Nishat is indicative of the fact that the growth in the real sector of the economy does impact share prices because such growth increases the levels of incomes, savings, and investments. The second research finding Mehr-un-Nisa and Nishat made was that a whenever there was

one percentage point increase in the inflation rate (INF), there was a corresponding fall in the stock prices of the firms studied by 0.729 percentage points. The implication of this inverse movement in the stock prices, Mehr-un-Nisa and Nishat pointed, is that inflationary pressures reduces savings and investments, thereby forcing investors on the market to pull out of the market through the sales of their shares. This in turn results in an increased supply of shares, thereby forcing the prices of the shares downward. The third finding of Mehr-un-Nisa and Nishat was that an increase in the interest rates (MMR) by one percentage points results in a 1.432 decrease in the share prices of the firms under study. This finding, according to Mehr-un-Nisa and Nishat, was to be expected because such an increase reduces money supply in the economy; which in turn causes some investors in the economy to reduce their investments in equity, in favor of cash or investment in interest bearing instruments. A reverse finding that was made by Mehr-un-Nisa and Nishat was that one percentage point increase in money supply (M2), increases share prices by 40.319 percentage points. In relation to the size of the stock market, (SZ), Mehr-un-Nisa and Nishat found that one parentage increase in the market size results only in 0.004 percentage point increase in the share price. This finding, according to Mehr-un-Nisa and Nishat, is insignificant and is indicative of the fact that trading on KSE is largely dependent on few companies with large market capitalization. Finally, in relation to the development of the financial markets in general (both money and capital markets), Mehr-un-Nisa and Nishat found that a percentage increase in the financial intermediation increases the share price by 0.015 percentage points. This, according to Mehr-un-Nisa and Nishat is indicative of the fact that the financial reforms or

liberalization in Pakistan in 2001 began paying off by showing a positive relationship between such liberalization and the prices of firms stocks that were traded on the KSE.

Determinants of an IPO's Fair Value and Preliminary Offer Price

Use of single vs. multiple valuation estimates. From the foregone, it is obvious that as to which valuation method(s) is/are employed by investment bankers in their valuation and pricing of a given IPO will be dependent on firm-specific factors and the macroeconomic or emerging-market factors that affect the performance of all the firms and their stocks in the giving economy. Investment bankers in their choice of valuation method(s), according to Pereiro (2002), are guided by whether to use a single valuation method or to use two or more of such valuation methods. The debate as to whether to use a single valuation or multiple valuation methods in the valuation of corporations is an issue that had raged within the cycles of taxation laws and jurisprudence in the United States. The Revenue Ruling 59-60 (1959-1 C.B. 237), in section 3, subsection 1 took notice of the fact that the determination of the fair market value of a closely held corporation will depend upon the circumstances of that corporation and hence "no formula can be devised that will be generally applicable to a multitude of different valuation." In spite of this legal and tax restrictions, investment bankers in their valuation of corporations for the purposes of IPO listings do resort to the use of multiple valuation methods (Roosenboom, 2007; Deloof et al., 2009). According Pereiro (2002), the use of multiple valuation methods by most practitioners is akin to the proverbial elephant and the blind men. The tale of each of the blind men on guessing the nature of the beast by touching it in many different spots did result in their understanding of the

nature of the beast. The valuation and pricing of the firm's IPO is not an exact science and hence each method tends to compute only one aspect of the firm's value.

Assignment of weights re multiple valuation estimates. Having used more than one valuation method, the investment bankers, according to Pereiro (2002) could opt for one of the two ways of reporting their valuation results. One approach, Pereiro spoke of, is to report the results obtained from each of these valuation methods without trying to reconcile the results in a unique value. The other approach, according to Pereiro is to synthesize the different results in a unique, singular, or synthetic value. For the purposes of getting an IPO listed, investment bankers may need to provide a single or unique value estimate, and this will require the use of some weighting of the various value estimates derived from the various valuation methods. According to Pereiro, the techniques for conducting such weightings could be categorized into explicit or implicit weighing methods. In relation to the implicit weighting techniques, Pereiro pointed out that investment bankers give the final (i.e., synthetic) value, without stating the basis for the derivation of such value from the various value estimates. On this score, Pereiro admonished that, the use of implicit weighting is not advisable because it does not enlighten investors or anyone interested in understanding the results of the valuation. In relation to the explicit weighting techniques, Pereiro spoke of fitness-based quantitative weighting and precision-based quantitative weighting. With the fitness-based techniques, Pereiro noted that the investment banker considers the purpose for which the valuation is being conducted as well as the characteristics of a corporation being valued. The investment banker then assigns for each value estimates: a number that reflects the

relative importance of a giving valuation method vis-à-vis the valuation purpose and firm characteristics. With the precision-based weighting technique, however, Pereiro pointed out that investment bankers resort to weighting the various valuation estimates using statistical precision of a given valuation method. The statistical precision of a given method, according to Pereiro, is measured as "the inverse of the standard deviation of the error of the valuation estimation" (p. 64). As to which method of weighting is more accurate than the other, Pereiro further noted, is a matter of debate among academics and hence the use of the fitness-based technique is common among investment bankers.

Empirical evidence on weighting in IPO valuation research. Roosenboom (2007), in his contribution to the literature on how investment bankers in France assign weight to the value estimates of the various valuation methods, pointed out that one of the bankers arrived at the fair value of a giving IPO by assigning a weight of 2/3 to the multiples value estimate and 1/3 to the discounted cash flow value estimate. This practical example by Roosenboom presupposed that values were assigned on the basis of the relative importance as suggested by the fitness-based quantitative weighting of Pereiro. Roosenboom further posited that Bayesian theory, as put forward by prior researchers, suggested that investment bankers are more likely to assign weights to those valuations that they believed to be more accurate for valuation of a given firm's IPO. In this regard, Roosenboom hypothesized that when larger and older corporations are being valued for the purposes of IPO listing, higher weights should be expected to be assigned to the direct valuations methods such as DCF and DDM. In the same vein, when relatively profitable, rapidly growing, and/or technology firms are being valued;

Roosenboom argued that higher weights are to be assigned to multiples valuation methods. EVA, according to Roosenboom, should be expected to be assigned higher weights when one can argue that accounting numbers are capable of capturing value as generated by tangible assets more than the value generation of intangible assets. Roosenboom also argued that when there is a commitment by an IPO firm to the payment of high dividends in the future that could be an indication that higher weighting should be assigned to the DDM.

Price discount and the setting of preliminary offer price. The key source of IPO underpricing is the deliberate introduction of a price discount by the investment banker that is leading the IPO listing efforts of a given corporation. This price discount, according to Roosenboom (2007) is computed by investment bankers' in France as "(fair value estimate - preliminary offer value)/fair value estimate" (p. 1226). The reasons for the introduction of such price discounts are behind the case for IPO underpricing considered in one of the succeeding sections of this literature review.

IPO Valuations: A Review of Management's Earnings Forecasts

Earnings Forecasts in IPO Valuations

Disclosure of earnings forecasts in IPO prospectuses. The disclosure of earnings forecasts in IPO prospectuses is meant to reduce the information asymmetry that usually exists between the management of the issuing firms and investors (Firth, Gounopoulos, & Pulm, 2013). In spite of this laudable objective, the disclosure of such forecasts is not universally adopted. In some jurisdictions, such disclosures are mandatory whilst in others they are not, and yet in others they are voluntary. According

to Clarkson, Dontoh, Richardson, and Sefcik (1992), these disclosures are almost nonexistent in the United States' markets, universal in the United Kingdom, and voluntary in the Canadian markets. Scholars, in this field, have advanced several empirical and practical arguments as to the pros and cons of such disclosures of earnings and terminal value forecast. In their examination of such disclosures in the Canadian markets, Jog and McConomy (2003) pointed out that such a disclosure gives investors much information on the extent of underpricing incorporated in the valuation and pricing of a given firms IPO. An earlier research in the same market by Clarkson et al. revealed that the inclusion of such forecasts in IPO prospectuses does provide investors with the good news about the earnings prospects of the issuing firms and enables the market to make corrections to any forecasting errors that may come to their notice. According to Firth et al., the role of such earnings forecasts in signaling the value of the issuing firm cannot be overemphasized in that their signaling impact is more pronounced than other signaling mechanisms that could exist in the market. In spite of all these advocacies for the disclosure of earnings forecasts in IPO prospectuses, Cormier, Lapointe-Antunes, and McConomy (2014) provided legal reasons as to why management could be reluctant in providing such forecasts. Cormier et al. pointed out that faced with less litigious environment corporate managers in Canada, unlike their counterparts in the United States, are at liberty to provide investors with such disclosures.

Measurement of forecast errors in IPO prospectuses. The mandatory or voluntary disclosures of earnings forecasts in IPO prospectuses in some jurisdictions have provided researchers with data for their assessment of the accuracy of such

forecasts. There seemed to be unanimity in the literature on the measurement of such inaccuracies or errors in earnings forecasts. Scholarly literature in the field, such as those of Bulut and Er (2011), Gounopoulos (2011), Jelic et al. (1998), and Lonkani and Firth (2005), spoke of two measurement metrics–the signed forecast error and the absolute forecast error. The signed forecast error, according to these scholars, measures the direction of bias in the forecast; whilst the absolute forecast error measures the overall level of accuracy in the forecasts.

Empirical findings on forecast errors in IPO prospectuses. Jelic et al. (1998) in their assessment of forecast accuracy in the IPO prospectuses of 124 listed companies on the Kuala Lumpur Stock Exchange between 1984 and 1995 found that the mean forecast error was +33.37% (p. 57). This result, Jelic et al. noted, was an indication of under forecasting depicting that corporate managers were conservative with their forecasting figures. Chen, Firth, and Krishnan (2001) conducting a similar research on the accuracy of forecasting errors in the IPO prospectuses of companies listed on the Hong Kong Stock Exchange found that the mean absolute forecast error was 21.96% (p. 226). This result, according to Chen et al., implied that the absolute forecast error was greater or lower than the forecasted profit by as much as 22% (p. 226). Lonkani and Firth (2005) found a mean and median forecast error (FE) of negative 6.88% and negative 4.02% respectively (p. 278). These findings were made by Lonkani and Firth when they examined the accuracy of earnings forecast provided in the IPO prospectus of listed firms in Thailand. The negative signs on the mean and median FE, Lonkani and Firth (2005) noted, indicated optimistic earnings forecasts in that the actual earnings are less than

forecast. This finding of Lonkani and Firth stood in contrast to the pessimistic forecast in other East Asian markets as was brought to the fore by the results of Jelic et al. (1998) and Chen et al. (2001). On the issue of forecasting accuracy, as measured by the absolute forecasting error, Lonkani and Firth found that the mean and median absolute forecasting errors were 35.76% and 20.83% respectively (p. 278). This result, Lonkani and Firth noted, was consistent with the absolute forecast errors observed in other East Asian markets.

Determinants of forecast errors in IPO prospectuses. Prior research in this field of financial economics had, according to Gounopoulos (2011), put forward some 14 potential factors that could explain the magnitude of forecast errors in IPO prospectuses. My research hypotheses, which closely followed those of Jelic et al. (1998), were tested on the basis of six of such potential variables. These six variables were firm's size, proportion of shares retained by the owners, forecast horizon, firm's operating history as measured by age, companies gearing, and auditors' reputation.

Firm size(SIZE). In relation to firm's size, the evidence gleaned from prior research, had been that, it is much easier to forecast the earnings prospects of larger companies than it is for smaller companies (Gounopoulos, 2011). This, according to Jelic et al., is because firstly, larger companies tend to be more stable and hence for these companies there is a high probability that management will be more accurate in putting forward their earnings forecasts. Secondly, Jelic et al. further pointed out that those companies also tend to have the financial muscle to provide the needed resources for the putting together such accurate earnings forecasts. Thirdly, Jelic et al. further noted that

such companies are usually in control of their market situations and hence they tend to be less susceptible to fluctuations in the economic environment in which they operate. Like, Jelic et al., the subsidiary hypothesis I tested under the firm size, as a determinant of forecast error, is "the larger the company, the lower the forecast error" (p. 66). In this regard, firm size could be deemed as being negatively correlated with absolute forecast error.

Retained ownership (OWN). The theoretical and empirical arguments and/or findings in financial economics are that, there exist information asymmetry and that corporate insiders have more information about the future prospects of a company when compared to corporate outsiders (Jog & McConomy, 2003; and Chen et al., 2001). In this regards, Gounopoulos (2011) argued that the measurement of the accuracy of earnings forecasts is equal to the extent to which pre-issue shareholders continue to hold onto the share after the IPO listing. Jelic et al. (1998), in buttressing these theoretical and empirical arguments, put forward a testable hypothesis that the forecast error should be lower if the proportion of post-IPO shares retained by pre-IPO owners is higher. In this regard, the higher the post-listing share ownership, by pre-listing shareholders, the more negatively correlated management earnings forecasts will be with absolute forecast error.

Forecast horizon (HOR). Jelic et al. (1998) noted of the varied and opposing arguments in the literature about the impact of short-term versus long-term forecasting horizons on absolute forecasting error. Some scholars, according to Jelic et al., have argued that the longer the forecasting horizon, the more accurate the forecasting can be; whilst others have argued otherwise. In spite of these opposing arguments, however,

Gounopoulos (2011)'s position was that the accuracy of every forecast tends to deteriorate the longer the forecasting horizons. This position could be buttressed with the earlier position of Chen et al. (2001) when they noted the increment in risk and uncertainty in forecasting over the long-term. In this respect, Chen et al. found that there is a significant positive relationship between forecasting horizon and forecasting errors. Jelic et al., in spite of their opposing argument above, sided with the view that the shorter the forecasting horizon; the more accurate forecasting tends to be. In this regard, in relation to the forecasting horizon variable, Jelic et al. hypothesized that the forecast error should be lower if the forecasting horizon is shorter. This means that whilst short-term forecasting horizons are correlated negatively with absolute forecast error; long-term forecasting horizons are rather correlated positively with absolute forecast error.

Firm's age (AGE). As noted in the previous sections of this literature review, firm's age is being used here as a proxy for measuring the operating history of a company that is putting its share for sales to the general public through an IPO. In forecasting, the importance of data emerging from the company's historical operating activities cannot be overemphasized (Jelic et al., 1998; Jog & McConomy 2003). The findings of Chen et al. (2001) buttressed this fact when they pointed out that older companies are less risky, as a result, of their experience in putting forward better and more accurate forecasts. In this regard, Jelic et al. put forward the hypothesis that the forecast error should be lower if the age of the IPO-firm is higher. This means that the older the company, the more accurate its earnings forecast tends to be.

Financial leverage (LEV). According to Jelic et al. (1998), it is widely accepted view in the literature that companies that have comparatively high levels of debt are highly volatile with regards to their profitability. This perceived volatility in their earnings makes their earnings forecast more susceptible to forecasting inaccuracies. This perception, according to Gounopoulos (2011), was buttressed by an earlier study that noted that the higher the level of firm's financial leverage, the higher its level of risk relating to the preparation of its earnings forecast. As a result of this assertion, Gounopoulos (2011) hypothesized that the higher the financial leverage, the higher one should expect the absolute forecast error to be. The hypothesis of Jelic et al. was rather the opposite when they claimed that the higher the financial leverage, the lower one should expect the absolute forecast error to be. This contrary view of Jelic et al. stemmed from the fact that firms that are highly leveraged (geared) are subjected to more rigorous scrutiny by their creditors, and hence there will be less managerial incentive in putting forward earnings forecasts that are error prone.

Auditor's reputation (AUD). The consensus in the literature is that the big four global audit firms are more reputable in their delivery of opinions on the accuracy or otherwise of management earnings forecasts included in the IPO prospectuses (Jelic et al., 1998). In seeking to test the relationship between auditors' reputation and the accuracy of earnings forecasts, Jelic et al. pointed out that the dummy variable of one could be assigned if the audit firm was one of the Big Four and zero if it was not. The logical hypothesis that follows from these assertions is that the absolute forecast error should be expected to be lower if a member of the Big Four verified the earnings

forecasts incorporated into the IPO prospectus of an IPO-firm. In other words, the deployment of any one of the Big Four audit firms is negatively related to absolute forecast error. The Big Four audit firms, according to Gerakos and Syverson (2014), are: Ernst & Young, Deloitte and Touché, KPMG, and PricewaterhouseCoopers.

Earnings Management in IPO Valuations

Definition of earnings management. Earnings management in financial reporting, according to Roosenboom et al. (2003), occurs when the structuring of financial transactions are in such a way that the financial reports mislead users about the underlying economic performance of the company. Financial reporting systems, Roosenboom et al., produces accounting earnings that are made up of actual cash flows from operating activities and non-cash- operating activities that are referred to as accruals. Accrual accounting, according to Roosenboom et al., arises when the recognition of transaction and/or events in the financial statements are made by managers in periods that do not match with the periods in which the related cash flows of those transactions/events occur. Earnings management occurs when the impact of such accrual accounting decisions by corporate managers is that of ensuring a giving outcome by way of reported earnings. In measuring earnings management, Dechow, Ge, and Schrand (2010) conducted a literature review of over 300 articles that had been put forward on quality of earnings since 1964. This extensive review of the literature by Dechow et al had revealed that almost all the proxies used for measuring earnings quality, and for that matter, earnings management are accrual-based. Dechow et al. spoke of the various proxies for the measurement of earning quality; but they were quick to add that as to

which proxy of accrual-based earning management a researcher ends up employing, the researcher should be mindful of the circumstances in which each proxy works well and not adopt the same proxy for all circumstances.

Factors influencing levels of earnings management. Literature in this field of financial economics had revealed various factors that have the potential of influencing the levels of earning management. Cormier and Martinez (2006) studied the relationship between management earnings forecasts, earnings management, and stock market in the valuation of IPO listings in the French markets. In this study, Cormier and Martinez considered such factors as the decision to comply with international accounting standards, the degree of independence of the board, a high-quality auditor, the ownership structure, and the ownership retained by the entrepreneur. In this study I followed Cormier and Martinez in considering the influence of each of these factors on the direction and magnitude of earnings management in prospectuses of Ghanaian IPOs.

IAS/IFRS compliance (IAS). The adoption of international accounting standards, according to Cormier and Martinez (2006), is a necessary, but not sufficient, condition for the achievement of high-quality financial reporting information. The key argument in the deployment of international accounting standards in the earnings reportage, in the prospectuses of IPO firms, is that such a deployment should result in the lowering of the information asymmetry between management and the potential investors. In this regard, Cormier and Martinez contended that the adoption of generally accepted international accounting standards will result in the production of high quality financial information on earnings. Cormier and Martinez, therefore, hypothesized that earnings management in

IPO earnings forecasts will be lower for IPO-firms that comply with IAS/IFRS standards. This hypothesis implies that the adoption of international accounting standards is negatively correlated with earnings management.

External board (EB). The role of effective corporate governance, in ensuring the production of high quality financial information had been given much space in the fields of accounting and financial economics. One metric for measuring the effectiveness of a corporation's governance framework, according to Cormier and Martinez (2006), is by assessing the level of independence of the board of directors (i.e., the extent to which the board is made up of external or non-executive directors). Using this metric as a proxy for measuring the extent of earnings management of IPO firms, Cormier and Martinez further hypothesized that earnings management will be lower for IPO-firms whose board of directors consist mainly of external or non-executive directors. In other words, the higher the representation of non-executive directors on corporate boards, the lower the magnitude of earnings management.

Auditor (AUD). As noted in the previous section on earnings forecast, the consensus in the literature is that the big four global audit firms are more reputable in their delivery of opinions on the accuracy or otherwise of financial statements and management earnings forecasts included in IPO prospectuses (Jelic et al., 1998). In view of this reliability perception, Cormier and Martinez (2006) also pointed, from their review of prior literature, that the use of any of the Big4 audit firms is of higher quality than a non-Big4 audit firm. In this regard, Cormier and Martinez put forward a testable hypothesis that earnings management will be lower for IPO-firms audited by any of Big 4

auditors. This means that when a firm's IPO prospectus is given a bag of acceptability by any of the Big4, that prospectus is devoid of the tendencies of earnings management.

Owner-manager (OWN). The widely held view in literature is that earnings management is a common occurrence in manager-controlled firms than in owner-controlled firms. The reason for this view, according to Cormier and Martinez (2006), is because managers are more prone to ensuring the maximization of their earnings-related bonus-payments. In this regard, Cormier and Martinez posited that earnings management in IPO earnings forecasts will be lower for IPO-firms whose pre-IPO shares are closely held by the pre-IPO owners.

Retained ownership (ROWN). The theoretical and empirical arguments or findings in the literature of financial economics are that there exist information asymmetry and that corporate insiders have more information about the future prospects of a company when compared to those outside of those corporations (Jog & McConomy, 2003; and Chen et al. 2001). In this regards, Gounopoulos (2011) argued that the measurement of the accuracy of management earnings forecasts can be high to given the extent to which pre-issue shareholders continue to hold onto the share after the IPO listing. Jelic et al. (1998), in buttressing these theoretical and empirical arguments, put forward a testable hypothesis that forecast errors in IPO earnings forecasts will be lower if the proportion of post-IPO shares retained by pre-IPO owners is higher. In a similar vein, Cormier and Martinez (2006) also argued that if the percentage of share ownership post-issue is higher when compared to pre-issue holdings, the incentive for earnings

management will be greatly reduced. Hence the higher the proportion of shares retained by the owners, the lower the tendencies for earnings management.

Post Issue Return Performance: The Case for IPOs Under/Overpricing

Are IPOs Really Underpriced?

Purnanandam and Swaminathan (2004) posed this all-important question as a title to their research on this phenomenon. The thrust of Purnanandam and Swaminathan's argument was that IPOs seemed underpriced because of the wrong measurement basis that had over the years been adopted by scholars in this field. Underpricing, according to the authors, will always be the phenomenon observed as long as the basis of measurement is that of comparing the offer price to the first-day return. This measurement basis had over the past decades consistently resulted in an average first-day return of between 10-15% (Purnanandam & Swaminathan, 2004, p. 811). This basis of measurement, in the opinion of Purnanandam and Swaminathan, ought to be reconsidered and, therefore, their paper is one of the first academic attempts in the reconsideration of this measurement basis. The argument of authors is that instead of measuring short-run IPO performance as the difference between the offer price and the first trading-day market price, their measurement should rather consider some notion of long-run fair value. In this respect, Purnanandam and Swaminathan computed 'fair values' using price multiples such as price-to-EBITDA; price-to-sales; and price-to-earnings of non-IPO industry peers. The fair values, once computed, are used to assess IPO performance by comparing those fair values (V) to the offer price (P). The results that had emerged from Purnanandam and Swaminathan's testing of their fair-value measurement on over 2,000

relatively large capitalization IPOs from 1980 to 1997 had revealed the median IPO as overvalued by about 14% to 50% (p. 812) and hence the question: are IPOs really underpriced?

Are IPOs Really Overpriced?

Zheng (2007), in response to Purnanandam and Swaminathan (2004), asked a counter question: are IPOs really overpriced? In responding to this question, Zheng conducted an empirical study of selected 2,493 IPOs over the same period of 1980-1997 using the same basis of sampling criteria that were used by Purnanandam and Swaminathan (2004, p. 814). In computing the fair value, Zheng (2007) departed from Purnanandam and Swaminathan on the point of the use of ex post instead of ex ante peer-matching non-IPO firms. The reason for such a departure, according to Zheng; was because Kim and Ritter (1999) had already argued that the valuation of IPOs using comparable firm multiples is not of use if those valuations were done using historical numbers rather than forecasts. Given this point of departure, Zheng christened his ex post peer-matching method as 'growth-matching method,' and that of Purnanandam and Swaminathan as 'comparable firm multiple method' (p. 10). Testing the two methods on relatively similar sampled data, Zheng's results using the comparable firm multiple method were very consistent with the results obtained by Purnanandam and Swaminathan. Using his growth-matching method, however, Zheng (2007, p. 22) came to the conclusion that the results obtained by Purnanandam and Swaminathan were sensitive to the two key issues of (a) control for growth expectation and (b) whether new primary shares were included when calculating price multiples. Addressing those issues revealed

that there was no overvaluation of IPO return performances. Zheng, therefore, concluded that the results were consistent with the widely held view that IPOs are underpriced at offer price and fairly valued in the aftermarket in relation to the comparable seasoned firms. In this respect IPO's cannot be said to be overpriced as claimed by Purnanandam and Swaminathan.

The Case for IPO Underpricing

Judging from Zheng's counter argument, there seems to be a case for IPO underpricing. The existence of this IPO underpricing is one of the most important anomalies or puzzles that have long fascinated financial economists (Zaremba & Żmudziński, 2013). An empirical research of Loughran, Ritter, and Rydqvist (1994) revealed the incidences of short-run underpricing for all the 25 countries that were covered by their study. The conclusion Loughran et al. came to was that the underpricing phenomenon exists in every country with a stock market. The differences observed about this phenomenon from one country to the other are the depth and breadth of the underpricing (Van Heerden & Alagidede, 2012). As pointed out by Ritter (1998), various explanations had been offered in IPO performance literature as to why there exists this phenomenon of short-run underpricing. According to Ritter, these explanations include, but were not limited to the winner's curse hypothesis, the market feedback hypothesis, the bandwagon hypothesis the investment banker's monopsony power hypothesis, the lawsuit avoidance hypothesis, the signaling hypothesis, and the ownership dispersion hypothesis.

The winner's curse hypothesis. This hypothesis, according to Lin, Kao, and Chen, (2010), holds that IPO underpricing is a consequence of information asymmetry and rationing. This information asymmetry, according to Lin et al., is one which exists between one group of investors (i.e., the informed investors) and another group of investors (i.e., the uninformed investors). When an IPO with a best performing prospects is put forward for sales, the informed investors who are aware of these prospects will crowd out the uninformed investors. When an IPO that is without a good prospect is put forward for sale, the informed investors will not subscribe, thereby, leaving the uninformed investors to oversubscribe and bear the subsequent losses that come with the bad prospects of that IPO. This curse of being denied good IPO offers whilst being saddled with oversubscribed bad IPOs do result in the uninformed investors not subscribing to IPOs when offered for sale. To avoid this undersubscription by the uninformed investors, investment banking firms and their clients in offering IPOs for sale do intentionally underpriced in order to avoid the failure of those IPOs, as a result, of this winner's curse hypothesis.

The market feedback hypothesis. This hypothesis is of the view that the market is more informed and holds more information than the corporate managers that are putting forward their IPOs for sales (Hill & Hiller, 2009). According to Ginglinger, Faugeron-Crouzet, and Vijayraghavan (2003), the market feedback hypothesis stands contrary to the notion of signaling theory, which holds that corporate managers being insiders have better information about their corporations than the market; hence they send information as signals to the market as to how they as managers perceived the prospects

of their corporations to be. The reverse to the signaling theory is that market participants given their understanding of IPO prospects and their post issue trading in those IPOs rather sends valuable information that informs the subsequent capital budgeting decisions of corporate managers. In view of this reserve information flow, Ritter (1998) argued that investment bankers may underprice IPOs and in this way induce regular investors to reveal information during the pre-selling period. This information, Ritter further pointed out, is then used to assist in the eventual pricing of IPOs issues.

The bandwagon hypothesis. This hypothesis, according to Ritter (1998) and Yong (2011), holds that investors will either end-up subscribing or not subscribing to a given IPO sales, not based on the information they possess about the prospects of the IPO, but on the basis of whether other investors are buying or not buying that IPO. In this regard, investment bankers and corporate managers have no other options, but to underprice their IPOs in order to induce, the first few, investors into buying the IPOs so as to kick start a buying bandwagon among other investors.

The investment banker's monopsony power hypothesis. The argument of this hypothesis, according Robinson and Robinson (2012), was that IPO underpricing is a means by which investment bankers absolve themselves of the legal liabilities and associated reputational damage if they are found to have spewed up IPOs whose values are more than the actual worth of the company. Another plausible reason Ritter (1998) had attributed to this underpricing hypothesis is that it allows investment bankers expend less marketing efforts.

The lawsuit avoidance hypothesis. This hypothesis holds that IPOs are deliberately underpriced by investment bankers in order to avoid the legal liabilities that do arise on the claims of violating the Securities Act of 1933. This Act affords investors the opportunity of bringing an IPO-related lawsuit against those involved in the marketing and sale of new equity issue (Lin, Pukthuanthong, & Walker, 2013). Damages in suits brought under the Act, Lin et al. further pointed out could be very costly in terms of settlement payments, waste of management time and destruction of underwriter's reputation. Given the weight of damages an overpriced IPO could engender: investment bankers are better-off underpricing their IPO issues as by so doing minimal or no damages will ensue in a legal suit. Ritter (1998) in summing up on these explanations noted that underpricing seems to be a means by which investment bankers tend to reduce the probability of a future lawsuit. Lowry and Shu (2002, p. 309) in their empirical study noted that there are two different perspective for the explanation of the law avoidance hypothesis. The first of these is that of 'the insurance effect' where firms with higher litigation risk underprice their IPOs by a greater amount as a form of insurance. The second perspective is that of 'the deterrence effect' where IPO underpricing is used by investment bankers and corporate managers as a means for lowering expected litigation costs.

The signaling hypothesis. Underpricing new issues, according to Ritter (1998), leaves investors with a good taste. This is because the underpricing of an IPO becomes a signal to the market as to the quality of the firm's future performance. The firm as well as the corporate insiders benefit from IPO signaling because this provides them with the

opportunity of selling further shares in the secondary market at higher share prices (Espenlaub & Tonks, 1998). According to Ritter, the empirical evidence in support of the signaling hypothesis has been doubtful in that the impact of IPO underpricing on the subsequent season sales of shares by IPO firms had not proven the hypothesis. This assertion was also buttressed by Espenlaub and Tonks when they noted that post-IPO share issuance is indeed related to initial returns, but the same is not true for insider selling.

The ownership dispersion hypothesis. This hypothesis, according to Ritter (1998), holds that investment bankers intentionally underpriced IPOs. This is because the creation of a large pool of dispersed ownership results in the generation of significant liquidity for the issue as well as a dispersed ownership that will not be able to stand in the way of management. Boulton, Smart, and Zutter (2010) in their empirical studies of this phenomenon noted that underpricing do indeed result in a broad ownership of IPO shares. This, according to Boulton et al., in turn increases secondary market liquidity and that this increment in the marketability and liquidity do result in reduced investor required return. Boulton et al. were, however, quick to add that such a broad dispersion of ownership has a cost of increasing investor-borne information.

Summary and Conclusion

In this literature review, I have exposed my readers to the relevant scholarly literature that has been penned so far in this field of financial economics. I began the literature review section by given my readers a pictorial view of the key thematic areas that will serve as a compass with which they can navigate through the remainder of the

literature review sections of this study. The three key thematic areas covered in this literature review were those of IPO valuation, IPO pricing, and IPO performance. Each of these thematic areas was designed to encapsulate the overall topic of this study: Valuation, pricing, and performance of initial public offering on the Ghana Stock Exchange.

In relation to the IPO valuation ambit of this study, I first drew my readers' attention to the role that is normally played by investment bankers in the valuation of those IPOs. Following this, my readers were given a rendition of the various IPO valuation methods that are at the disposal of these investment bankers. The literature review then continued with an examination of the firm-specific factors and the emerging market factors that underpin the choice of each of the valuation methods by investment bankers. In relation to the IPO pricing aspects of the literature review, the issues of price discounts and the setting of the preliminary and eventual offer prices were discussed. The IPO prices, once determined and the related stocks are offered for sale by the investment bankers, the attention of scholars then turns towards the accuracy of those IPO offerings. In this section of the study, I turned my readers' attention to the two key issues of accuracy measurement in IPO valuation and pricing–forecasting errors and earnings management. I provided literature on these two areas in relation to their definition, the factors that influenced them by way of magnitude and direction, and the empirical evidence that have been put forward by various scholars so far. In relation to the post-issue IPO return performance, the literature review concentrated on the arguments for and against IPO overpricing, on one hand, and IPO underpricing, on the other.

Having laid down the scholarly giants on whose work this research hinges upon, I now proceed to the methodology section of the study in chapter 3. In this methodology chapter, the detailed review of literature set forth in this chapter 2 informed the detailed operational definition and measurement of the hypothesized variables and the appropriate methodologies for collecting and analysing data needed in testing each of the six hypotheses. The chapter 2 also dovetailed into chapter 4 and 5 by providing the findings of other scholarly works in the field of financial economics that could be compared with the findings of this research study.

Chapter 3: Research Method

Introduction

In the first section of this chapter, I present the operationalization of the research hypotheses. I begin the section by restating the hypotheses that were set forth in Chapter 1 of the study. Following this restatement, I gave the definition and the measurement basis of each of the variables–dependent or independent–in each of the six hypotheses. In the second section of the chapter, I focus on the research design and rational. As noted in Chapter 1, the nature of the hypothesized variables was such that they could be best tested using a quantitative-led nonexperimental research design. In this section, I considered the rationale for choosing this design and the categorizations of the design. In the third section of this chapter, I considered the research methodology in which I set out the sampling and sampling procedures employed in this study. I follow with a detailed description of the data collection methods that I used in gathering the necessary data for testing of each of the hypothesized variables. I gave a description of the measurement instruments that I used in the collection of data. I then spell out the data analysis plan of the study which included the methods used to prepare the collected data for analysis. I continued the data analysis by considering the cross-sectional regressional analyses that I employed in the testing of the various hypotheses. I conclude chapter with a summary and conclusion section.

Operationalization of Research Hypotheses

Restatement of Research Hypotheses

Hypotheses 1: Choice of IPOs' valuation methods. H_0: The choice of IPO valuation methods by investment bankers in Ghana is not dependent on firm-specific factors and emerging market factors. H_1: The choice of IPO valuation methods by investment bankers in Ghana is dependent on firm-specific factors and emerging market factors.

Hypotheses 2: Fair value estimates of IPOs. H_0: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO does not depend on firm-specific and emerging market factors. H_1: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO depends on firm-specific factors and emerging market factors.

Hypotheses 3: Price discount and the setting of preliminary offer prices. H_0: The application of price discount in the setting of preliminary offer price of an IPO does not depend on firm-specific and emerging market factors. H_1: The application of price discount in the setting of preliminary offer price of an IPO depends on firm-specific and emerging market factors.

Hypotheses 4: Forecasts errors in IPO prospectuses. H_0: The absolute forecasting error observed for each IPO firm is not dependent on the firm's size, retained ownership, forecasting interval, age, gearing, and auditor's reputation. H_1: The absolute forecasting error observed for each IPO firm is dependent on the firm's size, retained ownership, forecasting interval, age, gearing, and auditor's reputation.

Hypotheses 5: Earnings management in IPO prospectuses. H_0: Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years. H_1: Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years.

Hypotheses 6: IPO pricing anomalies on the Ghana stock exchange. H_0: There is no significant cross-sectional relationship between price-to-value ratios (P/V) and over/undervalued first-day returns observed on the GSE. H_1: There is a significant cross-sectional relationship between price-to-value (P/V) ratios and over/undervalued first-day returns observed on the GSE.

Operational Definition and Measurement of Hypothesized Variables

In Table 1, I set forth the variables for each of the six hypotheses with respect to their dependent variables and independent variables alongside the scholarly sources that had previously used those variables.

Valuation methods as dependent variables in Hypotheses 1. As shown in the table, the dependent variables in Hypotheses 1 were the different valuation methods that were at the disposal of the investment bankers when valuing the stocks of a given IPO firm. These dependent variables remained the same for both the firm-specific and emerging-market factors. Those valuation methods comprised DCF, DDM, EVA, MULT, and OTH. The research work of Roosenboom (2007) informed my choice of these valuation methods.

Table 1

Dependent and Independent Variables in Each of the Six Hypotheses

Hypotheses No.	Hypotheses Title	Dependent Variables	Sources of DVs	Independent Variables	Sources of IVs
Hypothesis 1	Choice of IPOs' Valuation Methods: Firm-Specific Factors	DCF, DDM, EVA, MULT, OTH	Roosenboom (2007)	Size, Age, Asset Tangibility, Profitability, Sales Growth, and Dividend Payout Ratio.	Roosenboom (2007)
	Choice of IPOs' Valuation Methods: Emerging-Market Factors	DCF, DDM, EVA, MULT,OTH	Roosenboom (2007)	GDP, Exchnage Rates, Inflation, Interest Rates, Size of the Stock Market, Money Supply, and Financial Intermediation	Koller, Goedhart, and Wessels (2010); Mehr-un-Nisa and Nishat (2011)
Hypothesis 2	Fair Value Estimates of IPOs	DCFW, DDMW, EVAW, MULTW,OTHW	Roosenboom (2007)	Size, Age, Asset Tangibility, Profitability, Sales Growth, and Dividend Payout Ratio.	Roosenboom (2007)
Hypothesis 3	Price Discount and the Setting of Preliminary Offer Prices	Discount	Roosenboom (2007)	Size, Age, Asset Tangibility, Profitability, Sales Growth, and Dividend Payout Ratio.	Roosenboom (2007)
Hypothesis 4	Forecasts Errors in IPO Prospectuses	AFE	Bulut & Er (2011); Gounopoulos (2011); Lonkani and Firth (2005); and Jelic et al (1998)	Size, Retained Ownership, Forecasting Interval, Age, Gearing, Auditor's Reputation, Industry Factors, and/or Reduction in Actual Earnings	Bulut & Er (2011); Gounopoulos (2011); Lonkani and Firth (2005); and Jelic et al (1998)
Hypothesis 5	Earnings Management in IPO Prospectuses	DCA	Ahmad-Zaluki et al, (2011); Cormier and Martinez, (2006); and Roosenboom et al, (2003)	IAS/IFRS Compliance; External Board; Auditor; Ownership Structure; Retained Ownership.	Ahmad-Zaluki et al, (2011); Cormier and Martinez, (2006); and Roosenboom et al, (2003)
Hypothesis 6	IPO Pricing Anomalies on the Ghana Stock Exchange	R(1st Day)	Purnanandam and Swaminathan (2004)	Price-to-Value Ratio; Book-to-Market Ratio; Ratio of Accruals to Total Assets; IPO's Earnings Growth Rate; EBITDA Margin	Purnanandam and Swaminathan (2004)

Firm-specific factors as independent variables in Hypotheses 1, 2, and 3. In putting together the hypotheses relating to firm-specific factors, I was also inspired the work of Roosenboom (2007), who as cited by Deloof et al. (2009), pointed out that the

usefulness of a valuation method depends on the firm characteristics that are influencing the choice of such valuation method. In this regard, the firm-specific characteristics I considered were those relating to the size of the IPO firm (SIZE), the age of the firm (AGE), the extent to which its assets are tangible (AIP), the profitability of the firm prior to the listing of its stocks (PROF), the growth prospects of the firm in relation to sales (GROW), and the expected dividend payouts of the firm (DIV). I set forth the operational definitions of each of these firm-specific variables in Table 2.

