Walden University

College of Management and Technology

This is to certify that the doctoral study by

Marcia Yvonne Reid-Grant

has been found to be complete and satisfactory in all respects,
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Walden University
2018

Abstract

Share Retention, Underwriter Reputation, and Initial Public Offering Underpricing

by

Marcia Yvonne Reid-Grant

MBA, Bernard M. Baruch College, City University of New York, 1992

BSc, University of the West Indies, 1989

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

Initial public offering (IPO) underpricing is a costly practice that decreases the IPO

proceeds accruing to the issuing firms and can derail a firm's growth objectives. The

purpose of this correlational study was to determine the relationship between share

retention, underwriter reputation, and IPO underpricing among a population of IPOs

issued in Jamaica. The efficient market hypothesis served as the theoretical framework

for this study. Archived data for 52 IPOs issued in Jamaica from 1986 to 2018 were

collected and Spearman's correlation matrix and heteroscedasticity-consistent standard

errors regression analysis were applied. The outcomes of this study indicated no

significant relationship between share retention and IPO underpricing, $\alpha = .1$ and $\alpha = .05$,

$r = .059$, $p = .35$; however, there was partial acceptance of the alternative hypothesis that

underwriter reputation is related to IPO underpricing at $\alpha = .1$, $r = .234$, $p = .055$, but not

$\alpha = .05$. Additionally, underpricing was higher for IPOs supported by the high reputation

underwriters, and share retention was a slightly better predictor of IPO underpricing for

this group of IPOs, $R^2 = .02$, $p = .31$ versus $R^2 = .01$, $p = .75$. Finally, the overall model

indicated that the independent variables did not jointly explain IPO underpricing, $F(2, 45)$

$= .78$, $p = .455$, $R^2 = .032$. The results of this study might contribute to social change

because successful IPOs can increase employment opportunities as well as improve

income distribution and socioeconomic indicators for the communities served by IPO

firms.

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Dedication

To my son, Chadwyc Reed Grant, the person who sacrificed the most for me to

achieve this milestone. Thanks Chad, you are indeed a precious gift from God.

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First I would like to thank God for his unfailing love, unfettered patience and loving kindness that I have experienced repeatedly along this DBA journey. I can unreservedly say I could not have made it without him. To my son Chad, thanks for forgiving me even when you did not understand the many times I had to postpone your activities to meet a DBA deadline. I know my new-found availability may appear strange to you, but I am looking forward to it. I would like to especially acknowledge the contribution of my committee chair and advisor, Dr. Thomas Schaefer whose guidance, expertise, and motivation were critical to this process. Dr. Schaefer's hand-holding was indispensable, but I appreciate most of all his willingness to ask the difficult questions when I needed to be refocused and redirected.

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Section 1: Foundation of the Study

Each day, companies around the world list on various stock exchanges for the first time via an initial public offering (IPO) to capitalize on growth opportunities, and build sustainable businesses (Bateni & Asghari, 2014; Bradley & Camp, 2014). The IPO option of financing is one of three traditional options; the other two include bank financing and capital market debt (Perry, 2016). The decision to issue an IPO represents one of the most significant strategic shifts in a company's operations (Colombelli, 2015). The popularity of IPOs as an avenue to raise capital may explain the sustained interest in IPO underpricing (Asiri & Haji, 2015; Kumar, 2017; Thorsell & Isaksson, 2014; Yin, Yang, & Mehran, 2015). IPO underpricing provides the investor with significant first-day gains while simultaneously reducing the IPO proceeds accruing to the issuer by leaving money on the table (Bateni & Asghari, 2014; Miloud, 2014; Ritter, 2015).

The IPO financing option also brings into focus the importance of the signaling effect of share retention, as well as the role of the underwriter in balancing the needs of the investor for attractive first-day returns and that of the issuer for maximum IPO proceeds (Asiri & Haji, 2015; Darmadi & Gunawan, 2013; Mazouz, Agyei-Ampomah, Saadouni, & Yin, 2013; Reutzel & Belsito, 2015). Xu (2014) added that higher levels of the IPO underpricing relate to higher information asymmetry between the IPO firms and potential investors. The importance of share retention and underwriter reputation as drivers of IPO underpricing is well documented in the literature. However, with evidence supporting both sides of the discussion, there is no consensus about the impact of these variables on the nature and level of the underpricing.

Background of the Problem

Every company, regardless of type, size, industry, or mode of operations, needs access to reliable funding sources to facilitate successful operations, as well as achieve growth objectives, and the IPO is a popular vehicle for accessing such funding (Chandrashekar, 2014; Chughtai, Azeem, Amara, & Ali, 2014; Reutzel & Belsito, 2015). However, while going public represents a critical stage in the firm's life cycle, it also exposes the firm to IPO underpricing and increased public scrutiny (Chandrashekar, 2014; Dolvin & Fernhaber, 2014; Wu, 2014). In issuing an IPO, the firm's objective is to maximize the total proceeds (Bahadir, Dekinder, & Kohli, 2015), but underpricing impedes the achievement of that objective and is, therefore, a concern for issuers (Bacon & Arkorful, 2015; Wu, 2014).

Early researchers explained IPO underpricing by pointing to information asymmetry among the principal IPO stakeholders-issuers, investors, and underwriters as the primary cause (Baron, 1982; Leland & Pyle, 1977; Rock, 1986). Moreover, much of the existing research on this topic sampled companies and IPOs primarily from developed, emerging, and large developing economies (Ritter, 2017). Chen, Wang, Tong, and Zhu (2017) who investigated the relationship between IPO underpricing and economic freedom across 22 countries questioned why the degree of IPO underpricing vary so widely between developed and developing countries. IPO underpricing can negatively impact a company's IPO proceeds, its capacity to capitalize on growth prospects, and by implication, employment opportunities (Miloud, 2014; Ritter, 2015). Therefore, it is essential that company executives deciding to issue IPOs, including those

operating in small developing countries, understand how the number of shares retained by their firms' internal stakeholders, as well as their choice of IPO underwriter, may assuage the negative impact IPO underpricing (Darmadi & Gunawan, 2013; Jiang, Stohs, & Xie, 2015; Ritter, 2015).

Problem Statement

IPO underpricing is a costly practice for companies using IPO to raise capital because of the amount of money (shortfall in IPO proceeds) underpricing leaves on the table (Mayes & Alqahtani, 2015). For the period 1990 to 2012, average IPO underpricing in the United States was 19.7%, which reduced IPO proceeds per IPO by an average of $49.94 million (Thompson, 2016). The general business problem was that IPO underpricing and the related shortfall in IPO proceeds continue to impair the growth prospects for some companies. The specific business problem was that some executives of IPO companies wanting to list on the Jamaica Stock Exchange (JSE) may not understand the relationship between the IPO share retention ratio, the reputation of the IPO underwriter, and IPO underpricing (that is, the stock's percentage return on the first day of trading).

Purpose Statement

The purpose of this quantitative correlational study was to examine the relationship between the IPO share retention ratio, the reputation of the IPO underwriter, and IPO underpricing. The independent variables were IPO share retention ratio, measured by the percentage of IPO shares retained by the firm, and IPO underwriter reputation operationalized as underwriter's rank based on market share of IPOs

supported. The dependent variable was IPO underpricing as reflected by the first-day market return on the IPO stock. The population consists of companies that issued IPOs from January 1986 to July 2018 and trading on the JSE.

The results of this study may contribute to the business community by providing information to executives seeking financing via IPO on how to optimize the IPO process to ensure successful IPOs. The research outcomes may also generate better investment decisions by forcing increased information disclosure from issuers to investors. This study may contribute to social change by helping company executives and policymakers in small developing economies understand how successful IPOs can create employment opportunities, reduce income inequality, improve socioeconomic indicators such as education and health, and the overall standard of living across households within the communities served by these firms.

Nature of the Study

According to Park and Park (2016), the researcher must first consider the occurrence or event under investigation before selecting the research method appropriate to interrogate, clarify, and aid the understanding of the phenomenon. The quantitative method examines the relationship between variables using statistical procedures and numeric data (McCusker & Gunaydin, 2015). In line with the precedence set by previous researchers on this topic, such as Cornanic and Novak (2015), I adopted the quantitative research method for this study. The objective of the qualitative approach is to understand how individual or groups view a social problem (Bernard, 2013), while for the mixed method approach, the researcher purposefully combines the qualitative and quantitative

methods to gain multifaceted insights into an area of focus (Chiang-Hanisko, Newman, Dyess, Piyakong, & Liehr, 2016; Van Griensven, Moore, & Hall, 2014). Therefore the qualitative and mixed method approaches were not appropriate for this study.

I employed a correlational research design for this study. Correlational studies are appropriate if the objective of the research is to determine and explore the relationship that exists between quantifiable variables (Curtis, Comiskey, & Dempsey, 2016). The experimental design, though considered, was not appropriate for this study. Researchers use experiments to determine an outcome by controlling selected variable(s), subjecting participants to specific conditions (D'Onofrio, Lahey, Turkheimer, & Lichtenstein, 2013) or creating equivalence between the control and treatment groups by the random allocation of participants to each of these groups (Crane, Henriques, Husted, & Matten, 2017). These conditions did not exist for this study.

Research Questions

The primary question for this quantitative correlational study was: What is the relationship between the IPO share retention ratio, reputation of the IPO underwriter, and IPO underpricing? The following secondary questions support this primary research question.

RQ-1: What is the relationship, if any, between a firm's IPO share retention ratio and IPO underpricing?

RQ-2: What is the relationship, if any, between the reputation of the IPO underwriter and IPO underpricing?

RQ-3: Does the reputation of the IPO underwriter impact the relationship between IPO share retention ratio and IPO underpricing?

RQ-4: What is the joint relationship, if any, between firm's IPO share retention ratio, the reputation of the IPO underwriter, and IPO underpricing?

Hypotheses

For this study and in line with the primary and supporting research questions, I examined the following null and alternative hypotheses:

$H_0 1$: There is no statistically significant relationship between firm's IPO share retention ratio and IPO underpricing.

$H_a 1$: There is a statistically significant relationship between firm's IPO share retention ratio and IPO underpricing.

$H_0 2$: There is no statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing

$H_a 2$: There is a statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing.

$H_0 3$: The reputation of the IPO underwriter has no statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing.

$H_a 3$: The reputation of the IPO underwriter has a statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing.

$H_0 4$: The firm's IPO share retention ratio and the reputation of the IPO underwriter do not jointly explain IPO underpricing.

H_a4*:* The firm's IPO share retention ratio and the reputation of the IPO underwriter jointly explain IPO underpricing.

Theoretical Framework

The efficient market hypothesis (EMH), credited to Fama (1970), formed the theoretical framework for this study. The foundation principles of the EMH are that all investors share the same subjective probability distribution about the future value of shares, investors' return is indicative of their risk appetite, and that market efficiency exists in three forms (Bertella, Pires, Feng, & Stanley, 2014; Fama, 1970). According to Fama, market efficiency in its strongest form occurs when the securities' prices reflect all available information, while the weak and semi strong forms exist when the stock price reflects historical pricing and public information respectively.

Under conditions of the strong form of market efficiency, the stock price reflects all available information and should compensate for asymmetric information among IPO stakeholders (Jiang et al., 2015; Liu & Forester, 2014; Wu, 2014). Additionally, the suggestion by proponents of the EMH that shares are neither undervalued nor overvalued (Árendás & Chovancová, 2015) does not support the persistence of underpricing identified by Ritter (2015). However, Lowry and Schwert (2004) found that the IPO pricing process is somewhat market efficient because shares prices reflect public information. Therefore, investors and company executives should understand the principles of EMH given the potential impact of available information including their decisions on stock price and the firm's value (Degutis & Novickytė, 2014). The documented link between information asymmetry and IPO underpricing, based

particluarly on the work of Baron (1982), Leland and Pyle (1977), and Rock (1986), provides a basis for the adoption of the EMH as the theoretical frame this study.

Definition of Terms

Throughout this study, a few terms appear repeatedly. These terms may vary in meaning depending on the source or the topic. Therefore, definitions are appropriate to ensure that the reader understands what these terms mean in the context of this study.

Efficient market: According to Fama (1970), an efficient market is one in which the price of the stock fully reflects all available information includingthe firm's fundamental value.

Information asymmetry: Under conditions of information asymmetry, one party has more or better information than the other, creating a potential imbalance of power and setting the stage for possible opportunistic behavior (Fleischer & Staudt, 2014; Imam & Jaber, 2014). In the IPO process, information asymmetry exists between the following stakeholders, potential investors and issuers, issuers and underwriters, as well as among diverse groups of investors (Hull, Kwak, & Walker, 2016; Miloud, 2014; Regalli & Soana, 2013).

Initial public offering (IPO): Also referred to as going public, an IPO denotes the first time a privately owned company publicly sells its stocks on an open market (Asiri & Haji, 2015; Murthy, Singh, & Gupta, 2016; Jiang et al., 2015).

IPO underpricing: Underpricing occurs when the price of the IPO shares is lower than the intrinsic or true market value (Bateni & Asghari, 2014; Peterle & Berk, 2016). This practice results in a positive first-day initial return typically measured in percentage

(Leong & Sundarasen, 2015). The underpricing ratio, according to Wong, Wei, and Chau, (2014) is:

Underpricing ratio = (Day 1 Closing price - Offer price) ÷ offer price

Market efficiency: Market efficiency can exist in three forms: (a) in the strong form, the stock price interprets and reflects all available information (b) the weak form, indicates that the stock price reflects only historical price information, and (c) for the semi strong the price of the stock adjusts only to public information (Fama, 1970; Ţiţan, 2015).