Table 2

Operational Definition of Independent Variables: Firm-Specific Factors

Independent variable	Operational definition
Size	The total assets for the most recent 12-month balance sheet reported in the prospectus. That is the 12-months balance sheet prior to the IPO.
Age	The age of the IPO-firm where age is the difference between the IPO year and the founding year in the prospectus.
Asset's tangibility	Plant, property, and equipment from the most recent 12-month balance sheet disclosed in the prospectus divided by total assets. That is the 12-months balance sheet prior to the IPO.

Profitability	The ratio of current year's forecasted earnings before interest and taxes (EBIT) to current year's forecasted sales. Where current year is the year of IPO flotation and forecasted earnings and sales are the earnings and sales forecasts incorporated in the IPO prospectuses.
Sales growth	Forecasted sales growth during the current year. Where current year is the year of IPO flotation and forecasted sales growth is the growth in sales computed as the difference between the sales forecast of earnings incorporated in the IPO prospectuses and the actual sales as stated in the financial statements prior to the year of IPO flotation.
Dividend payout ratio	Future dividend payout ratio (dividends/net income) as disclosed in the prospectus. This future dividend payout ratio will be determined by averaging the payout ratio of the year-on-year projected financial statements.

Emerging-market factors as independent variables in Hypotheses 1, 2, and 3. Valuations in emerging markets, according to Koller et al. (2010), are influenced by the

need to adjust for such valuation complications as inflation (INF) and interest rate (MMR) and exchange rate (FER). Mehr-un-Nisa and Nishat (2011) in buttressing this assertion spoke of such additional macroeconomic or emerging market variables as the growth rate of gross domestic product (GDP), the size of the stock market (SD), the level of financial intermediation (FD), and the level of the money supply in the economy (M2). These measurement variables, as put forward by Koller et al as well as Mehr-un-Nisa and Nishat, informed my operationalization of the macroeconomic or emerging-market factors. I set forth the operational definition of each of these emerging market factors in the following table.

Table 3

Operational Definition of Independent Variables: Emerging-Market Factors

Independent variable	Operational definition
Gross Domestic Product (GDP)	This is the market value of all goods and services produced within a country during a giving time period–usually a year (Parkin, 2013).This will be measured as the annual percentage GDP growth rate of the Ghanaian economy for the year prior to the IPO flotation. The sources of this variable for this study were the World Bank national accounts data and the OECD National Accounts data files as reported byindexmundi.com.

Inflation	This is the extent to which the cost of living in Ghana rises on monthly basis. It is also the process in which the price level is rising and money is losing value (Parkin, 2013). This will be measured as the inflation rate for the year prior to the IPO flotation. The source of this variable for this study is the IMF's International Financial Statistics as reported byindexmundi.com.
Interest rates	This is the income that capital earns (Parkin, 2013). This will be measured as the percentage deposit interest rate in the Ghanaian economy for the year prior to the IPO flotation. The source of this variable for this study is the IMF's International Financial Statistics as reported byindexmundi.com.
Exchange Rate	This is price at which one currency exchange for another (Parkin, 2013). This will be measured as the real effective exchange rate index for the year prior to the IPO flotation. The source of this variable for this study is the IMF's International Financial Statistics as reported byindexmundi.com.
Stock Market Size	This is the size of the stock market as measured by the market capitalization of listed companies on the

	GSE in the year prior to the IPO flotation expressed as a percentage of GDP. The sources of this variable for this study are the Standard & Poor's, Global Stock Markets Factbook, and supplemental S&P data as reported byindexmundi.com.
Money Supply (M2)	A measure of money that consist of currency, travelers check and checking deposits owned by individuals, and businesses (M1), plus time deposits, savings deposits, money market mutual funds, and other deposit (Parkin, 2013). This will be measured as the percentage growth rate in money and quasi money within the Ghanaian economy for the year prior to the IPO flotation. The source of this variable for this study is the IMF's International Financial Statistics as reported byindexmundi.com.
Financial Intermediation	This variable that traces the developmental levels of financial intermediation in Ghana over the study period. This will be measured as domestic credit provided by the banking sector, for the year prior to the IPO flotation, expresses as a percentage of GDP within that year. The source of this variable for this study is the IMF International Financial Statistics as

reported byindexmundi.com.

To empirically model the choice of valuation methods on the GSE, I tested Hypothesis 1 through the following cross-sectional logistic regression equation:

$$MULT_i[DDM_i, DCF_i, EVA_i, DDM_i, OTH_i] = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i + \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i + \beta_{13} FD_i + \varepsilon_i \quad (1)$$

Weighting valuation methods as dependent variables in Hypotheses 2.

Roosenboom (2007) pointed out that the data he obtained from the French IPO market enabled him to determine the weights that were assigned by the underwriters to the different valuation methods. In assessing the role of each valuation method in the determination of a given IPO's fair value, Roosenboom used these assigned weights as the dependent variable and hence for the discounted cash flow (DCF) method, for example, the dependent variable was DCFW. Following Roosenboom, I also used the data obtained from the respective prospectuses of the IPOs on the GSE concerning the assignment of weights to the various valuation methods as the dependent variable. To empirically model these valuation weight assignments on the GSE, I tested Hypothesis 2 through the following cross-sectional OLS regression equation:

$$MULTW_i[DDMW_i, DCFW_i, EVAW_i, DDMW_i, OTHW_i]$$
$$= \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i$$
$$+ \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i$$
$$+ \beta_{13} FD_i + \varepsilon_i \quad (2)$$

Price discount/premium as the dependent variables in Hypothesis 3. As to the extent to which investment bankers on the GSE apply price discount in the setting of preliminary offer prices, Roosenboom (2007) pointed out that the computation of the discount as: "(fair value estimate - preliminary offer value)/fair value estimate" (p. 1226). To empirically model the offer IPO price discounts on the GSE, I tested Hypothesis 3 through the following cross-sectional regression equation:

$$DISCOUNT_i = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i$$
$$+ \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i$$
$$+ \beta_{13} FD_i + \varepsilon_i \quad (3)$$

Absolute forecast error as dependent variable in Hypothesis 4. The dependent variable used in this hypothesis was the AFE. This variable, according to Jelic et al (1998), could be mathematically defined as:

$$AFE = \frac{A_{j,T} - F_{j,T}}{F_{j,T}} x100 \quad (4)$$

Where: $A_{j,T}$ is the actual earnings for firm *j* at period *T* and $F_{j,T}$ is the forecast earnings for firm *j* at period *T*. In addition to *AFE*, scholars in this field agree that the

accuracy of earnings forecasts could and should also be assessed using forecast error (*FE*) and squared forecast error (SFQ). The mathematical definitions of these two additional variables were set forth by Jelic et al (1998) as:

$$FE = \left|\frac{A_{j,T} - F_{j,T}}{F_{j,T}}\right| x100 \quad (5)$$

$$SFQ = \left(\frac{A_{j,T} - F_{j,T}}{F_{j,T}}\right)^2 x100 \quad (6)$$

I set forth in Table 5 the operational definitions of each of the independent variables I used in predicting the observed forecast inaccuracies.

Table 4

Operational Definition of Independent Variables Relating to Hypothesis 4

Independent variable	Operational definition
Size	This is the total assets of the IPO-firms following the share issuance. That is the total assets for the IPO year as reported in the actual financial statements of that year.
Retained Ownership	Percentage of new shares retained by insiders or pre-IPO owners of the IPO firm.
Forecasting Interval	Forecast interval as the number of months between

	prospectus date and the year-end to which the forecasts pertain.
Age	The age of the IPO-firm where age is the difference between the IPO year and the founding year in the prospectus.
Gearing/Leverage	The ratio of total debts to total assets after the issue.
Auditor's Reputation	A dummy variable taking the value 1 if the auditor is one of the Big Four firms; otherwise 0.

In explaining the influence of each of the above dependent variables on the magnitude of forecast error, scholars have largely relied on the use of "cross-sectional regression models where the absolute forecast error enters as the dependent variable" (Lonkani & Firth, 2005, p. 275). In this regard, I tested Hypothesis 4 through the following cross-sectional regression model:

$$AFE_i = \beta_0 + \beta_1 SIZE_i + \beta_2 OWN_i + \beta_3 HOR_i + \beta_4 AGE_i + \beta_5 LEV_i + \beta_6 AUD_i + \varepsilon_i \quad (7)$$

Discretionary current accrual as the dependent variable in Hypothesis 5. The dependent variable used in this hypothesis was the discretionary current accrual (DCA). To operationally define this dependent variable, it is important to first define an IPO-firm's total accrual. According to Cormier and Martinez (2006), one of the best ways for such a definition is to see a firm's total accruals as "the difference between net earnings

and cash flow from operations" (p. 219). The reason for the adoption of such a simple definition is because whilst earnings estimates could easily be manipulated by management of the firm; such manipulations of cash flow from operations is not possible because the firm's bank accounts are in the custody of banks and other financial institutions outside the control of an IPO-firm's management. This definition also presupposed that total accruals could be easily inferred from the financial statements of a firm; whilst this is true, such inference, Cormier and Martinez pointed out, cannot be easily made when one is to decompose the total accruals into its discretionary and non-discretion components. Prior literature in this field have suggested various ways by which such a decomposition can be done, one such way alluded to by Roosenboom et al (2003) is the one put forward by DeAngelo in 1986 which held that discretionary current accrual (DCA) could be computed using:

$$DCA_{i,t} = \frac{CA_{i,t}}{(TA_{i,t} + TA_{i,t-1})/2} - \frac{CA_{i,t-1}}{(TA_{i,t-1} + TA_{i,t-2})/2} \quad (8)$$

Where $DCA_{i,t}$ is the discretionary current accrual of an IPO-firm *i*, *t* represents the fiscal year relative to the IPO (*t* =2, ..., 3), CA represents current accruals and TA stands for total assets. In relation to the CA, Roosenboom et al. (2003) noted from prior research that earnings management results, largely, from the changes in current accruals (i.e., changes working capital). These changes in current accruals, according to Roosenboom et al. (2003), could be computed as [(current assets – cash) – (current liabilities – current maturities of long-term debt)] (p. 251). Where 'maturities of long-term debt' are portions

of the long-term debts that are reclassified as current liabilities because, they will be falling due within the next financial year. I set forth the operational definitions of the independent variables relating to the Hypothesis 5 in the following table.

Table 5

Operational Definition of Independent Variables Relating to Hypothesis 5

Independent variable	Operational definition
IAS/FRS compliance	An indicator/dummy variable is utilized, taking a value of "1" if a firm is complying with IASB standards, and 0 otherwise.
External board	An indicator variable is utilized; taking a value of "1" if a firm's board of directors is composed of a majority of external members and "0" otherwise.
Auditor	An indicator variable is utilized; taking a value of "1" if a firm is audited by one of the "Big 4", and "0" otherwise.
Ownership/management structure	An indicator/dummy variable is utilized, taking a value of "1" if a firm pre-IPO was managed by the controlling stockholder(s) and "0" otherwise.
Retained ownership	The percentage of retained ownership by the initial controlling stockholder(s) following the IPO, taking

into account the primary issue and any secondary sale that the controlling stockholder may have made. The information will be gathered from the IPO prospectus.

In explaining the influence of each of the above variables on the level of earnings management, scholars have largely relied on the use of cross-sectional regression models where the discretionary current accruals (DCA) enters as the dependent variable (Roosenboom, 2003; Cormier and Martinez (2006); and Ahmad-Zaluki et al. 2011). In this regard, I tested Hypothesis 5 through the following cross-sectional regression equation:

$$DCA_i = \beta_0 + \beta_1 IAS_i + \beta_2 EB_i + \beta_3 AUD_i + \beta_4 OWN_i + \beta_5 ROWN_i + \varepsilon_i \quad (9)$$

First-day IPO returns as the dependent variable in Hypothesis 6. The dependent variable used in this hypothesis was *R(1st Day)* which implies the first-day return on an IPO-firm post issue. According to Purnanandam and Swaminathan (2004), this first-day return has traditionally been defined in literature as the difference between the offer price and the first trading-day market price. In this regard, Chambers and Dimson (2009) defined the first-day return ($RET_{i,1}$) as the change from the initial offer price ($P_{i,0}$) to the final price recorded on the ($P_{i,1}$):

$$RET = \frac{P_{i,1}}{P_{i,0}} - 1 \quad (10)$$

The operational definition of the independent variables that I used in explaining this *R(1st Day)* are set forth in the following.

Table 6

Operational Definition of Independent Variables Relating to Hypothesis 6

Independent variable	Operational definition
Price-to-Value ratio	The offer price-to-value ratio, where price is the first-day trading pricing of the IPO and value is the enterprise value of the IPO firm computed as the [(market value of equity + book value of debt – cash)/(shares outstanding after the offering)](Rhodes & Ligon, 2013) for the year of IPO flotation. The market value of equity is the product of the shares outstanding after the IPO offering and the as of the first-day trading price.
Book-to-Market ratio	The book-to-market ratio, where book is the book value of equity for the fiscal year after the IPO date and market is the market value of equity is the product of the shares outstanding after the IPO offering and the as of the first-day trading price
Growth	The forecasted sales growth during the current year. Where current year is the year of IPO flotation and

	forecasted sales growth is the growth in sales computed as the difference between the sales forecast of earnings incorporated in the IPO prospectuses and the actual sales as stated in the financial statements prior to the year of IPO flotation.
Accruals	The ratio of current accruals to total assets based on the first annual statement after the firm goes public and is considered a measure of earnings quality.
Sales	This is the sales for the fiscal year ending at least three months prior to the IPO date and is used as a control for size.
EBIT margin	The ratio of EBIT to sales for the fiscal year ending at least three months before the IPO goes public.

Following Purnanandam and Swaminathan (2004, p.826), I tested Hypothesis 6 through the following regression equation:

$$R(1^{st}\ Day)_i = \beta_0 + \beta_1 PV_i + \beta_2 BM_i + \beta_3 GROWTHAIP_i + \beta_4 ACCRUALS_i + \beta_5 SALES_i + \beta_6 EBITDA_i + \varepsilon_i \quad (11)$$

Research Design and Rational

Major categorizations of quantitative research design. In choosing a research design, Trochim (2006) admonishes that experimental design should be employed where random assignment and selection is possible. Quasi-experimental research design, Trochim further noted, is the design of choice where random assignment is impossible, but there exist control or comparison groups and the variables under study are capable of experimental manipulation by the researcher, to allow for the conduct of a near experimental research. Where there are no such groups (i.e., control or comparison groups) and where the manipulation of variables is simply impossible, the research design that is available to the researcher falls within the broader ambit of nonexperimental research. A substantial proportion of quantitative research is nonexperimental because, according to Johnson (2001), most important variables in social sciences are not easily manipulable. The topic under study, in this dissertation research, is rooted in financial economics, and according to Campbell, Lo, and MacKinlay (1997), the field of financial economics is a highly empirical discipline and that, among all branches of economics, the field of finance is the most empirical. In addition to its empirical nature, Campbell et al. further noted that the research design in financial economics, like other social sciences, is mostly nonexperimental. In view of these assertions, the research design of this study is a nonexperimental-based quantitative research.

Categorizations of nonexperimental research design. According to Johnson (2001), nonexperimental research could best be categorized along the two main

dimensions of ‘objective’ and ‘time.’ In relations to the objective dimension, a nonexperimental research could be intended to be descriptive, predictive, or explanatory. A nonexperimental research is descriptive where the researcher is primarily concerned with describing a phenomenon and documenting the characteristics of the phenomenon (Johnson, 2001). For a predictive nonexperimental research, the concern of the researcher is about the prediction or the forecasting of an event or phenomenon in the future, (Johnson, 2001). A research will be deemed to be explanatory if the researcher is trying to develop or test a theory about a phenomenon to explain the ‘how’ and ‘why’ the phenomenon operates in the way it does (Johnson, 2001). For the time dimension, Johnson noted that the intent of this dimension is to assess the kind of data that the researcher ought to collect. The types of nonexperimental research that could be conducted along this time dimension, according to Johnson, could be cross-sectional, longitudinal, or retrospective. In cross-sectional research, Johnson pointed out that data is collected from research participants at a single point in time. In longitudinal research the same data, according to Johnson, is collected at more than one point in time; thereby affording the researcher the opportunity of data comparison across time. In retrospective research, Johnson noted that, the researcher looks backward in time to find out information on independent variables that can assist in explaining the current differences in the dependent variable. In amalgamating these objectives and time dimensions of a nonexperimental research, Johnson put forward the following table.

Table 7

Types of Nonexperimental Research Designs

Research Objectives	Time Dimension		
	Retrospective	Cross-Sectional	Longitudinal
Descriptive	Retrospective, Descriptive Study (Type 1)	Cross-Sectional, Descriptive Study (Type 2)	Longitudinal, Descriptive Study (Type 3)
Predictive	Retrospective, Predictive Study (Type 4)	Cross-Sectional, Predictive Study (Type 5)	Longitudinal, Predictive Study (Type 6)
Explanatory	Retrospective, Explanatory Study (Type 7)	Cross-Sectional, Explanatory Study (Type 8)	Longitudinal, Explanatory Study (Type 9)

Note. From "Toward a new classification of nonexperimental quantitative research," by B. Johnson, 2001, *Educational Researcher, 30*(2), p. 10.

From the description of these dimensions, it is obvious that this quantitative research study of mine is 'cross-sectional' by way of time and 'explanatory' by way of objective. It is cross-sectional because I collected data for each of the variables in each of the six hypotheses at a time in which those data occurred. The study is also 'explanatory' because I sought to explain the processes and procedures of IPO valuations on the GSE as well as explaining the 'how' and 'why' those valuations were carried out.

Methodology

Statistical Power and Sample Size Analyses

In determining the sample sizes from the study populations, it is important for my readers to note that the statistical tools I used in the conduct of my data analysis were logistic regression and multiple ordinary least squares regression analyses. In determining the sample size when using logistic regression in the testing of Hypothesis 1, the G*Power software relies on the works of Demidenko (2007) and Hsieh, Bloch, and

Larsen (1998). A procedure based on the work of Demidenko (2007), according to Buchner, Faul, and Erdfelder (2009), "is more general and slightly more accurate than that proposed by Hsieh et al. (1998)" and hence they recommend the use of Demidenko's procedure. To determine the sample size for given study that intends to use logistic regression, one must first specify the effect size using the odds ratio, the probability of Y = 1 when X = 1, alpha value, and power size. For my analysis using the G*Power 3.1.7 software, prior assessment of the sample size was dependent on the level of odds ratio that I set given a probability of 0.5 of Y=1 when X=1, alpha value of 0.05, and power of 0.8. Setting my odds ratio, that a given valuation method will be chosen over the others at an odd ratio of 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, or 5.5 resulted in the sample sizes shown Table 8.

Table 8

*Sample Sizes Analysis Using G*Power and Demidenko (2007)'s Procedure*

Odd Ratio	Prob (Y=1, X = 1)	Alpha (α)	Power (1-β)	Sample Size (G*Power)
1.0	0.5	0.05	0.8	-1
1.5	0.5	0.05	0.8	163
2.0	0.5	0.05	0.8	64
2.5	0.5	0.05	0.8	41
3.0	0.5	0.05	0.8	32
3.5	0.5	0.05	0.8	28
4.0	0.5	0.05	0.8	25
4.5	0.5	0.05	0.8	23
5.0	0.5	0.05	0.8	21
5.5	0.5	0.05	0.8	20

In in the selection of my sample size for this study, I considered an odds ratio of between 3.0 and 5.5 beacuse the number of stocks listed on the GSE were 34 during the period under consideration. For the remaining five hypotheses, I subjected those hypotheses to empirical testing using multiple OLS regression analyses. For the testing of Hypotheses 2 and 3 using student t-statistic, I fed the G*Power software with the specification of an effect size of 0.3, alpha of 0.05, the number of predictors (i.e.,

independent variables) of 13 as specified in those hypotheses, and the power of analysis ranging from 0.6 to 0.95 results in the following plot of sample sizes:

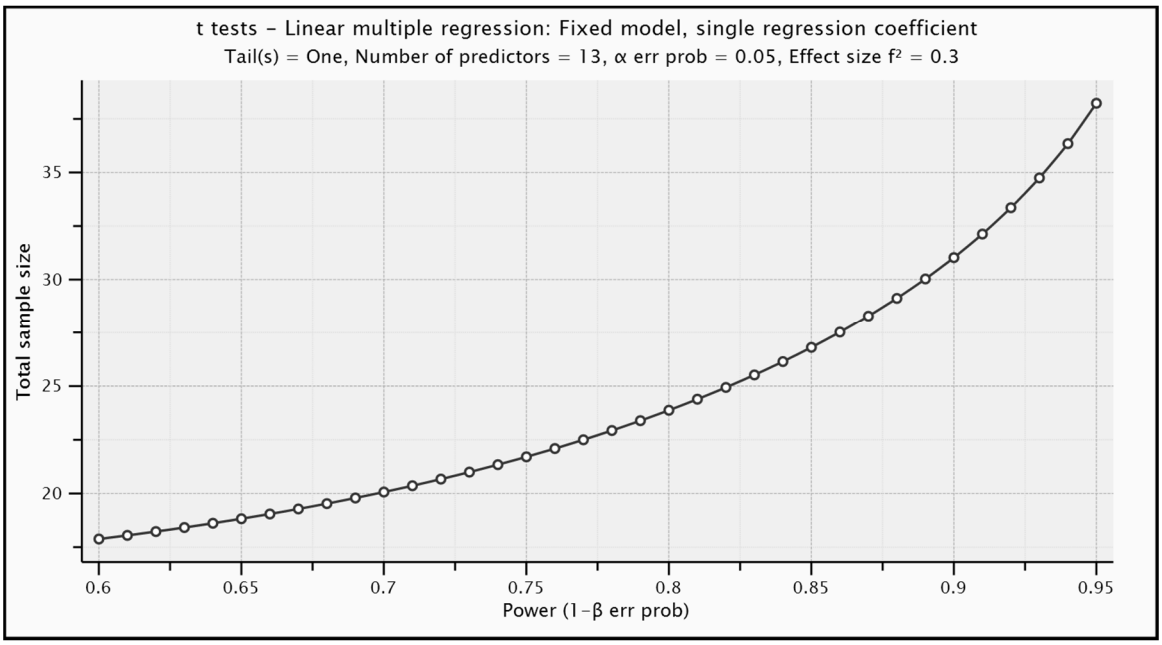

*Figure 4.*Sample size analysis for Hypotheses 2 and 3 using G*Power 3.1.7.

From the Figure 4, the sample size of 24 at 0.8 power of analysis will suffice for the testing of Hypotheses 2 and 3. For hypotheses 4, 5, and 6, the student t-statistic, when used along with the G*Power software specifications of an effect size of 0.3, alpha of 0.05, the number of predictors of 5, 6, and 6 as specified in Hypotheses 4, 5, and 6 respectively, and the power of analysis ranging from 0.6 to 0.95 results in the following plot of sample sizes:

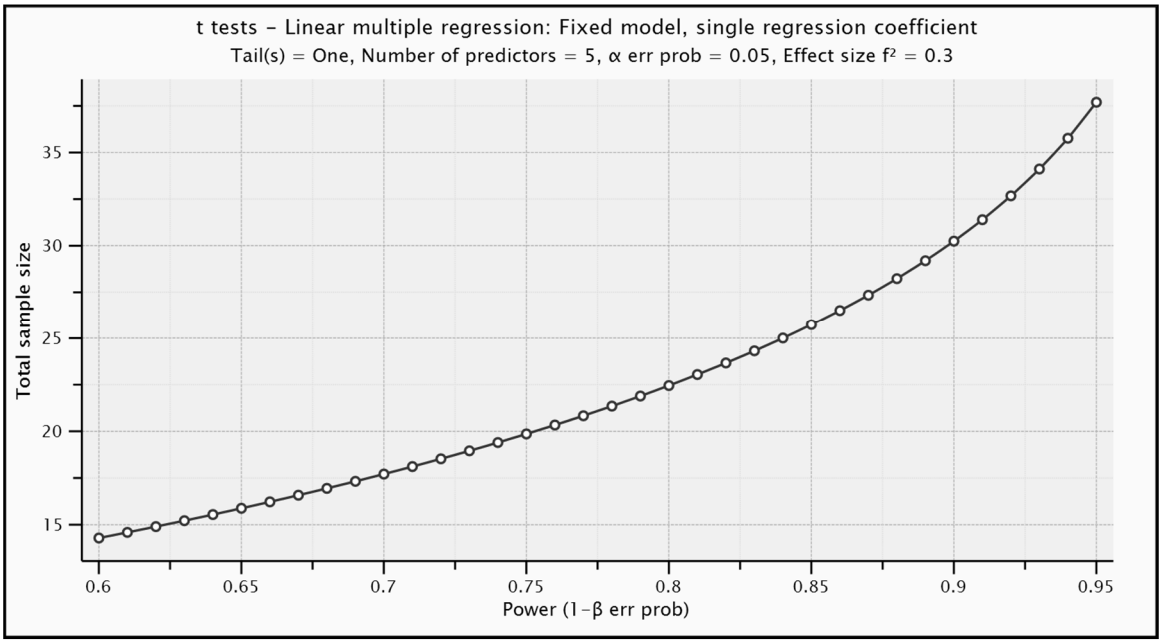

*Figure 5.*Sample size analyses for hypotheses 4, 5, & 3 using G*Power 3.1.7.

From the Figure 5, the sample size of 23 at 0.8 power of analysis will suffice for the testing of Hypotheses 4, 5, and 6.

Sampling Selection Criteria

The sample in this study includes 30 IPOs listed on the GSE from 1991 to 2012. These IPOs have been sampled to be part of this study because of the availability of valuation and pricing information contained in their prospectuses. The GSE since commencement of trading in November 1990 has had 52 activities of equity issuance as at the end of December 2012. These activities, each of which required one form of equity valuation or the other comprised 24 IPO listings, 5 Placements, 1 Offer-for-Sale, 2 Introductions, 18 Rights Issues, 1 Bonus Issue, and 1 Secondary Issue. For the purposes of this study, these equity issuance activities were generically referred to as IPOs. The

year-on-year equity issuance activities on the GSE and the related sample selection, inclusion, and exclusion criteria are set forth in the following table.

Table 9

Sample Selection, Inclusion, and Exclusion Criteria

	Inclusion Because of					Exclusion Because of			
Year	Initial Public Offering (IPO)	Placement	Offer-for-Sale (OFS)	Introduction	Rights Issue	Bonus Issue	Secondary Issue	Unavailability of Data	In Sample
1992	1.00	-	-	-	1.00	-	-	2.00	-
1993	-	-	-	-	-	-	-	-	-
1994	3.00	-	-	-	-	-	-	3.00	-
1995	2.00	1.00	1.00	-	1.00	-	-	2.00	3.00
1996	1.00	1.00	-	-	1.00	-	-	2.00	1.00
1997	-	-	-	-	1.00	-	-	1.00	-
1998	-	-	-	-	2.00	-	-	2.00	-
1999	1.00	-	-	-	1.00	-	-	1.00	1.00
2000	1.00	-	-	-	1.00	-	-	1.00	1.00
2001	-	-	-	-	-	-	-	-	-
2002	1.00	-	-	1.00	-	-	-	-	2.00
2003	1.00	-	-	-	2.00	-	-	1.00	2.00
2004	4.00	-	-	-	2.00	-	-	2.00	4.00
2005	1.00	-	-	-	-	-	-	-	1.00
2006	3.00	-	-	1.00	-	-	-	-	4.00
2007	2.00	-	-	-	1.00	-	-	1.00	2.00
2008	2.00	-	-	-	1.00	-	-	-	3.00
2009	1.00	-	-	-	4.00	-	-	2.00	3.00
2010	-	-	-	-	2.00	-	-	-	2.00
2011	1.00	-	-	-	1.00	-	-	1.00	1.00
2012	-	3.00	-	-	-	1.00	1.00	1.00	-
	25.00	5.00	1.00	2.00	21.00	1.00	1.00	22.00	30.00

Data Collection

I collected data required for the conduct of this study from secondary sources. The use of secondary data in this study cannot be overemphasized because, according to Frankfort-Nachmias and Nachmias (2008), there are conceptual, methodological, and cost reasons for use of such data sources. The study is about the valuation, pricing, and performance of IPOs whose data are in the IPO prospectuses, the related valuation reports of those IPOs held by the investment bankers, the annual financial statements of the IPO

firms, and the post-listing-trading results of those IPOs. The data relating to each of these documents are historical and, hence, conceptually can only be available as secondary data. Methodologically, Frankfort-Nachmias and Nachmias pointed out that, cross-sectional research designs can only be possible with the use of secondary data sources. Information or data about the 30 sampled IPOs were elicited from such sources as (a) the IPO prospectuses lodged with the GSE and/or Stocks and Exchange Commission of Ghana (i.e., the SEC); (b) the trading information of these IPO firms from the GSE; (c) the decision-making factors that had informed the IPO prices from the perspectives of both the investment banks and the IPO firms; and (d) the pre- and post-IPO financial records of the IPO firms contained in their respective prospectuses as well as on the database of Annual Report Ghana (ARG).

Data Analysis Plan

Preparation of data for analysis. I arranged and coded the collected data using the Microsoft Excel. This arrangement and coding facilitated my uploading of the data on to the IBM's SPSS software for further statistical analysis. Preparation of data for analysis, according to Green and Salkind (2011), also involved subjecting the data to missing-data analysis, analysis of outliers, analysis of the various assumptions that underpin logistic and ordinary least square regressions. I subjected my data to all these analysis and I shared the results of such analysis at the relevant sections of the study in both this chapter and the next. Preparation of data for analyses could also involve the transformation of data. Data transformation, according to Banasiewicz (2013), is the mathematical "re-expressing of data in different units with the goal of bringing about

desired data quality" (p. 131). This mathematical re-repression of data may be required when there is the need to ensure that the distributions between the dependent and independent variables in a linear regression are approximately normal (Zumel & Mount, 2014). These transformations, Banasiewicz further noted, do allow for direct side-by-side comparison of data that are otherwise not of direct comparable measures and hence has the advantage of improving the interpretability of data. In this study, I used the lognormal transformation of data as and when necessary.

Statistical analysis of Hypothesis 1. This hypothesis, as was noted in prior sections, boarded on the choice of IPO valuation methods by the various investment bankers that ply their trade on the GSE. The hypothesis by way of null and alternate claim holds that:

H_0: The choice of IPO valuation methods by investment bankers in Ghana is not influenced by firm-specific and emerging market factors.

H_1: The choice of IPO valuation methods by investment bankers in Ghana is influenced by firm-specific and emerging market factors.

The variables in Hypothesis 1, as was also noted in prior sections, were tested through the following regression equation:

$$MULT_i[DDM_i, DCF_i, EVA_i, DDM_i, OTH_i] = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i + \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i + \beta_{13} FD_i + \varepsilon_i \quad (12)$$

In relation to the statistical analysis of the variables in this hypothesis, I indicated earlier on in this chapter that I analyzed the hypothesis using logistic regression. The reason for this decision was because the dependent variables in this hypothesis were dichotomous or binary in nature. Logistic regression, according to Field (2009), is "a multiple regression but with an outcome variable that is categorical and predictor variables that are continues or categorical in nature" (p. 265). In buttressing this definition, Hailpern and Visintainer (2003) pointed out that the other two statistical models employed in the analysis of binary response data are the probit model and discriminant analysis. The use of a probit model was, however, discounted because "it lacks natural interpretation of regression parameters" (Hailpern & Visintainer, 2003, p. 213). The use of discriminant analysis addresses the regression parameter problem that confronts the probit model. In spite of this, however, the discriminant analysis requires the fulfillment of the assumption that the predictor variables are normally distributed and that they jointly assume a multivariate normal distribution. These assumptions, Hailpern and Visintainer further noted, are not usually fulfilled when variable in a regression analysis are dichotomous or discrete in nature. Logistic regression is superior to discriminant analysis because it does not make any assumption about the nature of variable distributions. Moreover logistic regression, unlike discriminant analysis, does not require the use of Bayes theorem in the extraction of variables of interest. Logistic regression, Hailpern and Visintainer concluded, is a direct probability model stated in terms of $Pr\{Y = 1|X\}$. In view of these superiorities, I followed Roosenboom (2007) in

using binary logistic regression in testing the choice of IPO valuation methods by investment bankers.

In order to deploy logistic regression, there is a need for me to transform the linear regression equation (12) into its logit format. According to Field (2009), in logistic regression, instead of predicting the value of a dependent variable *Y* from independent variable *X*, or several independent variables (*X*s), one should predict the probability of *Y* occurring giving known values of *X* or (*X*s). Where there are several independent variables (*X*s), Field posited that the logistic regression equation from which one can predict the probability of *Y* is given as flows:

$$P(Y_i) = \frac{1}{1+e^{-(b_0+b_1X_{1,i}+b_2X_{2,i}+\cdots+b_nX_{n,i})}} \tag{13}$$

From this logistic format, equation (12) could be logistically modeled. In this regard, the probability of an investment banker choosing to value an IPO using multiple (MULT) valuation method, for example, when giving the size of the IPO firm (SIZE), the age of the firm (AGE), the extent to which firm's assets are tangible (AIP), the profitability of the firm pre-IPO (PROF), the growth prospects of the firm in relation to sales (GROW), and the historical and/or expected dividend payouts of the firm (DIV), the GDP (GDP), inflation rate (INF), money market interest rates (MMR), money supply (M2), size of the stock market (SZ), and the financial depth of the stock market (FD). This choice of the investment banker could be logistically stated as:

$$P(Y_i) = \frac{1}{1+e^{-(b_0+b_1SIZE_i+b_2AGE_i+\cdots+b_{13}FD_i)}} \tag{14}$$

Following the modelling of the logistic regression, Hosmer Jr, Lemeshow, and Sturdivant (2013) spoke of the need for fitting the model, testing for the significance of the coefficient, and estimating the confidence interval. In analyzing Hypothesis 1 in Chapter 4, I undertook all this model fitting, coefficient's significance testing, and confidence interval estimations.

Statistical analysis of Hypothesis 2. This hypothesis, as was noted in prior sections of this chapter, boarded on how investment bankers on the GSE determined the fair value estimate of a giving IPO by assigning weights to the valuation estimate of each of the valuation methods. The hypothesis by way of null and alternate claims holds that:

H_0: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO does not depend on firm-specific and emerging market factors.

H_1: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO depends on firm's firm-specific and emerging market factors.

Hypothesis 2, as was pointed out in prior sections, was tested using the following OLS regression equation:

$$MULTW_i[DDMW_i, DCFW_i, EVAW_i, DDMW_i, OTHW_i]$$
$$= \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i$$
$$+ \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i$$
$$+ \beta_{13} FD_i + \varepsilon_i \quad (15)$$

For the statistical analysis of Hypotheses 2, 3, 4, and 5; I used multiple ordinary least squares regression (OLS). This is because each of the dependent variables in these hypotheses were not discrete but rather continues in nature. The OLS, according to Gujarati and Porter (2009), is commonly used in regression analysis because it is intuitively appealing and mathematically simpler than its nearest rival called maximum likelihood (ML). Regression, according to Field (2009), is a way of predicting the outcome (dependent) variable from one predictor (independent) variable (simple regression) or several predictor variables (multiple regression). Multiple regression is a general and highly flexible data analytic system (Cohen, Cohen, West & Aiken, 2013). Following the modelling of a given hypothesis using multiple regression, there is also a need for fitting the model, testing for the significance of the coefficient, and estimating the confidence interval. In analyzing Hypotheses 2, 3, 4, and 5 in Chapter 4, I undertook all this model fitting, coefficients significance testing, and confidence interval estimations.

Statistical analysis of Hypothesis 3. This hypothesis, as was noted in prior sections of this chapter, boarded on how investment bankers on the GSE introduce price discounts to the fair value estimate of a given IPO in arriving at the preliminary offer price of that IPO. The hypothesis by way of null and alternate claims holds that:

H_0: The application of price discount in the setting of preliminary offer price of an IPO does not depend on firm-specific and emerging market factors.

H_1: The application of price discount in the setting of preliminary offer price of an IPO depends on firm-specific and emerging market factors.

Hypothesis 3, as was pointed out in prior sections of this chapter, was tested using the following OLS regression equation:

$$DISCOUNT_i = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i + \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i + \beta_{13} FD_i + \varepsilon_i \quad (16)$$

Statistical analysis of Hypothesis 4. This hypothesis, as was noted in prior sections of this chapter, boarded on assessing the accuracy of earnings forecasts that are incorporated in the prospectuses of IPOs listed on the GSE. The hypothesis by way of null and alternate claims holds that:

H_0: The absolute forecasting error observed for each IPO firm is not influenced by the firm's size, retained ownership, forecasting interval, age, gearing, auditor's reputation, industry factors, and/or reduction in actual earnings.

H_1: The absolute forecasting error observed for each IPO firm is influenced by the firm's size, retained ownership, forecasting interval, age, gearing, auditor's reputation, industry factors, and/or reduction in actual earnings.

Hypothesis 4, as was pointed out in prior sections of this chapter, was tested using the following OLS regression equation:

$$AFE_i = \beta_0 + \beta_1 SIZE_i + \beta_2 OWN_i + \beta_3 HOR_i + \beta_4 AGE_i + \beta_5 LEV_i + \beta_6 AUD_i + \varepsilon_i \quad (17)$$

Statistical analysis of Hypothesis 5. This hypothesis, as was noted in prior sections of this chapter, boarded on assessing the incidences of earning management in

the earnings forecasts incorporated in the prospectuses of IPOs listed on the GSE. The hypothesis by way of null and alternate claims holds that:

H_0: Earnings forecasts in the prospectuses of Ghanaian IPO firms' do not exhibit non-zero earnings management.

H_1: Earnings forecasts in the prospectuses of Ghanaian IPO firms' do exhibit non-zero earnings management.

Hypothesis 5, as was pointed out in prior sections, was tested using the following regression equation:

$$DCA_i = \beta_0 + \beta_1 IAS_i + \beta_2 EB_i + \beta_3 AUD_i + \beta_4 OWN_i + \beta_5 ROWN_i + \varepsilon_i \quad (18)$$

Statistical analysis of Hypothesis 6. This hypothesis, as was noted in prior sections of this chapter, boarders on assessing the post-issue return performance of the IPOs that were listed on the GSE for the period under review. The hypothesis by way of null and alternate claims holds that:

H_0: There is no significant cross-sectional relationship between price-to-value (P/V) ratios and over/undervalued first-day returns that are observed on the GSE.

H_1: There is a significant cross-sectional relationship between price-to-value (P/V) ratios and over/undervalued first-day returns that are observed on the GSE.

Hypothesis 6, as was pointed out in prior sections of this chapter, was tested using the following regression equation:

$$R(1^{st}\ Day)_i = \beta_0 + \beta_1 PV_i + \beta_2 BM_i + \beta_3 GROWTHAIP_i + \beta_4 ACCRUALS_i + \beta_5 SALES_i + \beta_6 EBITDA_i + \varepsilon_i (19)$$

For the statistical analysis of Hypotheses 6; I also used multiple ordinary least squares regression (OLS).

Methodological Limitations

Dealing with missing data. The key methodological limitations I encountered boarded on the difficulties in the data collection. The first of these difficulties was that no reliable data on industry averages were available; hence, I had to proceed with the conduct of research without the inclusion of the industry-related factors in hypotheses 1-3 which I originally proposed to have included along with the firm-specific and emerging-market factors. The second of these difficulties had to do with legitimate, and to some extent illegitimate, missing data points and cases. By legitimate missing data, I mean the instances of missing data points where as a result of their exclusion in some IPO prospectuses, I could not obtain the required data for those points. Examples of this abound where an IPO on the GSE was done by way of introduction. The valuation and pricing of such introduced IPO-firm were already available; hence there was no need for the inclusion of forecasted financial statements in its prospectus. In such cases, the forecasted data points required for such an IPO will be non-existent and therefore missing. By illegitimate missing data points or cases, I mean those instances where the data or case, that ought to be kept, had not been kept in the various databases. For example, I set out to collect data relating to all the 35 listed firms on the GSE; I only ended up collecting data relating to only 30. This was because no IPO prospectuses were available for four of those IPO firms. I must, however, point out that the remaining one that was not added to the collected data was because the IPO-firm got listed in 2013

which was outside my sampled data period of 1992-2012. By legitimate and illegitimate missing data, I must be quick to point out that this description has nothing to do with legality or law. I borrowed the usage of these terms from the work of Osborne (2012) who dedicated a whole chapter of his book to the issues of missing or incomplete data. In dealing with the missing data points in this study, I was guided by Osborn's advice that the presence of missing data in any scientific research does not necessarily harm that research. Hence, when faced with such instances of missing data, the researcher must "use best practices and careful methodology to minimize missingness" (p. 131). Osborn also admonished that researchers should be transparent and report any incidences of missing data. Osborn also added that such reportage should include the rate of missingness in terms of the variables, and if possible provide reasons for that missingness. In response to this advice of Osborne, I provided the missing data summaries for all the variables in all the six hypotheses as follows:

Missing data analysis in Hypotheses 1-3. Using the SPSS Missing Data Analysis tool, the overall summary of the missing data in these hypotheses is shown in Figure 6.

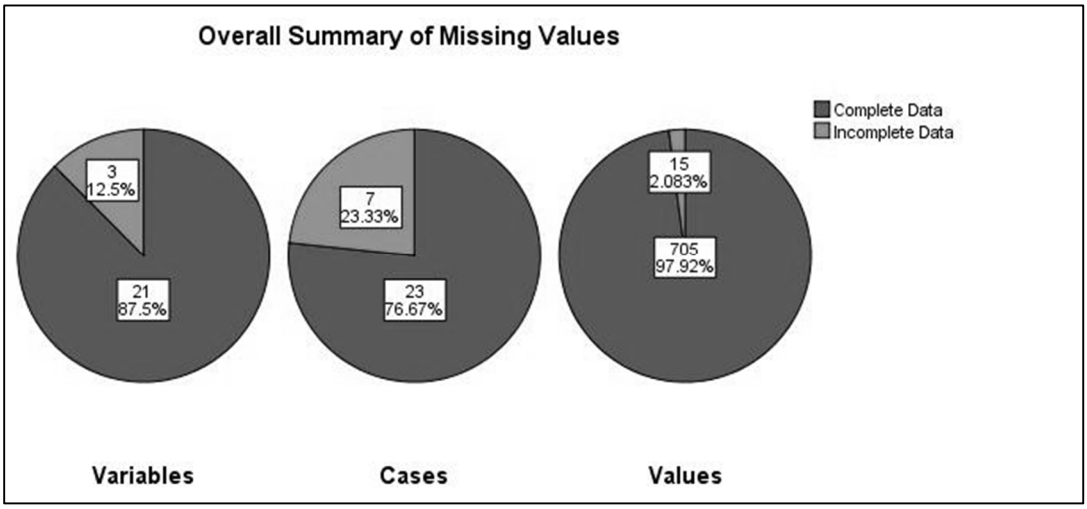

Figure 6. Overall summary of missing values in Hypotheses 1-3.

This summary, being an overall summary may not be very informative, and hence the SPSS provides summaries for the respective missing variables as set forth in the following table.

Table 10

Missing Data Analysis: Variable Summaries for Hypotheses 1-3

Variable Summary[a,b]

	Missing				
	N	Percent	Valid N	Mean	Std. Deviation
DIV (%)	7	23.3%	23	36.8676	17.36930
GROW (%)	4	13.3%	26	39.4920	31.16750
PROF (%)	4	13.3%	26	16.7572	16.24765

a. Maximum number of variables shown: 25

b. Minimum percentage of missing values for variable to be included: 10.0%

From this table, it would be realized that of all the variables–dependent and independent–in Hypotheses 1-3, only three of the independent variables had missing data points. In relation to the DIV variable seven of the 30 sampled IPO-firms had their data

points missing. This variable could be legitimately missing because four of those IPO-firms got listed without forecasted data. Hence, the DIV variable which I measured as a percentage of forecasted dividend payouts to forecasted net income will not have data points for these IPO-firms. The remaining three missing data points was simply because three of the firms who had forecasted financial statements in their IPO prospectuses did not make such estimates of dividend payouts. In relation to the GROW and the PROF variables which had missing data points for the four of the 30 sampled IPO firms, arose because those four firms did not have forecasted financial statements in their IPO prospectuses.

Missing data analysis in Hypotheses 4. Using SPSS Missing Data Analysis tool, the overall summary of the missing data in these hypotheses is shown Figure 7.

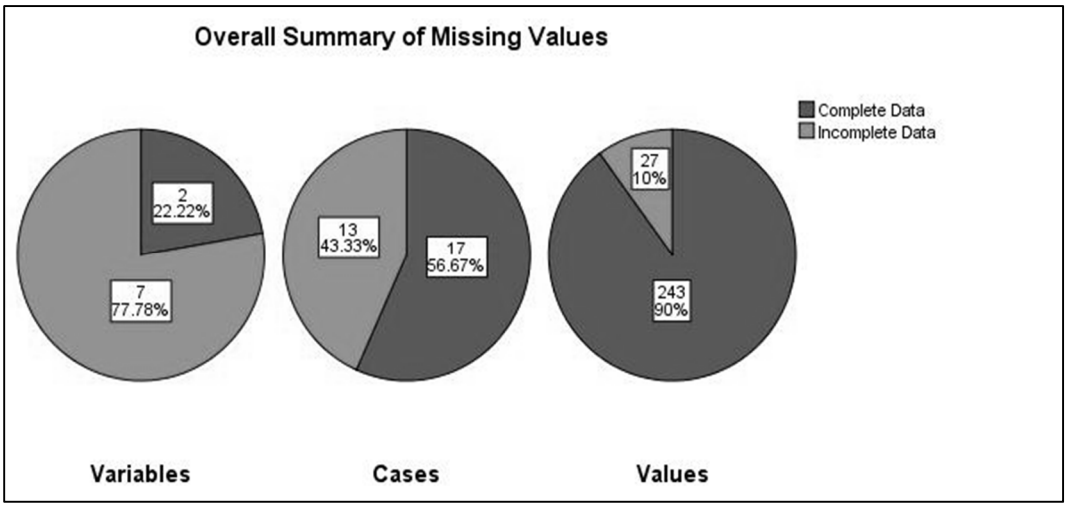

*Figure 7.*Overall summary of missing values in Hypotheses 4

This summary, being an overall summary may not be very informative, and hence the SPSS provides summaries for the respective missing variables as set forth in Table 11. From this table, it would be realized that of all the variables–dependent and

independent–in hypotheses 4, only two of the independent and three of the dependent variables had missing data points. In relation to the OWN variable eight of the 30 IPO-firms had their data points missing. This variable could be legitimately missing because not all the sampled IPO firms provided data relating to the percentage of the post-IPO shares retained by their pre-IPO owners.

Table 11

Missing Data Analysis: Variable Summaries for Hypotheses 4

Variable Summary[a,b]

	Missing				
	N	Percent	Valid N	Mean	Std. Deviation
OWN	8	26.7%	22	65.3514	19.47176
HOR	5	16.7%	25	43.5600	13.14686
SEQ	4	13.3%	26	71.8304	147.29512
FE	4	13.3%	26	-28.7802	54.08434
AFE	4	13.3%	26	49.8352	38.24643

a. Maximum number of variables shown: 25

b. Minimum percentage of missing values for variable to be included: 10.0%

In relation to the HOR and the AFE variables which had missing data points for the four of the 30 sampled IPO firms, this arose because those four firms did not have forecasted financial statements in their IPO prospectuses.

Missing data analysis in Hypotheses 5. Using SPSS Missing Data Analysis tool, the overall summary of the missing data in these hypotheses is shown Figure 8.

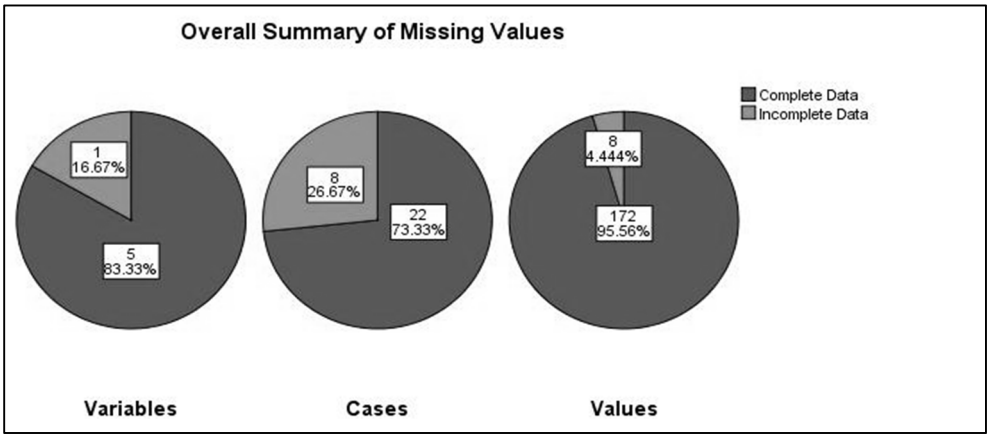

Figure 8. Overall summary of missing values in Hypotheses 5

This summary, being an overall summary may be not very informative, and hence the SPSS provides summaries for the respective missing variables as set forth in Table 12.

Table 12

Missing Data Analysis: Variable Summaries for Hypotheses 5

Variable Summary[a,b]

	Missing				
	N	Percent	Valid N	Mean	Std. Deviation
ROWN(%)	8	26.7%	22	65.3513	19.47159

a. Maximum number of variables shown: 25
b. Minimum percentage of missing values for variable to be included: 10.0%

From this table, it would be realized that of all the variables–dependent and independent–in Hypothesis 5, only one of the independent variables–ROWN–had missing data points. This variable, which was measured, in the same way, as the OWN variable in Hypothesis 4, had eight missing data points for eight of the 30 sampled IPO-firms. This variable could be legitimately missing because not all the sampled IPO firms

provided data relating to the percentage of post-IPO shares retained by their pre-IPO owners.

Missing data analysis in Hypotheses 6. Using SPSS Missing Data Analysis tool, the overall summary of the missing data in these hypotheses is shown Figure 9.

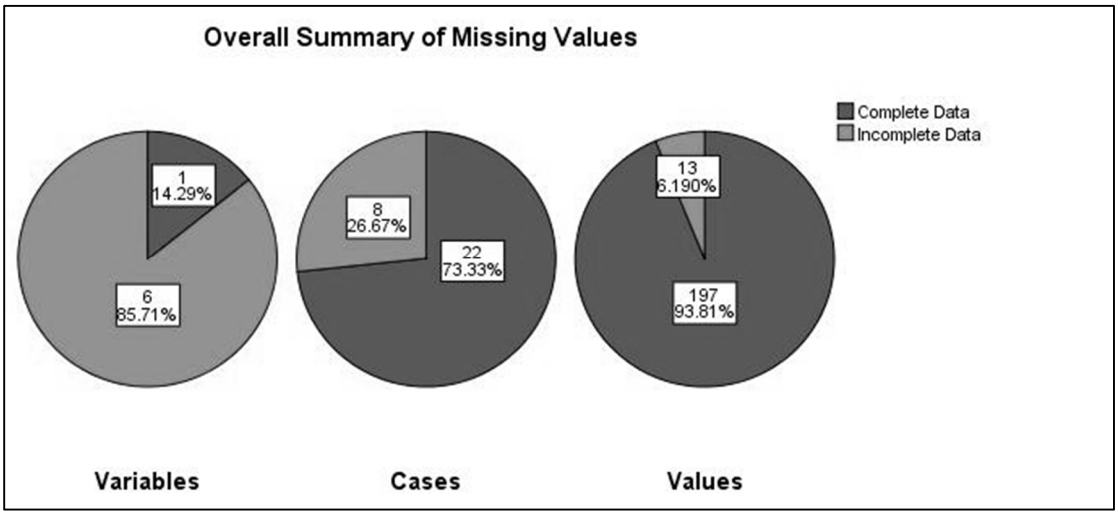

Figure 9. Overall summary of missing values in Hypotheses 6

This summary, being an overall summary may be not very informative, and hence the SPSS provides summaries for the respective missing variables as set forth in Table 13. From this table, it would be realized that of all the variables–dependent and independent–in Hypotheses 6, only three of the independent variables had missing data points. In relation to the GROWTHAIP variable the four missing data points was in respect to the four of the 30 sampled IPO firms that did not have forecasted financial statements in their IPO prospectuses. In relation to the BTM and the P/V ratios, these two variables which had some of their computational elements in common had these elements missing for three of the sampled IPO firms.

Table 13

Missing Data Analysis: Variable Summaries for Hypotheses 6

Variable Summary[a,b]					
	Missing				
	N	Percent	Valid N	Mean	Std. Deviation
GrowthAIP(%)	4	13.3%	26	39.4920	31.16750
BTM Ratio	3	10.0%	27	1.9299	4.03135
P/V Ratio	3	10.0%	27	.8366	.54363

a. Maximum number of variables shown: 25

b. Minimum percentage of missing values for variable to be included: 10.0%

Chosen methodology for minimizing missingness. Three main methodologies have been put forward for dealing with missing data. The first of these, according to Osborne (2012) is the 'listwise deletion' method. This method is the traditional methods of dealing with missing data and hence the default for many statistical packages including SPSS. This method merely deletes any cases with missing values on any variable in the analysis. The second method Osborne spoke of is the 'mean substitution' method. Under this method, the group or overall sample mean is substituted for each variable with missing data. The theory behind this method, according to Osborne, is that "in the absence of any other information, the mean is the best single estimate of any participant's score" (p. 118). The third and final method is the 'simple' or 'multiple imputations' methods. Under this method, the statistical package uses a variety of advanced computing techniques to estimate missing values by creating multiple versions of the same data. Each of these three methods has its advantages and disadvantages and although Osborne was careful to emphasize the supremacy of multiple imputation (MI) method; I dealt with

the issue of missing data points using the 'mean substitution' method. In this regard, for each of the variables with missing data points, I filled those missing data point with the average (i.e., mean) of the already existing data points for that variable. My fascination with this method was because of its simplicity. The main flaw of this 'mean substitution' method, according to Osborne, is that

> if 20% of a sample is missing, even at random, substituting the identical score for a large portion of the sample artificially reduces the variance of the variable, and as the percentage of missing data increases, the effects of missing data become more profound. (p. 118)

From my missing data analyses for each of the six hypotheses, it would be realised that none of those hypotheses suffered from such large portions of missingness as Osborne was alluding to.

Ethical Concerns and Procedures

This study, as I noted before in this chapter, is based on the use of data collected from secondary sources. The data collection process does not, therefore, involve survey or interview, so ethics is not an issue in this study. The only concern could come from the integrity of the data, but this is also not a concern because I collected all data from reputable databases. To accord with the Walden University's ethical requirements on data collection, I began my data collection for this study following Institutional Review Board's (IRB) approval. The IRB's approval number for my study was 09-29-14-0301854.

Summary and Conclusion

In this methodology chapter, I reiterated the six key hypotheses that underpinned this study. The key variables in each of these hypotheses were operationally defined. I identified cross-sectional, explanatory research design as the most suitable research design for this study. The methodological underpinnings of this study such as sampling and sampling procedures, data collection methods, and data analysis plan were all set forth in this chapter. The ethical and other methodological issues confronting this study were also spelt out in this chapter. This chapter also leads into the next chapter because having set out the research design and other methodological procedures; I now proceed to collect data that is meant to be analyzed in chapter 4 and to be discussed in chapter 5.

Chapter 4: Results

Introduction

In this study, I explored IPO valuation, pricing, and performance on the GSE. The five key purposes of the study were (a) to consider the return characteristics of the 30 IPOs listed on the GSE; (b) to examine the role of IPO valuations and pricing in explaining the observed return characteristics of the IPOs; (c) to examine the firm-specific factors and emerging market factors that had influenced the choice of valuation methods used by investment bankers in their valuation and pricing of those IPOs; (d) to review how these investment bankers combined the value estimates of those valuation methods to determine the fair value estimate and price of a given IPO; and (e) to examine the incidences of errors and the possibilities of earnings in the earnings forecasts as well as the financial statements incorporated in the IPO prospectuses of these corporations.

To fulfill these purposes, I posed four research questions:

1. What valuation methods do underwriters in Ghana use in valuing IPOs listed on the GSE and what firm-specific and emerging-market factors influenced their choice of those valuation methods?
2. How do underwriters combine the value estimate of each valuation method to arrive at fair values of IPOs and how do they set the preliminary offer price on the basis of those fair value estimates?
3. Are the management earnings forecasts and the pre-IPO financial statements incorporated in the prospectuses of Ghanaian IPO firms free from forecasting errors and the tendencies of earnings management?

4. What IPO pricing anomalies occur on the GSE and is there a cross-sectional relationships between the price-to-value ratios as determined by the investment bankers and the over/undervalued first-day returns observed on the GSE?

To subject each of these research questions to a scholarly study, I put forward six research hypotheses and subjected each of these hypotheses to statistical testing. In Hypothesis 1, I claimed that the choice of IPO valuation methods by investment bankers in Ghana is dependent on firm-specific factors and emerging market factors. My claim in Hypothesis 2 was that the weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO depends on firm-specific and emerging-market factors. In Hypothesis 3, I claimed that the application of price discount in the setting of preliminary offer price of an IPO depends on firm-specific and emerging market factors. In Hypothesis 4, my claim was that the absolute forecasting error observed for each IPO firm is dependent on the firm's size, retained ownership, forecasting interval, age, gearing, auditor's reputation, industry factors, and/or reduction in actual earnings. For Hypothesis 5, I claimed that earnings forecasts in the prospectuses of Ghanaian IPO firms' do exhibit non-zero earnings management. In Hypothesis 6, I considered IPO pricing anomalies on the GSE and claimed that there is a significant cross-sectional relationship between price-to-value (P/V) ratios and over/undervalued first-day returns observed on the GSE. In subjecting each of these hypotheses to statistical testing, I modeled Hypothesis 1 using binary logistic regression. I modeled the remaining five hypotheses using ordinary least squares regressions. The results of each of

these statistical modeling and testing are the subject matter of this Chapter 4. In this regard, I organized the remaining sections of the chapter as follows: (a) data collection, (b) data analyses–descriptive statistics, (c) data analyses–hypotheses testing, and (d) summary of results.

Data Collection

Sources of Data Collection

Data collection for this study, as I pointed out in Chapter 3, was done using secondary data sources. For each of these sources of data, I started with a complete universe of equity issuance activities on the GSE from its trading inception in 1992 to its trading activities of 2012. Secondary data on these equity issuance activities are held in the databases of the GSE, the Investment Banking Firms, the Issuing Firms, and other market watchers such as the Annual Reports Ghana (ARG). For inclusion in this sample the equity issuance activity has to satisfy the criteria of (a) being listed on the GSE; (b) being listed by way of an IPO, placement, offer-for-sale, introduction, and/or a rights issue; (c) being an issue of ordinary common shares and should not be a bonus issue or secondary issue; and (d) having a prospectus with clear indications of the valuation methods used, the respective weights assigned to the value estimate of each valuation method, and projected financial statements.

Sample Selection Criteria

The year-on-year equity issuance activities on the GSE and the related sample selection, inclusion, and exclusion criteria are set forth in Table 14.

Table 14

Sample Selection, Inclusion, and Exclusion Criteria

Year	Inclusion Because of					Exclusion Because of			In Sample
	Initial Public Offering (IPO)	Placement	Offer-for-Sale (OFS)	Introduction	Rights Issue	Bonus Issue	Secondary Issue	Unavailability of Data	
1992	1.00	-	-	-	1.00	-	-	2.00	-
1993	-	-	-	-	-	-	-	-	-
1994	3.00	-	-	-	-	-	-	3.00	-
1995	2.00	1.00	1.00	-	1.00	-	-	2.00	3.00
1996	1.00	1.00	-	-	1.00	-	-	2.00	1.00
1997	-	-	-	-	1.00	-	-	1.00	-
1998	-	-	-	-	2.00	-	-	2.00	-
1999	1.00	-	-	-	1.00	-	-	1.00	1.00
2000	1.00	-	-	-	1.00	-	-	1.00	1.00
2001	-	-	-	-	-	-	-	-	-
2002	1.00	-	-	1.00	-	-	-	-	2.00
2003	1.00	-	-	-	2.00	-	-	1.00	2.00
2004	4.00	-	-	-	2.00	-	-	2.00	4.00
2005	1.00	-	-	-	-	-	-	-	1.00
2006	3.00	-	-	1.00	-	-	-	-	4.00
2007	2.00	-	-	-	1.00	-	-	1.00	2.00
2008	2.00	-	-	-	1.00	-	-	-	3.00
2009	1.00	-	-	-	4.00	-	-	2.00	3.00
2010	-	-	-	-	2.00	-	-	-	2.00
2011	1.00	-	-	-	1.00	-	-	1.00	1.00
2012	-	3.00	-	-	-	1.00	1.00	1.00	-
	25.00	5.00	1.00	2.00	21.00	1.00	1.00	22.00	30.00

Data Analysis: Descriptive Statistics

Descriptive Statistics of the Variables in Hypotheses 1-3

Firm-specific factors. In relation to these factors, I provided in Table 15 their descriptive statics. As I pointed out in the prior chapters of this study, I obtained the data relating to the offer prices and the pre-offer financial statements from the prospectuses of the IPO firms.

Table 15

Descriptive Statistics of the Firm-Specific Variables in Hypotheses 1-3

Variables	Mean	Min	Median	Max	S.D.	*n*
Size (GH¢million)	578.72	0.11	39.46	12,347.50	2,241.32	30
Age (years)	27.23	4.00	23.00	51.00	13.28	30
AIP(%)	33.24	1.32	29.31	80.88	26.77	30
PROF(%)	16.76	(8.62)	14.37	63.79	15.28	26
GROW(%)	39.49	7.25	29.91	142.20	31.17	26
DIV(%)	36.87	8.73	30.00	81.28	17.37	23

I collected the data relating to the total assets from the balance sheet ending one financial year before the IPO. These total assets, which I used as a proxy for measuring the size of the IPO firms, showed that the average size (SIZE) of the listed firms on the GSE in millions of Ghana Cedis is GH¢578.72 (GH¢39.46, median). Restating these values in US dollar terms, at an average exchange rate of GH¢1.5642 to $1 over the 20-year study period, means that the average size of listed firms on the GSE in millions of dollars is $369.98 ($25.23, median). As noted in Chapter 3, I measured the age (AGE) of the IPO firms as the number of years the firm had been in existence prior to its IPO. I found out that the average age of the IPO firms, prior to their listing on the GSE, was 27.23 years (23.00 years, median). The average company listed on the GSE, according to my sample, had 33.24% (23.29%, median) of its assets base being in plant, property, and equipment (AIP) in the financial year before the IPO. The profitability (PROF) of the IPO firms, which I measured in terms of their forecasted earnings before interest and tax (EBIT) vis-à-vis the forecasted sales for the year of IPO flotation, had shown an average of 16.76% (14.37%, median). The forecasted sales growth (GROW) , which I expressed

as the percentage of excess forecasted sales for the year of IPO flotation over the actual sales recorded by the IPO firm in the pre-IPO year, revealed on the average that an IPO firm listed on the GSE was forecasted to experience 39.49% sales growth (29.91%, median). In relation to forecasted dividend payments (DIV), I found from the sampled data that an IPO firm on the average was forecasted to pay 36.87% (30.00%, median) of its net income as dividend to its shareholders.

Macroeconomic/emerging-market factors. In relation to these factors, I provide in Table 16 their descriptive statics.

Table 16

Descriptive Statistics of the Emerging-Market Variables in Hypotheses 1-3

Variables	Mean	Min	Median	Max	s.d.	*n*
GDP(%)	5.21	3.30	5.20	8.01	1.23	30
INF(%)	22.50	10.71	18.03	59.46	12.86	30
MMR(%)	15.26	0.00	14.32	32.05	9.29	30
FER	111.83	91.49	100.38	160.78	23.06	30
M2(%)	31.23	13.30	31.92	56.53	11.67	30
SZ(%)	14.33	0.00	15.47	34.33	9.45	30
FD(%)	24.90	16.31	25.75	35.13	5.75	30

The GDP growth, which I measured as the annual GPD growth rate experienced in the economy in the year before the IPO flotation, witnessed an average growth rate of 5.21% (5.20%, median). Inflation (INF) over the 20-years of IPO activities on the GSE averaged 22.50% (18.03%, median). This inflation, which I measured as the rate of inflation within the economy in the year prior to the IPO firm's listing on the GSE, ranged between 10.71% and 59.46% over the study period. The interest rate (MMR),

measured as the percentage rate of interest an investor/depositor was to earn from the money market, averaged 15.26% (14.32%, median). The level of exchange rate (FER) depreciation measured by the index of real effective exchange rate prevailing in the year before the IPO flotation, hovered around an average 111.83 (100.38, median). The level of the money supply (M2) in the Ghanaian economy over the 20-year period averaged 31.23% (31.92%, median). The size of the stock market (SZ), as measured by the GSE-All Share Index, indicated that the Ghanaian Stock Exchange witnessed an average growth of 14.33% (15.47%, median). This stock market size over the 20-year period of IPO-activities on the GSE grew from a minimum of 0.00% to 34.33% maximum. The level of financial intermediation (FD) within the Ghanaian economy increased from 16.31% to 35.13% with an average percentage intermediation of 24.90% (25.75%, median).

IPOs' valuation methods. In relation to these factors, I provided in Table 17, their descriptive statics. I divided this table into three different panels with Panel A accounting for the various valuation methods used in the valuation of the sampled IPOs on the GSE. In Panel B, I accounted for the weights that were assigned to each valuation methods and in Panel C; I gave an account of the level of price discounts offered on the GSE. From the table, it would be noted that the number of different valuation methods (NMETHOD) that the investment bankers used to value the IPOs revealed that these bankers mostly used more than one valuation method with the maximum number of methods used in a giving IPO valuation ranging from 1 to 5 methods. The average number of different valuation methods used in the valuation of the IPOs of each listed

firm on the GSE equaled 3.1. The percentage distribution of the investment bankers' usage of these IPO valuation methods indicated that the discounted cash flow model (DCF) is the most popular valuation method with 93.0% and the weight that was generally assigned to this method averaged 48.93%.The other valuation methods (OTW)–comprising mainly of net asset valuation (NAV), adjusted asset valuation (AAV), actuarial valuation (ACT), and existing market price (EMP)–follows with a percentage usage of 83.0% and the weight generally assigned to its value estimates averaged 33.67%. The multiples valuation (MULT)–comprising mainly of price-to-earning (P/E) ratio and price-to-book (P/B) ratio–flows in a distance third with 50% usage and the weight generally assigned to its value estimates having a percentage distribution of 16.27%. The dividend discounted model (DDM) follows in a very distant fourth with an average percentage usage of 0.03% and the average assigned weight of 1.00%.These descriptive statistics further revealed that those bankers do not use such methods as economic value added (EVA), residual income method (RIM), price-to-sales (P/S), and price-to-cash (P/C) as all of these methods recorded a percentage usage of zero respectively.

Table 17

Descriptive Statistics of the Dependent Variables in Hypotheses 1-3

Variables	Mean	Min	Median	Max	s.d.	*n*
Panel A: Valuation Methods						
P/E ratio	0.43	-	-	-	-	30
P/S ratio	-	-	-	-	-	30
P/B ratio	0.17	-	-	-	-	30
P/C ratio	-	-	-	-	-	30
MULT	0.50	-	-	-	-	30
DCF	0.93	-	-	-	-	30
DDM	0.03	-	-	-	-	30
EVA	-	-	-	-	-	30
NAV	0.20	-	-	-	-	30
AAV	0.67	-	-	-	-	30
ACT	0.07	-	-	-	-	30
EMP	0.10	-	-	-	-	30
OTH	0.83	-	-	-	-	30
NMETHOD	3.10	1.00	3.00	6.00	1.32	30
Panel B: Weighting of Valuation Methods						
P/E(%)	13.00	-	-	50.00	16.50	30
P/S(%)	-	-	-	-	-	30
P/B(%)	3.27	-	-	30.00	7.82	30
P/C(%)	-	-	-	-	-	30
MULTW(%)	16.27	-	2.50	50.00	18.33	30
DCFW(%)	48.93	-	50.00	70.00	19.60	30
DDMW(%)	1.00	-	-	30.00	5.48	30
EVAW(%)	-	-	-	-	-	30
NAV(%)	3.67	-	10.00	35.00	8.90	30
AAV(%)	18.33	-	20.00	50.00	16.83	30
ACT(%)	3.33	-	-	50.00	12.69	30
EMP(%)	8.33	-	-	100.00	26.53	30
OTW(%)	33.67	-	30.00	100.00	24.21	30
Panel B: IPOs' Pricing Discounts						
DISCOUNT(%)	8.74	-	0.71	85.07	17.66	30

Price discount. The descriptive statistics, in Table 17, seemed to depict that investment bankers and the management of listed firms had on the average offered a price discount (DISCOUNT) of 8.74%. The discounts, which I measured as the difference

between fair value estimate and the preliminary offer price, ranged from a state of no discount to as high as 85.07% discount offered by of one the sampled IPO firms.

Descriptive Statistics of the Variables in Hypotheses 4

Dependent variables. In Table 18, I set forth the three main metrics widely used in measuring the forecast accuracy of financial projections provided by the management of listed firms in their IPO prospectuses. These three main measures relate to forecast error (FE), absolute forecast error (AFE), and the squared forecast error (SQFE).

Table 18

Descriptive Statistics of the Dependent Variables in Hypotheses 4

Variables	Mean	Min	Median	Max	s.d.	*n*
FE(%)	(28.56)	(163.63)	(20.03)	62.45	54.01	26
AFE(%)	49.62	7.54	39.67	163.63	38.26	26
SQF(%)	71.77	1.13	24.02	751.70	147.30	26

The mean forecast error, which measures the extent to which the management of IPO firms had systematically over/underestimated their firms' earnings forecasts, stood at -28.56% (-20.03%, median). The negative sign of the forecasts error depicts that, on an average, the listed firms in Ghana have over-forecasted their earnings potentials by as much as 28.56%. The absolute forecast error, which measures the relative deviation of actual earnings from forecasted earnings, recorded on an average a deviation of 49.62% (39.67%, median). This measure, which gives an indication of the extent to which the forecasts were close to actual profits in absolute terms, showed that the earnings forecasts incorporated in the IPO prospectuses on the GSE had forecast inaccuracies amounting to 49.62% when compared with the actual earnings of the IPO firms post-issue. The squared

forecasts error widely used as a proxy for measuring investors' losses as a result of forecast inaccuracies, recorded an average of 71.77% (24.02%, median).

Independent variables. In Table 19, I set forth the descriptive statistics of the independent variables that were used to explain the average level of absolute forecast error (*AFE*) observed on the GSE.

Table 19

Descriptive Statistics of the Independent Variables in Hypotheses 4

Variables	Mean	Min	Median	Max	s.d.	*n*
Size (GH¢million)	1,164.32	0.31	85.59	16,488.17	3,487.26	29
Own (%)	65.35	20.00	65.33	99.55	19.47	22
Hor (months)	43.56	22.00	40.00	72.00	13.15	25
Age (years)	27.23	4.00	23.00	51.00	13.28	30
Lev (%)	51.49	4.44	50.45	90.16	28.54	29
Aud (Big4=1,0)	0.63	-	-	-	-	30

Using the actual post-issue total assets as a proxy for measuring the sizes of the IPO firms, the results of the collected data showed that the average size of the IPO firms after their listing on GSE was GH¢1,164.32 million (GH¢85.59 million, median). The post-issue retained ownership (OWN) of stocks by the pre-issue owners of the IPO-firms averaged 65.35% (65.33%, median). This level of percentage ownership by the pre-IPO owners hovered around 20.00% by way of the minimum and 99.55% by way of maximum observed retentions on the GSE. The forecasting horizon (HOR), which I measured as number of months between prospectuses date and the year-end to which the forecasts in the prospectuses pertain, recorded an average of 43.56 months (40.00 months, median). The minimum forecasting horizon observed on the GSE was 22.00 months whilst the maximum was 72.00 months. In relation to the age of the IPO firms

(AGE), which I measured as the number of years the firms had been in existence prior to their IPO, I found out that the average age of the IPO firms prior to their listing on the GSE was 27.23 years (23.00 years, median). The levels of indebtedness of the IPO-firms, measured as the percentage of total debt to total assets as recorded in the post-issue balance sheet of the IPO firm, showed that the firms at the time of their listing were geared/leveraged (LEV) at an average of 51.49% (50.45%, median). The distribution of this level of leverage was, however, widely dispersed with the least geared firm recording 4.44% and the most geared recording 90.16%. The proportion of the financial forecasts in the IPO prospectuses of the listed firms on the GSE verified by one of the Big-4 audit firms stood at an average of 63.00%.

Descriptive Statistics of the Variables in Hypotheses 5

Dependent variables. In Table 20, I set forth the descriptive statistics of the discretionary current accruals (DCA), which I used as a proxy for measuring the levels of earnings management in the pre- and post-issue financial statements of the listed firms on the GSE. Inspired by the work of DeAngelo (1986), I computed this earnings management metric as:

$$DCA_{i,t} = \frac{CA_{i,t}}{(TA_{i,t} + TA_{i,t-1})/2} - \frac{CA_{i,t-1}}{(TA_{i,t-1} + TA_{i,t-2})/2} \quad (20)$$

Where $DCA_{i,t}$ is the discretionary current accrual of an IPO-firm *i*, t represents the fiscal year relative to the IPO (t = -2, ..., +3), *CA* represents current accruals and *TA* stands for total assets.

Table 20

Descriptive Statistics: Discretionary Current Accruals in Hypotheses 5

Variables	Year (-2)	Year (-1)	Year (0)	Year (+1)	Year (+2)	Year (+3)
Mean	(9.58)	0.66	4.22	0.36	(8.31)	(1.40)
Median	(0.68)	(1.07)	4.60	0.58	(1.96)	(2.93)
s.d.	28.78	26.73	26.91	16.64	21.20	17.82
Minimum	(81.66)	(49.05)	(69.25)	(39.13)	(87.69)	(37.12)
Maximum	43.81	96.63	82.53	27.90	12.20	56.63
n	30.00	30.00	30.00	30.00	30.00	28.00

To allow for a comparative analysis, I set forth the descriptive statistics of DCA to account for the use of accruals 2 years before IPO flotations and 3 years after those flotations on the GSE. The average DCA of listed firms on the GSE which stood at -9.58% (-0.68, median) of total assets 2 years before their IPOs increased to +4.22% (+4.60%, median) in the financial year following the IPO. Three years after the IPO, however, the average DCA had reduced to -1.40% (-2.93%, median). From these statistics, it could be noted that the extent to which the management of IPO firms have deployed creative accounting techniques to window-dress or creatively manage the earnings of their firms witnessed an increase of 13.80%, (i.e., 9.58+4.22), in the financial year following the IPO. This was, however, reduced by 5.62%, (i.e., 4.22+1.4), in the 3 years following the IPO. To further provide an in-depth understanding of the deployment of earnings management, I provide the corresponding percentage changes in the net income to total assets as well as net operating cash flow to total assets in Table 21. I have also sought to further enhance these comparative analyses, between discretionary current accruals (DCA), net income (NI), and cash flows (CF), by providing a graphical presentation of their respective averages in Figure 10. From both their respective tables

and the figure, it could be noted that in the years leading to the IPO floatation on the GSE both discretionary accruals and net incomes had witnessed increases whilst the cash flows for the corresponding years had rather seen decreases.

Table 21

Descriptive Statistics of the Net Income and Net Operating Cash Flows

Variables	Year (-2)	Year (-1)	Year (0)	Year (+1)	Year (+2)	Year (+3)
			Panel A: Net income			
Mean	0.06	18.83	6.57	5.53	3.60	1.70
Median	4.27	1.55	3.83	3.91	3.80	3.60
s.d.	31.97	40.33	16.68	10.68	12.95	17.43
Minimum	(162.55)	(4.64)	(11.67)	(16.41)	(43.10)	(59.74)
Maximum	26.12	156.77	83.49	41.98	32.53	27.54
n	30.00	30.00	29.00	30.00	30.00	28.00
			Panel B: Cash flows			
Mean	9.31	6.10	1.40	12.91	8.95	11.44
Median	4.90	4.80	2.45	10.69	6.22	6.28
s.d.	14.17	12.98	29.79	19.22	16.52	26.46
Minimum	(22.33)	(16.44)	(120.29)	(14.93)	(13.50)	(15.84)
Maximum	45.95	41.05	72.46	84.06	71.80	134.21
n	28.00	28.00	27.00	30.00	30.00	29.00

The reverse is rather true for the successive years after the IPO flotations, where both the discretionary current accruals and net incomes have rather decreased whilst the cash flows have witnessed some increases. The combined effect of these metrics seemed to suggest the possibilities of earnings management prior to IPO floatation on the GSE.