Money left on the table: Money left on the table (MLOT) refers to the reduction in total IPO proceeds accruing to the issuing firm as a result of underpricing (Cornanic & Novak, 2015; Kesten & Mungan, 2015). In quantitative terms, Thompson (2016) defined money left on the table as absolute underpricing that is the difference between the first-day closing price and the initial offer price, multiplied by the number of shares offered. For example, MLOT = absolute underpricing x offering proceeds (Wong et al., 2014)

Share retention: Share retention refers to the block of shares not made available for sale to the public in the IPO but held by firm insiders e.g., the owner(s), directors, or executive management (He, Cordeiro, & Shaw, 2015). In the formulaic expression, share retention is the total number of shares retained divided by the total number of shares outstanding (Darmadi & Gunawan, 2013; He et al., 2015).

Small island developing states (SIDS): Small island developing states (SIDS) are coastal countries that share similar but specific sustainable development challenges relating to size, dependence, and vulnerability, which include limited resources that

deprive them of the benefits of economies of scale and small domestic markets making them highly dependent on international trade (United Nations-OHRLLS, 2015). These countries also rely heavily on remote external markets making them vulnerable to external shocks, as well as susceptible to communication and transportation inefficiencies and related high costs (United Nations-OHRLLS, 2015).

Underwriters: Underwriters support the IPO process by bringing an IPO to market and facilitate the sales of shares/securities to potential public investors (Wu & Wan, 2014). IPOs generally require the underwriting/brokerage services of professional underwriters (Kesten & Mungan, 2015).

Underwriter reputation: An underwriter reputation depends on its equity marketing or IPO history (Cao, Chen, & Wang, 2015). The reputation of the underwriter is a function of the market share of the number and/or value of IPOs brought to market and researchers use this basis to rank underwriters (Cao et al., 2015; He et al., 2015; Wu & Wan, 2014).

<div align="center">

Assumptions, Limitations, and Delimitations

</div>

Assumptions

Research assumptions are accepted principles and ideas that emerge from previous research work or other contexts and may represent aspects of the research but which cannot be proven or demonstrated to be true (Abdulai, 2015; Francis, 2014). While the goal was not to impose any undue restrictions on this study, the following underlying assumptions are noteworthy. First, I assumed that a linear relationship existed between the variables, the sample data points were independent and patterned a normal

distribution (see Zhang, Liu, Cole, & Belkin, 2015), and investors are risk averse with returns related to their risk appetite (Beatty & Ritter, 1986). Second, I assumed that each company in the sample, irrespective of classification, reported accurate information to the JSE, including audited financial and nonfinancial data in each reporting period in the required format.

Not classifying IPOs by separators such as company size, industry, or mode of operation, I assumed that the variables and relationships under investigation would not be sufficiently different across these dimensions to significantly influence the outcomes. The fourth assumption was that the operations of the JSE, including data governance, aligned to the international standards required for exchanges and as such the integrity and authenticity of the data are not principal concerns for investment communities. The fifth assumption was that the characteristics of companies whether multinational corporations (MNCs), small and medium enterprises (SMEs) or local conglomerates listed on the JSE typify companies operating in other small developing countries, thereby allowing for application of the results across territories. The final assumption of this study was that the data collection and archiving procedures adopted by the JSE are in line with international benchmarks and that the data governed by these procedures are exhaustive for the period defined in this research.

Limitations

Limitations are potential weaknesses in this research work generally outside of the control of the researcher (Leedy & Ormrod, 2013; Simon, 2015). The first limitation of this study was that the analyses span a data set that includes only companies that

issued IPOs in Jamaica from 1986 to 2018 and currently trading on the JSE. Despite the complexity and scope of the business arena and the possible range of industry classifications, the second limitation is that there is no distinction in this study between industries or company size; instead, the period of analysis to define the appropriate companies for the sample. Third, although there may be other proxies that can appropriately represent the variables used in this study, the proxy selected for each variable depended on data availability and the opportunity to collect the data independently.

Delimitations

The delimitations are characteristics such as objectives, research questions, and variables, supporting theories and data set that can limit the scope, set boundaries for research, and usually determined by the researcher (Leedy & Ormrod, 2013; Simon, 2015). Although this study is about an empirical analysis of IPO underpricing in small developing countries, the study focused only on Jamaica. A multi country approach to this investigation would have been ideal or even optimal, providing for the inclusion of other countries classified in this group both within and outside of the Caribbean. The multi country approach could allow for the assessment of the impact of dissimilarities and diversity in history, geography, resource availability, and stage of development.

However, this multi country approach was prohibitive from both from the perspective of monetary and time commitments and therefore not adopted. Instead, I limited the analysis to Jamaica and the data set to IPOs issued between the periods 1986 and 2018. There is, however, precedence for this approach, as demonstrated by the works

of Bansal and Khanna (2013) and Mazouz et al. (2013). The assumption that Jamaica sufficiently represented the group of small developing economies compensated for this restriction and allowed for useful insights and indications from the study about the causes of IPO underpricing and the impact on companies operating in other territories.

<div align="center">**Significance of the Study**</div>

Contribution to Business Practice

This study adds value to the business community in that the findings may help company executives in Jamaica and other small developing countries plan for and access financing via IPOs. The results of this study may indicate the existence and extent of IPO underpricing, providing the option to account for the funding shortfall typical from this phenomenon in their strategic and financial planning process. Having the data and analyses to show that IPO underpricing exists in their primary operating space may also allow companies and organizations lobbying on their behalf to frame, justify, and present arguments to minimize IPO underpricing.

The outcomes of this study may also help companies to more effectively plan for the IPO proceeds given that Gumanti, Lestari, and Mannan (2017) found that in Indonesia, IPOs slated to finance investment or growth generated lower underpricing and hence less money left on the table than IPOs designed to fund operations. Additionally, Ganesamoorthy and Shankar (2014), who studied the Indian market, suggested that new investments for business expansion bear results post incubation. Moreover, the expectations for firms with sufficient IPO proceeds include the transformation of

production techniques to achieve improved corporate social performance (CSP) (Luo, Qian, & Ren, 2015).

Regulatory and government policymakers who seek to create a business-friendly environment may use the findings of this study as a guide to stimulate employment and hence growth and development in small economies. Ritter (2015) reported that from 1996 to 2010, the average U.S. company added 822 jobs after a successful IPO and Pandes and Robinson (2014) indicated that the reduction in IPOs in the United States in the past decade (2000 to 2012) resulted in the loss of millions of jobs. From the perspective of the investor, the outcomes of my study may lead to more informed investment decisions by forcing increased information disclosure from issuing companies, providing investors with greater access to information. While existing mandatory disclosure requirements in the form of consumer protection laws increase information availability (Lager, 2016), the findings from this study could further influence expectations of investors regarding access to information as well as the drivers of underpricing. However, these disclosures and reporting requirements can be a costly and cumbersome barriers to accessing the funding markets especially for small businesses (Lager, 2016).

Implications for Social Change

The outcomes of this study may contribute to social change in the following ways. Successful IPOs lead to increased growth and profitability for the firm (Ritter, 2015), which may help to improve compensation and working conditions for firm employees. Firms that are able to maximize IPO proceeds may also be able to, through growth and expansion, increase employment opportunities for the communities which they serve

(Ritter, 2015). The increased employment may create additional opportunities to improve income distribution, socioeconomic indicators such as health and education, as well as improve the quality of life and overall standard of living across households (Sappin, 2016).

A Review of the Professional and Academic Literature

Introduction

The body of research evidence that supports the presence and persistence of IPO underpricing is expansive and commensurate with the interest and scrutiny from market players and research scholars (Jeribi, Jeribi, & Jarboui, 2014). The investigation of IPO underpricing spans country borders (Ritter, 2015), business cycles (Henry & Gregoriou, 2014), and diverse market conditions (Hedhili & Kammoun, 2014). The frequency of IPO issues may also explain the level of publicity and interest from academia as well as the extensive documentation on the subject (Cichello & Lamdin, 2016; Liu & Forester, 2014). Numerous empirical studies exist on the factors that could impact the first-day returns of IPOs, however meaningful comparison of outcomes to determine statistically significant and economic relevance can be problematic to establish because of differences in model and variable specifications as well as variation in research design, and choice of control variables (Butler, Keefe, & Kieschnick, 2014).

As reflected in the review of academic literature that follows, there is a broad pool of research work on IPO underpricing and the possible impact of share retained by the firm's internal stakeholders and the reputation of the IPO underwriter. Butler et al. (2014) who examined 48 potential determinants of IPO underpricing indicated that share

retention and underwriter reputation, the two independent variables for this study are among the 16 most robust determinants of IPO underpricing. This breadth of IPO information commenced with the foundation theorists who, based on their research, validated information asymmetry as one of the primary determinants of IPO underpricing (Baron, 1982; Rock, 1986; Welch, 1989), with ensuing researchers reporting both supporting and opposing empirical outcomes (Katti & Phani, 2016). However, the geographical focus of these previous research works has been primarily on developed, emerging, and the larger developing economies (Boulton, Smart, & Zutter, 2017; Ritter, 2017; Thompson, 2016) with limited emphasis on small developing countries. Given that underpricing is higher for developing countries relative to developed economies (Song et al.s,2017), and that the absence of small developing countries in much of the previous research, it may be helpful to explore IPO underpricing in the context of small developing countries, using Jamaica as the proxy for such smaller economies.

Search Strategy and Organization of the Literature Review

The starting point in executing the research strategy for this study was to identify the key terms and phrases to guide the literature search. These terms came from the problem and purpose statements, as well as the research questions and related hypotheses and included *IPOs, IPO pricing, information asymmetry, IPO underpricing, share retention, underwriter reputation* and *small developing countries*. Using these as initial search parameters, I conducted multiple searches using ABI / INFORM Complete, Business Source Complete, Emerald Management, ProQuest, and SAGE Premier. These

databases provide access to thousands of full-text academic articles from peer-reviewed journals.

The scope of the research. By reviewing the titles and/or abstracts of the over 350 articles, books, seminal works, and reports that surfaced from the sources listed above, I further refined using alignment to the problem and purpose statements as the guide to achieve a final reference count of 264 including 249 articles. Tables 1 and 2 contain the classification of the total references by publication type, date and peer-reviewed features. The date and peer-reviewed requirements for the articles are at 86.75% and 94.38% compliance levels respectively.

Table 1

Reference Count: Peer-Reviewed Compliance

Publication	Peer-reviewed	Non-peer-reviewed	Total	% Peer-reviewed
Articles	235	14	249	94.38%
Books		3	3	0%
Websites		9	9	0%
Government/International Agency		3	3	0%
Total	235	29	264	89.02%

Table 2

Reference Count: Date Compliance

Publication	Current (i.e., under 5 years)	Dated (i.e., over 5 years)	Total	% Current
Articles	216	33	249	86.75%
Books		3	3	0%
Websites	6	3	9	66.67%
Government/ International Agency	3		3	100%
Total	225	39	264	85.23%

Organization of the review. The literature review comprises four broad components. The first includes an overview and the restatement of the purpose of the study and the related hypotheses to provide context for the review of literature. The second component contains an in-depth discussion of the fundamentals, relevance, and empirical evidence of the EMH which forms the theoretical framework for this study. The third part of the literature review encompasses a discourse on the independent variables, IPO share retention ratio, and the reputation of the IPO underwriter. The discussion on each of these independent variables, includes the definition, measurement, and relationship, if any, to the dependent variable as defined in the purpose statement of this study. Following a similar format as the third component, the final segment of this literature review comprises a detailed discussion on the dependent variable, IPO underpricing including the definition, measurement, the impact on the actual IPO proceeds and money left on the table. This element of the literature review also includes the information asymmetry-based explanations for IPO underpricing purported by the foundation theorists, as well as evidence from related empirical research.

The purpose of this quantitative correlational study was to examine the relationship, if any, between IPO share retention ratio, the reputation of the IPO underwriter, and the first-day market return on the IPO stock price (IPO underpricing). In line with this purpose statement, I examined the following null and alternative hypotheses:

$H_0 1$: There is no statistically significant relationship between firm's IPO share retention ratio and IPO underpricing.

H_a1: There is a statistically significant relationship between firm's IPO share retention ratio and IPO underpricing.

H_02: There is no statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing

H_a2: There is a statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing.

H_03: The reputation of the IPO underwriter has no statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing.

H_a3: The reputation of the IPO underwriter has statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing.

H_04: The firm's IPO share retention ratio and the reputation of the IPO underwriter do not jointly explain IPO underpricing.

H_a4: The firm's IPO share retention ratio and the reputation of the IPO underwriter jointly explain IPO underpricing.