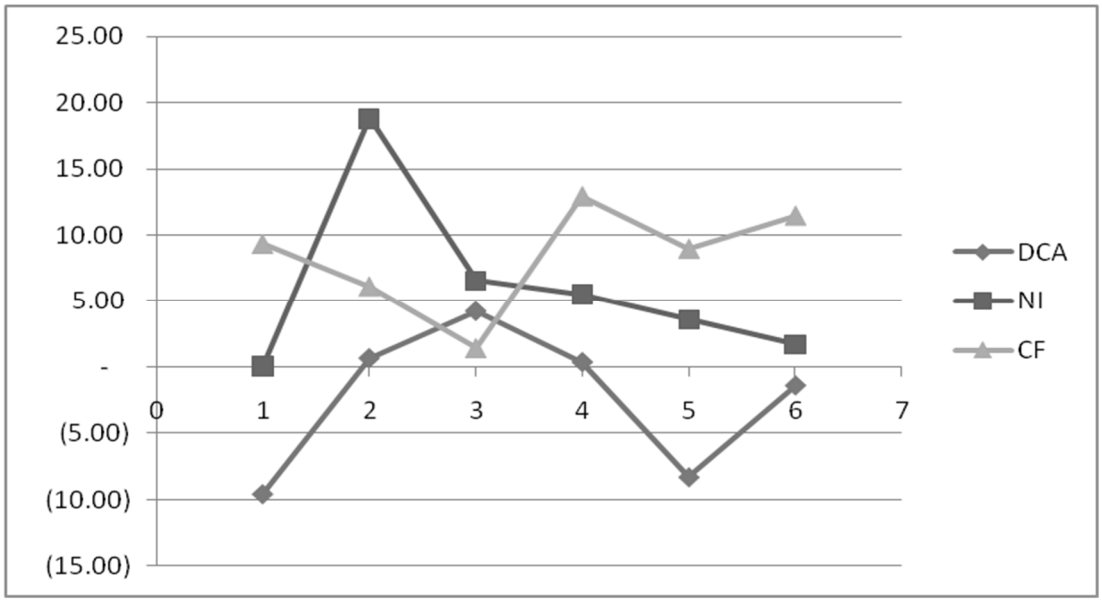

Figure 10. Graphical representation of the means of DCAs, NIs, and CFs

Independent variables. To, however, subject the above observation to an empirical testing, I provide in Table 22 the independent variables that I considered as being capable of explaining the observed tendencies of earning management.

Table 22

Descriptive Statistics of the Independent Variables in Hypothesis 5

Panel A: Dummy Variables	IAS		EB		AUD		OWN	
	n	%	n	%	n	%	n	%
0	11	36.7	4	13.3	11	36.7	21	70
1	19	63.3	26	86.7	19	63.3	9	30
Total	30	100	30	100	30	100	30	100
Panel B:Variables			Mean	Min	Median	Max	s.d.	n
ROWN(%)			65.35	20.00	65.34	99.55	19.47	22

In Panel A of Table 22, I provided the descriptive statistics of the independent variables measured in terms of the dummies of "0s" and "1s." In this regard, for the

variable relating to the use of international accounting standards (IAS), I assigned a dummy of "1" if the IPO firm's pre- and post-issue financial statements accorded with the international financial reporting standards (IFRSs), otherwise "0". From Panel A, it could be noticed that 63.3% of the sampled IPO firms had their financial statements according with the IFRSs whilst 36.7% used the Ghana Accounting Standards (GAS). For the variable relating to the extent to which the boards of IPO firms were made up of external/non-executive directors (EB) as against executive directors, I assigned a dummy variable of "1" if the majority of the pre -and post-IPO board of directors were non-executive board members, otherwise "0". From Panel A, it could be noticed that 86.7% of the sampled IPO firms had their board been made up of such non-executive directors whilst 13.3% of those firms have their boards dominated by their own executives. For the variable relating to the independent verification of the financial projections incorporated in the prospectuses of the IPO firms (AUD), I assigned a dummy variable of "1" if those projections were verified by one of the Big-4 audit firms, otherwise "0". From Panel A, it could be noticed that 63.3% of the sampled IPO firms had their verifications done by one of those Big-4 firms whilst 36.7% used other firms that were outside the ambit of the Big-4. In measuring the extent to which owners (OWN) were involved in the day-to-today management of the IPO firms before firms listing on the GSE, I utilized a dummy variable of "1" if a firm pre-IPO was managed by the controlling stockholder(s) and "0" otherwise. From Panel A, it could be noticed that 30% of the sampled firms had their owners involved in their day-to-day management; the remaining 70% did not have such ownership-management structure. In measuring the total number of post-IPO shares

retained by pre-IPO owners (ROWN), I used Panel B in presenting the results. From that Panel, it could be noticed that the percentage of post-IPO shares retained by pre-IPO owners averaged 65.35%. The results in the Panel further revealed that such post-IPO share retentions recorded a minimum of 20.00% and a maximum of 99.55% over the study period.

Descriptive Statistics of the Variables in Hypotheses 6

In Table 23, I set forth the descriptive statistics of both the dependent and independent variables in Hypothesis 6.

Table 23

Descriptive Statistics of the Variables in Hypothesis 6

Variables	Mean	Min	Median	Max	s.d.	n
R(1st Day) (%)	1.49	(50.00)	0.63	60.42	17.56	30
P/V Ratio	0.84	-	0.92	2.20	0.54	27
BTM Ratio	1.93	0.12	0.47	18.15	4.03	27
GrowthAIP (%)	39.49	7.25	29.91	142.20	31.17	26
Accurals (%)	5.18	(39.74)	3.88	71.46	24.90	29
Sales (GH¢million)	247.24	0.15	43.57	3,572.66	684.14	29
EBIT Margin (%)	15.93	(50.16)	14.49	54.80	23.84	29
MLOT (GH¢million)	1.31	(7.97)	0.013	37.86	7.49	30

Dependent variables. The mean first-day return (*R*(1st Day)), which is the dependent variable in Hypothesis 6, recorded an average of 1.49% (0.63%, median). Judging by this percentage average return, the listed firms on the GSE seemed to have underpriced their IPOs. This seeming underpricing meant that investors had, on average gained GH¢1.31 million (GH¢0.013 million, median) over 20-year period of IPO activities on the GSE as was recorded by the MLOT variable. This overall gains, however, came with some investors losing as much as GH¢7.97 million as a result of overpricing on one of the IPOs. On the IPO that investors recorded most of their gains as

a result of underpricing of that IPO amounted to GH¢37.86 million. For my readers to best understand these two extremes of IPOs under and overpricing on the GSE, I set the year-on-year analysis of the money left on the table (*MLOT*) in Table 24.The concept of 'money left on the table' holds that underpricing is the excess of the first-day trading price over an IPO's offer price. The greater the underpricing, the lower the gross IPO proceeds that accrues to the issuing firms, hence the greater the money those firms and their selling shareholders would have "left on the table" for the investors (Chambers & Dimson, 2009). IPO flotations on the GSE had resulted in money been left on the table for investors, because of the 14 years of IPO activities on the GSE presented in Table 24; nine of those years resulted in underpricing with the lowest amount recorded as GH¢0.01 million in 2002 and the highest recorded in the year 2008 of GH¢38.78 million. The IPO flotations on the GSE for the remaining 5 years had, however, witnessed overpricing–the excess of IPO offer price over the first-day trading price. If underpricing had been termed 'money left on the table,' then overpricing which is the opposite could also be termed 'money taken from the table.' The lowest amount of money taken from the table–overpricing–recorded on the GSE was GH¢0.02 million in 1991/2 whilst the highest amount recorded in the year 2003 was GH¢7.97 million.

Table 24

IPO Under/(Over) pricing and Money Left on the Table (MLOT)

Year	Sample Size	MLOT (GH¢million)	Mean (GH¢million)
1991/2	3	(0.02)	(0.01)
1994	2	(0.05)	(0.02)
1995	2	0.04	0.02
1996	2	0.28	0.14
1999	1	-	-
2000	1	0.28	0.28
2002	1	0.01	0.01
2003	1	(7.97)	(7.97)
2004	4	38.78	9.70
2005	1	(0.05)	(0.05)
2006	4	0.18	0.04
2007	1	1.54	1.54
2008	4	5.88	1.47
2009	1	-	-
2011	2	0.28	0.14
	30	39.19	1.31

Independent variables. Leading the pack of the independent variables that I used in explaining the under/(over) priced IPO offering on the GSE, is the price-to-value (P/V) ratio. The P/V ratio, which I measured as the ratio of first-day trading price to enterprise value of the IPO firm in the year of IPO flotation, recorded an average of 0.84 (0.92, median). The relationship between IPO under/(over) pricing and P/V ratio is that those IPOs with the lowest P/V ratios should earn the highest first-day returns (Purnanandam & Swaminathan, 2004, p. 823). In this regard, I will be able to explain the implications of the recorded average of 0.84 after my empirical testing of the above-noted proposition of P&S (2004) in the next section of this Chapter. The book-to-market ratio (BTM) is the

next variable that I used in explaining the observed under/(over) pricing of IPOs on the GSE. The BTM, which I measured as the ratio of book value of equity for the fiscal year after the IPO date and the market value of equity arising out of the first-day trading prices, recorded an average of 1.93 (0.47 median). The next variable growth (GROWTH) measures the percentage growth rate between the sales forecasted in the IPO year and the actual sales reported in the pre-IPO year income statements. This variable on the average showed that the IPO firms on the GSE had an average forecasted sale of 39.49% (29.91%, median) in the year of IPO floatation above the actual sales recorded in their pre-IPO income statements. The next variable I considered as worthy of explaining the observed under/(over) pricing of IPOs on the GSE is the ratio of accruals to total asset (ACCRUALS). This variable showed on the average that listed firms on the GSE had 5.18% (3.88%, median) of their total assets consisting of elements that are informed by accruals accounting. The other two remaining variables I considered were the actual sales (SALES) reported by the listed firms in the year of their IPO flotations and the margins of those sales that were reported as earnings before interest and tax (EBIT). The average sales recorded in the year of IPO flotations was GH¢247.57 million (GH¢43.57 million, median) and the average of EBIT margin of this sales was 15.93% (14.49%, median).

Data Analysis: Hypotheses Testing

Hypothesis 1: Choice of IPOs' Valuation Methods

As I pointed out in both chapters 1 and 3, the hypothesis tested here is:

H_0: The choice of IPO valuation methods by investment bankers in Ghana is not dependent on firm-specific factors and emerging market factors.

H_1: The choice of IPO valuation methods by investment bankers in Ghana is dependent on firm-specific factors and emerging market factors.

I also pointed out that this hypothesis was tested using the following binary logit model:

$$MULT_i[DDM_i, DCF_i, EVA_i, DDM_i, OTH_i]$$
$$= \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i$$
$$+ \beta_7 GDP_i + \beta_8 INF_i + + \beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i$$
$$+ \beta_{13} FD_i + \varepsilon_i \quad (21)$$

To operationalize this model, I considered each of these five categorical dependent variables as separate models in their own right. In this regard, I have entered each of those variables into the SPSS software as dummies of "0s" and "1s." For example, I have used a dummy variable of "1" if the investment banker used the multiples valuation (MULT) for a given IPO-firm and a dummy variable of "0" if the banker did not use the multiples valuation (MULT) for that IPO-firm. In entering each of the 13 independent variables into each of the binary models, I used a forced entry method for the first six independent variables in the equation. These variables accounted for the firm-specific factors and given that these same factors were subjected to a similar empirical testing by Roosenboom (2007), I forced entered them in Block 1 of the model building process. This forced entry method, according to Field (2009), is the default method for conducting regression and hence where predictors have already been tested in a prior research the forced entry method would be the most appropriate. The remaining seven independent variables relating to macroeconomic/emerging-market factors were

entered in Block 2 of the model using Forward Stepwise (Likelihood Ratio)–*Forward LR*. This entry method allows the SPSS, the free-hand of adding any of these market-related independent variables to the model depending on the ability of that variable to improve the predictability of the model. By way of detailed example of the analysis that can be made of each of the five models, I have provided the binary logit analysis of the multiples valuation model (MULT-model) in the following pages, for the rest of the models –the DDM-model, the DCF-model, and the OTH-model–I only provided summaries of their key results. I constructed no model for EVA valuation method because, as was pointed in the descriptive statistics section in this chapter, no IPO on the GSE was value and priced using this method.

MULT's binary logistic regression model. As was just noted, I carried out each of the binary logistic regression in blocks with (a) Block 0: taking account of no independent variable; (b) Block 1: taking account of the six independent variables relating to firm-specific factors; and (c) Block 2: taking account of the seven independent variables relating to emerging-market factors. For Block 0, the logistic regression model produced as a result of having the constant as the only variable in the equation is as shown in Table 25.

Table 25

MULT's Binary Logistic Model: Variables in the Equation in Block 0

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	0.000	.365	0.000	1	1.000	1.000

The next important SPSS output my readers ought to bear in mind in Block 0 is the classification table and this is shown in Table 26.

Table 26

MULT's Binary Logistic Model: Classification Table in Block 0

Classification Table[a,b]					
			Predicted		
			MULT		Percentage
Observed			Not Used	Used	Correct
Step 0	MULT	Not Used	0	15	0.0
		Used	0	15	100.0
	Overall Percentage				50.0

a. Constant is included in the model.
b. The cut value is .500

This table suggests that if my readers and I presumed to know nothing about our independent variables and guessed that an investment banker will be using multiple valuation method in his/her valuation of a giving IPO, we will be 50.0% correct most of the time. In Block 0, therefore, all the independent variables were treated as 'variables not in the equation.' The SPSS output to this treatment is as shown in Table 27.

Table 27

MULT's Binary Logistic Model: Variables Not in the Equation in Block 0

Variables not in the Equation					
			Score	df	Sig.
Step 0	Variables	SIZE	.585	1	.445
		AGE	.776	1	.378
		AIP	10.916	1	.001
		PROF	5.505	1	.019
		GROW	.000	1	.991
		DIV	4.203	1	.040
	Overall Statistics		16.896	6	.010

This output was intended to enable us know whether the inclusion of any of these independent variables will improve the prediction of the model. The model, according to the output in Table 27, could be enhanced if the independent variables relating to the extent to which the assets of the IPO-firms were assessed to be tangible (AIP), the firm's profitability (PROF), and its future dividend payments (DIV) are added to the constant. This is because the inclusion of these variables will be significant, given that each of them is shown to have a *p-value* of less than .05. If the inclusion of any of these variables will not have significantly changed the model, then there will not have been a reason to continue with the addition of that variable in this analysis. In spite of this assertion, force entering all the six firm-specific variables–significant or not–in "Block 1" is necessary because the overall significance of all the variables had a *p-value* of 0.01 which is less than .05. This depicts that their interactive effect is significant, and hence their entry will improve the predictability of the original model. The result of their entry is as shown in the SPSS output in Table 28.

Table 28

MULT's Binary Logistic Model: Classification Table in Block 1

Classification Table[a]					
			Predicted		
			MULT		Percentage
Observed			Not Used	Used	Correct
Step 1	MULT	Not Used	14	1	93.3
		Used	2	13	86.7
	Overall Percentage				90.0

a. The cut value is .500

From this output, it could be noted that the inclusion of the firm-specific variables had improved the predictive ability of the model by 40%–from 50% to 90%. In spite of this seeming improvement in the model's predictability, one needs to evaluate the model fitness and assess whether each of the independent variables included make any significant contribution to the model. For the assessment of the overall fitness of the new model, one will require the comparison of the log-likelihood (LL) statistics. SPSS, rather than report the log-likelihood itself, multiplies the log-likelihood by -2 to give -2LL. For the data under consideration, the null hypothesis model–that is the model produced in Block 0–had a -2LL of 41.589. The -2LL of the model built in Block 2, however, was 19.922. This reduction in the -2LL is an indication that the new model is a better predictor of the use or non-use of the multiples valuation methods by investment bankers on the GSE. As to how better the model predicts the outcome variable, SPSS provides the Model Chi Square, which is derived from the likelihood of observing the actual data under the assumption that the model that had been fitted is accurate.

Table 29

MULT's Logistic Model: Omnibus Tests of Model Coefficients in Block 1

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	21.667	6	.001
	Block	21.667	6	.001
	Mode	21.667	6	.001

The value of the model chi-square statistic works on the principle that the difference between -2LL for the best-fitting model and 2LL for the null hypothesis model (in which all the b values were set to zero in block 0) is distributed like chi-squared, with degrees of freedom equal to the number of predictors; this difference is the Model Chi-Square that SPSS referred to. For the data under consideration, the model's chi-square was 21.667 (i.e., 41.589-19.992), and this is as shown in Table 29. This reduction is significant ($\chi^2(6) = 21.667$, $p< 0.01$), depicting that the addition of the six firm-specific independent variables will significantly improve the models ability to predict the use of multiples valuation method by the investment bankers on the GSE. In summarizing the enhancement in the model in Block 1, the SPSS produces the following output which I set forth in Table 30.

Table 30

MULT's Binary Logistic Model: Model Summary in Block 1

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	19.922[a]	.514	.686

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Although there is no analogous statistic in logistic regression that close to the coefficient of determination R^2 in linear regression, the SPSS provides some approximations of the R^2 through the above-noted output. The Cox and Snell's R-Square attempts to imitate linear regressions' R-Square based on 'likelihood,' but its maximum can be (and is usually) less than 1.0, making it difficult to interpret. Here it is indicating that the logistic regression model explains 51.4% of the variation in the dependent variable–the use of multiples valuation method. The Nagelkerke modification ranges from 0 to 1 and is, therefore, considered as a more reliable measure of the relationship. Nagelkerke's R^2 will normally be higher than the Cox and Snell's test, and it is the most-reported of the R-squared estimates (Burns & Burns, 2008). In our case it is .686, indicating a strong relationship of 68.6% between the predictors and the outcome variable under consideration. To be double sure about the fitness of the new model, SPSS also provides an alternative to the chi-square model called the Hosmer and Lemeshow test (i.e., *H-L* test for short). This test divides subjects into ten ordered groups of subjects and then compares the number in the each group (observed) to the number predicted by the logistic regression model (predicted). These ten ordered groups for the data under consideration is as shown in Table 31.The ten ordered groups created based on their estimated probability; those with estimated probability below 0.1 form one group, and so on, up to those with probability 0.9 to 1.0. Each of these categories gets divided into two groups based on the actual observed outcome variable ('use' and 'not use' of the multiples valuation method). The expected frequencies for each of the cells obtained from the model.

Table 31

MULT' Binary Logistic Model: Contingency Table H-L Test in Block 1

Contingency Table for Hosmer and Lemeshow Test						
		MULT = Not Used		MULT = Used		
		Observed	Expected	Observed	Expected	Total
Step 1	1	3	2.941	0	.059	3
	2	3	2.828	0	.172	3
	3	2	2.578	1	.422	3
	4	2	2.425	1	.575	3
	5	3	2.126	0	.874	3
	6	1	1.272	2	1.728	3
	7	1	.557	2	2.443	3
	8	0	.189	3	2.811	3
	9	0	.064	3	2.936	3
	10	0	.020	3	2.980	3

The probability (*p*) value is computed from the chi-square distribution with 8 degrees of freedom to test the fitness of the logistic regression model. If the *H-L* goodness-of-fit test statistic is greater than .05, as it should be for well-fitting models, we fail to reject the null hypothesis that there is no difference between observed and model-predicted values, implying that the model's estimates fit the data at an acceptable level. That is, well-fitting models show non-significance on the *H-L* goodness-of-fit test. This desirable outcome of non-significance indicates that the model prediction does not significantly differ from the observed. For the data under consideration, the *H-L* goodness-of-fit test is as shown in Table 32.

Table 32

MULT's Binary Logistic Model: Hosmer and Lemeshow Test in Block 1

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	3.606	8	.891

This table indicated that the *H-L* goodness-of-fit test is non-significant ($\chi^2(8) = 3.606$, $p = 0.891$) and this is indicative of the fact that the model is predicting the real world data fairly well. In view of this high predictive ability of the firm-specific variables, I set in Table 33 the parameters of the model for Block 1:

Table 33

MULT's Binary Logistic Model: Variables in the Equation in Block 1

Variables in the Equation									
								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	SIZE	.000	.000	.037	1	.848	1.000	.999	1.001
	AGE	.079	.052	2.318	1	.128	1.083	.977	1.199
	AIP	-.072	.030	5.673	1	.017***	.931	.877	.987
	PROF	.064	.060	1.142	1	.285	1.066	.948	1.199
	GROW	-.003	.020	.026	1	.871	.997	.959	1.036
	DIV	.068	.046	2.206	1	.138	1.070	.979	1.171
	Constant	-2.789	2.425	1.322	1	.250	.061		

a. Variable(s) entered on step 1: SIZE, AGE, AIP, PROF, GROW, DIV.

In proceeding to make further claims about the predictive power of the variables provided in the table, it is important to point out that the stepwise entry of the market-related variables into the model building process in Block 2 resulted in none of those variables being added to the model.

In view of this, one can proceed with the model building based on the consideration of only firm-specific variables. In so proceeding, I will want at this point to illustrate the computation of the odds ratios for use of multiples valuation method by an

investment banker in the valuation of a given firm's IPO on the GSE. In computing the P(MULT), Table 33 becomes even more important and hence I will, at this juncture, explain some of its elements. The first of these elements is the B-value which is the same as the *b-value* in linear regression in that the value represents the change in the logit of the dependent variable with a unit change in the independent variable. The logit of the dependent variable is simply the natural logarithm of the odd of MULT occurring. These odds are the exponential values of *B* as shown in the table. The second important element in the output is the Wald statistic which has a chi-square distribution and enables us to determine whether the *B* coefficient for each of the predictor variable is significantly different from zero. The next important element is the Exp(B) column in the table. The Exp(B) presents the extent to which raising the corresponding measure by one unit influences the odds ratio and hence the Exp(B) interpreted in terms of the change in odds. If the value of Exp(B) exceeds 1 then the odds of an outcome occurring increase; if the value is less than 1, any increase in the predictor variable leads to a drop in the odds of an outcome occurring. From the variables under consideration, it could be noted that, with the exception of the AIP, none of the remaining six firm-specific variables had values for the Wald statistics that were significant in that they all report *p*-values greater than .05. In contrast, however, the Wald statistics for the AIP (Wald = 5.673, $p < .017$) significantly predict the use of MULT in the valuation of a given firms IPO on the GSE. The Exp(B) value for this AIP variable (exp B = .931, CI0.95 = .877, .987) indicate that if the value of AIP goes up by 1, then the odds of an investment banker using MULT reduces because its Exp(B) is less than 1. The confidence interval for this value ranged from 0.887 to

0.987, so one can be confident at a level of 95% that the value of Exp(B) in the population for the AIP variable lies somewhere between these two values. The Exp(B) values of variables such as SIZE, AGE, PROF, and DIV–in spite of their statistical insignificance–are all greater than 1, indicating that a unit change in the value of any one of them will increase the odds of an investment banker using the MULT valuation methods. The Exp(B) value of the variable GROW was like that of the AIP and hence, one unit increase in the observed value of GROW rather reduces the odds of MULT occurring.

In summing up on whether or not the use of MULT is dependent on both the firm-specific and market-related factors one can conclude that the null hypothesis cannot be rejected in favor of the alternate. In spite of this failure to reject the null hypothesis, however, the resulting model's ability to predict the odds of MULT occurring is so strong that it will not be out of place to claim that there is a practical, not statistical, argument that the choice of MULT as a valuation metric by investment bankers on the GSE is dependent on, at least, the six firm-specific factors. Proceeding on practical grounds, therefore, I can now turn to the computation of the odds ratio for use of MULT valuation methods on the GSE. In carrying out such calculations, Field (2009) admonished the use of the following steps:

Step 1*:* State the logistic regression equation from the final model:

$$P(MULT_i) = \frac{1}{1 + e^{-(B_0 + B_1 SIZE_i + B_2 AGE_i + \cdots + B_{13} FD_i}} \quad (22)$$

Where:

$$MULT_i = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i + \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i + \beta_{13} FD_i + \varepsilon_i \quad (23)$$

Step 2: Use the values of β_i values from the SPSS output in Table 33 and the X_i values for each IPO-firms under consideration to compute their $\beta_i X_i$ values. I have provided the computation of these values as part of the odds ratios' computations for each of the IPO firm in Table 34.

Step 3: Place the values of $\beta_i X_i$ into the logistic regression equation and the odds ratio's equations stated in Step 1, remembering to include the values of constant (β_o) and assuming the error term (ε_i) to be zero. These computations are shown in the Table 34 as well. By way of an illustration, however, using the value for an IPO-firm with the GSE Listing Code '*CAL*', I set forth the computations as required in this step as follows:

$$MULT_i = -2.79 + 0.00 + 1.19 - 0.14 + 2.06 - 0.10 + 2.93 = 2.61 \quad (24)$$

$$P(MULT_i) = \frac{1}{1 + e^{-2.61}} = 0.93057 \quad (25)$$

Therefore, for this IPO-firm there was a 93.06% chance that an investment banker valuing the IPO of such a firm would have used one of the multiples valuation methods.

Table 34

MULT's Binary Logistic Model: Computation of the Odds Ratios

GSE Listing Code	SIZE	AGE	AIP	PROF	GROW	DIV	*P(MULTi) = 1/(1+e-MULT)*			
	βiXi	*βiXi*	*βiXi*	*βiXi*	*βiXi*	*βiXi*	*Σ(βiXi)*	*βo*	$MULT_i$	$P(MULT_i)$
ACI	-	1.98	(5.82)	0.17	(0.09)	-	(3.77)	(2.79)	(6.56)	0.14
AGA	-	3.95	(5.79)	-	-	-	(1.84)	(2.79)	(4.63)	0.96
ALW	-	2.21	(4.59)	0.72	(0.07)	1.20	(0.53)	(2.79)	(3.32)	3.50
AYRTN	-	3.24	(2.33)	1.02	(0.06)	2.04	3.91	(2.79)	1.12	75.49
BOPP	-	3.00	(5.30)	1.75	(0.07)	2.04	1.42	(2.79)	(1.37)	20.25
CAL	-	1.19	(0.14)	2.06	(0.10)	2.39	5.38	(2.79)	2.60	93.06
CLYD	-	1.19	(2.12)	1.15	(0.12)	-	0.09	(2.79)	(2.70)	6.30
CML	-	1.74	(4.54)	(0.55)	(0.09)	-	(3.45)	(2.79)	(6.23)	0.20
CPC	-	1.74	(0.81)	0.06	(0.12)	0.59	1.47	(2.79)	(1.32)	21.02
EBG	-	1.34	(0.20)	1.22	(0.05)	3.57	5.89	(2.79)	3.10	95.69
EGL	-	1.26	(1.48)	0.91	(0.03)	4.01	4.67	(2.79)	1.88	86.72
ETI	-	1.82	(0.27)	-	-	-	1.55	(2.79)	(1.24)	22.46
GCB	-	3.40	(0.21)	2.45	(0.05)	2.04	7.63	(2.79)	4.84	99.21
GGBL	-	4.03	(5.25)	0.59	(0.06)	3.38	2.69	(2.79)	(0.10)	47.59
GOIL	-	3.71	(1.79)	0.13	(0.11)	1.59	3.54	(2.79)	0.75	67.87
GSR	-	1.90	(4.36)	-	-	-	(2.47)	(2.79)	(5.26)	0.52
GWEB	-	1.82	(3.65)	0.89	(0.12)	2.04	0.98	(2.79)	(1.81)	14.09
HFC	-	1.50	(0.23)	4.08	(0.14)	1.95	7.16	(2.79)	4.37	98.75
MLC	-	1.90	(2.98)	0.54	(0.08)	1.70	1.07	(2.79)	(1.72)	15.15
PBC	-	1.50	(3.98)	0.41	(0.02)	1.57	(0.52)	(2.79)	(3.31)	3.53
PKL	-	2.84	(4.35)	(0.34)	(0.17)	3.96	1.94	(2.79)	(0.85)	29.91
SCB	-	1.66	(0.09)	2.75	(0.19)	4.14	8.26	(2.79)	5.47	99.58
SIC	-	3.63	(1.84)	0.93	(0.14)	2.71	5.30	(2.79)	2.51	92.49
SOGEGH	-	1.58	(0.34)	2.28	(0.05)	3.40	6.87	(2.79)	4.08	98.34
SPL	-	3.48	(0.68)	1.35	(0.08)	2.04	6.12	(2.79)	3.33	96.54
SWL	-	1.42	(2.47)	1.53	(0.43)	1.70	1.75	(2.79)	(1.04)	26.16
TLW	-	0.71	(2.56)	-	-	-	(1.85)	(2.79)	(4.6342)	0.96
TOTAL	-	3.56	(1.21)	0.21	(0.34)	5.53	7.74	(2.79)	4.95	99.30
TRANSOL	-	0.32	(2.10)	0.23	(0.24)	2.93	1.14	(2.79)	(1.65)	16.11
UTB	-	0.95	(0.31)	1.35	(0.07)	1.15	3.07	(2.79)	0.28	57.04

DDM's binary logistic regression model. As I pointed out already, for each of the remaining binary logit models, I will only present the key summaries of their results. In running the model in SPSS, I noted that 96.7% of the model could be predicted by its constant (βo). Force entering the six independent firm-specific variables in Block 1 revealed that the model's predictive ability could be improved to a 100.0%. This was so because the model's -2LL, which was 8.769 in Block 0 had reduced to 0.000 in Block 1.

This reduction, was however, not significant ($\chi^2(6) = 8.769$, $p > 0.01$), depicting that the addition of the six firm-specific independent variables had not significantly improved the models ability to predict the use of discounted dividend valuation method (DDM) by the investment bankers on the GSE. This insignificance of the independent variables was further buttressed by the Cox and Snell's R-Square whose result of 0.253 indicates that those variables could only help in predicting the outcome variable by only 25.3%.The stepwise entry of the seven market-related variables into the Block 2 returned no results indicating that the addition of any of those variables would not make any significant change to the model produced in Block 1. In summing up on whether or not the use of DDM is dependent on both the firm-specific and market-related factors one can conclude that the null hypothesis cannot be rejected in favour of the alternate.

DCF's binary logistic regression model. In running the DCF-model, I found out that 93.3% of the model could be predicted by its constant (βo). Entering the six independent variables in Block 1 revealed that the model's predictive ability could not be improved by even a single percentage and hence still remained at 93.3%. This was so because the model's -2LL which was 14.696 in Block 0 reduced only by 0.770 to 13.925 in Block 1. This reduction was also not significant ($\chi^2(6) = 0.770$, $p > 0.01$), depicting that the addition of the six firm-specific independent variables had not significantly improved the models ability to predict the use of DCF valuation method by the investment bankers on the GSE. This lack of significance of the independent variables was further buttressed by the Cox and Snell's R-Square whose result of 0.025 indicates that those variables could help in predicting the outcome variable by only 2.50%. This predictive ability of

the model is also worse when measured with Nagelkerke's R^2 whose result was 0.065 which is indicative of the fact that the six independent variables were capable of predicting the outcome variable by only 6.50%. In view of this lack of predictive ability of these six independent variables, the stepwise entry of the seven market-related variables returned no results. In summing up on whether or not the use of DCF valuation method is dependent on both the firm-specific and market-related factors one can conclude that the null hypothesis cannot be rejected in favour of the alternate.

OTH's binary logistic regression model. The results relating to this model showed that 83.3% of the model could be predicted by its constant (βo). Entering the six firm-specific independent variables in Block 1 revealed that the model's predictive ability could be improved to 86.7%. This was so because the model's -2LL which was 27.034 in Block 0 had reduced to 18.315 in Block 1. This reduction, was however, not significant ($\chi^2(6) = 8.719$, $p > 0.01$), depicting that the addition of the six firm-specific independent variables in Block 1 had not significantly improved the models ability to predict the use of other valuations methods (OTH) by the investment bankers on the GSE. This insignificance of the independent variables is further buttressed by the Cox and Snell's R-Square whose result of 0.252 indicating that the addition of those independent variables to the constant in Block 1 could only help in predicting the outcome variable by only 25.2%. The stepwise entry of the market-variable saw the SPSS adding only one of such variables–GDP–in Block 2. This addition increased the model's predictive ability to 100%. This was so because; the model's -2LL which was 18.315 in Block 1 further reduced to 0.000. This reduction was shown to be significant ($\chi^2(6) = 0.000$, $p < 0.01$),

depicting that the addition of this GDP variables in Block 2 had significantly improved the models ability to predict the use of other valuations methods (OTH) by the investment bankers on the GSE. This improvement was further buttressed by the Cox and Snell's R-Square whose result had transformed from 0.252 in Block 1 to 0.594 indicating that the addition of that independent variable to the already existing constant and the six firm-specific variables in Block 2 had helped in increasing the prediction of the outcome variable to 59.4%. In spite of this improved predictive ability of the variables in Block 2, none of those variables seemed to have had a significant Wald statistic as can be seen from Table 35.

Table 35

OTH's Binary Logistic Model: Variables in the Equation in Block 2

Variables in the Equation									
								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	SIZE	.034	55.644	.000	1	1.000	1.035	.000	2.391E+47
	AGE	.321	223.306	.000	1	.999	1.379	.000	1.652E+190
	AIP	-.012	717.337	.000	1	1.000	.988	0.000	
	PROF	-.143	1366.066	.000	1	1.000	.867	0.000	
	GROW	-.036	259.862	.000	1	1.000	.964	.000	1.509E+221
	DIV	-1.986	615.476	.000	1	.997	.137	0.000	
	GDP	-38.098	12444.664	.000	1	.998	.000	0.000	
	Constant	295.046	85220.291	.000	1	.997	1.371E+128		

a. Variable(s) entered on step 1: GDP.

In summing up on whether or not the choice of OTH valuation methods are dependent on both the firm-specific and market-related factors one can conclude that the null hypothesis cannot be rejected in favour of the alternate.

Hypothesis 2: Fair Value Estimates of IPOs

In this section, I tested the following:

H_0: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO does not depend on firm-specific factors and emerging market factors.

H_1: The weight assigned to the value estimate of each valuation method in determining the fair value estimate of an IPO depends on firm-specific factors and emerging market factors.

I also pointed out that this hypothesis will be tested using the following ordinary least squares (OLS) regression model:

$$MULTW_i[DDMW_i, DCFW_i, EVAW_i, DDMW_i, OTHW_i]$$
$$= \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i$$
$$+ \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i$$
$$+ \beta_{13} FD_i + \varepsilon_i \quad (26)$$

To operationalize this model, I considered each of the five dependent variables as separate models in their own right. In this regard, I have entered each of those variables into the SPSS as separate dependent variables resulting in the creation of five different OLS models – MULT-Model, DDM-Model, DCF-Model, EVA-Model, and OTH-Model. As was the case with the models in Hypothesis 1, I entered each of the 13 independent variables into each of the OLS models using forced entry method for the first six firm-specific independent variables in the each of the model. These variables I forced entered into Block 1 because Roosenboom (2007) subjected similar variables to empirical testing on the French IPO-Market. This forced entry method, according to Field (2009), is the default method for conducting regression and hence where predictors have already been

tested in a prior research the forced entry method would be the most appropriate. I entered the remaining seven independent variables relating to emerging-market factors n Block 2 of the model using a stepwise method. This method of entry, as was noted before, allows the SPSS the free-hand of adding any of these market-related independent variables to the model depending on the ability of that variable to improve the predictability of the model.

MULTW's OLS regression model. I provided a summary of the resulting regression model for the MULTW in Table 36. From the Table, it could be noted that the regression model accounted for 43.8% of the variance in the assignment of weight to the multiple valuation methods by the investment bankers on the GSE. This level of the models prediction is significant at F (6, 23) = 2.993, and p< .05.

Table 36

MULTHW's OLS Regression Model: Overall Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.662[a]	.438	.292	15.41623	.438	2.993	6	23	.026	2.006

a. Predictors: (Constant), DIV (%), PROF (%), SIZE (GHS'million), GROW (%), AGE (Years), AIP (%)
b. Dependent Variable: MULTW (%)

In coming out with this overall level of significance, SPSS had excluded all the market-related variables from the model, depicting that the addition of any of those variables did not significantly improve the overall predictability of the model. In this regard, the level of significance and the predictive relationship observed in the

overall model related only to the six firm-specific variables. In spite of the overall level of significance, it is important for me to delve into the respective predictability of each of the individual firm-specific variable constituting of the model.

Table 37

MULTW's OLS Regression Model: Table of Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	11.415	11.650		.980	.337	-12.686	35.515		
	SIZE	-.001	.001	-.083	-.512	.614	-.003	.002	.935	1.069
	AGE (Years)	.166	.237	.121	.700	.491	-.325	.658	.824	1.214
	AIP (%)	-.334	.132	-.487	-2.526	.019	-.607	-.060	.656	1.524
	PROF (%)	.206	.221	.170	.933	.360	-.251	.664	.734	1.363
	GROW (%)	-.036	.104	-.058	-.350	.729	-.251	.179	.903	1.108
	DIV (%)	.281	.199	.239	1.411	.172	-.131	.693	.852	1.174

a. Dependent Variable: MULTW (%)

From this table, it would be realized that of the six firm-specific variables only the tangibility of IPO-firms' assets (AIP) variable had a significant predictive ability in explaining the weights that are assigned to the multiples valuation methods when such valuation methods are used by investment bankers on the GSE. The AIP variable is significant because it was the only variable with a *p-value* that was less than .05. The variable, however, was negatively correlated with such assignment of weight because its coefficient/beta was -0.334. This negative relationship presupposed that the greater an IPO-firms assets tangibility, the less weight the investment bankers assign to the use of multiples valuation methods in the valuation of the IPO of such a firm. Giving the overall level of significance of the model, one can conclude that the weight assigned to the multiples valuation method (MULT) is dependent on the firm-specific variables and

hence the null hypothesis can be rejected in favour of the alternate hypothesis. In this regard summarizing the results of the regression model from the coefficient table yields:

$$MULTW_i = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i \quad (27)$$

$$MULTW_i = 11.415 - 0.001(SIZE_i) + 0.166 AGE_i - 0.334(AIP_i) + 0.206(PROF_i) - 0.036(GROW_i) + 0.281(DIV_i) \quad (28)$$

For the model to be considered as being capable of generalization, the model, like any other multiple regression models, will have to fulfill assumptions of multicollinearity, homoscedasticity, autocorrelation, and normality. In relation to the multicollinearity assumption, the regression model could be said to violate such an assumption when there is a high correlation between two or more of the firm-specific predictor variables. According to Field (2009), multicollinearity poses a challenge to multiple regressions because as collinearity increases (a) so does the standard errors associated with the β coefficients thereby making the βs less trustworthy; (b) the size of R (i.e., the measure of correlation between predictors and the outcome) is limited or reduced; and (c) the relative importance of each of the individual predictors becomes less noticeable. The SPSS produces various collinearity diagnostics of which the two most common are the variance inflation factor (VIF) and its reciprocal called the tolerance statistics. The general rules of thumb are that (a) if any of the VIF values is greater than 10; and/or (b) if the average VIF is substantially greater than 1 then there will be a cause for concern and the regression model will be biased (Field, 2009). In relation to the tolerance, the general rule of thumb is that a tolerance below 0.2 indicates a potential

problem and hence a sign of multicollinearity (Field, 2009). For the regression model under consideration, it would be noted from Table 37 that the VIFs for all the six firm-specific variables were less than 10 and their average VIF was 1.242 and this is not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there is no collinearity among the predictor variables. In relation to the homoscedasticity assumption, Field pointed out that "at each level of the predictor variables, the variance of the residuals should be constant" (p. 220) and that if they are not, they will be said to be heteroscedastic. To assess whether the homoscedasticity assumption, Field admonishes the use of a scatter plot of ZRSID against ZPRED and for the data under consideration such a plot is as shown in Figure 11.