The Efficient Market Hypothesis (EMH)

Foundation theorists of IPO underpricing including Baron (1982), Leland and Pyle (1977), and Rock (1986) explained that IPO underpricing, the dependent variable in this study, in the context of information asymmetry. However, in an efficient market, the stock price already reflects all relevant information as soon as they become available (Naseer & Tariq, 2015) and should therefore eliminate concerns about information asymmetry. Accordingly, the EMH implies that the investment should focus on the investors' risk and return tradeoff and not information asymmetry and by extension

underpricing (see Naseer & Tariq, 2015). Additionally, Hu (2014) implied that in the face of opportunistically behavior by the firm, if markets are efficient and integrated, then market gains (including underpricing) should be zero. Such is the nature of the debate surrounding the EMH and it is this debate around the presence of market efficiency, information asymmetry and by implication IPO underpricing that supports the adoption of the EMH as the theoretical framework for this study.

Despite having building blocks dating back to the 16th-century, Fama (1970) presented the central tenets of the EMH as documented in the current body of literature. According to the EMH, as enunciated by Fama (1970), all investors share the same subjective probability distribution about the future value of their stock investment and investors' investment returns align to their risk appetite (Bertella et al., 2014; Fama, 1970). According to Fama, the market efficiency exists in three forms: in the strong form, the market price of the stock fully reflects all available information. Market efficiency can also exist in the weak and semi strong forms where securities prices reflect only historical pricing and price information and public information respectively (Fama, 1970). The EMH and its main principles are founded on the concept of information asymmetry which underpins the foundation arguments of and the relevance to IPO underpricing.

The principles of market efficiency that support the EMH seem consistent with the pronouncements of Gibson (1889). According to Gibson, when shares go public, the market-driven acquired value represents the best unbiased representation of the information available on these stocks. However, market efficiency rarely exists in its

purest form and market efficiency is not static but evolves such that periods of both market efficiency and market inefficiency can exist (Árendás & Chovancová, 2015). Gehrig and Fohlin (2006) found that to be true centuries before. In their investigation of stocks trading on the Berlin Stock Exchange in the late 19th and early 20th centuries, Gehrig and Fohlin found that informational efficiency changed over time. It is therefore important for executives to understand that the stock market displays varying levels of efficiency over time and accordingly prices may signal varying level of company information to investors.

Fama (1970) stated that an ideal market is one in which security prices provide accurate signals about resource allocation. The implication of Fama's position is that securities prices and the retention of shares by management release signalsto the market (and investors) about the firm's operations, including production-investment decisions, because under conditions of market efficiency, the prices of securities fully reflect available information on the companies (Fama, 1970; Keefe, 2014; Naseer & Tariq, 2015).

The EMH is one of the most controversial economic theories of the last half-century with questions raised about its relevance and empirical validity (Árendás & Chovancová, 2015; Degutis & Novickytė, 2014; Hu, 2014). According to Ţiţan (2015), market efficiency is difficult to test resulting in inconclusive empirical outcomes. De Sousa, Campos, and Howden (2015) lamented that as a hypothesis, EMH does not meet the two necessary conditions of a hypothesis; a logical proof of the EMH does not exist and it does not meet any rigorous empirical test without critical reservations. As such, de

Sousa et al. advocated that the EMH is more of a conjecture that continues to trigger controversy. With increased speculation, instability, and vulnerability to shocks in the financial system, the EMH is perpetually on trial by the global financial markets and economies (Chakrabarti, 2015), without consensus on the verdict. The debate surrounding the EMH and its implications for investors' behavior continue with theoretical and empirical studies both supporting and invalidating the findings.

An efficient market reflects all meaningful information, and there should not be any undervalued or overvalued shares (Árendás & Chovancová, 2015). Also, the presence and persistence of asset-pricing anomalies, such as IPO underpricing, may cause researchers to challenge the assertion that asset returns cannot be predicted (Chakrabarti, 2015). Further, the IPO pricing processes create a mechanism outside the self-regulating market framework, which does not fully incorporate public information and may suggest information asymmetry in favor of the underwriter (Lowry & Schwert, 2004). For example, the IPO pricing process contravenes the principles of the efficient market when prestigious underwriters price the offer in line with the lower, historical value based on industry fundamentals (Chua, 2014; Ojo, 2014).

The information advantage of the issuers relative to the investors is critical to price setting process for an IPO (Imam & Jaber, 2014) and contradicts the principles of EMH (Liu & Forester, 2014). This argument seems to find support in the report by Prorokowski and Roszkowska (2014) that in the global financial crisis environment investors are more prudent towards equity investments in emerging markets. Therefore, in this example, a lower offer price and hence underpricing would be necessary to

compensate investors for assuming the risks associated with investing in a company for which complete information does not exist (de Oliveira & Martelanc, 2014; Liu & Forester, 2014; Wu, 2014). This argument appears to controverts one of the central themes of the EMH that share price reflect varying levels of market information. Furthermore, the market anomaly found by Liu and Forrester (2014), when they investigated 6,247 firms that issued IPOs between 1987 and 2012 could imply that the EMH continues to be vulnerable to criticism that complete information exists in an efficient market environment. Liu and Forester also suggested that management decisions can impact IPO performance, implying a misalignment with the principles of EMH. The EMH's indication that prices reflect varying levels of information could contradict the potential investors' need for underpricing to compensate for the risk of investing in a new company or the importance of signals such as share retention and underwriter reputation.

Fleischer and Staudt (2014) examined 1,326 IPOs issued between 2004 and 2011 and found evidence of another example of empirical pricing anomaly. The results of this research work by Fleischer and Staudt indicated that taxes, though not considered in the EMH framework, could benefit either the issuer or investor in the IPO process. While Alcaniz, Gomez-Bezares, and Ugarte (2017) found evidence that information (intellectual) disclosure remains consistent with the semi strong form of EMH but had no impact on IPO underpricing.

The context of EMH implies that the offer price adjusts only partially to the information available in the IPO pricing period leading to a positive relationship between the offer price and underpricing (Boulton, Smart, & Zutter, 2013). The market correction

occurs because the efficient market mechanism, as defined, had no influence on the pricing of the IPO shares, or the investors' decisions made in this environment of information asymmetry (Fleischer & Staudt, 2014; Regalli & Soana, 2013). These adjustments could mean that the IPO offer price did not previously reflect the required level of information or the company's fundamental value, as the EMH seem to imply. Additionally, the presence of asset-pricing anomalies such as IPO underpricing leads to questions about the empirical strength of the EMH given that underpricing should compensate investors for investing in an IPO company in the absence of information equity (Liu & Forester, 2014; Wu, 2014). The evidence from empirical studies that anomalies such as IPO underpricing exist and may be required by potential investors raises questions about the EMH principle that price reflect varying levels of available information.

Among the theorists who questioned the validity of the EMH are the proponents of behavioral finance. Behavioral finance is a significant contributor to the field of finance by applying psychology models and theories to explain investor behavior in the financial market particularly as related to their patterns in financial decision making (Tetteh & Hayfron, 2017). The starting point for this theory is the human factor – what people do and why (Kapor, 2014). While the EMH focuses on the rationality of investors, stock market prices reflecting all available information, and investors making decisions based on probability distribution and risk appetite, the advocates of the behavioral theories argue that investors remain susceptible to other influencers such as utility maximization, psychological and socioeconomic factors such as age, education, capital

invested, culture, and profession (Fama, 1970; Hu, 2014; Huang, Shieh, & Kao, 2016; Kapor, 2014; Ritter, 2003a; Tetteh & Hayfron, 2017).

These psychological biases influence their norms, beliefs, and preferences and hence manifest in their behaviors and habits (Tetteh & Hayfron, 2017). Additionally, the psychological factors better explain the irrational behaviors, irregularities, anomalies, and/or inconsistencies observed, identified, or experienced in the market and contradict the EMH's rationality assumption (Huang et al., 2016; Tetteh & Hayfron, 2017). Additionally, Huang et al. (2016), as well as Tetteh and Hayfron (2017), concurred that the arguments of the traditional theories cannot adequately explain some of the systematic errors that can affect the market price of assets causing irrational decisions, inefficient placement of resources, market anomalies, and volatilities. By understanding how people react, investors may be able to modify their behaviors to achieve more rational and profitable outcomes while minimizing the psychological biases in investment process and undue exposure to adverse consequences such as higher transaction costs (Yusuf, 2015). The suggestions by behavioral theorists that dynamics other than the traditional factors such as risk appetite may influence investors' decisions could explain why potential investors may be willing to participate in the IPOs of new companies and consider signals of firm quality such as share retention and underwriter reputation.

According to Ritter (2003a), the prospect theory, which is a part of the broad behavioral finance group of theories, is purely descriptive, assumes loss aversion, and helps to explain choices in the context of uncertainty. Ritter also argued that behavioral finance incorporates the behavioral principle of framing in the choices individuals face,

and as such if given two related options, an individual may choose to treat the events separately or integrate them. Ritter suggested that this framing principle may help to explain why firms seem not to negotiate harder with their IPO underwriter to minimize the amount of money left on the table. When issuing an IPO, the company owner/executive integrates the options of IPO underpricing and reduced IPO proceeds with share dilution, and considers the former a net better option and hence does not push for less underpricing (Ritter, 2003a). The IPO underwriter may capitalize on this behavioral finance process adopted by the owner to build investor loyalty through additional underpricing (Ritter, 2003a; Wu, 2014). The arguments of behavioral finance and its suggested influence on the relationship between the principals of IPO issuing firm and underwriters may underscore the relevance of underwriter reputation as a signal to the market and a variable in this study.

The contradictions and empirical anomalies outlined above may help to explain why the empirical evidence on IPO pricing is such a puzzle to supporters of the efficient market hypothesis (Alcaniz et al., 2017; Bansal & Khanna, 2013). Moreover, it may also explain the suggestion by Țițan (2015) that a new theoretical model may be necessary given the pace and level of market and economic changes. Despite the controversy around the EMH, including the constant debate around the impact of information availability on IPO pricing, the EMH continue to influence the operations of the modern financial markets, and the importance of understanding the role of market efficiency and information availability (Degutis & Novickytė, 2014; Lowry & Schwert, 2004). These reasons justified the use of EMH as the theoretical framework of this study. The principle

of market efficiency embedded in the EMH and the documented differences in economic fundamentals between developed and developing countries including market conditions may impact IPO underpricing (Liu, Uchida, & Gao, 2014; United Nations-OHRLLS, 2015). In light of these factors, exploring IPO underpricing as a market pricing anomalies in the context of a small developing economy yielded outcomes that may broaden the debate and in the process expand the body of empirical evidence on this topic.

In the remaining segments of this literature review, I discussed, from the perspective of the literature, the independent variables for this study, that is, IPO share retention ratio and the reputation of the IPO underwriter, followed by the dependent variable, that is, IPO underpricing. For each variable, the discourse include the definition and measurement of the variable as well as the relationship with the other variables in this study. The supporting theoretical and empirical evidence outlined in the literature provided the context and basis for the discussion.

IPO Share Retention Ratio

The IPO share retention ratio is one of two explanatory variables in this quantitative correlational study. In this study, share retention represents the block of shares not available for sale to the public in an IPO but retained by the firm's internal stakeholders (Alcaniz, Gomez-Bezares, & Ugarte, 2015; Darmadi & Gunawan, 2013). The related IPO share retention ratio refers to the total number of shares retained in the firm expressed as a percentage of the total number of shares available (He et al., 2015).

Measurement of the IPO share retention ratio. Shares retention ratio which refers to the percentage of shares retained by the firms' insiders, or management equity

ownership, measures the total shares owned by insiders (i.e., management, owners, and directors) compared to the total number of shares outstanding before the IPO (He et al., 2015). The use of this ratio occurred frequently in the literature.

IPO retention ratio = [(# of shares O/S - shares offered in IPO) ÷ # of shares O/S] x 100
 where O/S means outstanding

In Jamaica, there is a 20% minimum level of shares that must be made available to the public in an IPO (JSE, 2009). However, cultural norms such as the fear of relinquishing company controlmay increase the tendency for companies in Jamaica, especially smaller companies to treat this minimum as their maximum (JSE, 2018). It is possible that some of these procedurals differences may impact the level of shares retained and hence IPO underpricing in Jamaica. Accordingly, this study may add to the discussion on the impact of IPO share retention ratio on IPO underpricing.

Share retention as a signal. Leland and Pyle (1977) were the first to introduce the argument that the shares retained by a firm act as a signal of IPO quality and firm value. According to the signaling theory, the business owner has information about a project or firm that can ascribe a specific value to the project or firm slated for financing, but the principals of the firm has no reliable means of communicating this value to prospective investors who, according to the EMH will use their subjective probability distribution to value the project or firm (Katti & Phani, 2016; Leland & Pyle, 1977). Leland and Pyle suggested that if potential shareholders believe it is in the best interest of the business owner to be honest about the value of the project or firm, these investors will respond positively to an entrepreneur's signal regarding the project or firm value.

Applying calculus, Leland and Pyle applied their theoretical model to introduce the concept that the percentage of shares retained in the project or firm by the business owner is a noiseless signal, perceived by investors as an indication of the true project or firm value. Therefore, the issuer's willingness to invest in their firm's equity serves is a signal to the market of project or firm quality value, and without this signal of quality, the average return on the project or firm's stock may be low (Leland & Pyle, 1977).

The implication of Leland and Pyle's (1977) signaling model is that potential investors view retention of shares by internal stakeholders as a valuable signal such that a decrease/increase in the proportion of shares retained would constitute a negative/positive signal for the market. Chen and Yang, (2013) suggested that the signaling theory offers little guidance on what the relationship should be between underpricing and managerial ownership, and therefore argued that this relationship is an empirical issue. The signaling model put forward by Leland and Pyle laid the foundation, for the discussion of the empirical research on IPO share retention ratio as a signal to potential investors and as one of the drivers of IPO underpricing.

Kumar (2017) investigated the relationship between share retention and underpricing in the Indian market. Using the standard t-test for equality of means and the F-test for overall significance as benchmarks, Kumar concluded, from the examination of 112 service sector IPOs issued in the Indian market, that a positive relationship exists between share retention and underpricing. The findings of Jiang et al. (2015) contradicted those of Kumar, indicating a negative relationship between the number of shares retained by an IPO issuer and level of underpricing. Darmadi and Gunawan (2013) agreed that the

shares retained by insiders reduce information asymmetry by signaling quality to potential investors. Higher share retention by the internal stakeholders also aligns the interests of managers with those of external shareholders demonstrating the convergence of interest effect (Chen & Yang, 2013) and in the process reduces the possibility of principal-agency conflicts (Darmadi & Gunawan, 2013; Djerbi & Anis, 2015).

The availability of information to the market, as reflected by the sale of shares or the reputation of the underwriter, impacts the first-day return and suggests lower information asymmetry, improved market efficiency, and less underpricing for firms that disclose more information about the IPO to the public (Chhabra, Kiran, & Sah, 2017; Fama, 1970). Miloud (2014) suggested that company insiders retaining a significant equity position in the company is indicative, from the investors' perspective, of the IPO quality because internal stakeholders of high-quality companies would retain a relatively high equity stake in their company. Miloud's model implied that underpricing is not necessary to induce the investors to participate in an IPO issue because they can infer firm value and IPO quality from the share retention signal and that there is an inverse relationship between the share retention ratio and IPO underpricing. The study of the interaction of share retention and IPO underpricing in Jamaica may help to assess congruence to or divergence from this model.

Share retention and IPO underpricing. Darmadi and Gunawan (2013) used the premise elucidated by Leland and Pyle (1977) to build the hypothesis around ownership structure. Accordingly, Darmadi and Gunawan hypothesized that a higher fraction of shares retained by insiders (i.e., ownership concentration) should lead to greater

underpricing. Darmadi and Gunawan applied cross-sectional regressions to 101 firms that issued IPOs in Indonesia's primary equity market between January 2003 and July 2011, mapping underpricing as the dependent variable to four explanatory variables and selected control variables. According to Bernerth, Cole, Taylor, and Walker (2017), control variables help improve the accuracy of estimates of the relationships among variables and remove some of the distortions, noise, and contamination that may surface in the analyses. Control variables may also enhance the accuracy of the estimates of relationships among variables, improve conservativeness of the hypotheses tests, or reduce the possibility of spurious explanations of the empirical findings (Becker, et al., 2016).

The findings from Darmadi and Gunawan's (2013) research did not support the hypothesis and indicated that ownership concentration is not significantly related to underpricing (Darmadi & Gunawan, 2013). Gumanti et al. (2017) found similar insignificant results when they investigated 290 IPOs that went public between 1989 and 2005 in the Indonesian market. Gumanti et al. found a negative, insignificant relationship between the shares retained and the level of underpricing. The outcomes from these studies contradicted Leland and Pyle's original conclusion and implied that potential investors might not see share retention by insiders as an indicator of the IPO firm's quality. Darmadi and Gunawan speculated that Indonesia's special market conditions of low proportions of shares offered to the public with often no change in ownership/control of the IPO firm impacted the results. The Jamaica IPO market operates under similar conditions as that of Indonesia in relation to the low proportion of IPO shares offered to

the market, and therefore the outcomes of this study may provide insights comparative with those of Darmadi and Gunawan.

Darmadi and Gunawan (2013) also explored whether share retention for family-owned businesses provided any unique signals to investors. The results from their investigation indicated that the IPO firm's share retention ratio seems not to signal firm quality to investors nor reduce the level of information asymmetry (Darmadi & Gunawan, 2013). Signori, Kotlar, De Massis, and Vismara (2015) found that retaining control was more important to family owners than economic wealth and hence owners of family businesses tended to willingly accept IPO underpricing. Signori et al. investigated 1,743 IPOs issues from 1995 to 2011 across seven European counties. Mousa, Ritchie, and Reed (2014) found a negative relationship between founder-CEO board involvement and IPO value when they examined 123 high-tech firms that went public from 2001 to 2005. Accordingly, Mousa et al. interpreted this negative relationship to mean that investors viewed the dominance of founders as a negative signal. The information that many Jamaican IPO firms tend to offer only the minimum number of shares to the market may raise similar concerns among investors.

Darmadi and Gunawan (2013) also examined share retention for publicly listed state-owned enterprises and found that the protracted corporatization process that occurs before an IPO implies effective corporate governance practices, strong firm performance, and appeared to signal IPO quality to investors but led to greater underpricing. Salama and Khalifa (2014) found for Egyptian state-owned companies, a significant relationship between offer ratio, (i.e., the inverse of share retention ratio), and the initial returns,

which were significantly different from the market average. The results indicated that underpricing was a signal to attract market players to invest in the IPO (Salama & Khalifa, 2014).

Alcaniz et al. (2015) explored whether low levels of retained ownership meant that the firm must compensate for this negative signal by disclosing more information in the IPO prospectus. Alcaniz et al. applied linear and non-linear regressions to a sample of 56 Spain-based companies that issued IPOs during the period 1996 and 2007 and found support for their prediction of a significant negative relationship between the percentage of shares retained and the level of information disclosed. The results implied that firms often try to correct any negative signal communicated to the market by low share retention (i.e., below 50%) with an increased level of information disclosure especially non-financial (Alcaniz et al., 2015). In summary, the empirical evidence seems to suggest that the higher the percentage of shares retained by the previous owner(s) the more impactful the signal to the market (see Hidayat & Kusumastuti, 2014).

The high-quality signal emanating from a high-retention ratio is justified because owners of a good company would be reluctant to effectively transfer a large proportion of the future cash flows to an outside investor by lowering their current shareholding (Miloud, 2014). Firms are therefore, willing to underprice to generate excess demand and ensure broad-based distribution of the shares among many small shareholders instead of concentrated ownership in the hands of any single external shareholder who could challenge the management (Miloud, 2014). Within this context, Miloud's (2014) model explored whether dispersed ownership increases with IPO underpricing by analyzing

approximately 798 IPOs issued on the Paris Stock Exchange from January 1995 to December 2008. The findings revealed a negative relationship between underpricing and the number of shareholders (i.e., dispersed shareholdings) suggesting that a high degree of underpricing correlates to an increased ownership concentration (Miloud, 2014). This outcome combined with the findings regarding the relationship between shares retained, liquidity, and trading activities led Miloud to conclude that French investors may not interpret the share retention signal from pre-IPO owners as worth contemplating. Miloud's findings contradicted that of Leland and Pyle (1977) but aligned with those of Chen and Yang's (2013) China-based study and Darmadi and Gunawan's (2013) research in the Indonesian market. Retention of ownership is also an important factor for Jamaican IPO firms and the average share retention ratio may supports this claim.

Deb's (2014) research probed whether the proportion of the IPO shares retained by the firm's insiders and the IPO issue price communicate to investors privately held information such as the fundamental value of the firm. Share retention by external and internal directors provides a strong signal of firm quality and enhances the credibility of the IPO firm (Deb, 2014). The directors' inability to sell their shares in the IPO firm until after the lock-up period supports this perspective (Deb, 2014). Deb hypothesized that increased equity ownership by both inside and outside directors resulted in lower underpricing and tested this hypothesis by applying correlation and regression analyses to a sample of 417 firms that issued IPOs in the U.S. market between 2001 and 2004. Isolating underpricing as the dependent variable and internal and external directors as explanatory variables, Deb found evidence that the level of shares retained by directors at

the time of an IPO is a significant corporate governance signal. Additionally, Deb indicated that this governance signal addressed the issue of underpricing, and allowed pre-IPO owners to maximize returns with lower underpricing, and less money left on the table. The results from Deb's study were consistent with those of Ammer and Ahmad-Zaluki (2015), who investigated 190 companies that issued IPOs in the Malaysian market between 2002 and 2012 and found that a negative relationship existed between management ownership and IPO underpricing. The general indication from these studies is that shares retained by the firm impact the level of underpricing of the IPO issue, thus increasing the relevance of this which also explored the impact of share retention on IPO underpricing.

However, the outcomes from the research of Ammer and Ahmad-Zaluki (2015) run counter to those of Darmadi and Gunawan (2013) who did not find any significant relationship between share ownership and underpricing and Miloud (2014) who concluded that French investors did not read any signal from share retention. It is possible that the difference in market and regulatory fundamentals specific to the geographical jurisdictions of these studies influenced the difference in the outcome and provided a basis for this study to explore these variables in Jamaica to determine whether there is support for or opposition to the outcomes.

The Reputation of the IPO Underwriter

Given the complexity of the IPO process and the possible influence that the underwriter can bring to bear in an IPO negotiation, it is advisable that the IPO firm engages the support of an underwriter (Cornanic & Novak, 2015; Wu & Wan, 2014). The

success of an IPO depends heavily on the underwriter's ability to tell and sell a story about a bright future for a company with an exceptional business plan and execution strategy (Wu & Wan, 2014). The underwriter understands that according to Yu and Wen, (2015) issuer's demand for capital and investor's sentiment are essential drivers of offer volume.

Additionally, the reputation of the underwriter matters because a more prestigious underwriter brings more reputational capital to the IPO process than the less reputable underwriter, and IPO firms who engage high-reputation underwriters receive significant incremental benefits, including higher offer values, (Bangsund, 2014; Fernando, Gatchev, May, & Megginson, 2015). Dimovski (2015) added that these reputable underwriters are often not more costly, based on the investigation of 87 Australian A-REIT IPOs issued from 1994 to 2013. Underpricing increases the overall cost of the issue (Rubalcava, 2016), and while cost is a significant factor for firms especially for SMEs, in may be worth it to acquire the underwriting/brokerage services of a prestigious investment bank. This argument that the underwriter's reputation brings value to the IPO process supports the inclusion of underwriter reputation as one of the independent variable in this study.

The role of the underwriter. The IPO underwriter plays the critical role of providing reliable information to potential investors (Adriani, Deidda, & Sonderegger, 2014). The underwriter also supports the firm in other essential roles such as validation which signals to investors the status of the business and is the primary focus of the certification theories initiated by Logue (1973), price stabilizer (Deb, 2014; Mazouz et al., 2013), and liquidity provider (Deb, 2014). While the IPO can build off a firm's

visibility and notoriety (Batnini, & Hammami, 2015), the underwriter's reputation also signals to investors the strength of a firm by certifying the quality of and adding credibility to IPOs, especially for young firms (Bangsund, 2014; He et al., 2015). Further, the reputable underwriter can ease the uncertainty associated with the asymmetric information between IPO issuers and investors, moderate the perception by investors of issuer dominance (He et al., 2015), and help to nullify the firm's risk of newness to the market (He et al., 2015; Reutzel & Belsito, 2015; Wu & Wan, 2014).

Additionally, Bangsund (2014) indicated that the reputable underwriter also signals the quality and effective pricing of the IPO, that is, the price reflect the value of the stock, which supports the tenets of the EMH. The underwriters execute their various roles by capitalizing on their extensive contact network to push demand and thereby helping the firm to successfully achieve its funding objectives (He et al., 2015; Wu & Wan, 2014). According to He et al. (2015), there is sufficient research to support the position that underwriters must straddle the competing interests of the issuer and the investor. The issuer would prefer a higher price to maximize IPO proceeds and minimize money left on the table, while the investor would like to optimize short-term gains (Mazouz et al., 2013; Reutzel & Belsito, 2015). Serving the interest of the issuer is an imperative for the underwriter because higher IPO proceeds mean higher underwriting fees and greater access to future IPOs and SEOs, given that companies' behavior relating to underwriting of issues tends to be repetitive (Cao et al., 2015).

Similarly, the underwriter must also ensure that the investors' interest gain the significnace it requires even at the expense of lower underwriting fees in the current

period (He et al., 2015; Wu, 2014). Accordingly, satisfying the investors increases underwriter reputation among their clientele, generates demand, increases the probability of the IPO success, carves out a loyal set of potential investors, and lowers the amount of effort needed to underwrite current and future IPOs (He et al., 2015; Wu, 2014). Even though underwriters' roles and behaviors tend to be universal across borders, there are instances in Jamaica when IPO firms do not employ the formal underwriting services but retain an investment bank for advisory and brokerage services (JSE, 2018). Omitting the formal underwriting process may impact the role underwriters play in supporting IPOs in Jamaica and as such this study may expand the discussion on the role of the underwriter in the IPO process and the relationship with IPO underpricing.

Measuring underwriter reputation. The IPO literature provides various proxies used by researchers to measure the reputation of the IPO underwriter. Wu and Wan (2014) defined underwriting activities in terms of dollar value in the official currency of the research location or volume that is, the number of IPOs underwritten and or the frequency. These measures, derived from IPO activities underwritten over time, are appropriate given that reputation typically improves over time and depends on past successes (Wu & Wan, 2014). Market share is the most common measure of underwriter reputation and provides indicative information on the quality of the underwriter (Bangsund, 2014). In 2015, Jeribi introduced a multi-dimensional measure in the Tunisian market and ranked underwriters accordingly. Jeribi's (2015) approach for measuring underwriter reputation involved the use of a composite of measures adopted by previous researchers. Jeribi augmented the traditional measures including those

introduced by Carter and Manaster (1990) and Megginson–Weiss (1991) with additions such as including the number of IPO shares requested by each underwriter relative to the total shares, the underwriter's capital, the size of the IPO issue for underwriting as well as the underwriter's turnover and age.