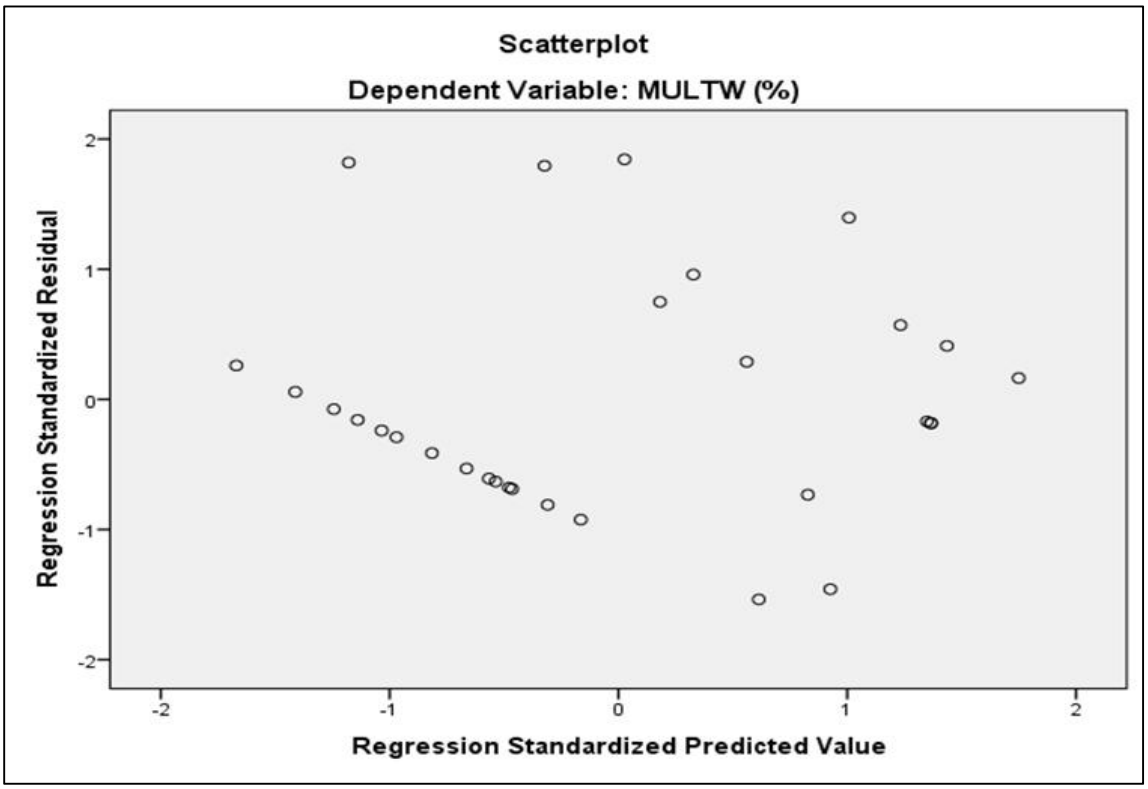

Figure 11. Plot of *ZRESID against *ZPRED for the MULTW's OLS Regression Model

When data is exhibiting homoscedasticity, Field (2009) further pointed out the scatter plot should show "a random array of dots evenly dispersed around zero" (p. 247). In other words, the scatter plot should show a random pattern and should not funnel out. For the scatter plot shown in Figure 11, it is obvious that the data is not showing a distinct funneling but rather a random pattern, indicating that the variance of the residuals exhibit homoscedasticity. For the autocorrelation assumption, Field pointed out that "for any two observations, the residual terms should be uncorrelated (or independent)" (p. 220). If the residuals are not independent, they will be said to be auto-correlated or serial-correlated. The Durbin-Watson test statistic is usually relied upon to assess the existence of autocorrelation or lack of independence of errors. This test statistic can vary between 0 and 4 with a value of 2 depicting that the residuals are uncorrelated. A value greater than 2 indicates a negative correlation, whereas a value below 2 indicates a positive correlation (Field, 2009). For the data under consideration, the Durbin-Watson statistic was 2.006 depicting that the residuals are not auto/serially correlated. In relation to the normality assumption, Figure 12 is testament to the fact that the data under consideration is normally distributed. In view of the overall significance of the model and its accordance with the various assumptions of multiple regressions, I can confidently say that the weight assigned by investment bankers on the GSE to use of multiples valuation methods in IPO valuation is dependent upon the six firm-specific variables and hence the null hypothesis should be rejected in favour of the alternate hypothesis.

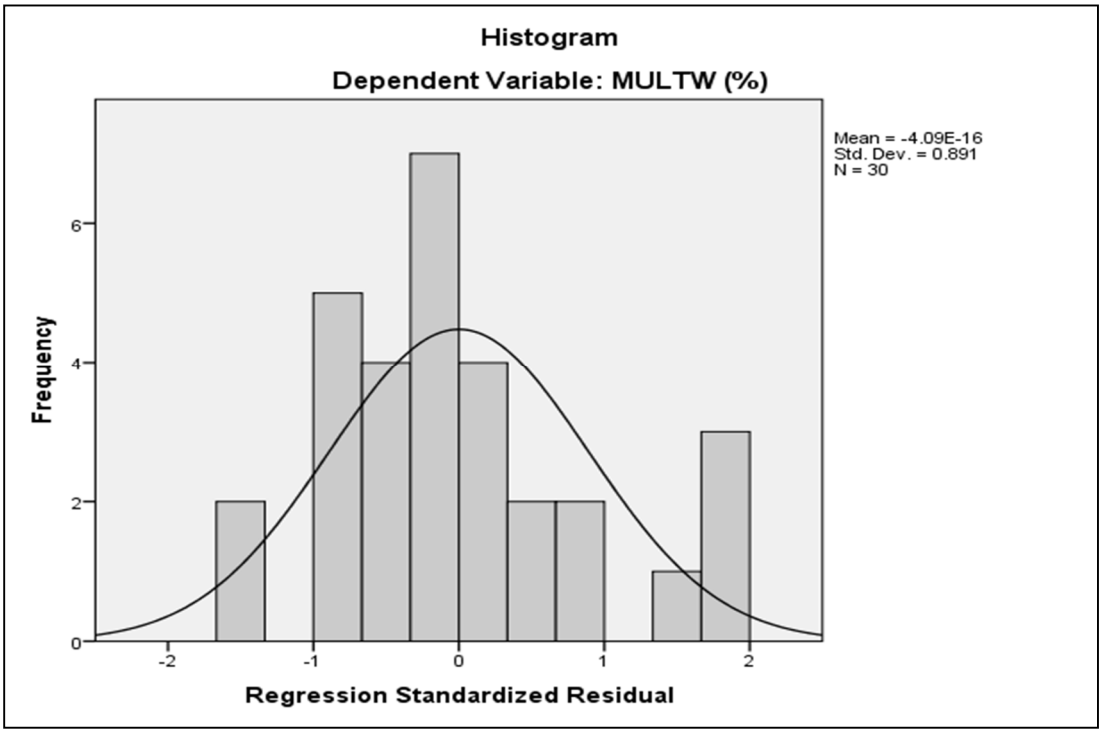

Figure 12. Histogram of normally distributed residuals for the MULTW's OLS Model

DDMW's OLS regression model. A summary of the resulting regression model for the DDMW is provided in Table 38. From the Table, it could be noted that the regression model accounted for only 14.6% of the variance in the assignment of weight to the discounted dividend valuation method by the investment bankers on the GSE. This level of the models prediction was not significant at F (6, 23) = 0.653, and $p > .05$. In coming out with this overall level of insignificance, SPSS had excluded all the market-related variables from the model, depicting that the addition of any of those variables did not also significantly improve the overall predictability of the model.

Table 38

DDMW's OLS Regression Model: Overall Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.382[a]	.146	-.077	5.68500	.146	.653	6	23	.687	1.929

a. Predictors: (Constant), DIV (%), PROF (%), SIZE (GHS'million), GROW (%), AGE (Years), AIP (%)

b. Dependent Variable: DDMW (%)

In spite of this overall level of insignificance, it is important for me to delve into the respective predictability of each of the individual firm-specific variable in the constituting the model.

Table 39

DDMW's OLS Regression Model: Table of Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.860	4.296		.433	.669	-7.028	10.747		
	SIZE (GHS'million)	6.125E-05	.000	.025	.126	.901	-.001	.001	.935	1.069
	AGE (Years)	.142	.088	.344	1.620	.119	-.039	.323	.824	1.214
	AIP (%)	-.066	.049	-.323	-1.358	.188	-.167	.035	.656	1.524
	PROF (%)	-.021	.082	-.059	-.262	.796	-.190	.147	.734	1.363
	GROW (%)	-.011	.038	-.059	-.291	.773	-.090	.068	.903	1.108
	DIV (%)	-.051	.073	-.145	-.694	.495	-.203	.101	.852	1.174

a. Dependent Variable: DDMW (%)

From Table 39, it would be realized that none of the six firm-specific variables had a significant predictive ability in explaining the weights that are assigned to the discounted dividend valuation method when such valuation methods are used by investment bankers on the GSE. This was because all variables had a *p*-value that was

greater than .05. For these reasons of the overall and individual levels of insignificance of the model, one can conclude that the weight assigned to the discounted dividend valuation method (*DDM*) is not dependent on both the firm-specific and market-related variables; hence the null hypothesis cannot be rejected in favour of the alternate hypothesis. In spite of failure to reject the null hypothesis, the resulting insignificant model could be summarized from the above coefficients in Table 39 as follows:

$$DDMW_i = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i \quad (29)$$

$$MULTW_i = 1.860 - 0.00006125(SIZE_i) + 0.142(AGE_i) - 0.066(AIP_i) - 0.021(PROF_i) - 0.011(GROW_i) - 0.051(DIV_i) \quad (30)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 39 that the VIFs for all the six firm-specific variables were less than 10 and their average VIF which stood at 0.837 was less than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there is no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 13.

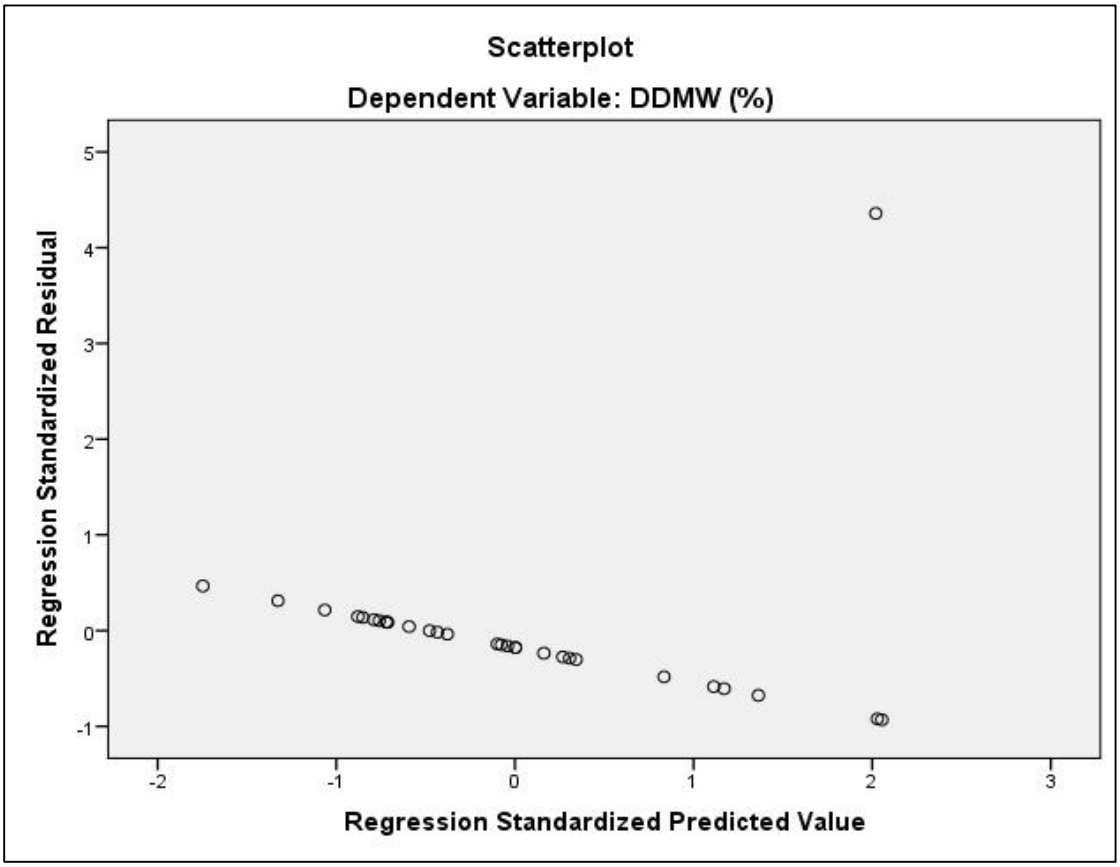

Figure 13. Plot of *ZRESID against *ZPRED for the DDMW's OLS Regression Model

From this histogram plot in Figure 13, it could be noted that the data is not showing a random pattern but rather a distinct funneling, indicating that the variance of the residuals exhibit heteroscedasticity and hence the assumption of homoscedasticity is violated by the model. For the autocorrelation assumption, the Durbin-Watson statistic is 1.929 depicting that the residuals are somewhat not auto/serially correlated and hence the model has accorded with the assumption of autocorrelation. In relation to the normality assumption, Figure 14 proves that this assumption too is violated.

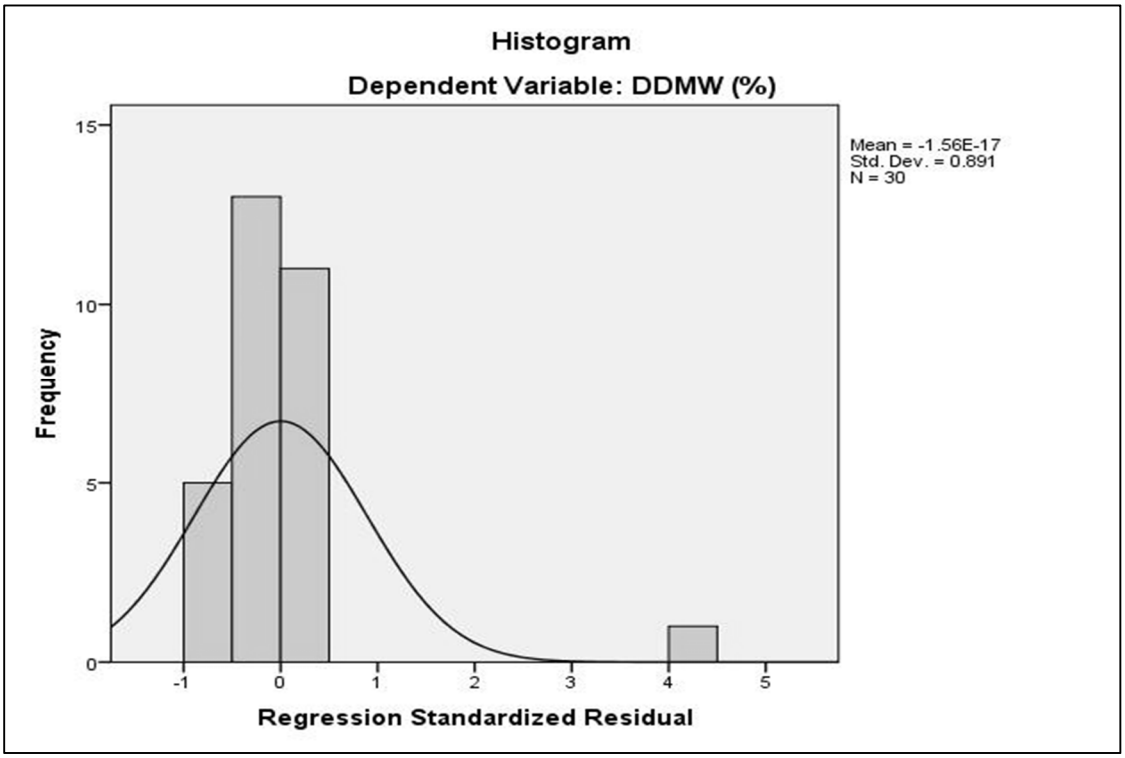

Figure 14. Histogram of normally distributed residuals for the DDMW's OLS Model

In view of the overall non-significance of the model and its violations of three out four of the most critical assumptions of linear regression, I cannot help but to confidently say that the weight assigned by investment bankers on the GSE to the use of dividend discounted valuation method in IPO valuations is not dependent upon any of the hypothesized firm-specific and market-related variables and hence the null hypothesis cannot be rejected in favour of the alternate.

DCFW's OLS regression model. The summary of the resulting regression models for the DCFW are provided in Table 40. From the Table, it could be noted that two models have resulted from the forced entry of the six-firm specific variables in Block 1 and the stepwise entry of an additional seven market-related variables in Block 2.

Model 1 accounted for only 16.3% of the variance in the assignment of weight to the discounted cash flow valuation method by the investment bankers on the GSE. This level of the model's prediction was not significant at F (6, 23) = 0.744, and p> .05. Model 2, on the other hand, accounted for as much as 46.9% of the variance in the assignment of weight to the discounted cash flow valuation method by the investment bankers on the GSE. This level of the model's prediction was significant at F (6, 22) = 12.695, and p< .05.

Table 40

DCFW's OLS Regression Model: Overall Model Summary

Model Summary[c]

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.403[a]	.163	-.056	20.16843	.163	.744	6	23	.620	
2	.685[b]	.469	.300	16.42117	.306	12.695	1	22	.002	1.943

a. Predictors: (Constant), DIV (%), PROF (%), SIZE (GHS'million), GROW (%), AGE (Years), AIP (%)
b. Predictors: (Constant), DIV (%), PROF (%), SIZE (GHS'million), GROW (%), AGE (Years), AIP (%), GPD (%)
c. Dependent Variable: DCFW (%)

In coming out with this overall level of significance in model 2, however, SPSS had excluded all the market-related variables from the model with the exception of the GDP variable, depicting that the addition of the GDP variable had a significant effect in transforming an otherwise insignificant model in Block 1 into a significant model in Block 2 and thereby improved the overall predictability of the model. In spite of this overall level of significance of the model 2, it is important for me to delve into the respective predictability of each of the individual firm-specific and the additional market-related variable in constituting the model in Block 2.

Table 41

DCFW's OLS Regression Model: Table of Coefficients

Coefficients[a]										
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	47.124	15.241		3.092	.005	15.594	78.653		
	SIZE (GHS'million)	.000	.002	-.056	-.285	.778	-.004	.003	.935	1.069
	AGE (Years)	-.323	.311	-.218	-1.039	.310	-.965	.320	.824	1.214
	AIP (%)	.219	.173	.298	1.266	.218	-.139	.576	.656	1.524
	PROF (%)	-.038	.289	-.029	-.130	.897	-.636	.561	.734	1.363
	GROW (%)	.164	.136	.242	1.207	.240	-.117	.445	.903	1.108
	DIV (%)	-.062	.261	-.049	-.236	.815	-.601	.477	.852	1.174
2	(Constant)	110.787	21.755		5.093	.000	65.671	155.904		
	SIZE (GHS'million)	.002	.002	.223	1.250	.225	-.001	.005	.755	1.324
	AGE (Years)	-.219	.255	-.148	-.859	.399	-.747	.309	.813	1.230
	AIP (%)	.210	.141	.286	1.490	.151	-.082	.501	.656	1.525
	PROF (%)	-.182	.239	-.140	-.763	.453	-.678	.313	.713	1.403
	GROW (%)	.052	.115	.077	.455	.654	-.186	.291	.836	1.197
	DIV (%)	-.210	.216	-.166	-.970	.343	-.658	.239	.820	1.219
	GPD (%)	-10.693	3.001	-.669	-3.563	.002	-16.917	-4.469	.684	1.462

a. Dependent Variable: DCFW (%)

From the Table 41, it would be realized that none of the six firm-specific variables had a significant predictive ability in explaining the weights that are assigned to the discounted dividend valuation method when such valuation methods are used by investment bankers on the GSE. This was because all variables had a *p*-value that was greater than .05. In spite of this, however, the only market-related variable –GDP–had a significant predictive ability in that it had a *p*-value that was less than .05. For this reason of the overall level of model significance despite the individual level of insignificance on the part of the firm-specific variables, one can conclude that the weight assigned to the discounted cash flow dividend valuation method (DCF) is dependent on both the six firm-specific variables and one of the market-related variables–the GDP, hence the null hypothesis should be rejected in favour of the alternate hypothesis. In view of this

rejection of the null hypothesis, the resulting significant model could be summarized from the above coefficients in Table 41 as follows:

$$DCFW_i = \beta_0 + \beta_1 SIZE_i + \beta_2 (AGE_i) + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i + \beta_6 GDP_i \quad (31)$$

$$DCFW_i = 110.787 + 0.002(SIZE_i) - 0.219(AGE_i) + 0.210(AIP_i) + 0.182(PROF_i) + 0.052(GROW_i) - 0.210(DIV_i) - 10.693(GDP_i) \quad (32)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 41 that the VIFs for all the six firm-specific variables and the one market-related variable were less than 10 and their average VIF which stood at 1.337 and this was not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there is no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 15. From this histogram plot, it could be noted that the data is showing a random pattern rather than any form of distinct funneling, indicating that the variance of the residuals exhibit homoscedasticity.

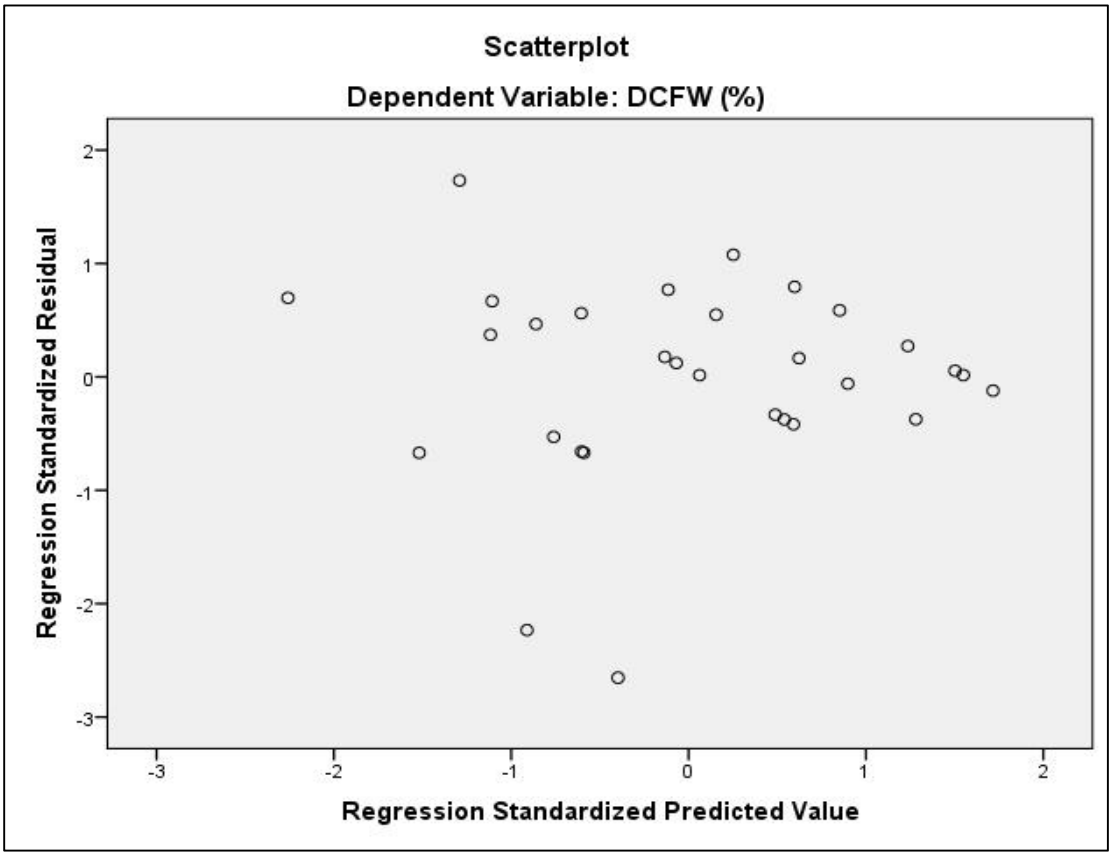

Figure 15. Plot of *ZRESID against *ZPRED for the DDMW's OLS Regression Model

For the autocorrelation assumption, the Durbin-Watson statistic is 1.943 depicting that the residuals are somewhat not auto/serially correlated and hence the model has also accorded with the assumption of autocorrelation. In relation to the normality assumption, Figure 16 also proves that this assumption had been accorded with.

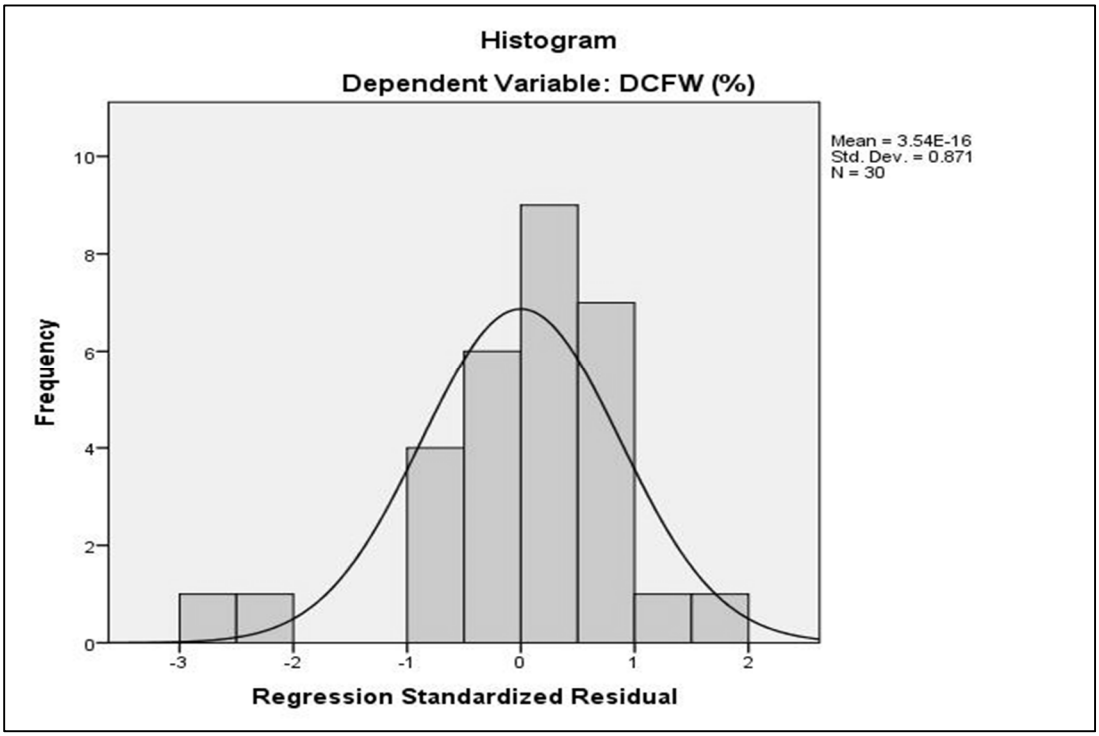

Figure 16. Histogram of normally distributed residuals for the DCFW's OLS Model

In view of the overall significance of the model and its accordance with all of the most important assumptions of linear regression, I safely say that the weight assigned by investment bankers on the GSE to the use of dividend discounted valuation method in IPO valuations is dependent upon the six hypothesized firm-specific and GDP as a market-related variable and hence the null hypothesis should be rejected in favour of the alternate.

OTHW's OLS regression model. I have provided a summary of the resulting regression model for the OTHW in Table 42. From the Table, it could be noted that the regression model accounted for only 13.1% of the variance in the assignment of weight to the other valuation methods used by the investment bankers on the GSE.

Table 42

OTHW's OLS Regression Model: Overall Model Summary

Model Summary[b]										
					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.362[a]	.131	-.096	25.48293	.131	.577	6	23	.745	2.048

a. Predictors: (Constant), DIV (%), PROF (%), SIZE (GHS'million), GROW (%), AGE (Years), AIP (%)

b. Dependent Variable: OTHW (%)

This level of the model's prediction was not significant at F (6, 23) = 0.653, and p> .05. In coming out with this overall level of insignificance, SPSS had excluded all the market-related variables from the model, depicting that the addition of any of those variables did not also significantly improve the overall predictability of the model. In spite of this overall level of insignificance, it is important for me to delve into the respective predictability of each of the individual firm-specific variable in the constitution of the model.

Table 43

OTHW-model's OLS Regression: Table of Coefficients

Coefficients[a]										
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	39.602	19.258		2.056	.051	-.235	79.440		
	SIZE (GHS'million)	.001	.002	.102	.507	.617	-.003	.006	.935	1.069
	AGE (Years)	.014	.393	.008	.037	.971	-.798	.826	.824	1.214
	AIP (%)	.181	.218	.199	.829	.415	-.270	.632	.656	1.524
	PROF (%)	-.147	.366	-.091	-.403	.691	-.904	.609	.734	1.363
	GROW (%)	-.117	.172	-.139	-.679	.504	-.472	.239	.903	1.108
	DIV (%)	-.168	.329	-.108	-.512	.614	-.850	.513	.852	1.174

a. Dependent Variable: OTHW (%)

From Table 43, it would be realized that none of the six firm-specific variables had a significant predictive ability in explaining the weights that are assigned to the other

valuation methods. This was because all the variables had a *p*-value that was greater than .05. For these reasons of the overall and individual levels of insignificance of the model, one can conclude that the weight assigned to the other valuation methods (OTH) is not dependent on both the firm-specific and market-related variables and hence the null hypothesis cannot be rejected in favour of the alternate. In spite of failure to reject the null hypothesis, the resulting insignificant model could be summarized from the coefficients in Table 43 as follows:

$$OTHW_i = \beta_0 + \beta_1 SIZE_i + \beta_2(AGE_i) + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i \quad (33)$$

$$OTHW_i = 39.602 + 0.001(SIZE_i) + 0.014(AGE_i) + 0.181(AIP_i) - 0.147(PROF_i) - 0.117(GROW_i) - 0.168(DIV_i) \quad (34)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 43 that the VIFs for all the six firm-specific variables were less than 10 and their average VIF which stood at 1.242 was not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there is no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 17.

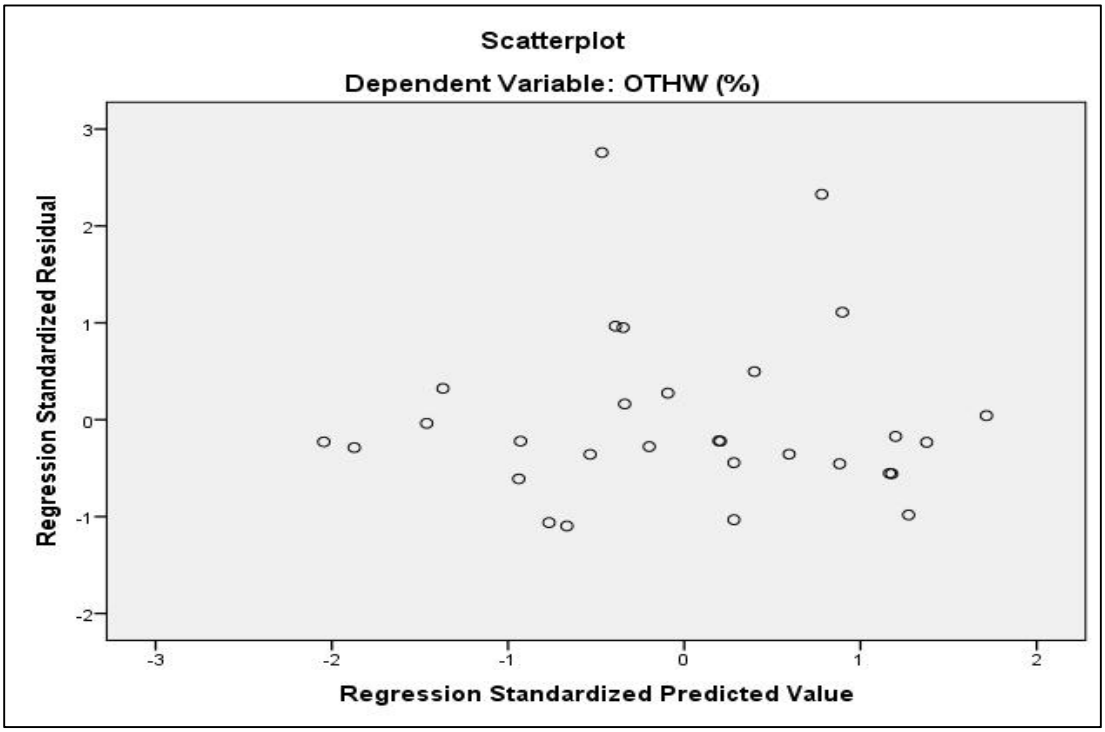

Figure 17. Plot of *ZRESID against *ZPRED for the OTHW's OLS Regression Model

From this histogram plot in Figure 17, it could be noted that the data is showing a random pattern rather than a distinct funneling, indicating that the variance of the residuals exhibit homoscedasticity. For the autocorrelation assumption, the Durbin-Watson statistic is 2.048 depicting that the residuals are not auto/serially correlated and hence the model has accorded with the assumption of autocorrelation as well. In relation to the normality assumption, Figure 18 proves that this assumption too was accorded with.

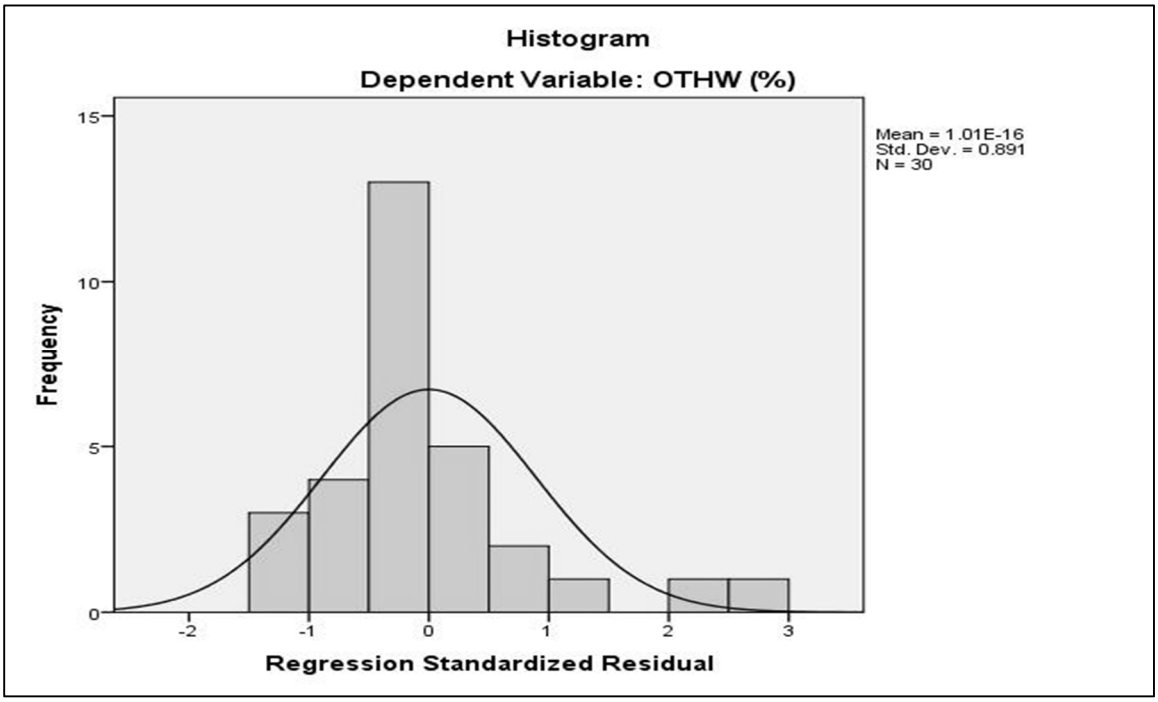

Figure 18. Histogram of normally distributed residuals for the OTHW's OLS Model

In view of the overall insignificance of the model in spite of its accordance with the most important assumptions of linear regression, I cannot help but to safely say that the weight assigned by investment bankers on the GSE to the use of other valuation methods is not dependent upon any of the hypothesized firm-specific and market-related variables and hence the null hypothesis cannot be rejected in favour of the alternate hypothesis.

Hypothesis 3: Price Discounts and the Setting of Preliminary Offer Prices

The hypothesis to be tested here is:

H_0: The application of price discount in the setting of preliminary offer price of an IPO does not depend on firm-specific factors and emerging market factors.

H_1: The application of price discount in the setting of preliminary offer price of an IPO depends on firm-specific factors and emerging market factors.

I also pointed out that this hypothesis will be tested using the following ordinary least squares (OLS) regression model:

$$DISCOUNT_i = \beta_0 + \beta_1 SIZE_i + \beta_2 AGE_i + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i + \beta_7 GDP_i + \beta_8 INF_i + +\beta_9 MMR_i + \beta_{10} FER_i + \beta_{11} M2_i + \beta_{12} SZ_i + \beta_{13} FD_i + \varepsilon_i \quad (35)$$

To operationalize this model, I entered each of the first six firm-specific independent variables into the model using forced entry method. These variables were forced entered into Block 1 because Roosenboom (2007) subjected similar variables to empirical testing on the French IPO market. This forced entry method, according to Field (2009), is the default method for conducting regression and hence where predictors have already been tested in a prior research the forced entry method would be the most appropriate. I entered the remaining seven independent market-related variables in Block 2 of the model using a stepwise method. This method of entry, as was noted before, allows the SPSS the free-hand of adding any of these market-related independent variables to the model depending on the ability of that variable to improve the predictability of the model. A summary of the resulting DISCOUNT's regression model is provided in Table 44. From the Table, it could be noted that the regression model accounted for only 18.0% of the variance in the price discount offered by the management of IPO-firms and their investment bankers.