The two most frequently used methods outlined in the literature for measuring the reputation of the IPO underwriter are Megginson–Weiss (MW) (1991) and Carter and Manaster (CM) (199), sometimes used in the updated/modified or extended forms. Loughran and Ritter (2004) amended the CM measure ranking system to account for IPOs led by penny stock underwriters and range from a low of 1 to 9 (Loughran & Ritter, 2004). The measure for the CM indicator defines the underwriter rankings in tombstone announcements with ranks ranging in scores from 0.5 to 9 (Carter & Manaster, 1990). The MW measure estimate the market share of underwriters based on IPOs underwritten/supported using a range from zero to one hundred (Jeribi, 2015).

There is no universal rule regarding the ranking system adopted by a researcher, but depends on the preference of the research or can be specific to the research, for example, Cao et al. (2015) used MW primarily but included the CM to improve the robustness of the outcomes while, He et al. (2015), Deb (2014), and Reutzel and Belsito, (2015) followed only the CM measurement approach. Other studies adopted country/region specific measures depending on the geographical scope of their research; for example, (a) Wu and Wan (2014) measured underwriter reputation using the ranking system of the Securities Association of China for their China-specific study, and (b) Indriani and Marlia's (2015) applied the ranking from the Indonesian Stock Exchange

(IDX) to study underwriter reputation in Indonesia. Other researchers opted to collect and analyze market information such as Mazouz et al. (2013) who studied Hong Kong. Darmadi and Gunawan (2013) used for their research on Indonesia globally recognized sources such as the Bloomberg ranking. The information in the literature indicated that the method adopted to measure underwriter reputation is decided by the researcher, and the adoption a country-specific approach to measure underwriter reputation in this study has precedence in the literature.

Underwriter reputation and IPO underpricing. Implicit in the findings of Beatty and Ritter (1986) is the position that effective pricing is an primary deliverable for the underwriter. According to Wu and Wan (2014), excessive underpricing or overpricing by the underwriter leads to loss of credibility in the market, impaired reputation and may lead to loss of investors, issuers, and income. In contrast, having a track record of effective pricing builds an enviable reputation that can translate to successful IPOs and increased income for the underwriter (Wu & Wan, 2014).

The literature includes extensive empirical studies on the relationship between underwriter reputation, asymmetry information, and IPO underpricing with diverse outcomes and conclusions. Results exist to support both the presence (positive and negative) and absence of a significant relationship among these variables. First, the central premise of the certification theories as enunciated by Booth and Smith (1986), Carter and Manaster (1990), and Logue (1973) is that a negative relationship exists between underwriter reputation and underpricing and that the underwriter's certification role reduces the need for underpricing. Subsequent research works which support this

position include Darmadi and Gunawan (2013), who examined the impact of underwriter reputation on IPO underpricing, board structure, and corporate ownership in 101 firms that issued IPOs between 2003 and 2011 in the Indonesian market.

Indriani and Marlia's (2015) also found evidence to substantiate their prediction of significant correlation between underwriter reputation and underpricing. After testing a sample of 72 firms that issued underpriced IPOs in the Indonesian market during that period 2009 and 2013, Indriani and Marlia concurred with the theories of certification models. Gumanti, Nurhayati, and Maulidia, (2015) found a significant negative relationship between the reputation of underwriters and IPO underpricing supporting the argument that reputable underwriters could lead to lower underpricing. Indriani and Marlia's work was specific to Indonesia where they found that underpricing averaged 27.22% and this outcome is similar to that of Darmadi and Gunawan (2013) and Gumanti et al. who conducted research in the same market, but higher than the level of underpricing found from the U.S. based research of Deb's (2014) and Ritter's (2015).

He et al. (2015) concurred with the certification theories that a prestigious underwriter, because of their market expertise, the ability to screen quality IPO firms, and IPO track record will add credibility and provide certification value to an IPO issue, especially for newer firms. From their analyses of 1,071 firms, He et al. found that underwriter reputation reduces the length of the lockup period. This reduction in the lockup period was due to the certification effect which mitigates information asymmetry that encapsulates the investors' concerns about their exposure to the actions of internal pre-IPO owners (He et al., 2015). The implication, borne out by the results of the study

by He et al. that underwriter reputation reduces the need for underpricing, has repeated support from other researchers including Darmadi and Gunawan (2013) and Gumanti et al. (2015). The results of all these studies provided sufficient evidence that underwriter reputation impacts the level of underpricing and as such the outcome from this study which examined underwriter reputation as a driver of underpricing, can expand the existing body of literature.

In contrast, there is equally strong evidence to challenge the arguments put forward by the certification theorists that underwriter reputation reduces the level of underpricing. Song, Tan, and Yang (2014) found in their investigation of 948 Chinese IPO firms a positive relationship between underwriter reputation and underpricing while Wu and Wan, (2014) found no significant correlation between underwriter reputation and underpricing even after adjusting for market impact. The research outcome indicated that underwriter reputation does not contribute to the narrowing of the variance between the issuing price and the first-day closing price, and from the investors' perspective, underwriters' pricing actions do not convey the information they need about the intrinsic value of the stock (Wu & Wan, 2014).

The findings from the study by Wu and Wan (2014) seem to align to the position of Johnson and Miller (1988) who questioned why is it that all investors did not gravitate only to the IPOs represented by reputable underwriters if a link between IPO pricing and underwriter reputation. Johnson and Miller built their model on the supposition that there is market segmentation based on the fundamental risk of the IPO and that reputable underwriters represent IPOs in the less risky market segment. The outcome of the

analyses from Johnson and Miller indicated that when risk-adjusted returns proxied IPO performance, no statistically significant relationship exists between underpricing and underwriter reputation. Deb (2014) also found support for Johnson and Miller's position when he examined underwriter reputation, underpricing ownership, and liquidity as the model's control variables. An analysis conducted on a sample of 417 firms that issued IPOs in the United States from 2001 to 2004 did not support the findings of the certification theorists as underwriter reputation did not have a statistically significant impact on underpricing (Deb, 2014). The literature also provided evidence that indicates no any significant impact of underwriter reputation on IPO underpricing, thereby broadening the debate, supporting the lack of consensus and the increasing relevance of the contents of this study that examined underwriter reputation as one of the predictors of underpricing.

However, there was evidence to suggest that reputable underwriters not only certify IPOs, as outlined by the early certification theorists such as Booth and Smith (1986) but also act as a stabilizer, a position supported by Mazouz et al. (2013). Mazouz et al.'s (2013) empirical study on the role of the underwriter as a price stabilizer involved 115 IPOs issued on the Hong Kong Stock Exchange between April 2003 and June 2010 and subsequently went through the stabilization process. Stabilization means the underwriter stays in the post IPO market to support the prices of and thereby bolster demand for IPOs for newly issued stocks (Mazouz et al., 2013). Mazouz et al. found that stabilized IPOs were more common among reputable underwriters and experienced less underpricing than other IPOs. Moreover, Mazouz et al. believe that through the act of

stabilization, underwriters may also help to increase the proceeds accruing to issuers by reducing the total money left on the table and in the process boosts the income and reputation of the underwriters. Jeribi et al. (2014) found in their study of 33 IPOs issued from 1994 to 2012 in the principal and alternate Tunisian stock markets that reputable underwriters supported their IPOs during the first four weeks more than the low reputation underwriters. The literature on IPO includes the stabilization role of the underwriter and while this aspect of their role in the IPO process may be beyond the scope of this study, it presents another option for further research.

The average return on the stocks supported by reputable underwriters was 25.75%, more than four times higher than that of the low reputation underwriters (Jeribi et al., 2014). Bédard, Coulombe, and Courteau (2016) found that the underwriter associated with the IPO issue acted as a substitute for earnings forecast in the prospectus and resulted in reduced underpricing among non-forecasting firms. The results from Bédard et al.'s application of multiple regression analysis and Pearson correlation coefficient to 244 IPOs issued in Quebec over the period 1982 to 2002, provided evidence of a significant negative relationship between the quality coefficient (in which they incorporated underwriter reputation) and underpricing. Counter to their hypothesis that a negative correlation exists between underwriter's market share and IPO underpricing, Ammer and Ahmad-Zaluki, (2015), found a positive but insignificant relationship. Reputable underwriters, as indicated by higher market share, resulted in increased underpricing which averaged 21.22% (Ammer & Ahmad-Zaluki, 2015). This level of underpricing was lower than the 38.16% that Abu Bakar and Uzaki (2013) found

in the same country but among 420 Malaysian companies compliant with Islamic laws. The findings of Ammer and Ahmad-Zaluki were at odds with those of the early certification theorists such as Booth and Smith (1986) but collaborated those of Loughran and Ritter (2004). The increased IPO underpricing that researchers found to be associated with high-reputation underwriters is an important area of investigation in this study.

Similar to Deb (2014), He et al. (2015) explored underwriter reputation as one of the minor factors in a model that focused on the lockup period and underpricing. The lockup period, typically defined as the period of 180 days occur when the owners of an IPO company agree not to dispose of their shares following an IPO (He, et al., 2015). The reputation of the underwriter represents an important positive signal to investors and reduces investors' concerns and information asymmetry, as well as the length of the lockup period because their reputation replaces the need for the other signals such longer lockup periods and underpricing (He et al., 2015). Chipeta and Jardine (2014) suggested that the use of international investments banks by local firms in the South African IPO market improved the post-initial market performance of IPOs. The reputation of the underwriter who supports an IPO signals the market about the quality of the IPO firm and the examination of this variable as a signal in the Jamaica market will expand the body of research in this area.

Using a similar approach as that adopted for the discussion of the independent variables, the remainder of the literature review comprises a detailed discourse on IPO underpricing, the dependent variable for this study. The principal components of the discussion include the variable definition incorporating the money left on the table

argument. Other aspects of the discussion in this final part of the literature review are the measurement of IPO underpricing, as well as the impact of information asymmetry as purported by original theorists and supported by subsequent empirical researchers on the topic.

IPO Underpricing

Described as one of the most puzzling empirical regularities of the IPO market, IPO underpricing is a pervasive phenomenon (Asiri & Haji, 2015; Bacon & Arkorful, 2015; Cornanic & Novak, 2015). According to the literature, IPO underpricing occurs in a number of countries (Cornanic & Novak, 2015; Darmadi & Gunawan, 2013) persists over time (Cichello & Lamdin, 2016; Cornanic & Novak, 2015; Gokkaya, Highfield, Roskelley, & Steele, 2015) and across various periods (Kesten & Mungan, 2015; Leong & Sundarasen, 2015; Miloud, 2014; Tanda & Anderloni, 2014). Significant first-day return is also evident across industries (Burrill, 2014; Kumar, 2017), markets (Jeribi et al., 2014), and robust across measurement models (Miloud, 2014; Reddy, 2015). According to Deng and Zhou (2016), IPOs are universal but more pronounced in developing countries such as the Chinese market.

Despite being probed from many angles, this topic continues to sustain the interest of academicians and market players in the IPO space (Jeribi et al., 2014; Liu & Forester, 2014). Arguments exist on both sides as to whether IPO underpricing is beneficial or costly to the business, but Deb (2014) suggested that the positive implications of underpricing may help to explain why IPO underpricing persists despite effective internal governance. Given that this study will explore the impact of IPO share

retention ratio and the reputation of the IPO underwriter on IPO underpricing with a sample that spans over 30 years, it is possible that the outcome may provide some insights on the persistence of IPO underpricing in the context of this small island developing country.

The argument that IPO underpricing remains persistent in an environment of market efficiency finds support from the outcome of Gehrig and Fohlin's (2006) research. Gehrig and Fohlin found evidence of market inefficiency and IPO underpricing in the late 19th and early 20th centuries when they analyzed 408 multi-sector stocks which traded on the Berlin Stock Exchange in 1880, 1890, 1900, and 1910. Their research revealed that despite the presence of informational inefficiency and adverse selection costs, both these variables improved over the research period implying some applicability of the EMH. IPO underpricing not only persists over time as indicated earlier, but high initial returns also lingered beyond the immediacy of the first day of trading, as indicated by Reilly and Hatfield (1969) who investigated 53 IPOs issued across two periods, December 1963 to August 1964 and January 1965 to June 1965. Reilly and Hatfield compared the changes in market price to the indices of the Dow Jones Industrial Average (DWIA) and the Over the Counter Industrial Average (OTC) and found strong support for the hypothesis that IPOs outperform the market in both the short and long term. The market and firm-specific risks that the investor assumes because of the unseasoned nature of an IPO may be the reason for the strong returns relative to the market (Reilly & Hatfield, 1969).

Similarly, the argument that IPO underpricing is protracted also found support from the literature. Tanda and Anderloni (2014), who studied 103 European companies from the life science industries that issued IPOs from 2002 to 2007 across multiples countries in Europe, indicated that high initial returns often extend beyond the first day of trading averaging approximately 12% on day one and 17% a week after. Based on their research of 75 IPOs issued on the Karachi Stock Exchange from 2000 to 2011, Mumtaz and Ahmed (2014) found average underpricing of 30.3% on day one and 24.2% on day 13.

Jeribi et al. (2014) studied 33 IPOs issued in the Tunisian market between 1994 and 2012 and found that the high returns on day one for firms that engaged high and low reputation underwriters extended beyond the one week stated by Tanda and Anderloni (2014) into week five and three respectively. In contrast, Bansal and Khanna (2013) found evidence that contradicts these results when they explored underpricing in the context of a mandatory, regulated IPO grading. The examination by Bansal & Khanna of 168 IPOs listed on the Bombay Stock Exchange between 2007 and 2011 revealed that the initial first-day return on IPO shares tends not to retain its first-day momentum and often turn negative by day four. While an in-depth investigation of the performance of the stock in the long-term is outside the scope of this study, the outcomes can provide information on day one performance of the stock and suggest long term performance as an area for future research.

Definition of IPO underpricing. The IPO pricing process is critical but complex and except for decisions relating to the size of the IPO offer, the share price is the most

important outcome of the IPO process (Imam & Jaber, 2014; Katti & Phani, 2016; Kesten & Mungan, 2015). Ganesamoorthy and Shankar (2014) indicated that the market plays a critical role in the pricing process and the pricing of the company's share is a function of the market perception of earnings potential. However, in addition to market dubieties, the following factors complicate the IPO pricing process: (a) uncertainty around the demand, (b) time constraints (given the firm's usual urgent need for capital) (c) price inflexibility (once the firm makes the offer) (d) difference in the issuers versus the investors' perception of the value of the firm (Katti & Phani, 2016) (e) market newness of the IPO firm (Handa & Singh, 2014; Imam & Jaber, 2014) (f) relatively high degree of volatility and riskiness of the new firm (Peterle & Berk, 2016), and (g) balancing the interests of the issuers and the investors (Tamm & Varma, 2014).

From the perspective of Imam and Jaber (2014), the liability of market newness makes pricing an IPO close to its projected market value difficult because the market price of a stock is a risk-return relationship driven by company fundamentals. Unlike a traded company, the IPO firm is often unknown to investors and lacks the track records and history that can substantiate the quality of the issue and justify the firm's potential, resulting in information asymmetry between the internal stakeholders and the investors (Handa & Singh, 2014; Imam & Jaber, 2014; Peterle & Berk, 2016). This scenario implies that the EMH principle, which states that the stock prices reflect available information, may not be evident for these new firms because the market analysts lack the data to define the risk-return relationship that would guide the pricing process (Imam & Jaber, 2014). However, for many IPOs, the market assumes that underwriters tend to

price the stocks conservatively resulting in stock price appreciation on the first day of trading (Christofi, Bailey, & Carroll, 2015). Many of the IPO firms in the sample for this study are new companies to the market and for which information asymmetry exists between investors and issuers and the IPO offer price does not reflect available information as assumed by the EMH.

The outcome of the pricing process relative to the first day of trading occurs in one of three forms. First, a negative initial return also referred to as overpricing (Asiri & Haji, 2015; Leong & Sundarasen, 2015; Liu & Forester, 2014), occurs when the first-day market price is below the initial offer price, resulting in potential loss to the investors. Second, pricing efficiency occurs when the initial market return is close to or equal to zero because the offer price is the same as or close to the price on the first day of trading (Almeida & Leal, 2015). Finally, when the market price on day one of trading is higher than the offer price it generates a positive initial market return to the investor and this denotes underpricing (Bateni & Asghari, 2014; Leong & Sundarasen, 2015; Peterle & Berk, 2016).

Alternatively, underpricing exists where the underwriters' action aligns to the expectations of potential investors by pricing the IPO shares below the perceived market value of the firm (Gulati, Bose, & Roy, 2017). Keef, Keefe, and Khaled (2015) suggested that this third scenario where a positive first-day return occurs (i.e., underpricing) is typically the case. Degutis and Novickytė (2014) raised concerns about the empirical significance and soundness of the EMH in the context of pricing anomalies where market

prices often do not align to the intrinsic value of the stock, such as in instances of underpricing.

Pricing an IPO requires the underwriter to balance the interests of both issuer and the investor by minimizing the money left on the table and allowing a positive initial return respectively **(**Almeida & Leal, 2015; Tamm & Varma, 2014). However, balancing the interest of IPO stakeholders is never easy since underpricing is not a zero-sum practice, because increasing the first-day return to the investor that is, higher underpricing, translates to lower IPO proceeds accruing to the firm and increases the amount of money left on the table (Asiri & Haji, 2015). In an IPO, underpricing forms a part of the firm's cost structure because underpricing reduces the total IPO proceeds from the sales of the IPO shares (Husnan, Hanafi, & Munandar, 2014). Underpricing is a function of the pricing of the IPO, therefore the underpricing outcomes of this study can indicate the success of the underwriter's pricing efficiency and the effort at balancing the interest of the issuer and the investor.

Money left on the table. Underpricing of a stock that can occur when a firm goes public implies that the issuer's preference would be for a higher priced IPO to increase the issuer's aggregate proceeds (Asiri & Haji, 2015; Ritter, 2015). However, pricing below the subsequent first-day market price reduces the average intake per share and leaves money on the table (Cornanic & Novak, 2015; Handa & Singh, 2014; Kesten & Mungan, 2015). In formulaic terms, Thompson (2016) defined money left on the table (MLOT) as absolute underpricing (i.e., the difference between the first-day market price

and the initial offer price) multiplied by the number of shares offered. This definition

aligns to formulaic representation depicted by Wong et al. (2014) that is,

MLOT = (absolute underpricing per stock) x (# of offer shares)

where absolute underpricing per share = Day 1 closing price - offer price

Firms go public to maximize the total proceeds from the IPO (Bahadir et al.,

2015). For this reason, underpricing and its impact on investment capabilities and growth

opportunities are areas of concern for issuers (Bacon & Arkorful, 2015; Wu, 2014). Total

money left on the table from 8,253 IPOs issued from 1980 to 2016 in the United States

was $155.16 billion, with an estimated average of $18.80M for each firm that issued an

IPO during this period (see Ritter, 2017). Jeppsson (2016) indicated that underpricing

averaged 17.5% among venture-backed biotechnology IPOs issued from 1980 to 2015,

and this resulted in a total of $6.3 billion in IPO proceeds left on the table. Despite the

related costs and potential impact on growth opportunities of leaving money on the table,

supporters of the principal-agency theory suggest that for internal stakeholders, it may be

a worthwhile sacrifice to align the interests of the underwriters to that of the firm (Wu,

2014). Nevertheless, aligning the interest of the principal with that of the agent can be

expensive and issuers may become insensitive to the amount of IPO proceeds left on the

table and the impact on the firm's growth prospects because underpricing can help to

increase the personal wealth of the firm's internal stakeholders (Kultys, 2016; Thompson,

2016). In small developing countries where funding can be a significant challenge

(Acharya, 2014), understanding that leaving money on the table in an IPO can impact

growth and development may help executives in Jamaica to have more informed

discussions with their underwriters about IPO objectives.

Measurement of IPO underpricing. IPO underpricing represents the difference

between the IPO's offer price and the closing market price on the first day of trading

(Bacon & Arkorful, 2015; Leong & Sundarasen, 2015). Typically measured in percentage

format, IPO underpricing is the difference between what investors will pay and what the

issuers expect them to pay expressed as the average first-day initial return on the IPO

stock (Donnelly & Hajbaba, 2014; Reddy, 2015; Shen, Coakley, & Instefjord, 2014;

Wong et al., 2014). That is,

$$\% \, underpricing \ = [(CP - OP) \div OP] \, x \, 100\%$$

OR

$$\% \, IR_i \ = \ [(CP_i \div OP_i) - 1] \, \times 100\%$$

where IR_i = initial return or underpricing

CP_i = closing price of the ith stock on the first day of trading

OP_i = offer price for the ith stock

IPO underpricing and information asymmetry. Early researchers such as

Baron (1982), Rock (1986), and Welch (1989) hypothesized and tested information

asymmetry as a determinant of IPO underpricing. Katti and Phani (2016) added that the

level of information disparity differs among various groups of IPO players and to varying

degrees. This information divergence can lead to variation in the perceived price of the

IPO share and implied firm value (Katti & Phani, 2016). The information variance in the

perceived price means that one party has more or better information than the other which

can create an imbalance of power that fosters opportunistic behavior (Hull et al., 2016; Miloud, 2014).

Relative to the issuer and the underwriter, potential IPO investors have incomplete information about the company's fundamentals and must, therefore, mitigate the associated risks by demanding a reduced offer price as a motivation to participate in the IPO issue (Fleischer & Staudt, 2014; Imam & Jaber, 2014). According to Katti and Phani (2016), the level of the underpricing that must occur to induce investors is a function of the degree of difficulty faced by the issuer in determining the information gap among various categories of investors. To stimulate demand, ensure a successful issue in the context of information asymmetry, and to entice the investors back to the market, IPO firms, and underwriter may intentionally price the IPO such that underpricing occurs (Katti & Phani, 2016).

Despite the various studies that support the theory that information asymmetry helps to explain the degree of underpricing, some researchers believed other factors could impact IPO performance and underpricing. For example, Katti and Phani (2016) argued that firm-specific and market-specific factors could drive underpricing and country-specific factors may impact underpricing given the various levels of underpricing across geographical borders (see Ritter (2017). Many of the signals to investors are from IPO firms but exogenous factors can also influence investor behavior (Dolvin & Fernhaber, 2014). Tupper (2016) found in research of 562 firms (including firms with founder-CEOs and firms with foreign origins) that went public from 2005 to 2010, that the ecosystems operative during the IPO issue impact how the market accepts selected firm-specific

features, implying that the environment existing at the time of an IPO may influence the IPO's performance. In light of this, understanding IPO underpricing and the relationship with IPO share retention ratio and the reputation of the IPO underwriter within the context of the unique fundamentals of this small developing country (see United Nations-OHRLLS, 2015), may help to expand the body of literature on this topic.

According to Husnan et al. (2014), it is difficult to understand the deliberate underpricing of an IPO issue given that underpricing leaves money on the table and contravenes the firm's objective of maximizing IPO proceeds. The remainder of this literature review may help to address this question and starts with an overview of the foundation theories. The literature review also contains the role and impact of information asymmetry in explaining the relationship between independent and dependent variables adopted for this study, that is, IPO share retention ratio, reputation of the IPO underwriter, and IPO underpricing. Specifically, this component of the literature review includes the following theories (a) Baron's (1982) principal-agency, (b) Rock's (1986) winner's curse, (c) Leland and Pyle's (1977) signaling theories, and (d) underwriter-based certification models initiated by Logue (1973) and other researchers. Wu (2014) highlighted several non-asymmetric information theories such as dynamic information acquisition theory and informational cascades theory. However, these theories are outside the scope of this study.

Principal-agency problem. The narrative surrounding the principal-agency theory builds on the premise that the acquisition of personal wealth, self-interest, and self-centeredness are the primary motivators of individuals (Dorsey, 2014). According to the

principal-agency theory, collaborative parties in this arrangement have varying and sometimes competing goals: the principal (who delegates the tasks) employs the agent (who executes the tasks) to act on their behalf (Bernstein, Buse, & Bilimoria, 2016; Dorsey, 2014). The agents' actions in their own best interest may create information asymmetry (Bernstein et al., 2016) therefore though expensive, inducements to align the interest of the agent to that of the principal are necessary to ensure that the principal's goals do not become subservient to those of the agent (Dorsey, 2014; Kultys, 2016). Quality corporate governance through ownership dispersion can assist the separation of ownership and managerial control issues, but the use of stock options to compensate an executive management team is one way to achieve alignment of objectives and resolve potential principal-agency conflicts in companies (Long, 2016; Shen & Gentry, 2014). The IPO issuer can also achieve this alignment by engaging the underwriter in a firm commitment contract in which the underwriter guarantees to the issuer an agreed amount of IPO proceeds (Chen & Wu, 2015).

Baron (1982) modelled the principal-agency principle to explain the underpricing by arguing that in the IPO environment, a countervailing force exists between issuing firms (the principal) and underwriters (the agent). There is information asymmetry between the issuer and the underwriter, and the information advantage resides with the underwriter especially relating market conditions for potential demand for the new shares (Katti & Phani, 2016; Wu, 2014). The underwriter capitalizes on this information advantage and related influence on the IPO pricing/selling process by adjusting the price to ensure that the level of underpricing encourages both current and future demand with

minimum efforts (Wu, 2014). The underwriter achieves this objective, however, at the expense of benefits to the issuers such as higher proceeds accruing to the firm (Katti & Phani, 2016).

While the primary objective of the issuer is to maximize expected return on the IPO, this objective may diverge from that of the underwriter, which is to deliberately underprice the issue to support distribution and boost demand (Katti & Phani, 2016; Wu, 2014). From the issuer's perspective, maximizing the expected proceeds, reducing money left on the table, and improving the capacity of the firm to achieve its growth objectives mean pricing the issue at the highest level possible for the market to absorb (Miloud, 2014). However, the issuer has less information on pricing, demand, and distribution and may have to concede to underpriced shares as an incentive for the underwriter who believe that underpricing the issue will increase the demand for current and future issues and minimize possible underwriting losses (Bacon & Arkorful, 2015; Katti & Phani, 2016). Thus underpricing move may be necessary to align the interest of the underwriter to that of the issuer (Baron, 1982).