Table 44

DISCOUNT's OLS Regression Model: Overall Model Summary

Model Summary[b]										
					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.424[a]	.180	-.034	17.96083	.180	.841	6	23	.551	2.370

a. Predictors: (Constant), DIV (%), PROF (%), SIZE (GHS'million), GROW (%), AGE (Years), AIP (%)
b. Dependent Variable: DISCOUNT (%)

This level of the models prediction was not significant at F (6, 23) = .841, and p> .05. In coming out with this overall level of insignificance, SPSS had excluded all the market-related variables from the model, depicting that the addition of any of those variables did not also significantly improve the overall predictability of the model. In spite of this overall level of insignificance, it is important for me to delve into the respective predictability of each of the individual firm-specific variable in the constitution of the model.

Table 45

DISCOUNT's OLS Regression: Table of Coefficients

Coefficients[a]										
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	5.369	13.573		.396	.696	-22.710	33.447		
	SIZE (GHS'million)	6.654E-06	.002	.001	.004	.997	-.003	.003	.935	1.069
	AGE (Years)	.573	.277	.431	2.071	.050	.001	1.145	.824	1.214
	AIP (%)	-.174	.154	-.263	-1.128	.271	-.492	.145	.656	1.524
	PROF (%)	-.108	.258	-.092	-.418	.680	-.641	.426	.734	1.363
	GROW (%)	-.029	.121	-.047	-.238	.814	-.279	.222	.903	1.108
	DIV (%)	-.103	.232	-.090	-.442	.662	-.583	.377	.852	1.174

a. Dependent Variable: DISCOUNT (%)

From Table 45, it would be realized that none of the six firm-specific variables had a significant predictive ability in explaining the price discounts offered in the sales of

the various IPOs on the GSE. This was because all the variables had a *p*-value that was greater than .05. For these reasons of overall and individual levels of insignificance of the model, one can conclude that the price discounts that were offered on each IPO were not dependent on both the firm-specific and market-related variables and hence the null hypothesis cannot be rejected in favour of the alternate. In spite of failure to reject the null hypothesis, the resulting insignificant model could be summarized from the coefficients in Table 45 as follows:

$$DISCOUNT_i = \beta_0 + \beta_1 SIZE_i + \beta_2(AGE_i) + \beta_3 AIP_i + \beta_4 PROF_i + \beta_5 GROW_i + \beta_6 DIV_i \quad (36)$$

$$DISCOUNT_i = 5.369 + 0.0000006654(SIZE_i) + 0.0573(AGE_i) - 0.174(AIP_i) - 0.108(PROF_i) - 0.029(GROW_i) - 0.103(DIV_i) \quad (37)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 45 that the VIFs for all the six firm-specific variables were less than 10 and their average VIF which stood at 1.242 was not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there is no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 19.

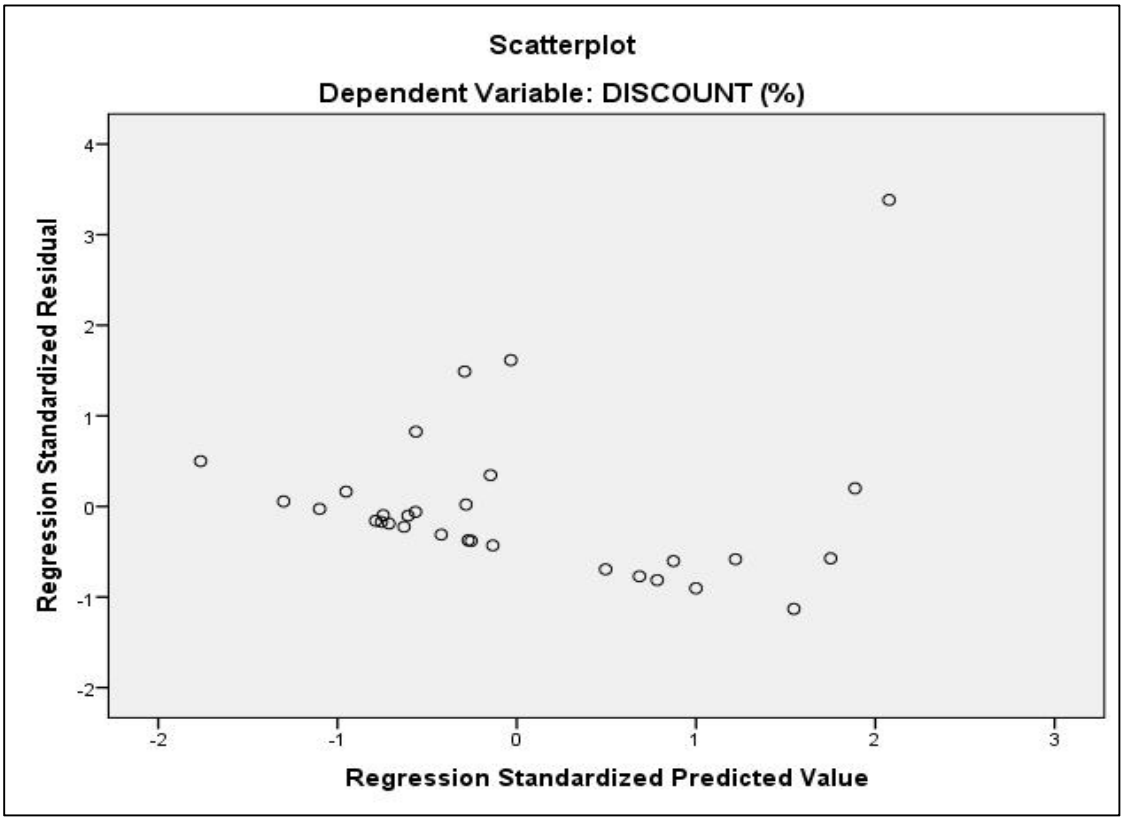

Figure 19. Plot of *ZRESID against *ZPRED for the DICOUNT's OLS Model

From this histogram plot, it could be noted that the data is not showing a random pattern but is rather showing a distinct funneling, indicating that the variance of the residuals exhibit heteroscedasticity and in this regard the assumption of homoscedasticity is violated. For the autocorrelation assumption, the Durbin-Watson statistic is 2.37 seems to be depicting that the residuals are auto/serially correlated, and hence the model has also violated the assumption of autocorrelation. In relation to the normality, Figure 20 proves that this assumption was rather accorded with.

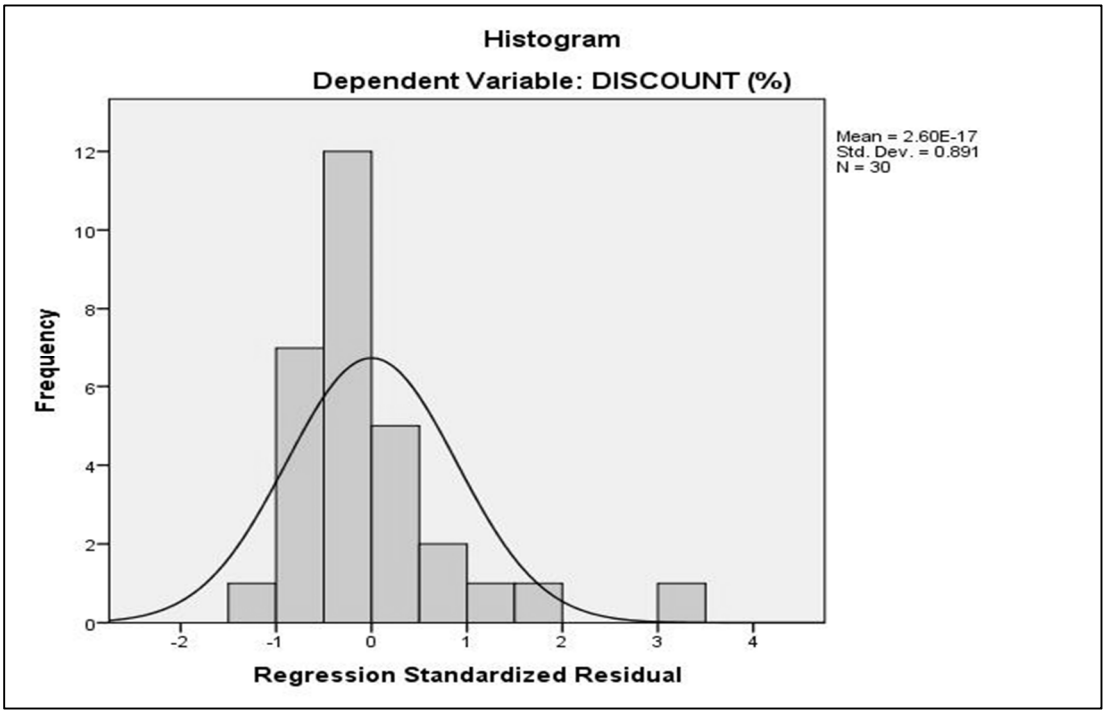

Figure 20. Histogram of normally distributed residuals for the DSICOUNT' OLS model

In view of the overall insignificance of the model and its violation of some of the most important assumptions of linear regression, I cannot help but to safely say that the price discounts offered during the IPO offerings on the GSE were not dependent upon any of the hypothesized firm-specific and market-related variables and hence the null hypothesis cannot be rejected in favour of the alternate hypothesis.

Hypothesis 4: Forecast Errors in IPOs' Valuation

The hypothesis, I tested here is:

H_0: The absolute forecasting error observed for each IPO firm is not dependent on the firm's size, retained ownership, forecasting interval, age, gearing, and auditor's reputation.

H_1: The absolute forecasting error observed for each IPO firm is dependent on the firm's size, retained ownership, forecasting interval, age, gearing, and auditor's reputation.

I also pointed out that this hypothesis will be tested using the following ordinary least squares (OLS) regression model:

$$AFE_i = \beta_0 + \beta_1 SIZE_i + \beta_2 OWN_i + \beta_3 HOR_i + \beta_4 AGE_i + \beta_5 LEV_i + \beta_6 AUD_i + \varepsilon_i \quad (38)$$

To operationalize this model, I entered each of the six independent variables into the model using forced entry method. These variables were forced entered into Block 1 because Gounopoulos (2011) and several other scholars alluded to in the prior chapters, have subjected similar variables to empirical testing in other stock markets around the world. This forced entry method, according to Field (2009), is the default method of conducting regression and hence where predictors have already been tested in a prior research the forced entry method would be the most appropriate. I have provided a summary of the resulting AFE regression model n Table 46.

Table 46

AFE's OLS Regression Model: Overall Model Summary

Model Summary[b]

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.378[a]	.143	-.080	36.98761	.143	.640	6	23	.697	1.978

a. Predictors: (Constant), AUD, HOR, SIZE, LEV, AGE, OWN

b. Dependent Variable: AFE

From Table 46, it could be noted that the regression model accounted for only 14.30% of the variance in the average absolute forecast error (AFE) observed in the

projected earnings of the sampled IPO-firms on the GSE. This level of the models prediction was not significant at F (6, 23) = .640, and p> .05. In spite of this overall level of insignificance, it is important for me to delve into the respective predictability of each of the independent variables in the model.

Table 47

AFE's OLS Regression Model: Table of Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	92.092	46.453		1.983	.059	-4.002	188.187		
	SIZE	-1.554E-06	.002	.000	-.001	.999	-.005	.005	.779	1.284
	OWN	-.335	.418	-.201	-.801	.431	-1.200	.530	.593	1.686
	HOR	.315	.638	.109	.494	.626	-1.005	1.635	.769	1.300
	AGE	-.545	.656	-.203	-.831	.414	-1.901	.811	.622	1.608
	LEV	-.510	.294	-.402	-1.738	.096	-1.118	.097	.695	1.438
	AUD	6.947	17.825	.096	.390	.700	-29.926	43.820	.618	1.618

a. Dependent Variable: AFE

From Table 47, it would be realized that none of the independent variables had a significant predictive ability in explaining the average AFE observed in the earnings projections of IPO-firms on the GSE. This was because all the variables had a p-value that was greater than .05. For these reasons of overall and individual levels of insignificance of the model, one can conclude that the absolute forecast errors observed on the GSE for each IPO-firm were not dependent on the hypothesized independent variables and hence the null hypothesis cannot be rejected in favour of the alternate. In spite of failure to reject the null hypothesis, the resulting insignificant model could be summarized from the coefficients in Table 47 as follows:

$$AFE_i = \beta_0 + \beta_1 SIZE_i + \beta_2 OWN_i + \beta_3 HOR_i + \beta_4 AGE_i + \beta_5 LEV_i + \beta_6 AUD_i + \varepsilon_i \quad (39)$$

$$AFE_i = 92.092 - 0.0000001554(SIZE_i) - 0.335(OWN_i) + 0.315(HOR_i) - 0.545(AGE_i) - 0.510(LEV_i) + 6.947(AUD_i) + \varepsilon_i \quad (40)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 47 that the VIFs for all the six independent variables were less than 10 and their average VIF which stood at 1.489 was not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there was no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 21.

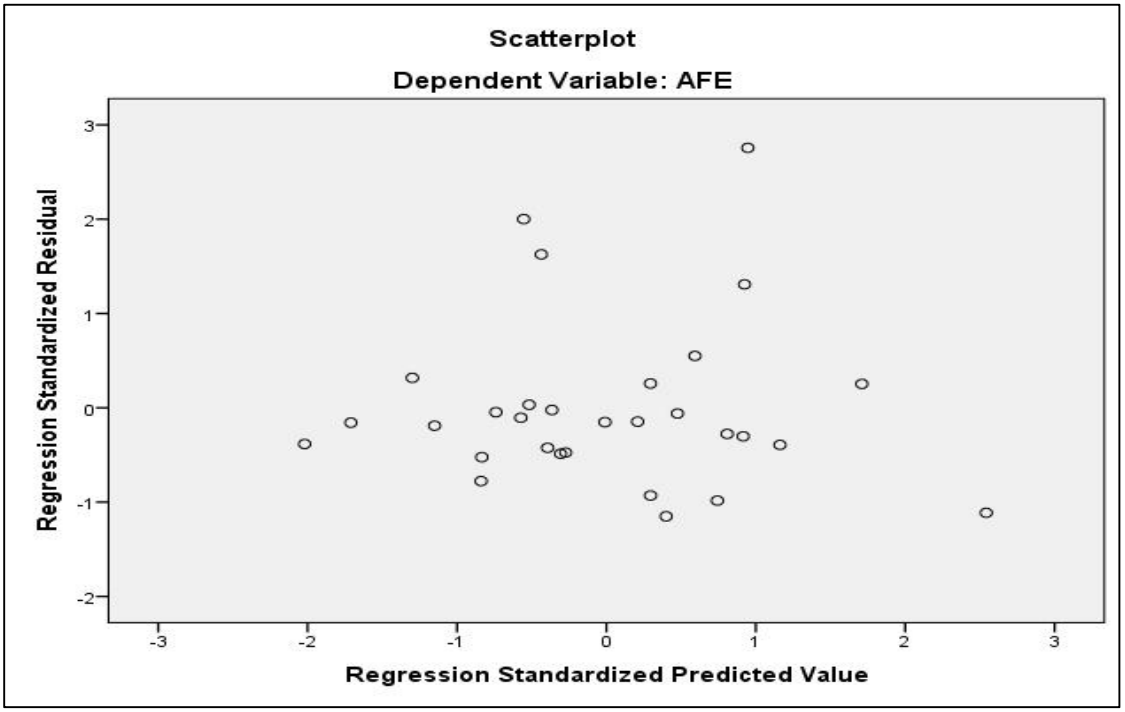

Figure 21. Plot of *ZRESID against *ZPRED for the AFE's OLS Model

From this histogram plot in Figure 21, it could be noted that the data is showing a random pattern rather a distinct funneling, indicating that the variance of the residuals

exhibit homoscedasticity. For the autocorrelation assumption, the Durbin-Watson statistic is 1.978 seemed to be depicting that the residuals are not auto/serially correlated, and hence the model has accorded with the assumption of autocorrelation as well. In relation to the normality, Figure 22 proves that this assumption was also accorded with.

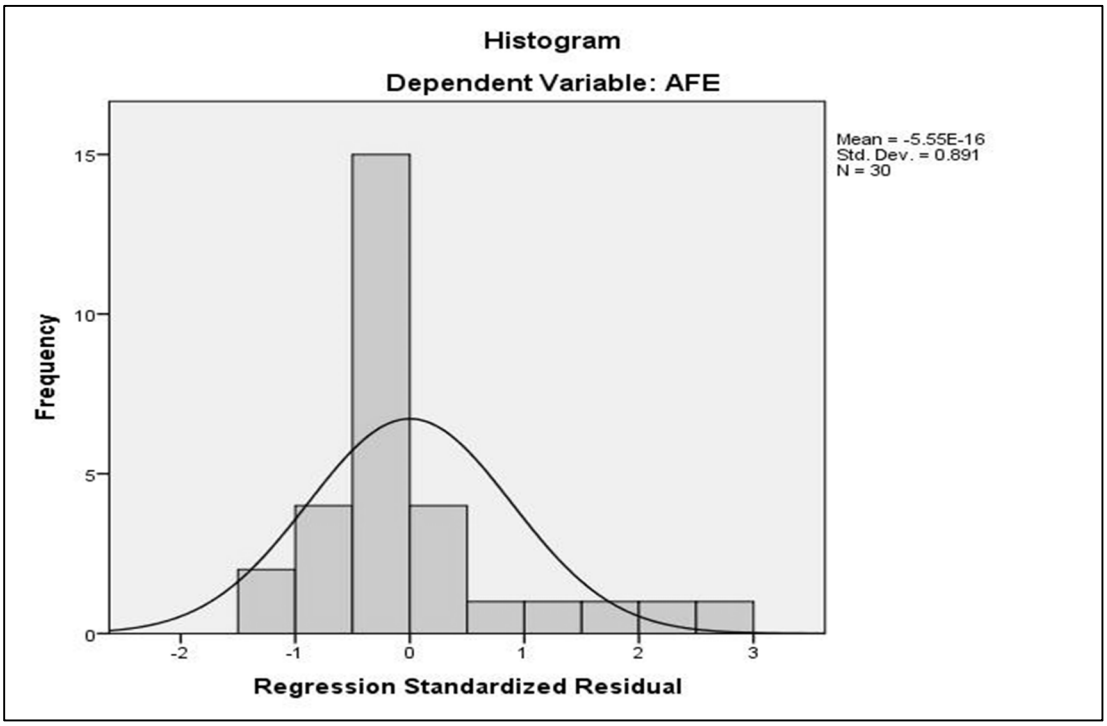

Figure 22. Histogram of normally distributed residuals for the AFE's OLS Model

In view of the overall insignificance of the model and in spite of its accordance with the most important assumptions of linear regression, I cannot help but to safely say that the absolute forecast errors observed in the earnings forecasts of IPO offerings on the GSE were not dependent upon any of the hypothesized independent variables and hence the null hypothesis cannot be rejected in favour of the alternate.

Hypothesis 5: Earning Management in IPOs' Valuation

The hypothesis to be tested here is:

H_0: Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years.

H_1: Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years.

I also pointed out that this hypothesis will be tested using the following ordinary least squares (OLS) regression model:

$$DCA_i = \beta_0 + \beta_1 IAS_i + \beta_2 EB_i + \beta_3 AUD_i + \beta_4 OWN_i + \beta_5 ROWN_i + \varepsilon_i \quad (41)$$

To operationalize this model, I entered each of the independent variables into the model using forced entry method. These variables were forced entered into Block 1 because scholars such as Roosenboom, (2003); Cormier and Martinez (2006); and Ahmad-Zaluki, et al. (2011) have subjected similar variables to empirical testing on other stock markets around the world. This forced entry method, according to Field (2009), is the default method for conducting regression and hence where predictors have already been tested in a prior research the forced entry method would be the most appropriate. I provide a summary of the resulting DCA regression model in Table 48.

Table 48

DCA's OLS Regression Model: Overall Model Summary

Model Summary[b]

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.574[a]	.330	.190	24.21378	.330	2.361	5	24	.071	1.799

a. Predictors: (Constant), ROWN(%), IAS, EB, AUD, OWN

b. Dependent Variable: Yr(0)_DCA

From Table 48, it could be noted that the regression model accounted for 33.0% of the variance in the discretionary current accruals (DCA) observed during the year of IPO floatation of the sampled IPO-firms on the GSE. This level of the model's prediction was, however, not significant at $F(5, 23) = 2.361$, and $p > .05$. In spite of this overall level of insignificance, it is important for me to delve into the respective predictability of each of the independent variables in the model.

Table 49

DCA's OLS Regression Model: Table of Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-49.493	25.308		-1.956	.062	-101.726	2.741		
	IAS	-1.844	11.316	-.034	-.163	.872	-25.199	21.511	.657	1.522
	EB	31.704	16.692	.407	1.899	.070	-2.746	66.154	.607	1.647
	AUD	-2.226	10.899	-.041	-.204	.840	-24.720	20.268	.708	1.411
	OWN	36.058	13.381	.625	2.695	.013	8.442	63.674	.520	1.924
	ROWN(%)	.296	.262	.202	1.132	.269	-.244	.837	.877	1.140

a. Dependent Variable: Yr(0)_DCA

From Table 49, it would be realized that with the exception of variable OWN, none of the other independent variables had a significant predictive ability in explaining the average DCA observed in the financial performance and position of IPO-firms on the GSE. This was because all these variables had a p-value that was greater than .05. The variable, OWN was, however, significant in that its *p*-value was less than .05. In spite of the individual significance of this very variable, giving the overall and individual levels of insignificance of the model, one can conclude that the Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and post-issue IPO years and hence the null hypothesis cannot be rejected in favour of the alternate. In spite of failure to reject

the null hypothesis, the resulting insignificant model could be summarized from the coefficients in Table 49 as follows:

$$DCA_i = \beta_0 + \beta_1 IAS_i + \beta_2 EB_i + \beta_3 AUD_i + \beta_4 OWN_i + \beta_5 ROWN_i + \varepsilon_i \quad (42)$$

$$DCA_i = -49.493 - 1.844(IAS_i) + 31.704(EB_i) - 2.226(AUD_i) + 36.058(OWN_i) + 0.296(ROWN_i) + \varepsilon_i \quad (43)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 49 that the VIFs for all the six firm-specific variables were less than 10 and their average VIF which stood at 1.529 was not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there was no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 23.

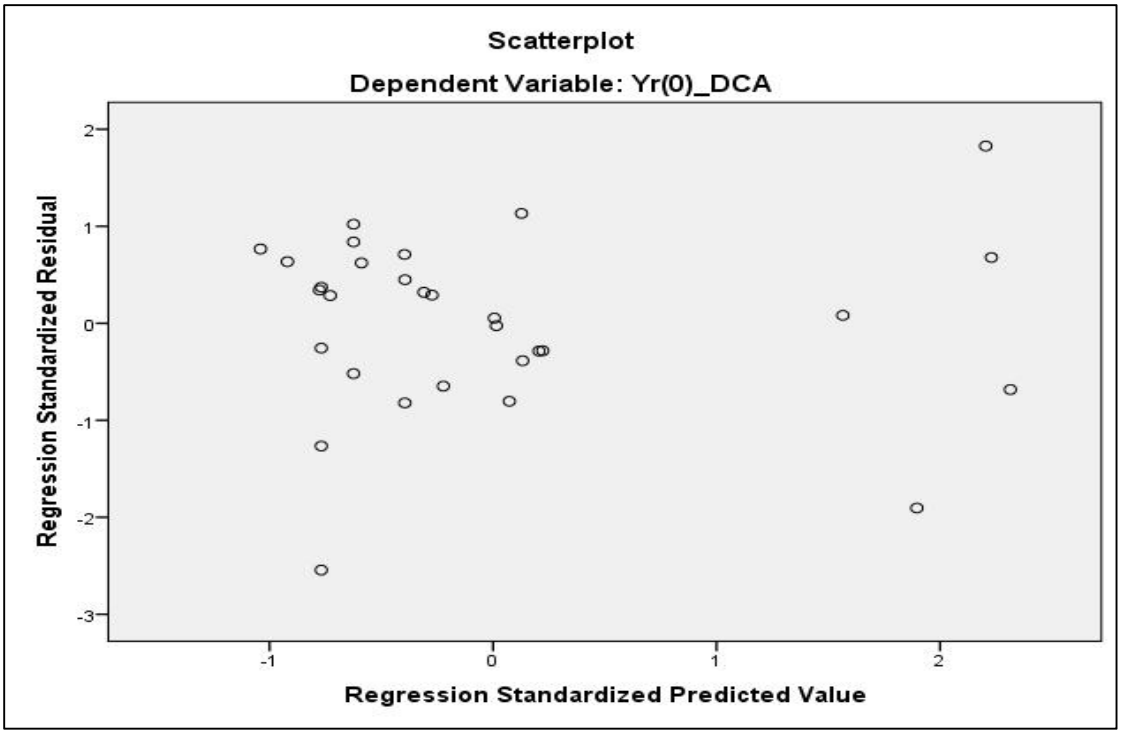

Figure 23. Plot of *ZRESID against *ZPRED for the DCA's OLS Model

From this histogram plot in Figure 23, it could be noted that the data is showing a random pattern rather a distinct funneling, indicating that the variance of the residuals exhibit homoscedasticity. For the autocorrelation assumption, the Durbin-Watson statistic of 1.799 seemed to be depicting that the residuals are not auto/serially correlated and hence the model has accorded with the assumption of autocorrelation as well. In relation to the normality, Figure 24 proves that this assumption was also accorded with.

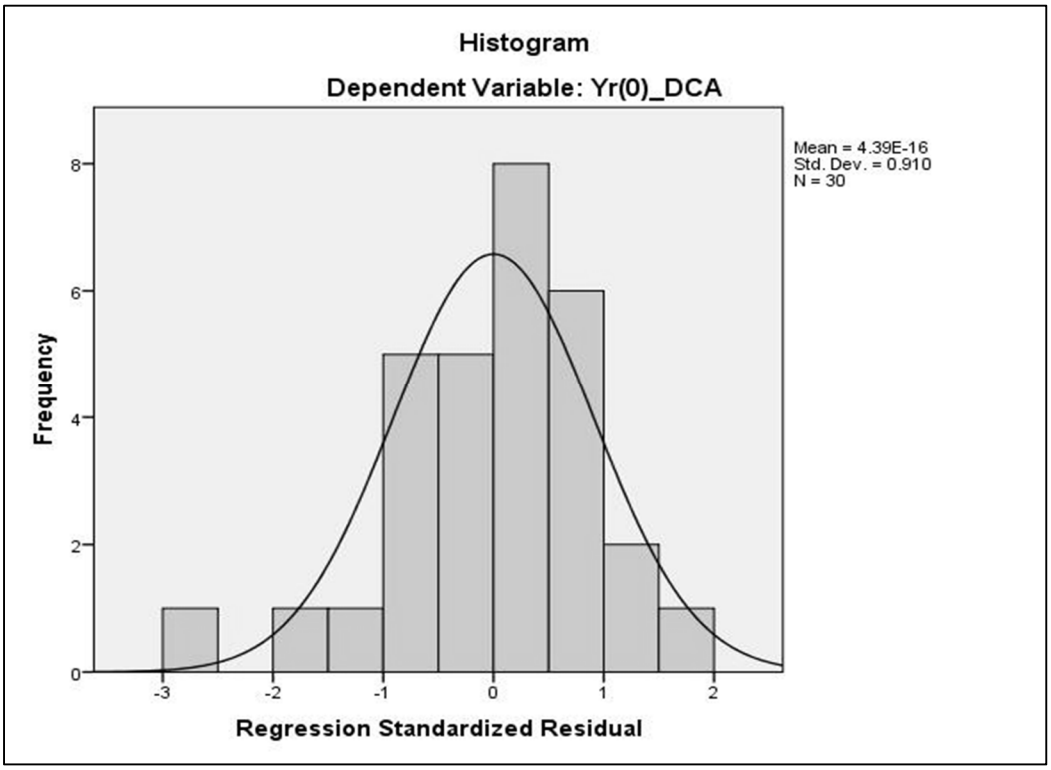

Figure 24. Histogram of normally distributed residuals for the DCA's OLS Model

In view of the overall insignificance of the model and in spite of its accordance with the most important assumptions of linear regression, I cannot help but to safely say that Ghanaian IPO firms' do not exhibit non-zero earnings management in the pre- and

post-issue IPO years and hence the null hypothesis cannot be rejected in favour of the alternate.

Hypothesis 6: IPO Pricing Anomalies on the Ghana Stock Exchange

The hypothesis I tested here was:

H_0: There is no significant cross-sectional relationship between price-to-value ratios (P/V) and over/undervalued first-day returns observed on the GSE.

H_1: There is a significant cross-sectional relationship between price-to-value (P/V) ratios and over/undervalued first-day returns observed on the GSE.

I also pointed out that this hypothesis will be tested using the following ordinary least squares (OLS) regression model:

$$R(1^{st}\ Day)_i = \beta_0 + \beta_1 PV_i + \beta_2 BM_i + \beta_3 GROWTHAIP_i + \beta_4 ACCRUALS_i + \beta_5 SALES_i + \beta_6 EBITDA_i + \varepsilon_i \quad (44)$$

To operationalize this model, I entered each of the independent variables into the model using forced entry method. These variables were forced entered into Block 1 because scholars such as Purnanandam and Swaminathan (2004) have subjected similar variables to empirical testing in other stock markets around the world. This forced entry method, according to Field (2009), is the default method for conducting regression and hence where predictors have already been tested in a prior research the forced entry method would be the most appropriate. I provided a summary of the resulting R(1st Day) regression model in Table 50.

Table 50

R(1st Day)'s OLS Regression Model: Overall Model Summary

Model Summary[b]										
					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.503[a]	.253	.058	13.18396	.253	1.298	6	23	.297	2.150

a. Predictors: (Constant), EBIT (%), Accural(%), P/V Ratio, GrowthAIP(%), Sales(GHS'million), BTM Ratio
b. Dependent Variable: R(1st Day)(%)

From Table 50, it could be noted that the regression model accounted for 25.30% of the variance in the percentage of first day return (R(1st Day)) observed in the sampled IPO-firms on the GSE. This level of the model's prediction was not significant at $F(6, 23) = 1.298$, and $p > .05$. In spite of this overall level of insignificance, it is important for me to delve into the respective predictability of each of the independent variables in the model.

Table 51

R(1st Day)'s OLS Regression Model: Table of Coefficients

Coefficients[a]										
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-14.337	6.530		-2.195	.038	-27.846	-.827		
	P/V Ratio	13.082	5.030	.496	2.601	.016	2.676	23.487	.892	1.121
	BTM Ratio	.504	.773	.142	.651	.521	-1.096	2.103	.688	1.453
	GrowthAIP(%)	.029	.086	.061	.334	.741	-.148	.206	.974	1.027
	Accural(%)	-.041	.102	-.074	-.406	.689	-.252	.169	.966	1.035
	Sales(GHS'million)	.001	.004	.032	.160	.874	-.008	.009	.802	1.247
	EBIT (%)	.061	.126	.105	.481	.635	-.200	.322	.686	1.457

a. Dependent Variable: R(1st Day)(%)

From Table 51, it would be realized that with the exception of variable P/V *ratio,* none of the other independent variables had a significant predictive ability in explaining the first-day return observed in the post-issue performance of the sampled IPO-firms on the GSE. This was because all these variables had a *p*-value that was greater than .05.

The variable P/V ratio was, however, significant in that its *p*-value was less than .05. In addition to this individual level of significance and the overall significance of the model, there seem to be significant cross-sectional relationship between price-to-value ratios (P/V) and over/undervalued first-day returns observed on the GSE and hence the null hypothesis should be rejected in favour of the alternate. In view of this rejection of the null hypothesis, the resulting significant model could be summarized from the coefficients Table 51 as follows:

$$R(1^{st}\ Day)_i = \beta_0 + \beta_1 PV_i + \beta_2 BM_i + \beta_3 GROWTHAIP_i + \beta_4 ACCRUALS_i + \beta_5 SALES_i + \beta_6 EBITDA_i + \varepsilon_{\mathrm{i}} \quad (45)$$

$$R(1^{st}\ Day)_i = -14.337 + 13.082(PV_i) + 0.504(BM_i) + 0.029(GROWTHAIP_i) - 0.041(ACCRUALS_i) + 0.001(SALES_i) + 0.061(EBITDA_i) + \varepsilon_i \quad (46)$$

In assessing the model's compliance with the various assumptions of linear regression, it could first be noted from Table 51 that the VIFs for all the six firm-specific variables were less than 10 and their average VIF which stood at 1.223 was not substantially greater than 1. The tolerance statistics for each of variables were all well above 0.02, and hence one can safely conclude that there was no collinearity among the predictor variables. In relation to the homoscedasticity assumption, the scatter plot of ZRSID against ZPRED for the model is as shown in Figure 25. From this histogram plot, it could be noted that the data is showing a random pattern rather a distinct funneling, indicating that the variance of the residuals exhibit homoscedasticity. For the autocorrelation assumption, the Durbin-Watson statistic of 2.150 seemed to be depicting that the residuals are not auto/serially correlated, and hence the model has accorded with

the assumption of autocorrelation as well. In relation to the normality, Figure 26 proves that this assumption was also accorded with.

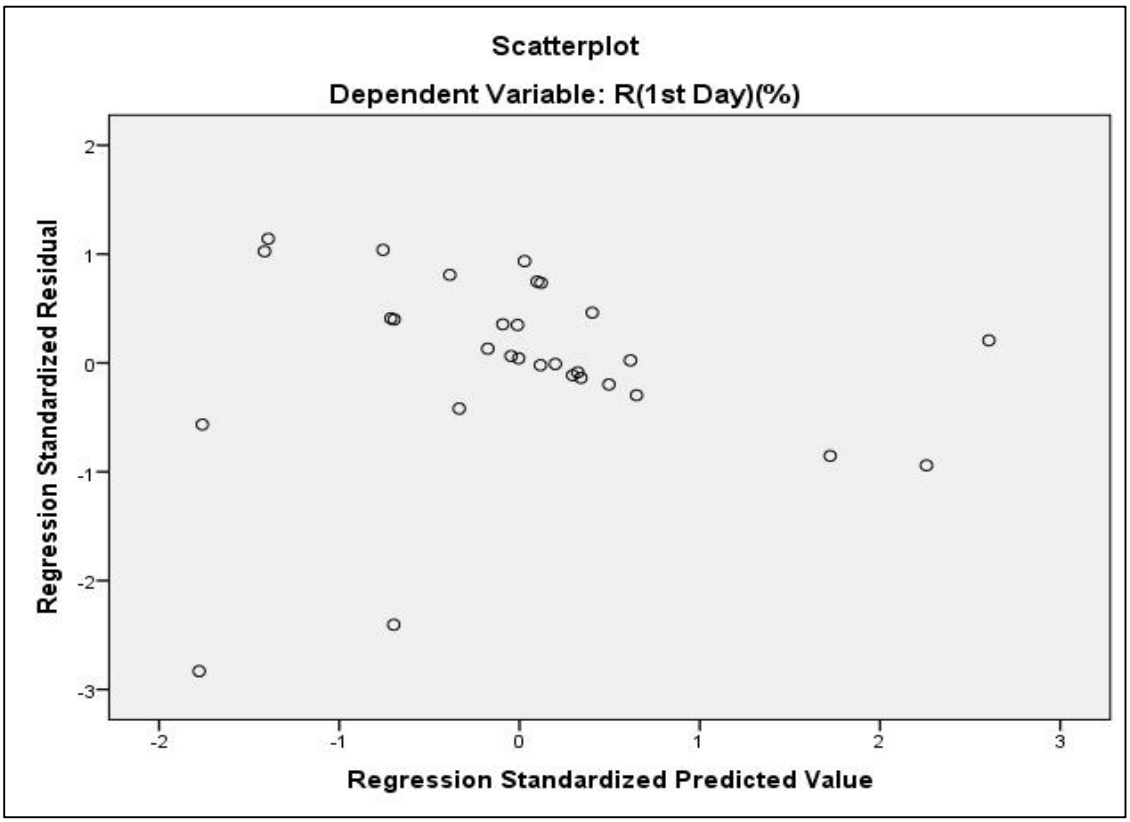

Figure 25. Plot of *ZRESID against *ZPRED for the R(1st Day)'s OLS Model

In view of the overall significance of the model and its accordance with the most important assumptions of linear regression, I cannot help but to safely say that the there is significant cross-sectional relationship between price-to-value ratios (P/V) and over/undervalued first-day returns observed on the GSE, and hence the null hypothesis should be rejected in favour of the alternate.

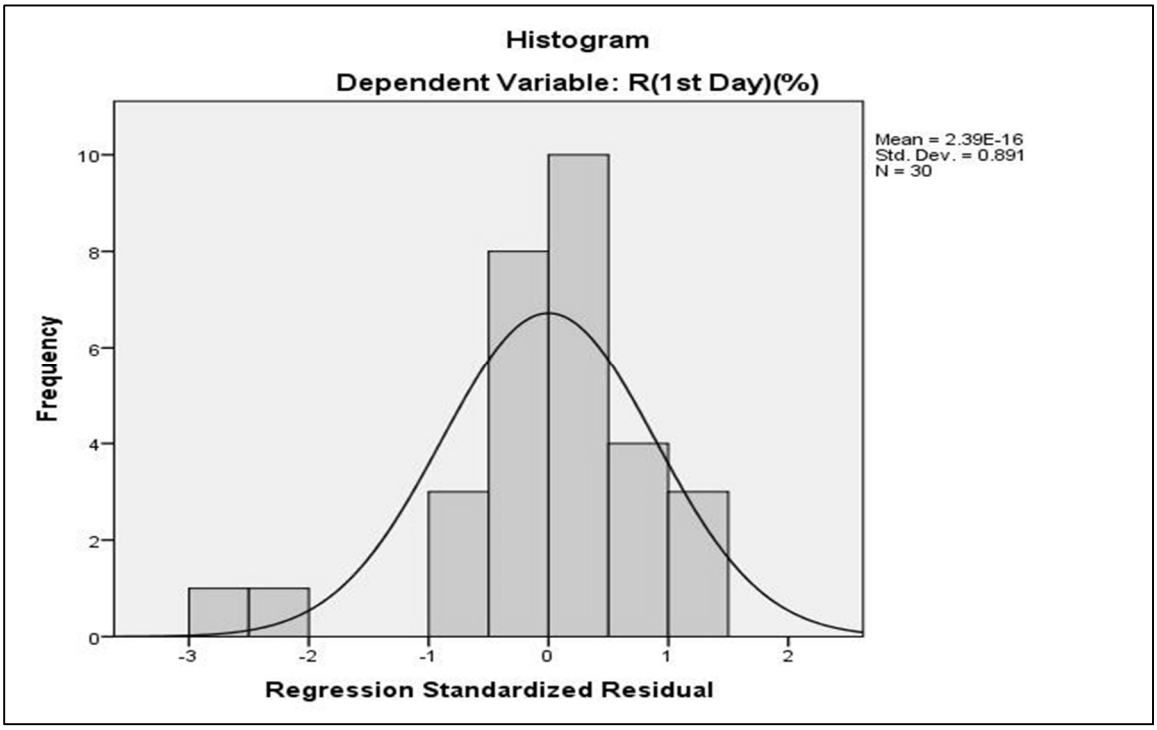

Figure 26. Histogram of normally distributed residuals for R(1st Day) OLS Model

Summary of Results

In Chapter 4, I presented the results of my research. My intention was that through these findings, I will be able to provide answers to the four research questions I posed at the beginning of this Chapter. The first of these research questions was: what valuation methods do underwriters in Ghana use in valuing IPOs listed on the GSE and what firm-specific and emerging market factors influenced their choice of those valuation methods? In relation to the first part of this question, I found out that the valuation methods that are used on the GSE in the valuation of a giving firm's IPO are the discounted cash flow method (DCF), the adjusted asset-based valuation method (AAV), the net asset valuation method (NAV), the price-to-earnings (P/E) ratio, price-to-book (P/B) ratios, and the dividend valuations method (DDM). I also found, though contrary to

my hypothesis, that investment bankers on the GSE do not use such valuation methods as price-to-sales (P/S), price-to-cash-flow (P/C), economic value added (EVA), and residual income (RIM). In relation to the second part of this question, I found that there the choice of those valuations methods by the investment bankers on the GSE does not necessarily depend on any of the hypothesized firm-specific or market related factors.