Even though both the issuer and the underwriter sacrifice gains when underpricing occurs (Bernstein et al., 2016), Wu (2014) indicated that they also benefit from underpricing an IPO. Although underwriters will receive lower underwriting fees as a result of the underpricing, they will secure future fees from the success of future IPO issues by engendering the loyalty of their regular customers with strong initial returns in the current period (Wu, 2014). Similarly, underpricing may appear to be detrimental to issuers given concerns about leaving money on the table, but the higher sales volume

associated with the underpriced shares may increase the total proceeds accruing to the issuer (Bacon & Arkorful, 2015; Wu, 2014).

Baron's (1982) theory is not without contradictions and controversy. First, Beatty and Ritter (1986) found evidence to support a significant relationship between the underwriter's intermediary process and information asymmetry. Beatty and Ritter researched 1,028 U.S. IPOs issued from 1977 to 1982 and found that the issuer was aware of the presence of information asymmetry and that the underwriter induced the degree of underpricing. The findings of the study by Regalli and Soana (2013) supported the outcomes of Baron's (1982). Regalli and Soana applied a logit regression model and descriptive statistics to 213 Italian-issued bank IPOs in Italy between 1985 and 2007 and concluded that their findings appear to be consistent with Baron's hypothesis and that this theory may help to explain underpricing in Italy.

By contrast, Muscarella and Vetsuypens' (1989) examined the validity of Baron's theory in the U.S. market by investigating IPOs of 38 investment banks that went public in the period 1970–1987 under the assumption of information asymmetry between issuers and underwriters. The IPOs issued by these investment banks were self-underwritten, suggesting that the issuer is also the informed underwriter (Muscarella & Vetsuypens, 1989). The results from Muscarella and Vetsuypens' study did not support the hypothesis or the results of Baron's model and indicated that these self-underwritten IPOs experienced statistically significant underpricing relative to the IPOs of the other companies.

Using a more comprehensive research design, Cheung and Krinsky (1994) tested Baron's model on all Canadian investment bankers that went public on the Toronto Stock Exchange (TSE) between 1982 and 1988. However, unlike Muscarella and Vetsuypens who applied Baron's model to only IPOs of investment bankers, Cheung and Krinsky compared the price behavior of IPOs of both investment bankers and comparable noninvestment bankers. Their outcomes were similar to those of Muscarella and Vetsuypens and contradicted the implication of Baron's theory that is, cases where the issuer is also an informed investment banker, there should be no underpricing.

However, the critique of the principal-agency theory includes more than just the empirical testing and validation of Baron's (1982) model. For example, Kultys (2016) in his theoretical framework suggested that the simplistic premises which underpin the principal-agency theory (a) underestimate the actions and relationships between market players, (b) have limited applicability, and (c) are not sufficient to adequately describe the complexities of human behavior. Additionally, Kultys, (2016) suggested other factors that IPO issuers should consider including control mechanisms required to align the interest of the principal with that of the agent (a) can be expensive and (b) may also cause legal and ownership complications that can impact the operations of the IPO company. For example, agreeing to underprice to align the interest of the underwriter to that of the firm can rob the firm of growth opportunities because of the money left on the table (Wu, 2014).

Finally, Bendickson, Muldoon, Liguori, and Davis (2016) argued that the principal-agency theory is a function of its time and does not address (a) the socially

embedded issues associated with the family firm, (b) changes in the economy and technology which educate stakeholders, such as employees, and (c) modern phenomena such as social media, which impacts the level and speed of communication. There is the implication that the estimated 500 million tweets per day from social media-based Twitters IPO sentiment analysis could provide valuable information to market stakeholders (Liew & Wang, 2016). While the concerns of Bendickson et al. would apply in the Jamaican context, given that some IPO issuers especially those trading on JSE junior market do not engage underwriting services in its purest sense (JSE, 2018), it may also constrain the applicability of the principal-agency theory as a reasonable explanation of underpricing within the context of this small developing country.

Winner's curse theory. Also referred to as the adverse selection theory, Kevin Rock (1986) presented the winner's curse theory in 1986 on the basis that asymmetric information exists between two groups of investors. These two groups of investors, called the informed and the uninformed, have dissimilar roles, but are equally important to the success of the IPO (Bacon & Arkorful, 2015). These potential investors face varying degree of information asymmetry which creates heterogeneity of investment objectives and uncertainty around the firm's valuation, making increased access to information critical but costly (Katti & Phani, 2016). According to Katti and Phani (2016), Rock's theory essentially assumed convergence in the roles of the issuer and underwriter, thereby mitigating the possibility of agency conflicts between them.

The first group of investors is the informed investors because of proprietary knowledge of the expected value of the IPO in the secondary market based on data

collected and analysed (Miloud, 2014). This group, Katti and Phani (2016) indicated are primarily institutional investors who can use their economies of scale to acquire the required information. From this informed position, the investors can reduce the information asymmetry and gain insights about the quality of the IPO (Bacon & Arkorful, 2015). The other group of investors labelled uninformed, has access only to public information, and unlike the precision with which the informed investors can assess the quality of the IPO, this group has only a probability distribution with which to assess IPO quality, and therefore cannot necessarily determine the best IPOs in which to invest (Katti & Phani, 2016).

The issuer's objective is to set an optimal price that will attract the informed investor by rewarding and compensating these investors for obtaining superior information and the uninformed investors who tend to invest for longer periods (Katti & Phani, 2016). Armed with their knowledge about the expected value of the IPO share, the informed investors will only demand shares from high-quality firms when the offer price is below the expected market value that is, underpriced (Bacon & Arkorful, 2015). The uninformed investors, however, do not know the expected value, and therefore cannot distinguish between overpriced or underpriced issues (Wu, 2014). Hence the uninformed investors receive a disproportional allocation of poorly performing IPO and the winner's curse (Bacon & Arkorful, 2015; Michaely & Shaw, 1994; Miloud, 2014). However, underpricing fosters competition which increases the demand from both groups of investors resulting in the rationed allocation of the underpriced issues via a fair and equitable distribution mechanism (Bacon & Arkorful, 2015).

Researchers who applied empirical testing to Rock's (1986) model include Beatty and Ritter (1986) who considered, among other things how the informed investors would identify which IPOs to invest and how the issuer may control the level of underpricing. Beatty and Ritter who examined 1,082 common stock IPOs issued from 1977 through 1982, under the assumptions that riskier IPOs must disclose more information about the IPO and larger companies are less risky than smaller companies, found a positive relation between expected return and *ex-ante* uncertainty. Beatty and Ritter's research outcomes support the principles of the EMH suggesting a positive relationship between returns and the risk inherent in the issue. Consequently, Beatty and Ritter concluded that investors would explore IPOs with a high degree of ex-ante risk because of the opportunity to increase initial first-day returns. Given that the dependent variable in this study is IPO underpricing, the outcome of this study may indicate the level of underpricing evident in this small developing economies and possible insights as to the risks associated with the IPOs issued in the Jamaican market.

Michaely and Shaw (1994) tested Rock's (1986) model and found support for their hypotheses that (a) underpricing exists in an environment of asymmetrical information, (b) information heterogeneity exists among investors, and (c) underpricing is necessary to attract the uninformed investors back to the market and compensate these investors for the winner's curse. Using a study period from 1984 to 1988, Michaely and Shaw examined the returns of 778 regular operating companies which typically attract both types of investors—informed and uninformed and 39 master limited partnerships (MLPs), which only attract uninformed investors. In support of Rock's theory, the

outcomes for operating companies showed that underpricing averaged 8.5% and was statistically significant, the IPOs of MLPs displayed marginal overpricing that was not statistically significant.

As a result of this adverse selection process and the higher probability of investing in overpriced shares, uninformed investors will on average lose money in the IPO market and will need underpricing to induce these investors back to the market (Wu, 2014), while underpricing compensates the informed investors for the costs of becoming informed (Bacon & Arkorful, 2015; Miloud, 2014; Wu, 2014). Similarly, Jiang et al. (2015) found that oversubscription by informed (institutional investors) and uninformed investors (retail investors) to be one of the determinants of underpricing in the Indian IPOs. However, Bhattacharya and Chakrabarti (2014) found when they investigated 70 Indian IPOs issued from May 2010 to November 2011 that the degree of IPO underpricing is negatively related to adverse selection risk in the IPO market, and information made available as a result of underpricing can counter post IPO adverse selection problems in the market. Institutional investors, defined by Katti and Phani (2016) as the informed investors, constitute the larger segment of investors in the Jamaican IPO market (JSE, 2018). Accordingly, the level of underpricing indicated by this study may point to the extent and influence of the private versus the institutional investors in this small developing economy.

Signaling theories. The signaling model, first enunciated by Leland and Pyle (1977), found support from Allen and Faulhaber (1989), Welch (1989), and Hidayat and Kusumastuti (2014). According to Wu (2014) the signaling theory built on the

assumption that information inequity exists between the investor and the issuer and Lee, Jin, and Li (2015) opined that IPOs are among the few corporate events that provide the firm with a distinct information advantage relative to investors and the firm may choose to capitalize on that advantage. This asymmetric information affords internal stakeholders of the IPO firm exclusive access to information about the prospects of the firm and therefore can apply extensive control over the internal decision-making process (Hull, Kwak, & Walker, 2014). The more informed IPO issuers are aware of the information gap that the average investor faces and understand that this information gap limits the investor's ability to assess the firm value and IPO quality (Wu, 2014). Wu also indicated that investors therefore, cannot distinguish between high-quality and low-quality firms because of the limited or no access to private insider information.

As a result of this information deficiency, the financial markets and the investors will value all IPOs at an average price and force out of the market any IPO priced above this average price (Hidayat & Kusumastuti, 2014). Accordingly, issuers disclose their otherwise private information by sending overt signals to the investors to address information asymmetry, allay risk concerns, spur demand, generate interest in, and differentiate their IPO from the other IPOs in that market (Miloud, 2014). The issuing firm, therefore, increases the disclosure of verifiable quantitative information via the financial statements and prospectus to reduce uncertainty (Miloud, 2014; Thompson, 2016). Miloud (2014) also pointed out that soft qualitative information, though more difficult to verify externally and can be more easily manipulated, may also be available, while Loughran and McDonald (2014) suggested regulations such as the plain English

rule, which US regulators require, should help to provide investors with information devoid of legal terminologies and complex information.

Like Miloud (2014), Widarjo, Rahmawati, Bandi, and Widagdo, (2017) concluded that intellectual capital disclosure had a significant negative effect on underpricing. Intellectual capital disclosure may reduce information asymmetry and hence provide potential investors with a basis to assess the quality, value, and future of a prospective IPO firm (Widarjo et al., 2017). Barth, Landsman, and Taylor (2017) explored the effect of the reduced disclosure provisions under the US-based Jumpstart Our Business Startups Act (JOBS Act) on information uncertainty in IPO firms. Using a sample of 376 firms, 158 emerging growth companies which benefit under the JOBS Act and 218 non-emerging growth firms, found that reduction in mandatory disclose regarding some aspects of the business resulted in higher IPO underpricing (Barth et al., 2017). SMEs that trade on the JSE junior market must comply with more lenient disclosure rules, similar to what the US-based JOBS Act seeks to achieve, and therefore the findings from this study may be able to shed some light on the level of underpricing experienced by IPO firms operating under these conditions in the Jamaican IPO market.

According to Hidayat and Kusumastuti (2014), the high-quality firm can signal to the market its firm's condition, and the market will react to these positive signals along with other announcements available at the time of the IPO. Hidayat and Kusumastuti argued further that it is important that these signals are costly and difficult to be replicated by low-quality firms. Even though Leland and Pyle (1977) initiated the first discourse on signaling and identified IPO share retention ratio as the primary signal,

subsequent studies isolated or suggested other signals including IPO underpricing (Allen & Faulhaber, 1989; Welch, 1989), corporate governance (Hidayat & Kusumastuti, 2014), dividends payments (Allen & Faulhaber, 1989; Chen, Chou, & Lee, 2014), and research and development (R&D) projects (Hull et al., 2016). In this study, the discussion includes two of these signals, underpricing in the segment below and IPO share retention ratio included earlier in the discussion of the independent variables.

IPO underpricing as a signal. Using a similar underlying argument as Leland and Pyle (1977), Allen and Faulhaber (1989) explored underpricing as a signal of IPO quality. The underpricing signal will attract investors to the market because of investors' belief that only strong, high-quality companies can absorb the costs associated with underpricing (Miloud, 2014; Welch, 1989). Despite the importance of the signaling model as the economic rationale for explaining IPO underpricing, the empirical evidence provides mixed results (Michaely & Shaw, 1994).

Michaely and Shaw (1994) tested three of the proposals put forward by Allen and Faulhaber's (1989) model and found no support for any. Contrary to the model, Michaely and Shaw found that firms that pay dividends or experience higher earnings during IPO's first two years of trading show significantly lower underpricing. Based on the result of their study, Michaely and Shaw concluded that underpricing did not appear to signal high-quality firms because greater underpricing relates to lower subsequent earnings, not higher as predicted by Allen and Faulhaber. Additionally, firms that underprice less paid higher dividends not lower as predicted and market reactions to dividend announcements did not depend on the initial underpricing of the firm's IPO (Michaely & Shaw, 1994).