The second question, I posed was: how do underwriters combine the value estimate of each valuation method to arrive at fair value of IPOs and how do they set the preliminary offer price on the basis of those fair value estimates? On this question, I found from the results that the underwriters or investment bankers in Ghana mostly use more than one valuation method in arriving at the fair value estimate of a given firm's IPO. In arriving at such fair value estimates, the investment bankers assign weights to the value estimates of each of the valuation methods used. The assignment of these weights, contrary to my hypothesis, does not necessarily depend on any of the hypothesized firm-specific and market-related factors. I also found out from the results that the investment bankers in arriving at the final offer price do give price discounts on the estimated fair values to the investors.

In relation to the third research question: are management earnings forecasts in the prospectuses of Ghanaian IPO firms free from forecasting errors and the tendencies of earnings management? I found out that the IPOs listed on the GSE–like their listed counterparts in other frontier or emerging markets–are not free from forecasting errors. Using the forecast error (FE) as a headline measurement metric, I found out that the listed firms on the GSE have on the average over-forecasted their earnings potentials. In

relation to the earnings management ambit of the question, I found out that the use of discretionary current accruals by the management of Ghanaian corporations increases in the years just prior to their listing on the GSE and thereafter the use of such accruals reduces. This observed increasing, and decreasing trends in the use of discretionary current accruals give an indication of the tendencies of earnings management by listed firms on the GSE.

The fourth and final questions I sought answers to was: what IPO pricing anomalies occur on the GSE and are there a cross-sectional relationship between the price-to-value ratios as determined by the investment bankers and the over/undervalued first-day returns observed on the GSE? I found out from the results that IPOs on the GSE were on the average underpriced and that over the 20-year period of IPO activities on the market monies were left on the table for investors as a result of the observed underpricing. I also found out that there was significant cross-sectional relationship between the price-to-value ratios and the underpricing return-performance observed on the market.

Giving the results obtained in this chapter, I now proceed to chapter 5 where I discussed the findings of the analyzed data in relation to providing answers to each of the four research questions on which this study revolved. I also presented in chapter 5 the implications of the research findings for each of the major stakeholders on the GSE and gave recommendations for action, social change, and further research.

Chapter 5: Discussions, Conclusions, and Recommendations

Introduction

In this study, I investigated the valuations, pricing, and performance of 30 sampled IPOs listed on the GSE for the 20-year period 1992-2012. In conducting the investigation, I had a five-fold purpose (a) considering the return characteristics of those IPOs; (b) examining the role of valuation and pricing in explaining the observed return characteristics of those IPOs; (c) considering the firm-specific and emerging market factors that had influenced the choice of IPO valuation methods by the listed firm managers and their investment bankers; (d) reviewing combination of the value estimates of each of the valuation methods in determining the fair value estimate and the eventual price of a given IPO; and (e) examining the incidences of errors and the possibilities of earnings management in the financial data that were used to back those IPO valuation and pricing. To fulfill these purposes, I conducted a 20-year cross-sectional explanatory e research that explored the valuation, pricing, and performance of IPOs on the GSE. The four research questions were as follows:

1. What valuation methods do underwriters in Ghana use in valuing IPOs listed on the GSE and what firm-specific and emerging-market factors influenced their choice of those valuation methods?
2. How do underwriters combine the value estimate of each valuation method to arrive at fair values of IPOs and how do they set the preliminary offer price on the basis of those fair value estimates?

3. Are the management earnings forecasts and the pre-IPO financial statements incorporated in the prospectuses of Ghanaian IPO firms free from forecasting errors and the tendencies of earnings management?
4. What IPO pricing anomalies occur on the GSE and is there a cross-sectional relationships between the price-to-value ratios as determined by the investment bankers and the over/undervalued first-day returns observed on the GSE?

The main findings of this study revealed, in relation to the first research question, that the methods used in the valuation of the 30 sampled IPOs included: (a) the discounted cash flow method (DCF); (b) the adjusted asset-based valuation method (AAV); (c) the net asset valuation method (NAV); (d) the price-to-earnings (P/E) ratio; (e) price-to-book (P/B) ratios; and (f) the dividend valuations method (DDM). The results also revealed that none of the hypothesized firm-specific and/or emerging-market factors influenced the choice of those valuation methods. These findings, as are elaborated further in later sections of this chapter, might imply that investment bankers on GSE randomly select valuation methods. A further implication of these findings is that those bankers do not give much thought to the characteristics of the firm or the market-related factors pertaining in the economy in which the firms were operating. This could also mean that the choice of valuation methods on the GSE is influenced more by the investment bankers' familiarity with those valuation methods. In this regard, investment bankers operating on the GSE seemed to always use the same methods for valuing the stocks of the firms they bring public.

For the second question, I found that investment bankers used more than one valuation method in determining the fair value estimates of IPOs on the GSE. Roosenboom (2007) and Deloof et al. (2009) also found the use of more than one valuation methods on Euronext Paris and Euronext Brussels respectively. In arriving at such fair value estimates, the investment bankers on the GSE, assigned weights to the value estimates of each of the valuation methods used. The assignment of these weights, the results further revealed, were influenced by the purpose of the valuation and the characteristics of the firms being valued. I also found from the results that corporate managers and their investment bankers offered price discounts on the estimated fair values. The results, however, revealed that none of the hypothesized firm-specific and emerging-market factors influenced the offer of those price discounts. The reasons for these findings could also be attributed to the over familiarity of investment bankers with certain valuation methods I spoke about in the previous paragraph.

In relation to the third research question, I found that the IPOs listed on the GSE were not free from the possibilities of forecasting errors. The research works on the Stock Exchange of Thailand (SET) by Lonkani and Firth (2005) and the Istanbul Stock Exchange (ISE) by Bulut and Er (2011) found the same results. Using the forecast error (FE) as a headline measurement metric, I discovered that listed firms on the GSE had over-forecasted their earnings potentials by as much as 28.56%. The over-forecasting found on the SET and ISE were 6.86% and 13.44% respectively. These findings imply that the forecasting error I found on the GSE was 15.12% and 21.70% above the percentage found on the ISE and SET respectively. In relation to the earnings

management, I found that the use of discretionary current accruals (DCA) increased in the years leading to IPO listings on the GSE. I also found that the use of such accruals rather reduced in the years after the IPOs. These observed increasing and decreasing trends of DCA, implied the use of earning management in the pre-IPO financial statements incorporated in the prospectuses of listed firms on the GSE. The corresponding increasing and decreasing trends in the net incomes (NI) reported in the financial statements of the sampled IPOs confirms the observed implications of earnings management. Furthermore, the cash flows of those IPO firms were rather converse to the increasing and decreasing trends observed in relation to DCA and NI. Cash flows might have witnessed a reverse trend because, unlike accruals and net income, it less likely for corporate managers to manipulate cash flows (Cormier & Martinez, 2006).

For the fourth and final research questions, the results showed that IPOs on the GSE were on the average underpriced by 1.49%. This finding confirms the claim of Loughran et al. (1994) that all countries with stock exchanges do experience the short-run underpricing phenomenon. My result of an average 1.49% on the GSE seemed to be on the lower side when juxtaposed against the results reported in other markets. According to Purnanandam and Swaminathan (2004), the underpricing phenomenon recorded in the United States' markets had, for decades, averaged between 10 to 15%. Chambers and Dimson (2009) found that underpricing in the United Kingdom had averaged 19% for over 21 years since market reforms in 1986. The findings of Adjasi, Osei, and Fiawoyife (2011) on the Nigerian Stock Exchange (NSE) revealed an incredible 43.28%. My finding on the GSE implied that monies were mostly left on the table by the listed firms

for the benefit of investors in the market. In an extreme case of money being left on the table, investors gained as much as GH¢37.86 million from the IPO of the then Ashanti Gold Fields (now listed as AngloGold Ashanti, following a takeover). The results, however, showed that in some circumstances monies were taken from the investors by the listed firms as a result of IPO overpricing. In an extreme case of money being taken from investors, I found that investors lost as much as GH¢7.97 million from the IPO of Cocoa Processing Company Limited (CPC). I also found that there was significant cross-sectional relationship between the price-to-value (P/V) ratios and the observed under/overpricing of IPO return performance on the market. This implied that the P/V ratios could explain the return performances observed on the GSE.

In the next section of this chapter (i.e., interpretations of research findings), I provided detailed discussions of these research findings. I did so in the context of the theoretical and/or conceptual frameworks that underpinned this study, as well as the larger body of IPO literature set forth in chapter 2. I followed this interpretation section with such other sections as: (a) the implication for social change–in which I examined the roles of the various stakeholders in furthering the required improvements in the valuation and pricing of IPOs on the GSE; (b) the key limitations of the study–these related to the difficulties I encountered in data collection as well as the need for caution in the generalization of the research findings to other markets; (c) recommendations for further actions–where I called for rigorous scrutiny of the actual and projected financial statements incorporated in the prospective IPO prospectuses as a means of dealing with the menace of over-forecasting and earnings management observed in the market; (d)

recommendation for further research–where I proposed the extension of these research to cover other frontier or emerging stocks markets in Africa; and (e) concluding statement–in which I recapped the discussions of my findings, recommendations, and conclusion that I reached in this and other chapters of the study.

Interpretation of Research Findings

Research Question 1: Choice IPO Valuation Methods

The valuation methods used by the investment bankers on the GSE were devoid of such eccentric methods as price-to-sales (P/S), price-to-cash-flow (P/C), economic value added (EVA), and residual income (RIM). The discounted cash flow (DCF) was the most popular method: it was used to value 93.33% of the 30 IPOs studied on the market. This high rate of DCF's usage on the GSE was consistent with its high rate of usage on the Euronext Brussels. Deloof et al. (2009) in their study of 49 IPOs on the Euronext Brussels between 1993 and 2001 found the usage of DCF in the valuation of all the 49 IPOs. This high rate of usage on both the GSE and Euronext Brussels confirms the claimed theoretical and practical superiority of DCF over the other valuation methods. This theoretical and practical supremacy of DCF, according to Deloof et al., is anchored in the fact that the method takes into account the fundamentals characteristics of the IPO-firms. These characteristics included the future cash flows, the growth prospects, and the related risks that tell us about value of the IPO-firm independent of market prices (Deloof et al., 2009). In the opinion of Pereiro (2006), however, the widespread use of DCF as a primary tool in valuations was mainly due to the influence of mainstream financial economics thinking on practitioners. The implication of these propositions is that the

widespread use of DCF on the GSE could be due either to (a) the perceived superiority of the method by the investment bankers, or (b) the influence of mainstream financial economics thinking the investment bankers were exposed to in their undergraduate and/or post graduate education.

To tease out the fundamentals that had accounted for such rate of usage of DCF, I hypothesized that the choice of the method on the GSE was influenced by firm-specific and emerging-market factors. The hypothesized firm-specific factors included such variables as the size of the IPO firm (SIZE), the age of the firm (AGE), the extent to which firm's assets are tangible (AIP), the profitability of the firm pre-IPO (PROF), the growth prospects of the firm in relation to sales (GROW), and the historical and expected dividend payouts of the firm (DIV). I could not find evidence from the empirical results that any of those firm-specific factors influenced the choice of DCF method on the GSE. This finding was consistent with the results of Roosenboom (2007) on Euronext Paris. On this market, Roosenboom could also not find evidence that any of those firm-specific factors influenced the choice of DCF method in the valuation of 228 IPOs. In relation to emerging market variables–GDP, inflation rate (INF), money market interest rates (MMR), exchange rate (FER), money supply (M2), size of the stock exchange (SZ), and the financial depth of the stock exchange (FD)–I could not find evidence of the influence of any of those variables. The implication of these findings could be that investment bankers on GSE randomly select the DCF valuation method without given much thought to (a) the characteristics of the firm being valued, or (b) the market-related factors prevailing in the economy within which the firm was being valued. This random selection

could further imply that the choice of DCF on the GSE is more influenced by the investment banker's familiarity with the DCF valuation methods. These implications support Pereiro's proposition that the mainstream financial economics thinking is behind the investment bankers' choice of the DCF and other valuation methods. This might also imply that each of the investment bankers on the GSE always uses DCF to value the shares of the corporations they bring public. This is because the 6.67% non-usage of DCF on the GSE arose in only two circumstances of IPO valuation and pricing. Those two IPOs were valued using the price averages available in the markets in which their firms were already trading. In the case of Golden Star Resource (GSR), for example, the offer price of GH¢3.00 per share was determined based on "the 20-day weighted volume average price of GSR's common shares on AMEX as of November 14, 2007" (GSR's Prospectus, p. 10).

The price-to-earnings (P/E) ratio and price-to-book (P/B) ratios were the only multiples valuation methods used in the valuation of the 30 sampled IPOs. The P/E ratio recorded a usage of 43% whilst the P/B ratio accounted for a percentage usage of 7%. This summed up to 50% usage of the multiple valuation methods on the GSE. This percentage usage was 31.63% less than the usage of multiples valuation methods on Euronext Brussels reported by Deloof et al. (2009). The finding on the Euronext Brussels was that of the 49 sampled IPOs, 40–representing 81.63%–were valued using multiples methods. Unlike the GSE, however, Deloof et al also found that in addition to the P/E and P/B ratios, other multiples such as P/C, Enterprise Value/EBITDA, Enterprise Value/Sales, Dividend yield, and P/E-to-growth were also used to varying degrees in the

valuation of IPOs on the Euronext Brussels. The usage of multiples valuation methods on the GSE were not as high because the market is relatively small: hence there were not that many comparators. In spite of this, I found that the choice of comparable firms on the GSE depended on the industry in which the IPO operated. In the case of Ayrton Drugs Manufacturing Limited (AYRTN), for example, the use of P/E ratio was "derived from the prevailing market perception of the values of companies in the same or comparable regulated industry, [that is] companies regulated by the Food and Drugs Board namely Starwin Products Ltd (SPL) and PZ Limited" (AYRTN's Prospectus, p. 35). This confirms the findings of Berkman et al. (2000) that firms in the same industry have similar risk, growth characteristics, and accounting methods.

In the choice of multiples valuation methods on the GSE, the only firm-specific variable that was statistically significant was the extent to which IPO-firms' assets were tangible (AIP). This finding implied that at core of P/E and P/B ratios is the book value of firms' assets and liabilities. Roosenboom (2007) rather found profitability (PROF) and growth (GROW) as the firm-specific factors that influenced the choice of multiple valuation methods on the Euronext Paris. The implication of Roosenboom's findings was that IPO-firms that were forecasted to be relatively profitable and rapidly growing were more likely to use one of the multiples valuation methods. From my results on the GSE, I also found that none of the emerging-market factors significantly influenced the use of multiple valuations methods. I came to the same conclusions in relation to other valuation model choices such as the DCF, DDM, and OTH. These findings were, however, contrary to those of Mehr-un-Nisa and Nishat (2011) who found some market-related

variables as statistically significant, in their study of 221 stocks on the Karachi Stock Exchange (KSE) in Pakistan. These variables were GDP, inflation rate (INF), money market interest rates (MMR), money supply (M2), and the financial depth of the stock exchange (FD). The lack of statistical significance of any of these variables on the GSE could be due either to (a) the over-familiarity of investment bankers with the various valuation methods; or (b) the limited nature of the sampled IPOs studied on the GSE.

The discounted dividend method (DDM) was the least popular valuation methods on the GSE because it recorded a percentage usage of 0.03%. In fact, of the 30 sampled IPOs, only one firm adopted the DDM valuation. This finding was contrary to the results of Deloof et al. (2009) who found that of the 49 sampled firms on the Euronext Brussels, 24 of these firms (60%) used the DDM. In spite of this 60% usage rate of DDM, Deloof et al. noted that this valuation method was considered by investment bankers in Belgium to be too conservative. In view of this, most of those bankers were less reliant on value estimate of DDM. The use of DDM, Deloof et al. further noted, was for the purposes of serving as a check on the value estimates derived using other valuation techniques. These findings of Deloof et al. could explain the observed unpopularity of DDM on the GSE. This could imply that investment bankers in Ghana, like their counterparts in Belgium, do not regard the value estimates of DDM as a reliable. Starwin Products Limited (SPL) was the only firm that deployed DDM on the GSE. In this deployment, SPL derived 30% of the fair value of its IPO from the use of this valuation method. The investment bankers of SPL justified their usage of DDM on the ground that "the assignment of 30% to the constant dividend growth price estimating model is to reflect the importance current

shareholders attached to the firm's ability to pay dividends"(SPL's Prospectus, p. 33). This justification presupposed that if it were not for this desire of the SPL's pre-IPO shareholders, the use of DDM would not have been necessary. In view of this fact, it was not possible for me to assess the firm-specific and emerging-market factors that could have influenced the choice of DDM by the generality of investment bankers on the GSE.

The key finding in relation to the use of other valuation methods (OTH)–net asset valuation (NAV) and adjusted asset valuation (AAV)–revealed a percentage usage of 83%. This high rate of usage positioned the OTH as the most used valuation methods on the GSE, second only to the DCF. The widespread use of the OTH valuation methods on the GSE relates to the ease with which investments bankers could employ the services of third party valuation agencies. These valuation agencies were hired to verify the existing assets of a firm intending listed and to give a fair value estimate of those assets. These fair value estimates were derived through the revaluation of net book values (i.e., net asset valuation (NAV)) or adjustments of those assets to reflect their fair market values (i.e., adjusted asset valuation (AAV)). In relation to the firm-specific and market-related factors that influenced the choice of OTH valuation methods, I found that none of those factors were statistically significant. This finding was consistent with that of Roosenboom (2007) who could not find as statistically significant the firm-specific factors that influenced the choice of OTH valuation methods on the Euronext Paris. The implication of these findings might be that investment bankers on the GSE, like their counterparts on Euronext Paris, do not give much thought to factors that could influence their choice of OTH valuation methods.

Research Question 2: Fair Values and Setting of IPO Offer Prices

This research question boarded on how underwriters combined the value estimate of each valuation method to arrive at fair values and the preliminary offer prices of the IPOs. One of the key findings revealed the use explicit fitness-based quantitative weighting techniques. According to Pereiro (2002), the usage of this weighting technique depends on the purpose for which the valuation was being conducted and the characteristics of a corporation being valued. The investment bankers, then assign for each value estimates with a weight that reflects the relative importance of a giving valuation method vis-à-vis the valuation purpose and firm characteristics. To buttress these assertions of Pereiro, I provide in the following paragraphs the justification for weight-assignments incorporated on page 35 of the IPO Prospectus of AYRTN:

1. The assignment of weight of 25% to the Net Book Value approach is designed to reflect the fundamental importance of facilities, buildings, machinery, and equipment in the production process, which ultimately determines the ability of the enterprise to generate products for sale. Typically in the Pharmaceutical Industry the importance of deployable assets to viable operations could be weighed anywhere from 20% to 35%. The 25% applied is a fair average.
2. The validity of any enterprise is significantly reflected in its ability to generate and return cash flow for reinvestment and dividend payments. Every investor's preference to hold equity in a firm which has the potential to generate cash flow over and above its operating requirements. Firms in this category have the potential to pay dividends and also to reinvest, resulting in higher future cash

flows and dividends. The assignment of a weight of 45% to the FCFE [i.e., DCF] model of share pricing is to reflect this importance.

3. The weight of 30% assigned to the P/E model is to reflect the importance of stock market's perception of the present and future strengths and potential of companies in the same regulated industry as AYRTN. The inference is that even though AYRTN is currently not listed on the GSE, 30% of its current estimated value is derived from the prevailing market perception of the values of companies in the same or comparable regulated industry, [that is] companies regulated by the Food and Drugs Board namely Starwin Products Ltd (SPL) and PZ Limited.

In relation to the factors that influenced these assignments of weight on the GSE, I hypothesized that such assignments would be dependent on the firm-specific and emerging-market factors. In assigning weight to the multiples valuation methods on the GSE, the findings revealed the tangibility of IPO-firms' assets (AIP) as the only statistically significant variable. This finding was not in conformity with the findings of Roosenboom (2007) in relation to the weight assigned to these valuation methods on the Euronext Paris. Roosenboom, rather, found the growth prospects of IPO firms (GROW) and their historical and expected dividend payouts (DIV) as the statistically significant variables. I did not find evidence that any of the hypothesized firm-specific and emerging-market variables influenced the weight assignments to the value estimates of DDM and OTH on the GSE. These findings do not also conform to the results of Roosenboom (2007) on the Euronext Paris. Roosenboom found, in relation to DDM, that the historical and expected dividend payouts (DIV) of the IPO-firms influenced the

assignments of weight. On the weight assigned to the values estimates of OTH, Roosenboom reported as statistically significant the pre-IPO profitability (PROF) of the IPO firms. For the assignment of weight to the value estimate of DCF valuation method, the results on the GSE revealed GDP as the only significant emerging-market variable that influenced the investment bankers. Like Roosenboom, I could not find any of the hypothesized firm-specific variables as statistically significant.

In relation to the determination of final offer prices of the 30 sampled IPOs on the GSE, I found that investment bankers introduced discounts on the preliminary offer prices. This is consistent with the conceptual framework of IPO valuation and pricing of Roosenboom (2012) reproduced in chapter 1 of this study. Using the IPO offerings of AYRTN as an example, the preliminary offer price per share that resulted from the combined value estimates DCF, P/E, and NAV was GH¢0.0918. The investment bankers in offering a price discount asserted that "from the exhaustive analysis of the company's operating circumstances and past financial performance as contained in our share price valuation, we recommend a price of GH¢0.0850 per share" (AYRTN's Prospectus, p. 35). To make the potential investors aware of this price discount, the investment bankers added that "this price offers investors a discount of GH¢0.00680 per share on the estimated value of the company" (AYRTN's Prospectus, p. 35). This finding confirms Roosenboom (2007) assertion that the offer of these price discounts become one of the key messages sold to investors during road shows, and other marketing campaigns launched in support of a pending IPO. In teasing out the factors that influenced the offering of price discounts, I hypothesized the same firm-specific and emerging-market

variables that had been the subject of this study so far. I found that none of those variables were statistically significant. Roosenboom (2007) in his research, however, found the growth prospects of IPO firms (GROW) to be influential. The implication of my finding might be that investment bankers on the GSE perceive the offer of such price discounts as a concomitant part of valuing and pricing IPOs. This perception could mean that those bankers do not give much thought to the firm-specific and/or market-related factors.

Research Question 3: Forecasting Errors and Earnings Management

In this research question, I considered whether the actual and projected financial statements in the IPO prospectuses were free from forecasting errors and earnings management. The results on forecasting errors revealed that the mean forecast error (FE) stood at -28.56%. The FE measures the extent to which the management of IPO firms had systematically over/underestimated their firms' earnings forecasts. The negative sign of the forecasts error implied that, on an average, the listed firms in Ghana have over-forecasted their earnings potentials by as much as 28.56%. The absolute forecast error (AFE), which measures the relative deviation of actual earnings from forecasted earnings, recorded an average deviation of 49.62%. The measure gives an indication of the extent to which the forecasts were close to actual profits in absolute terms. The observed AFE implied that the earnings forecasts in the IPO prospectuses on the GSE had forecast inaccuracies of 49.62% relative to the actual post-issue earnings of the IPO-firms. This finding was consistent with the results of Abrokwa and Nkansah (2014), whose study on the same GSE from 2004 to 2011, found that the earnings forecasts were not accurate. To

put my findings in a context, I provide in Table 52 the results of similar studies considered in the literature review in chapter 2 of this study.

Table 52

Summary of Previous Studies on the Accuracy of Forecast Earnings

Study	Country	Period	Sample	Forecast Error (%)	Absolute Forecast Error (%)
Jelic et al (1998)	Malaysia	1984-1995	122	33.37	54.10
Chen et al (2001)	Hong Kong	1993-1996	162	9.94	21.96
Lonkani & Firth (2005)	Thailand	1991-1996	175	(6.86)	35.76
Bulut & Er (2011)	Turkey	2000-2007	30	(13.44)	79.01
Gounopoulos (2011)	Greece	1994-2001	208	8.04	42.82

From these comparative results in Table 52, the observed forecasting inaccuracies on the GSE were closer to results obtained by Lonkani and Firth (2005) and Bulut and Er (2011). The over-forecasting of 28.56% observed on the GSE seemed high when compared with the 6.86% and 13.44% over-forecasting, respectively, found in Thai and Turkish markets. The absolute forecast error (AFE) of 49.62% found on the GSE seemed to have ranged between the 35.76% and 79.01% observed in the Thai and Turkish markets respectively. This implied that whilst the AFE was within the observed range, the FE was above the Turkish and the Thai markets by 15.12% and 21.70% respectively.

In examining the factors that had influenced the observed forecasts inaccuracies on the GSE, I used the AFE as the dependent variable. I hypothesized that the level of AFE observed on the GSE could be predicted by such independent variables as the IPO firm' size (SIZE), proportion of shares retained by the pre-IPO owners of the firm (OWN), forecast horizon (HOR) of the IPO firm's earnings forecasts, the pre-IPO

operating history of the IPO firm as measured by age (AGE), the level of IPO firm's gearing/leverage post-issue (LEV), and the reputation of the IPO firm's auditors (AUD) pre-issue. From the results, I found that none of these independent variables were statistically significant. To put these findings in a context, I provide in Table 53 a summary of the results of related studies.

Table 53

Determinants of Prospectuses' Forecast Errors Investigated in Prior Studies

Study	Country	SIZE	OWN	HOR	AGE	LEV	AUD
Jelic et al (1998)	Malaysia	+		+	+*	+	+
Chen et al (2001)	Hong Kong	+	+	+	+	+	+**
Lonkani & Firth (2005)	Thailand	+**		+**	+	+	
Bulut & Er (2011)	Turkey	+*	+**	+***	+	+	+***
Gounopoulos (2011)	Greece	+	+**	+	+**	+	

*** the result is significant at one perecent level,** the result is significant at five perecent level,* the result is significant at ten perecent level

From Table 53, it could be noted that it is not unusual for the result of a quantitative study such as this to have none of the independent variables being statistically significant. Table 53 also showed that Chen et al. (2001) studied all the six independent variables that I examined in this study. Chen et al., found the use of the Big-4 Audit firms (AUD) as the only statistically significant variable on the Stock Exchange of Hong Kong (SEHK). My findings on the GSE were, however, not consistent with those of Abrokwa and Nkansah (2014) who in a similar study on the same GSE found, as statistically significant, such variables as the IPO firm' size (SIZE), forecast horizon (HOR) of the IPO firm's earnings forecasts, and the reputation of the IPO firm's auditors (AUD) pre-issue. These findings of Abrokwa and Nkansah were contrary to the results I obtained mainly because of the methodological differences between their study and mine.

Abrokwa and Nkansah studied the forecasting accuracy of 14 stocks on the GSE between 2004 and 2011. In their study, they treated the periods covered by the earnings forecast of each of these 14 firms–averaging between 3-5 year forecasting period–as distinct data points. This resulted in them having and examining a total of 55 data points of earnings forecasts. If I had followed this approach of Abrokwa and Nkansah, I would have had 100 data points in total from 30 sampled IPOs that I studied. I, however, could not follow Abrokwa and Nkansah because I could not find other literature in this field of IPO research that supported their approach.

In relation to the second part of the research question, I investigated the tendencies for earnings management in the financial statements incorporated in IPO prospectuses on the GSE. In measuring these tendencies of window-dressing, I used the discretionary current accruals (DCA) as a proxy. From the results, I found that the DCA which stood at -9.58% 2 years prior to the IPO listings had increased to +4.22% in the year following the IPOs. Three years after the IPO, however, the average DCA had reduced to -1.40%. From these results, it could be concluded earnings management on the GSE had witnessed an increase of 13.80%, (i.e., 9.58+4.22), in the first financial year following the IPO. This was, however, reduced by 5.62%, (i.e., 4.22+1.4), in the 3 years following the IPO. To situate these findings within the larger body of literature, I relied on the research results of Roosenboom et al. (2003). In the study of 64 IPOs on the Euronext Amsterdam, Roosenboom et al., found an average DCA of -1.5% two year before the IPO. This increased to 6.5% in the first financial year as a public company. Roosenboom et al. further noted that other studies in the field had “generally documented

earnings management ranging from 1.5% to 5% of lagged total assets" (p. 256). The observed 13.80% on the GSE was, therefore, far higher than the range observed in other markets. These findings implied that the deployment of earnings management was prevalent on the GSE. This observation is further buttressed by the findings that both DCA and net incomes (NI) witnessed increases whilst the cash flows (CF) rather decreased. These results confirm the claim of Cormier and Martinez (2006) that it is less likely for corporate managers to manipulate cash flow. This further implied that whilst it is easy to manipulate accruals and net incomes through earning management, such manipulations on cash flows is rarely possible. This is because cash, as a financial accounting variable, is usually outside the control of corporate managers.

To examine the existence of earning management in the IPO prospectuses of GSE listed firms, I used DCA as dependent variable. The independent variables that I used in explaining the observed DCA included the decision of the IPO firm to comply with international accounting standards (IAS), the extent to which the firm's board of directors consist of non-executive directors (EB), the quality of the firm's auditor (AUD), the ownership structure of the firm's shares pre-issue (OWN), and the post-issue levels of shares ownership retained by the pre-IPO owners (ROWN). From the results, I found the pre-IPO ownership structure of the firm (OWN) as the only variable that was significant in explaining the level of earnings management observed in the year following the IPO. Cormier and Martinez (2006) conducted a similar study of 118 IPO firms listed on Euronext Paris between 2000 and 2002. They found compliance with international accounting standards (IAS), the extent to which the firm's board of directors consist of

non-executive (EB), the post-issue levels of shares ownership retained by the pre-IPO owners (ROWN), and the quality the firm's auditor (AUD) as statistically significant. My findings on the GSE implied the higher the level of owner-managers, the less the window-dressing of the financial statements incorporated in the IPO prospectuses. This conclusion should, however, be juxtaposed against the concerns of overcompensation and overexpensing raised by Pereiro (2002) and Koller et al. (2010). Overcompensation of owner-managers means that the salaries paid to such managers are usually higher than average salaries on the labor market (Pereiro, 2002). Overexpensing arises where owner-managers' personal or private spending are treated as corporate expenses (Pereiro, 2002). The existence of these related phenomena of overcompensation and overexpensing could rather make owner-manager firms more prone to earnings management.

Research Question 4: Characteristics of IPO Return Performance

In this research question, I considered the IPO pricing anomalies–under/overpricing–observed on the GSE. I also considered whether there was a cross-sectional relationship between the price-to-value ratios and the observed pricing anomaly. From the results, I found that the first-day return (R(1st Day)) recorded an average of 1.49%. This average return depicts that the listed firms on the GSE seemed to have, generally, underpriced their IPOs. This finding is in conformity with the results of Loughran et al (1994) who found the incidences of short-run underpricing in all the 25 countries covered in their study. My finding on the GSE also confirmed the conclusion reached by Loughran et al. that the underpricing phenomenon exists in every country with a stock market. My finding of an average short-run underpricing on the GSE of

1.49% seemed to be on the lower side. This is because Purnanandam and Swaminathan (2004) claimed that the underpricing phenomenon on the United State's markets had over the past decades averaged between 10-15% (p. 811). Chambers and Dimson (2009) found that underpricing in the UK had averaged 19% in the 21 years since the market reforms in 1986. The 1.49% average I observed could be due to the relatively small number of stocks listed on the GSE. Notwithstanding the relatively lower underpricing average on the GSE, Van Heerden and Alagidede (2012) found that the depth and breadth of the underpricing differs one country to the next. Adjasi et al. (2011) who studied 125 IPO on the Nigerian Stock Exchange (NSE) found a rather incredible 43.28% underpricing on that market. The finding of 43.28% was incredible because it was over and above the 10-15% found in the United States and the 19% found in the United Kingdom.

A related concept that goes hand-in-hand with the phenomenon of underpricing is the concept of money left on the table (MLOT). This concept asserts that the greater the underpricing of a given IPO, the lower the gross sales proceeds of the IPO that accrues to the issuing firm (Chambers & Dimson, 2009). This, according to Chambers and Dimson (2009), means that the greater the money those firms and their selling shareholders would have "left on the table" for the investors. My findings on MLOT revealed that underpricing on the GSE resulted in an average of GH¢1.31 million being left on the table. The highest amount of money left on the table for investors amounted to GH¢37.86 million on the IPO of then Ashanti Gold Fields. I also found that some IPOs on the GSE were rather overpriced implying that money taken from investors. The extreme case of

such overpricing on the GSE amounted to GH¢7.97 million on the IPO of Cocoa Processing Company Limited (CPC).

The independent variables that I used to explain the over/underpricing on the GSE were the price-to-value ratio of the IPO firm's stocks (P/V), the book-to-market value of the IPO firm's equity (BTMV), the level of accruals in the IPO firm's earnings post-issue (ACCRUALS), the consensus analysts' earnings growth rate for the IPO firm's stock post-issue (GROWTHAIP), and the post-issue ratio of IPO firm's EBITDA to sales (EBITDA). From the results, I found the price-to-value ratio of the IPO firm's stocks (P/V) to be statistically significant. This implied that there was a cross-sectional relationship between the price-to-value ratios and the observed underpricing on the GSE.

Implications for Social Change

In addition to the contribution of this study to the existing body of knowledge, the research findings also have significant implications for positive social change. This is because those findings draw attention to the key roles of the various stakeholders involved in the IPO pricing and valuation on the GSE. In the following subsections, I am further elaborating on the social change implications of the study's findings on the different concerned stakeholders.

The Ghana Stock Exchange

A critical aspect of the study, I wish to bring to the notice of the GSE, is the need to ensure that IPO offerings accurately reflect the underlying fundamentals of the IPO-firms. The findings have shown an average underpricing of 1.49% over the 20 year-period of IPO activities on the market. Through this underpricing, investors had on the

average gained GH¢1.31 million as a result of money being left on the table. In spite of this gains, the same investors had in an extreme case of IPO overpricing lost as much as GH¢7.97 million. Moreover, the level of earnings management in the pre-IPO financial statements incorporated in IPO prospectuses recorded an average of 13.80% of lagged total assets. This finding is well above the 1.5% to 5.0% of lagged total assets expected of IPO offerings in an exchange (Roosenboom et al., 2003). The findings have also shown the forecast errors (FE) on the GSE were 15.12% and 21.07% above those observed in the Turkish and Thai markets. These extreme cases of investor losses, forecasting errors, and earnings management could have contributed to the recent levels of IPO undersubscription observed on the GSE. The IPO offerings of Tullow Oil Plc, which recorded an undersubscription of 11.75% in 2011 was a typical example. For the GSE to increase the ratio of listed companies to the number of enterprises within the Ghanaian economy; then the way it values and prices IPOs are important. In this regard, the management and board of the GSE in their review of the actual and projected financial statements, incorporated in IPO prospectuses, should go beyond just a mere reliance on auditor certifications. Such reviews should include the measurement of forecasting errors and earnings management in those financial statements. This review is necessary because the earnings projections–which form the foundation for the eventual valuation and pricing of IPOs–come from these financial statements.

The Investment Bankers

The findings of this study revealed that there is more room for improvement in the investment bankers' valuation and pricing of IPOs on the GSE. The result showed that

over-familiarity widely informed investment bankers' choice of the various valuation methods. The result also revealed that their selection of those methods was not necessarily dependent on the firm-specific and the market-related factors. I made a similar finding of the investment bankers' determination of the preliminary offer prices of the IPOs they had listed on the GSE. The investment bankers also offered price discounts without much attention paid to the firm-specific and market-related factors. Investment bankers need to reconsider their over-familiarity with the various valuation methods, their determination of preliminary offer prices, and their arbitrary offer of price discounts. This will ensure that potential IPO-firms are valued and priced on the basis of their unique firm characteristics and the economic environment in which they are operating. In addition to using auditors in the certification of the actual and projected financial statements, investment bankers should strengthen their own due diligence of the corporation they lead public. In this way, the observed tendencies of forecast inaccuracies and high levels of earnings management could be reduced to acceptable levels. These reductions will ensure improvements in the valuation and pricing of IPOs by these investment bankers. In the long-run, the investment bankers will stand to benefit as investors confidence and corporate perceptions of their professional services will equally be enhanced.

The Corporations Wishing Listed

For corporations wishing and intending listed on the GSE, the findings provide them with the opportunity of learning from the mistakes of their forebears. These mistakes of their forebears included window-dressing or creatively manipulating their

pre-IPO financial statements and over-forecasting of their projected financial statements. These mistakes do result in the over/underpricing anomalies witnessed on the GSE. The perpetuation of these mistakes by corporation wishing listed on the GSE will only lead to further loss of investor confidence in the market. This loss of investor confidence comes with the consequence of undersubscriptions. The result of these undersubscriptions had in the cases of Commit Properties Limited and Hearts of Oak Football Club resulted in their inability to meet the listing requirement of the exchange. These firms could not, therefore, get listed on the GSE.

The Regulatory/Supervisory Authorities

When valuation and pricing of Facebook's IPO went wrong, the regulatory or supervisory authorities came up for blame. In the case of capital markets in Ghana, the SEC has the responsibility for ensuring the protection of investors over IPO offerings on the GSE. In this regard, the findings of this research could contribute to the enhancement of the regulatory and/or supervisory role of such a policy maker. One reason attributed to the failure of regulators in the case of the Facebook's IPO was their inability to ensure transparency. There was a lack of such transparency in relation to the revenue and earnings projections used in the valuation and pricing of that IPO. My findings on the GSE had also revealed the possibilities of over-forecasting the earnings projections and the tendencies of earnings manipulation of the pre-IPO financial statements. The SEC, much more than the GSE, should be rigorous with their review of those actual and projected financials in the IPO prospectuses of the firms intending listed. For as Cervellati et al. (2013) cautioned in relation to Facebook's IPO; the failure of the

Ghanaian SEC could provoke stock crashes and damage investors' confidence in the overall financial system.

The Investing Public

One of the primary goals of this research is to contribute to the improvement of investor confidence on the GSE. The findings have revealed mix results of investors– gaining in some instances of IPO offerings and losing in others. Admittedly these winning and losing scenarios are part of the risks involved in being an investor on any stock exchange. If the other major stakeholders paid heed to the findings of this research; the confidence of investors in the IPO activities on the GSE might improve. The investing public, especially institutional investors have a role to play in this improvement of the accuracy of IPO valuation and pricing on the GSE. Institutional investors could contribute by actively participating in the pre-bookbuilding meetings with the investment bankers. In these pre-bookbuilding meetings, the institutional investors should come out with their own research reports that give an indication of a possible price range of a pending IPO. These research reports could transform the role of institutional investors into information-revealing participants in the valuation and pricing of IPOs on the GSE. In this regard, the institutional and other informed investors will become information-revealing and not just information-receiving participants.

Limitations of the Study

In the conduct of this study, the key limitations I encountered related to the difficulties in data collection and the generalizability of the study findings beyond the GSE. In relation to the difficulties in data collection, my initial proposal included primary

data collection. The need for primary data collection in a study such this, was pointed out by Deloof et al. (2009) in their conduct of a similar study on the Euronext Brussels. According to Deloof et al., gathering of practical information about the actual conduct of valuation and pricing of IPOs can only come from speaking with the investment bankers. In this regard, I initially proposed to augment my secondary data collection with the conduct of face-to-face interviews with 5 of the 20 investment banking firms. I also proposed to have administered survey instruments among the remaining 15 investment bankers, 35 IPO-firm managers, and 60 institutional investors. These interviews and surveys were tailored to soliciting data relating to the roles each of these participants in the valuation and pricing of IPO on the GSE. The conduct of this interviews and surveys required a letter of cooperation from the various firms from which I was to draw the survey and interview participants. These letters of agreement–which were necessary for securing Walden University's IRB final approval–were not forthcoming for two months or so. In the end, I had to concentrate only on the use of secondary data. If the collection of primary data were possible, it would have enabled me to speak to the reasons for the under/overpricing anomalies observed the GSE. In my pre-data collection proposal, I also expressed a desire to consider the industry-related factors in addition to the firm-specific and emerging market factors in the study. During the secondary data collection, it became impossible for me to obtain the data relating to such industry related variables. If the collection of primary data were possible, I would not have encountered this difficulty of data collection relating to the industry-related factors.

Another key limitation I encountered was in relation to the need for caution in generalizing the findings of the study beyond the GSE. This generalization "involves drawing broad conclusions from particular instances–that is, making an inference about the unobserved based on the observed" (Polit & Beck, 2010, p. 1451). My observations about IPO valuation, pricing, and performance in emerging market related only to the 30 sampled IPOs on the GSE. In drawing unobserved inference from this study, such an inference should be restricted only to the entire population of IPOs on the GSE. This, therefore, calls for some level of caution when making generalization of the findings of this study to other stock markets. This warning of mine is akin to that of Pereiro (2002) who advised of similar care when interpreting results of research conducted in emerging markets. Pereiro provided several reasons as to why there is the need for such caution. The first of these reasons is that emerging stock markets tend to be relatively small in relation to the universe of corporations that operate in those markets. The second reason is that the importance of capital markets in emerging economies is insignificant relative to GDPs of those economies. The third reason related to the highly concentrated nature of emerging stock markets and hence their equity trading and related activities hovers around only small number of stocks. The fourth reason is that the cost of capital information in emerging stock markets is scares, unreliable and volatile. The fifth reason is that data series in emerging stock markets are extremely short; because price and performance data from periods before economic openings are useless.

Recommendations for Action

The first recommendation for action is a call for rigorous scrutiny of the actual and projected financial statements that form the basis for valuation, pricing, and performance of IPOs. The call for this scrutiny is in relation to the reduction in the observed forecast errors and earnings management in those financial statements. This scrutiny has the potential of ensuring transparent financial statements, as well as the protection of investors and enhancement of their confidence in the IPO activities on the GSE. As was noted by Cervellati et al. (2013), the absence of this transparency has the potential of provoking stock crashes and damaging investors' confidence in the overall financial system. This call for action is an appeal that the concerned stakeholders on the GSE ought to take serious.

The second recommendation for action is a call for the SEC and GSE to be aware of the possibilities of overcompensation and overexpensing in the financial statements of potential IPO-firms. This call is important where a firm intending listed on the GSE is owner-managed. Review of the financial statements of owner-manager firms intending listing on the GSE will help in reducing the observed tendencies of earnings management. Overcompensation in owner-manager firms, according to Pereiro (2002), arises as a result of less clarity in the treatment of salaries and dividends paid to those owner-managers. The SEC and GSE could estimate excess compensation to owner-managers by analyzing the average salaries paid to equivalent managerial roles in the labor market. The SEC and GSE could deal with overexpensing by carefully scrutinizing corporate expenses to detect and eliminate personal expenses of owners.

The third recommendation for action is a call for corporate managers and their investment bankers to move from financial budgeting to financial forecasting. My examination of most of the IPO prospectuses revealed that the financial projections provided by those firms were budgets and not financial forecasts. Although both forecasting and budgeting borders on the development of futuristic plans, the two are not one and the same. Whilst budgeting has its roots in the use of accounting information, forecasting is an integration of accounting, statistical, and econometric modeling. My review of the IPO prospectuses did not reveal the usage of such statistical and econometric modeling of the financial projections incorporated in those prospectuses. A move towards forecasting, and not budgeting, could also help in the reduction of the forecasting errors observed on the GSE.

The fourth and final recommendation for action is a call on institutional investors to build their own valuation models. This call means that investors on the GSE should go beyond just the mere reliance on analyst reports and recommendations on pending IPOs. The call also means that investors should also go beyond just using static earnings and cash-flow ratios as a means of assessing upcoming IPOs. This is because the extent of information production from such traditional ratios is quite limited (Jenkinson & Jones, 2009). This call is also apt because of the findings of such levels of IPO overpricing which in an extreme case resulted in a loss of GH¢7.97 million by investors. The building up of independent valuation models by the institutional and other informed investors would enable those investors avoid such losses in the future.

Recommendations for Further Studies

The first recommendation for further study is rather a recommendation for the dissemination of the findings of this study. It is when practitioners and other scholars become aware of the study that they can further the study. In this regard, I intend to circulate my research findings through presentations at academic and professional conferences. I also intend to serialize my study and its results in print media such as the Ghanaian Business and Financial Times (B&FT). I also intend to serialize my study and its results through the relevant social media platforms. I will be publishing my research through the UMI Dissertation Publishing on ProQuest. I also intend to serialize the study in a way that will allow for further publications in major financial journals in Africa and the world as a whole.

My second and final recommendation for future study stems from the limited generalizability of the findings in this research. My principal recommendation for future research is that the current study should be expanded to include other emerging/frontier markets in Africa. This research could examine the valuation, pricing, and performance of IPOs in such markets as the Johannesburg Stock Exchange (JSE), the Egyptian Stock Exchange (ESE), The Nigerian Stock Exchange (NSE), and the Kenyan Stock Exchange (KSE). The extension of my research to include such other markets in Africa could provide the researchers with a larger sample size to make generalization possible. This research could also consider the administration of surveys on the roles of investment bankers, corporate managers, and institutional investors in the valuation, pricing, and performance of IPOs in emerging African markets.

Concluding Statement

This dissertation research is unique in the sense that it focused on all aspects of IPOs' valuation, pricing, and performance. In relation to the valuation, the study examined the methods used in valuing IPOs on the GSE, as well as the weights assigned to the value estimates of each of those valuation methods. I further examined the levels of price discounts offered by the management of IPO-firms and their investment bankers in arriving at the eventual offer prices of the sampled IPOs. Prior to the determination of these offer prices, investment bankers had to determine the IPOs' fair values. To do so, there was a need to have the actual and projected financial statements of the pending IPO-firm. In this study, I subjected these two categories of financial statements incorporated in the IPO prospectuses to test. I tested the actual financial statements for the tendencies of earnings management and the projected financial statements for the possibilities of forecasting inaccuracies. Finally, I examined in this study the short-term return performance of the IPO-firms listed on the GSE.

From the findings, I can conclude in relation to valuation methods that the discounted cash flow method (DCF) is the most popular and widely used method. This was closely followed by the asset-based valuation methods such as the net asset valuation (NAV) and the adjusted assets valuation (AAV). The multiples valuation methods used were the P/E and P/B ratios, but their usage was only possible where comparative multiples were available on the market. Only one IPO-firm used the discounted dividend model (DDM) as one of the methods in its IPO valuation. I also found that for any giving IPO's valuation, listed-firm managers and their investment bankers used more than one

valuation method. In assigning weights to value estimates of each of these valuation methods, I found that investment bankers considered the purpose of the valuations and the characteristics of the corporations being valued. In relation to the tendencies of earnings management, I found that such tendencies existed on the GSE. This is because the use of discretionary accruals prior to the IPOs' listings increased beyond the level considered as normal. I also found that these increases in discretionary accruals were buttressed by equally increasing net incomes without corresponding increases in the cash flows of those corporations. I also established that there were possibilities of forecasting inaccuracies in the projected financial statements incorporated in the prospectuses of the sampled IPOs. In relation to the IPO pricing anomalies, I found that the IPOs on the GSE were generally underpriced. I also found that this underpricing had resulted in investors gaining as much as GH¢37.86 million in the case of the then Ashanti Gold Fields. Other notable investor gains that had resulted from underpricing included a GH¢2.93 million gains on the IPO of SIC Insurance Company Limited (SIC), and GH¢2.79 million in relation to the IPO of UT Financial Services Limited (UTB). This finding should, however, be juxtaposed against IPOs overpricing that had in an extreme case resulted in investors losing as much as GH¢7.97 million on the IPO of Cocoa Processing Company Limited (CPC).

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Appendix A: Data Sheet – Dependent Variables in Hypotheses 1-3

Data Sheet of Dependent Variables for Hypotheses 1-3

GSE Listing Code	Relative Valuation Methods	Fundamental Valuation Mehtods				NMETHOD	Assignment of Valuation Weights (%)				Discount
	MULT	*DCF*	*DDM*	*EVA*	*OTH*		*MULTW*	*DCFW*	*DDMW*	*OTHW*	
											(%)
ACI*	0	1	0	0	1	2		60		40	4.55
AGA	1	1	0	0	1	4	30	50		20	-
ALW	0	1	0	0	1	2		70		30	6.98
AYRTN	1	1	0	0	1	4	30	45		25	7.41
BOPP	0	1	0	0	1	2		70		30	13.85
CAL	1	1	0	0	1	4	50	30		20	-
CLYD	0	1	0	0	1	2		60		40	-
CMLT	0	1	0	0	1	2		60		40	2.34
CPC	0	1	0	0	1	2		70		30	-
EBG	1	1	0	0	0	3	40	60		-	-
EGL	1	1	0	0	0	5	15	30		55	-
ETI	0	1	0	0	1	2				100	-
GCB	1	1	0	0	1	4	30	50		20	11.56
GGBL	0	1	0	0	0	3		30		70	4.46
GOIL	1	1	0	0	1	5	45	45		10	85.07
GSR	0	0	0	0	1	1				100	1.42
GWEB	0	1	0	0	1	2		50		50	-
HFC	1	1	0	0	1	4	30	50		20	19.35
MLC	0	1	0	0	1	2		70		30	-
PBC	0	1	0	0	1	2		70		30	-
PKL	0	1	0	0	1	2		70		30	37.50
SCB	1	1	0	0	1	4	40	50		10	3.43
SIC	1	1	0	0	0	6	28	18		55	-
SOGEGH	1	1	0	0	1	4	40	50		10	33.33
SPL	1	1	1	0	1	5	5	30	30	35	26.47
SWL	0	1	0	0	1	2		70		30	-
TLW	0	0	0	0	1	1		50		50	-
TOTAL	1	1	0	0	1	4	30	60		10	-
TRANSOL	1	1	0	0	0	4	40	60		-	4.51
UTB	1	1	0	0	1	4	35	40		25	-

Appendix B: Data Sheet – Independent Variables in Hypotheses 1-3

Data Sheet for the Independent Variables in Hypotheses 1-3													
GSE Listing Code	**Firm Specific Factors**						**Macroeconomic/Emerging-Market Factors**						
	SIZE (GH¢million)	*AGE* (years)	*AIP* (%)	*PROF* (%)	*GROW* (%)	*DIV* (%)	*GDP (%)*	*INF(%)*	*MMR*	*FER*	*M2(%)*	*SZ (%)*	*FD(%)*
ACI	3.62	25.00	80.88	2.63	30.14	-	5.28	18.03	21.32	160.78	39.08	1.15	16.31
AGA	945.12	50.00	80.47	-	-	-	5.20	26.67	14.32	92.79	23.24	18.68	26.92
ALW	70.60	28.00	63.71	11.31	24.78	17.62	4.11	59.46	28.73	115.96	43.17	25.51	18.59
AYRTN	4.48	41.00	32.31	15.96	20.00	30.00	5.90	15.12	10.16	100.00	19.47	15.47	30.84
BOPP	13.42	38.00	73.64	27.36	24.15	30.00	5.20	26.67	14.32	92.79	23.24	18.68	26.92
CAL	58.78	15.00	1.98	32.15	33.83	35.09	5.20	26.67	14.32	92.79	23.24	18.68	26.92
CLYD	0.43	15.00	29.47	17.95	40.61	-	5.20	26.67	14.32	92.79	23.24	18.68	26.92
CML	0.21	22.00	63.10	(8.62)	29.67	-	4.70	14.62	32.05	142.26	17.49	18.50	24.57
CPC	23.72	22.00	11.19	0.95	40.51	8.73	4.50	14.82	16.21	92.56	39.21	12.01	34.59
EBG	319.57	17.00	2.72	19.11	16.81	52.50	5.90	15.12	10.16	100.00	19.47	15.47	30.84
EGL	38.43	16.00	20.62	14.23	10.26	58.91	5.28	18.03	21.32	160.78	39.08	1.15	16.31
ETI	6.45	23.00	3.71	-	-	-	5.90	15.12	10.16	100.00	19.47	15.47	30.84
GCB	779.20	43.00	2.98	38.27	15.44	30.00	4.11	59.46	28.73	115.96	43.17	25.51	18.59
GGBL	197.08	51.00	72.89	9.16	19.60	49.77	8.01	10.71	0.00	97.63	31.92	10.98	28.37
GOIL	58.62	47.00	24.86	2.03	36.75	23.45	6.40	10.92	8.89	105.26	39.34	15.84	21.10
GSR	611.34	24.00	60.60	-	-	-	6.46	10.73	8.90	104.54	36.83	9.61	22.86
GWEB	0.84	23.00	50.63	13.90	40.00	30.00	5.60	12.62	13.63	91.49	27.28	29.77	31.43
HFC	258.29	19.00	3.20	63.79	47.57	28.67	4.85	24.96	23.63	123.92	33.50	1.98	21.35
MLC	11.18	24.00	41.45	8.36	25.38	24.93	4.85	24.96	23.63	123.92	33.50	1.98	21.35
PBC	5.65	19.00	55.24	6.40	7.25	23.09	4.40	12.41	23.56	140.50	25.42	11.87	32.52
PKL	3.00	36.00	60.49	(5.33)	55.74	58.19	3.30	24.87	23.15	100.38	52.57	34.33	18.40
SCB	984.94	21.00	1.32	42.93	62.78	60.83	3.33	37.26	0.00	157.50	13.30	0.00	17.51
SIC	64.09	46.00	25.54	14.52	45.68	39.89	6.46	10.73	8.90	104.54	36.83	9.61	22.86
SOGEGH	436.77	20.00	4.70	35.63	17.03	50.00	3.30	24.87	23.15	100.38	52.57	34.33	18.40
SPL	0.82	44.00	9.39	21.14	25.00	30.00	5.20	26.67	14.32	92.79	23.24	18.68	26.92
SWL	0.11	18.00	34.30	23.84	142.20	25.00	4.00	32.91	30.85	92.96	56.53	9.93	35.13
TLW	12,347.50	9.00	35.50	-	-	-	8.01	10.71	0.00	97.63	31.92	10.98	28.37
TOTAL	40.48	45.00	16.86	3.33	114.52	81.28	3.33	37.26	0.00	157.50	13.30	0.00	17.51
TRANSOL	2.11	4.00	29.14	3.56	78.82	43.08	5.90	15.12	10.16	100.00	19.47	15.47	30.84
UTB	74.80	12.00	4.35	21.15	22.27	16.93	6.46	10.73	8.90	104.54	36.83	9.61	22.86

Appendix C: Data Sheet – Dependent and Independent Variables in Hypotheses 4

Data Sheet of Dependent & Independent Variables in Hypotheses 4									
GSE Listing Code	**Dependent Variable(s)**			**Independent Variables**					
	AFE	*FE*	*SFQ*	*SIZE*	*OWN*	*HOR*	*AGE*	*LEV*	*AUD*
ACI	163.63	(163.63)	751.70	8.79	-	36.00	25.00	37.26	1
AGA	-	-	-	1,230.85	67.40	-	50.00	36.57	1
ALW	115.50	(115.50)	137.03	59.56	-	60.00	28.00	74.85	0
AYRTN	22.55	(9.40)	6.18	7.52	79.91	54.00	41.00	15.67	1
BOPP	53.13	(53.13)	47.45	12.69	60.00	30.00	38.00	10.55	0
CAL	37.27	37.27	16.41	82.55	82.07	52.00	15.00	79.89	1
CLYD	50.05	(50.05)	48.94	1.11	68.82	45.00	15.00	20.49	0
CMLT	18.37	18.37	16.86	-	73.25	24.00	22.00	-	0
CPC	50.11	(29.44)	45.03	334.48	75.00	28.00	22.00	4.94	0
EBG	7.54	7.54	1.13	431.86	94.87	31.00	17.00	90.16	1
EGL	62.45	62.45	90.19	114.83	-	36.00	16.00	50.45	0
ETI	-	-	-	10,084.54	67.32	-	23.00	86.06	1
GCB	20.08	20.08	8.42	1,154.72	40.00	22.00	43.00	84.68	1
GGBL	11.77	0.48	2.80	204.19	-	72.00	51.00	77.62	1
GOIL	26.46	0.93	9.14	81.36	57.27	52.00	47.00	72.84	1
GSR	-	-	-	753.71	98.66	-	24.00	30.44	1
GWEB	109.79	(109.79)	183.18	1.12	51.43	40.00	23.00	26.55	0
HFC	27.96	(27.96)	12.49	364.49	-	60.00	19.00	80.25	0
MLC	18.52	(18.52)	6.77	13.36	61.21	36.00	24.00	46.79	1
PBC	42.01	(42.01)	44.28	4.69	20.00	33.00	19.00	4.44	0
PKL	103.24	(103.24)	149.27	3.06	-	48.00	36.00	69.39	1
SCB	8.89	8.89	1.86	1,404.21	-	36.00	21.00	88.64	1
SIC	46.36	6.02	26.16	85.58	50.00	60.00	46.00	47.75	1
SOGEGH	27.73	(21.54)	8.57	576.69	40.00	60.00	20.00	81.18	0
SPL	77.25	(77.25)	61.79	2.68	55.47	51.00	44.00	30.63	1
SWL	49.59	(49.59)	50.26	0.31	63.35	35.00	18.00	24.03	0
TLW	-	-	-	16,488.17	99.55	-	9.00	55.18	1
TOTAL	37.33	15.31	21.87	126.12	-	-	45.00	56.17	1
TRANSOL	81.35	(81.35)	106.76	4.29	75.00	38.00	4.00	23.01	1
UTB	26.79	26.79	13.04	127.82	57.15	50.00	12.00	86.80	1

Data Sheet of Dependent & Independent Variables in Hypotheses 4

GSE Listing Code	Dependent Variable(s)			Independent Variables					
	AFE	*FE*	*SFQ*	*ln(SIZE)*	*OWN*	*HOR*	*ln(1+AGE)*	*LEV*	*AUD*
ACI	163.63	(163.63)	751.70	2.17	-	36.00	3.26	37.26	1
AGA	-	-	-	7.12	67.40	-	3.93	36.57	1
ALW	115.50	(115.50)	137.03	4.09	-	60.00	3.37	74.85	0
AYRTN	22.55	(9.40)	6.18	2.02	79.91	54.00	3.74	15.67	1
BOPP	53.13	(53.13)	47.45	2.54	60.00	30.00	3.66	10.55	0
CAL	37.27	37.27	16.41	4.41	82.07	52.00	2.77	79.89	1
CLYD	50.05	(50.05)	48.94	0.10	68.82	45.00	2.77	20.49	0
CMLT	18.37	18.37	16.86	-	73.25	24.00	3.14	-	0
CPC	50.11	(29.44)	45.03	5.81	75.00	28.00	3.14	4.94	0
EBG	7.54	7.54	1.13	6.07	94.87	31.00	2.89	90.16	1
EGL	62.45	62.45	90.19	4.74	-	36.00	2.83	50.45	0
ETI	-	-	-	9.22	67.32	-	3.18	86.06	1
GCB	20.08	20.08	8.42	7.05	40.00	22.00	3.78	84.68	1
GGBL	11.77	0.48	2.80	5.32	-	72.00	3.95	77.62	1
GOIL	26.46	0.93	9.14	4.40	57.27	52.00	3.87	72.84	1
GSR	-	-	-	6.63	98.66	-	3.22	30.44	1
GWEB	109.79	(109.79)	183.18	0.11	51.43	40.00	3.18	26.55	0
HFC	27.96	(27.96)	12.49	5.90	-	60.00	3.00	80.25	0
MLC	18.52	(18.52)	6.77	2.59	61.21	36.00	3.22	46.79	1
PBC	42.01	(42.01)	44.28	1.54	20.00	33.00	3.00	4.44	0
PKL	103.24	(103.24)	149.27	1.12	-	48.00	3.61	69.39	1
SCB	8.89	8.89	1.86	7.25	-	36.00	3.09	88.64	1
SIC	46.36	6.02	26.16	4.45	50.00	60.00	3.85	47.75	1
SOGEGH	27.73	(21.54)	8.57	6.36	40.00	60.00	3.04	81.18	0
SPL	77.25	(77.25)	61.79	0.98	55.47	51.00	3.81	30.63	1
SWL	49.59	(49.59)	50.26	(1.16)	63.35	35.00	2.94	24.03	0
TLW	-	-	-	9.71	99.55	-	2.30	55.18	1
TOTAL	37.33	15.31	21.87	4.84	-	-	3.83	56.17	1
TRANSOL	81.35	(81.35)	106.76	1.46	75.00	38.00	1.61	23.01	1
UTB	26.79	26.79	13.04	4.85	57.15	50.00	2.56	86.80	1

Appendix D: Data Sheet – Dependent and Independent Variables in Hypotheses 5

Dependent and Independent Variables for Hypotheses 5											
GSE Listing Code	**Dependent Variable(s)**						**Independent Variables**				
	DCA						*IAS*	*EB*	*AUD*	*OWN*	*ROWN*
	Year (-2)	Year(-1)	Year (0)	Year (+1)	Year (+2)	Year (+3)					*%*
ACI	(71.20)	96.63	30.38	2.71	(2.37)	6.15	1	1	1	1	-
AGA	(1.83)	2.66	(21.76)	10.03	(1.64)	(5.33)	1	1	1	0	67.40
ALW	(67.96)	(15.57)	(17.99)	21.89	6.99	6.46	1	1	0	0	-
AYRTN	6.27	17.49	33.61	(19.21)	9.92	8.14	1	0	1	1	79.91
BOPP	(15.13)	15.68	7.02	(2.61)	(1.77)	0.10	0	1	0	0	60.00
CAL	7.28	(1.53)	5.61	(5.99)	(49.03)	56.63	0	1	1	0	82.07
CLYD	15.26	55.95	55.11	(39.13)	(87.69)	37.31	0	1	0	1	68.82
CMLT	(0.79)	(0.37)	23.44	0.58	3.72	(11.51)	0	1	0	1	73.25
CPC	(8.37)	(5.08)	3.82	(9.23)	(1.92)	(10.90)	0	1	0	0	75.00
EBG	2.59	(0.58)	(3.09)	7.14	(2.01)	5.55	1	1	1	0	94.87
EGL	(0.58)	(4.94)	19.31	(16.16)	(4.83)	(2.39)	1	1	0	0	-
ETI	2.10	(13.14)	15.29	(3.13)	(5.70)	(8.61)	1	1	1	0	67.32
GCB	2.11	3.21	5.37	1.10	12.20	(21.75)	1	1	1	0	40.00
GGBL	(37.15)	20.94	(13.86)	25.83	(7.93)	-	1	1	1	0	-
GOIL	(2.68)	9.14	10.18	(5.81)	(17.29)	6.25	1	1	1	0	57.27
GSR	(3.55)	(1.49)	0.46	(4.44)	3.53	(3.69)	1	1	1	0	98.66
GWEB	43.81	(27.54)	(12.60)	(15.12)	(2.05)	(17.19)	0	1	0	1	51.43
HFC	(20.63)	20.61	14.88	(32.77)	10.26	(0.41)	1	1	0	0	-
MLC	0.08	4.17	9.02	(3.87)	5.01	(4.34)	0	1	1	0	61.21
PBC	11.99	(8.35)	6.69	4.75	11.97	(10.00)	0	1	0	0	20.00
PKL	(52.59)	(46.47)	(69.25)	12.93	(7.65)	(31.88)	1	1	1	0	-
SCB	(1.70)	(21.30)	(38.29)	7.06	7.82	(6.71)	1	1	1	0	-
SIC	20.77	(18.39)	(0.12)	13.17	(0.86)	3.24	1	1	1	0	50.00
SOGEGH	(0.04)	(0.65)	0.51	27.90	(34.47)	(3.47)	1	1	0	0	40.00
SPL	2.37	0.49	(14.90)	26.23	(24.69)	(6.10)	0	0	1	1	55.47
SWL	(19.37)	2.05	(14.12)	26.13	(26.90)	4.44	0	0	0	1	63.35
TLW	21.15	(4.27)	0.81	4.26	5.83	-	1	1	1	0	99.55
TOTAL	(81.66)	(5.82)	1.36	2.79	2.30	3.21	1	1	1	0	-
TRANSOL	(42.81)	(49.05)	82.53	(20.96)	(29.87)	(37.12)	0	1	1	1	75.00
UTB	4.78	(4.73)	7.17	(5.37)	(20.12)	4.58	1	0	1	1	57.15

Appendix E: Data Sheet – Pre-/Post-IPO Percentage Net Incomes and Cash Flows

Dependent and Independent Variables for Hypotheses 5												
GSE Listing Code	**Dependent Variable(s)**											
	Net Income						*Net Operating Cash Flow*					
	Year (-2)	Year(-1)	Year (0)	Year (+1)	Year (+2)	Year (+3)	Year (-2)	Year(-1)	Year (0)	Year (+1)	Year (+2)	Year (+3)
ACI	(162.55)	0.06	(7.89)	(5.22)	(3.12)	(11.48)	15.40	5.45	(4.90)	(0.18)	6.38	(11.55)
AGA	26.12	156.77	23.05	12.01	4.88	5.98	45.95	26.09	31.46	16.50	10.71	29.72
ALW	(0.01)	(0.00)	0.01	(0.01)	(0.01)	(0.00)	0.03	(0.02)	0.01	(0.01)	0.01	0.00
AYRTN	17.03	0.76	13.74	16.24	16.98	22.38	15.63	10.30	8.62	14.20	2.56	18.05
BOPP	21.78	1.47	4.06	0.13	6.74	4.19	22.92	9.70	(0.23)	8.39	4.64	7.84
CAL	4.50	2.15	4.22	2.75	2.99	2.74	12.85	4.53	2.45	9.69	(13.50)	7.52
CLYD	11.01	0.10	12.31	10.07	4.80	(20.23)	17.74	2.02	(13.66)	17.15	17.71	6.28
CMLT	(3.02)	(0.02)	-	12.67	15.80	3.31	2.49	(0.96)	-	13.27	21.67	9.05
CPC	20.83	1.64	2.75	(0.91)	0.90	1.12	-	-	-	0.01	0.94	10.62
EBG	5.56	17.33	3.83	2.92	3.65	3.88	3.93	5.05	4.42	3.98	3.86	4.77
EGL	10.32	3.68	7.27	12.46	8.66	11.47	10.70	12.77	15.67	11.35	6.34	12.02
ETI	2.45	125.46	1.34	0.72	1.26	1.21	2.33	2.23	3.83	2.47	7.36	(1.04)
GCB	1.50	26.01	2.85	2.28	0.98	2.66	(1.19)	8.40	(4.08)	12.06	4.84	16.17
GGBL	2.30	(4.64)	0.23	12.25	6.13	-	20.87	(11.01)	25.23	14.10	13.64	-
GOIL	2.93	3.48	4.94	4.27	5.28	6.10	4.51	(15.13)	4.37	14.02	19.95	11.36
GSR	(2.35)	60.31	(4.43)	(16.41)	(0.93)	(0.87)	0.52	3.30	0.84	4.33	15.28	14.37
GWEB	6.20	0.25	22.64	1.94	16.53	19.97	(22.33)	(4.48)	(14.91)	7.17	(12.45)	(15.80)
HFC	1.59	5.77	2.37	2.49	2.59	3.98	41.66	(16.44)	10.53	16.62	(4.53)	5.94
MLC	4.43	0.49	4.17	5.35	4.80	0.34	(0.13)	(0.25)	(2.83)	1.11	6.11	0.43
PBC	(6.11)	(0.91)	(10.25)	9.61	9.38	9.46	-	-	72.46	68.03	71.80	13.51
PKL	(16.72)	(0.29)	(11.67)	(15.78)	(15.40)	(36.92)	(6.45)	(1.04)	(4.33)	3.22	(0.07)	(0.19)
SCB	4.27	33.19	4.09	4.33	3.94	5.70	7.16	11.64	9.33	10.04	7.74	4.17
SIC	4.27	2.95	83.49	41.98	32.53	24.18	5.30	5.01	(120.29)	25.90	(12.46)	37.23
SOGEGH	2.77	15.52	3.35	23.76	25.40	27.54	2.03	(0.44)	15.86	84.06	40.70	134.21
SPL	19.29	0.20	0.43	9.96	2.78	0.79	(4.85)	36.07	(6.23)	4.48	(0.52)	3.32
SWL	9.45	0.01	9.88	(0.30)	(14.45)	8.76	19.25	22.05	(4.79)	(14.93)	(0.03)	3.33
TLW	0.51	106.85	6.48	0.71	1.88	-	4.59	8.75	16.28	16.21	15.17	-
TOTAL	(1.63)	1.37	3.04	5.96	4.20	9.15	8.93	0.75	(11.48)	12.39	(1.07)	27.88
TRANSOL	10.41	0.60	-	6.22	(43.10)	(59.74)	28.11	41.05	-	(7.58)	25.17	(15.84)
UTB	4.67	4.47	4.15	3.55	1.80	1.83	2.69	5.15	4.11	19.13	10.54	(1.53)

Appendix F: Data Sheet – Dependent and Independent Variables in Hypotheses 6

Dependent and Independent Variables for Hypotheses 6								
GSE Listing Code	**Dependent Variable(s)**		**Independent Variables**					
	R(1st Day) (%)	*MLOT (GH¢'million)*	*PV Ratio*	*BM*	*GROWT(%)*	*ACCURALS*	*SALES*	*EBIT*
ACI	(20.00)	(0.02)	0.09	0.52	30.14	(14.03)	3.01	(17.27)
AGA	60.43	37.86	0.92	0.25	-	(8.82)	563.63	36.97
ALW	0.71	0.00	0.88	0.69	24.78	(39.74)	7.53	15.69
AYRTN	3.53	0.13	1.02	0.34	20.00	54.94	7.95	22.09
BOPP	12.00	0.84	1.01	0.58	24.15	13.31	8.18	6.27
CAL	-	-	1.19	0.55	33.83	9.72	14.79	30.86
CLYD	10.00	0.08	1.06	0.47	40.61	41.76	1.29	14.49
CMLT	5.00	0.00	0.18	0.31	29.67	-	-	-
CPC	(37.00)	(7.97)	0.61	0.31	40.51	11.35	24.97	4.05
EBG	0.55	0.05	1.00	0.24	16.81	0.23	63.18	37.98
EGL	-	-	-	-	10.26	71.46	68.27	14.19
ETI	-	-	0.85	0.29	-	2.89	1,197.02	48.91
GCB	8.00	0.27	0.17	8.03	15.44	3.88	18.29	34.89
GGBL	-	-	-	-	19.60	(38.12)	244.29	8.47
GOIL	7.50	1.54	0.77	0.49	36.75	12.12	306.49	1.75
GSR	3.33	0.19	0.43	0.72	-	(0.43)	312.45	(50.16)
GWEB	(8.33)	(0.05)	0.93	0.35	40.00	10.39	0.68	(26.20)
HFC	-	-	0.00	18.15	47.57	23.56	70.95	49.32
MLC	(50.00)	(0.05)	0.03	1.87	25.38	21.26	0.46	7.17
PBC	4.00	0.28	1.02	0.12	7.25	(4.60)	49.97	(0.96)
PKL	20.00	0.01	2.20	0.43	55.74	(26.88)	9.91	(0.91)
SCB	-	-	0.00	4.88	62.78	(32.46)	218.57	54.80
SIC	8.33	2.93	1.04	0.70	45.68	(5.02)	52.81	18.15
SOGEGH	2.50	0.03	1.63	9.87	17.03	0.84	96.40	39.14
SPL	-	-	1.89	0.61	25.00	12.68	1.46	7.05
SWL	4.00	0.01	0.90	0.42	142.20	4.02	0.15	35.09
TLW	0.26	0.28	0.82	0.27	-	(6.28)	3,572.66	46.56
TOTAL	-	-	-	-	114.52	(7.73)	177.83	3.44
TRANSOL	-	-	0.96	0.41	78.82	33.74	33.04	2.85
UTB	10.00	2.76	1.00	0.24	22.27	6.11	43.57	17.33

Curriculum Vitae

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EDUCATION

PhD Management – Finance Expected 2015

Walden University, Minneapolis, Minnesota

Dissertation Topic: *Valuation, pricing, and performance of Initial Public Offering on the Ghana Stock Exchange*

Dissertation Advisor: Dr. Mohammad Sharifzadeh

Master of Laws (LLM) - International Finance & Banking Law 2013

University of Liverpool

Liverpool, UK

Master of Business Administration (MBA) – Finance 2009

Ghana Institute of Management and Public Administration

Accra, Ghana

Fellow, Chartered Certified Accountant (FCCA) 2004

Association of Certified Chartered Accountants (ACCA)

Glasgow, UK

Graduate, Certified Accounting Technician 2001

Association of Certified Chartered Accountants (ACCA)

Glasgow, UK

PROFESSIONAL EXPERIENCE

Chief Accountant 2014 - Present

Controller and Accountant General's Department (CAGD)

Accra, Ghana

Project Accountant 2007-2014

CAGD/Ministry of Food and Agriculture

Accra, Ghana

- Established the accounting and internal control systems of the Project which assisted in ensuring that project specialists, implementing agencies, suppliers, contractors, and consultants were aware of the control environment within which the project operated.
- Maintained all accounting records in an appropriate and acceptable form to the AfDB as the funding agency and the Government of Ghana (GoG) as the counterpart financier.
- Successfully completed the annual audits for the 2007, 2008, 2009, 2010, 2011, 2012, and 2013 accounting periods and duly received the Bank's 'No Objection' for each of these audits. These audits were performed by Delloite (2007-2008); Benning, Anang & Partners (2009-2011) and PricewaterhouseCoopers (2012-2013).
- Drafted each year's Annual Work Plans & Budgets (AWP&B) in conjunction with the other members of the project and solely responsible for their consolidation as well as ensuring compliance with the execution of those plans and budgets by the project team members.
- Prepared the withdrawal applications and justified the Project's expenditures needed for the replenishment of the Project's Revolving Fund Account by the AfDB.
- Prepared the direct payment requests meant for a direct disbursement of funds to the suppliers, contractors and consultants.
- Prepared and established Letters of Credits (LCs) for suppliers and contractors were necessary.
- Installed and operationalized the Sun Accounting Software as part of the

accounting and management information systems of the Project.

Senior Audit Manager 2004-2007

Asafu-Adjaye & Partners

Accra, Ghana

- Drafted audit plans with regards to the timing and staffing of audits together with arrangements for attendance at stock takes and requests to third parties for confirmations.
- Monitored the progress of each audit to ensure that the impact of deviations from the planned timetable was minimized.
- Carried out a formal and comprehensive review of the audit work done to ensure that a conclusive opinion can be formed on the financial statements in question.
- Drafted financial statements and management letters for the review by the engagement partner before submission to clients' management.
- Undertook staff appraisal to ensure that all employees involved in each audit work were and continued to be competent in the conduct of those audits.

TEACHING EXPERIENCE

Adjunct Instructor of Business 2004-2007

Center for Business Studies

Accra, Ghana

- Teach face-to-face final and intermediate courses in accountancy.

Adjunct Instructor of Business 2004-2007

Financial Training and Management Company (FTMC)

Accra, Ghana

- Teach face-to-face final and intermediate courses in accountancy.

COURSES TAUGHT

Paper 1.2 Financial Information for Management
Paper 2.4 Financial Management and Control
Paper 3.1 Audit and Assurance Services
Paper 3.5 Strategic Business Planning and Development
Paper 3.6 Advance Corporate Reporting
Paper 3.7 Strategic Financial Management

CERTIFICATION

- SWap, Mid-term Expenditure Framework and Program Portfolio Monitoring by Setym International in Montreal, Canada. 2011
- Workshop on Project Performance Enhancement Tool by the African Development Institute of the African Development Bank in Koforidua, Ghana. 2010
- National Project Implementation Workshop by the African Development Institute of the African Development Bank in Accra, Ghana. 2009

COMPUTER SKILLS

- Blackboard
- Microsoft Office
- SPSS Statistical Software
- Sun Accounting Systems
- Turnitin