Francis, Hasan, Lothian, and Sun (2010) studied 413 foreign IPOs issued in the U.S. market from 1985 to 2000 but domiciled in either financially integrated or segmented markets. Francis et al. found evidence that signaling helps to determine underpricing especially for firms domiciled in countries with segmented markets because these firms tend to face relatively high information asymmetry, and difficulty accessing external capital markets. Francis et al. concluded that in line with the premise of the signaling theory, some firms may sacrifice IPO proceeds by accepting underpricing in the current period because of the signal of a more favorable price for seasoned offerings. Small developing countries with small dependent economies tend to have segmented financial markets, as defined by Francis et al. (2010). Accordingly, the findings from this study which investigated underpricing as an outcome (in other words, the desired and undesired outcomes for the investor and the issuer respectively) may point to the extent to which the underpricing holds as a market signal in this small economy.

Certification theories. The theorists who purport or support the certification argument, Logue (1973), Booth and Smith (1986), Beatty and Ritter (1986), Carter and Manaster (1990), and Michaely and Shaw (1994) followed a premise similar to that outlined in the signaling theories. Information asymmetry exists between investors and issuers and that both the investors and the issuers are aware of this information gap (Beatty & Ritter, 1986; Booth & Smith, 1986). The investors understand that insiders are in a position to selectively present information that can support the overpricing of the issue (Katti & Phani, 2016). Accordingly, Katti and Phani (2016) suggested that potential investors require third parties to act as observable indications of the quality the issue, to

validate the information released by the issuer regarding the value of the IPO, and to address the inherent issuer bias.

Certification indicates the achievement of a minimum level of quality and can reduce asymmetric information (Van Der Schaar, & Zhang, 2015). The third parties required by investors to act as certifiers of IPO issues included prestigious underwriters, usually investment bankers who primarily provide underwriting services to IPO issuers (Booth & Smith, 1986; Bangsund, 2014). Reputable auditors also act as certifiers and according to Chipeta and Jardine (2014), auditors may improve IPO performance. Chipeta and Jardine found that South African firms that use the dominant international auditors tend to have improved performance as measured by post-market adjusted returns. The final group of certifiers is venture capitalists and according to Heo, Sohn, and Ji (2014) this group tends to invest in firms especially SMEs based on the strength of IPOs. Venture capitalists have a tendency to retain equity positions after an IPO (Cao, Tang, & Yuan, 2013; Miloud, 2016; Tanda & Anderloni, 2014), bring much to the investment including time commitment, managerial services, monitoring, and networking skills through access to key industry stakeholders (Bhagat, 2014), and can use the IPO as a vehicle to exit the investment (Guo, Jiang, & Mai, 2015).

According to Handa and Singh (2014), the reputation of these third parties provides the investors with insights about the quality and risk level of the firm. Reputable certifiers also bring legitimacy and credibility to the issue and issuers at the time of IPO, thus strengthening market valuations and performance (Handa & Singh, 2014). In addition to these external third-party certifiers, Bansal and Khanna (2013) added

regulators, stating that the mandatory grading of IPOs, as is the case in India, also acts as a source of credible certification.

Bansal and Khanna (2013) investigated 168 IPOs issued in India and found that the mandatory grading of IPOs impacted the level of underpricing in the market. Specifically, Bansal and Khanna found evidence to show that underpricing was lower under the post-grading regime and also lower for high-grade IPOs. Similar findings also surfaced when Sharma (2014) investigated a sample of 131 graded IPOs in the overall data set of 355 IPOs and found evidence to show that there was a negative relationship between grading and IPO underpricing with the non-graded stock showing almost three times more underpricing and the graded IPOs.

Banerjee and Rangamani (2014) did not find any evidence to support the claim that graded IPOs had a positive impact on underpricing. Similarly, when Jacob and Agarwalla (2015) applied cross-sectional regression to a sample of 182 graded IPOs issued from 2005 to 2011, Jacob and Agarwalla found no significant impact on underpricing. However, the results of the investigation indicated that the grading of the IPOs impacted the demand by institutional investors but not retail investors (Jacob & Agarwalla, 2015). In this study I have confined the discussion of the certification models solely to the role and impact of the underwriter.

Logue (1973), who was among the first to suggest that underwriters played a certification role in the IPO process, used a sample of 250 IPOs issued between 1965 and 1969 to model IPO market performance as the dependent variable against ten independent variables including underwriter prestige Logue (1973) found that IPOs

underwritten by non-prestigious underwriters outperformed the market when compared to those supported by prestigious underwriters, implying that there was a greater level of underpricing with the former than the latter. Booth and Smith's (1986) model also investigated the relationship between IPO performance and the underwriter reputation and found evidence to support the prediction that there is a positive relationship between underpricing and the potential reduction in information asymmetry. Booth and Smith argued that good companies will try to reduce information asymmetry by recruiting the services of brand name underwriters to provide credibility to the issue. Investors use the underwriter's reputation to assess IPO quality because underwriters invest much in building their reputation and credibility and will not endanger this reputation by associating with risky IPOs (Booth & Smith, 1986).

Beatty and Ritter's (1986) certification model incorporated Rock's (1986) premise that asymmetric information exists between the informed and uninformed investors. However, unlike Rock (1986) who argued that underpricing is an incentive to lure the uninformed investors back to the IPO market, Beatty and Ritter suggested that the market value of the IPO is more important to the investor, and therefore predicted a positive relationship between underpricing and uncertainty (risk) associated with the IPO market value. Beatty and Ritter assumed that the issuer is aware of the fundamentals of the company and introduced the underwriter as part of the oversight mechanism. Beatty and Ritter conducted their research over two distinct periods and determining that of the 49 underwriters examined in the first period, 25 underwriters priced in alignment with the risk of the IPO issues, while the other 24 mispriced. In the subsequent period, the 25

underwriters who applied efficient pricing experienced a 50% less erosion of their market share relative to the underwriters who mispriced issues (Beatty & Ritter, 1986), suggesting that the market value of the IPO is important to the investor who will stay with the underwriter who prices the IPO close to its market value.

Subsequent studies including that of Carter and Manaster (1990) explored the assertion of their predecessors that less underpricing occurs when information asymmetry declines. In their model, underwriters were the conduits through which information asymmetry declined because reputable underwriters will only represent high-quality IPOs (Carter & Manaster, 1990). The outcome of their research in which they found a statistically significant negative relationship between underpricing and underwriter reputation supported the premise that less underpricing occurs when information asymmetry declines. The findings from Michaely and Shaw's (1994) study of a larger sample of 947 companies that issued IPOs from 1984 to 1988 confirmed these results.

As implied by Ritter (2003b) in his work on European and American IPO markets, even with consistent research findings across theoretical and empirical studies, generally accepted answers to questions relating to market phenomenon such as IPO underpricing raised in literature may not suffice beyond the current period. Ritter indicated that new questions will continue to surface because no steady state exists for the financial markets nor the IPO ecosystem. This study may, therefore, add to the literature by providing some answers but also raising some questions about businesses in small economies seeking to understand the relationship between IPO underpricing, IPO share retention ratio, and the reputation of the IPO underwriter. Accordingly, this study may

contribute to improved business operations by helping potential IPO firms to more effectively manage the IPO process, improve the interaction with the IPO underwriter, attract potential investors, and maximize IPO porceeds.

Transition

Extensive documentation exists in the literature about the interplay of IPO share retention ratio, the reputation of the IPO underwriter, and IPO underpricing. However, while the evidence suggests that the theoretical basis has a sound foundation, the empirical evidence is mixed and lacks consesnsus. The complexity, convergence, and contradiction surrounding the topic of IPO underpricing may explain the continued interest from business practitioners, the academic community, and market players across countries, as well as the need for additional research.

The premise that IPO underpricing is unavoidable in an environment of information asymmetry (Jiang et al., 2015), supports the use of the EMH, itself underpinned by asymmetric information, to frame this study. This literature review highlighted the existing research on IPO underpricing and what researchers had to say about its relationship with IPO share retention ratio, and the reputation of the IPO underwriter within the context of asymmetric information. Additionally, most of the documented work included research on IPO underpricing mainly in developed, emerging and large developing economies with limited research on small developing countries. Katti and Phani (2016) noted that the extent of information asymmetry as reported in the literature differs in developing and emerging economies relative to developed countries suggesting the need for additional research to help the business community in smaller

dependent economies understand and optimize the IPO process. This study may contribute to this area.

Section 2 includes information on the process and methodology adopted for this quantitative correlational study. Specifically, this section contains a discussion on my role as the researcher, the process of data collection and data analysis, hypotheses formulation and testing, research method and design, as well as issues relating to ethics, reliability, and validity. In section 3, I presented the results of the data analysis prefaced by the evaluation of assumptions required to apply parametric tests and multiple regressions. Section 3 also includes application for professional practice, implications for social change, recommendations for action and further study, reflections, and conclusions.

Section 2: The Project

The purpose of this quantitative correlational study was to examine the relationship between the IPO share retention ratio, the reputation of the IPO underwriter, and IPO underpricing. The independent variables are IPO share retention ratio, measured by the percentage of IPO shares retained, and IPO underwriter reputation operationalized as underwriter's rank based on market share of IPOs supported in the market. The dependent variable is IPO underpricing as indicated by the first-day market return on the IPO stock price. The population included IPO firms trading on the JSE.

The results of this study may contribute to the business community by providing information to company executives seeking financing via IPO on how best to optimize the IPO process to ensure successful IPOs. The research outcomes may also generate better investment decisions by forcing increased information disclosure from issuers to investors. This study may contribute to social change by helping company executives and policymakers in small developing economies to understand how successful IPOs can increase employment, and thereby reduce income inequality and improve socioeconomic indicators across households and communities that they serve.

Role of the Researcher

In line with Garg (2016), the role of the researcher in this quantitative correlational study involved collecting, organizing, standardizing, analyzing, and interpreting the data. The researcher is also accountable for the research design and execution, setting the context of the research, defining the search terms, hypotheses, and analytical parameters, determining the appropriate population and sample, as well as the

tools to analyze the data (Moon, 2015; Warwick-Booth, 2014). As implied in the report of Köhler, Landis, and Cortina (2017), the role of the researcher includes identifying an appropriate research question supported by the relevant literature, selecting a research design aligned to the research question, ensuring suitable sample and research context, high measurement standard and quality as well as effective reporting of design and procedures.

In conducting research, it is essential for the researcher to observe and maintain ethical standards and concerns at each stage of the research process and account for ethical considerations (Greenwood, 2016; Ngulube, 2015). The expectation is that researchers must act responsibly and in an ethical manner particularly when conducting research involving humans and animals (Holbrook, Dally, Avery, Lovat, & Fairbairn, (2017). Therefore, the researcher should think and act ethically, and the ethics review process is a conduit to support the development of such skills (Hott, Limberg, Ohrt, & Schmit, 2015; Tatebe, 2015). As part of this process, the Belmont Report (1979) provides compliance guidelines for researchers who include human subjects as part of their research. This study did not include any human participants, only data from secondary sources. Therefore, the guidelines from the Belmont Report do not apply.

One of the principal roles of the researcher is to avoid or mitigate bias by adopting the appropriate steps (Garg, 2016). There are three possible sources from which bias could have entered in the management and analysis of the data in this study. First, I was recently employed to a commercial bank whicis part of a financial group of companies that includes an investment bank. This investment bank supports IPOs issued

by the companies in the sample. Second, because of the size and reach of this financial group, some of the sample companies may also conduct business with the organization. Third, at the personal level, my investment portfolio includes stocks managed by an investment bank that supports firms in the sample. However, the use of the historical and quantitative data in research improves the objectivity (Park & Park, 2016), and applying secondary data for this study protected the data, analyses, and outcomes from the influence of such relationships. However, I am fully aware that these relationships exist and could have, over time, influence personal beliefs and perceptions about the companies in this sample and their operations.

Participants

Previous researchers on IPOs and IPO underpricing, such as Miloud (2014) and Ritter (2015), used secondary data in their research. In line with this precedence, I used secondary publicly available data and did not include human participants in this study. The use of secondary data diminishes the need to adhere the guidelines relating to respect, beneficence, non-maleficence, and justice enunciated by Bhaskar and Manjuladevi (2016), and the compliance directives detailed in the Belmont Report (1979).

The secondary data for this study came from the JSE, which houses annual reports and prospectuses for all companies that issued IPOs and those traded on both JSE's main and junior markets. In addition to its main market the JSE also has a junior market designed to encourage and promote investment in Jamaica's entrepreneurship and economic development by listing small and medium-sized companies (SMEs) with

capital base ranging from $50 to $500 million Jamaican dollars and an IPO offer of at least $50 million (JSE, 2009). Pandes and Robinson's (2014) position that the development of a junior market is essential to the economic health of a country seems to support the establishment of the JSE junior market. This could possibly explained why Pandes and Robinson lamented that the decline in the number of IPO issues in the US market especially for smaller companies impacted the ability of smaller companies to raise capital, and in the process tempered the growth of smaller companies and eliminate millions of jobs. The average number of IPOs per year declined by 68.06%, from 310 to 99 for the period 2001 to 2012 relative to the period 1980 to 2000, and the decline was worse for small companies (Gao, Ritter, & Zhu, 2013). The decline for IPOs issued by small companies averaged 83.03% with mean volume dwindling from 165 IPOs per year during 1980-2000 to 28 per year during 2001-2012 (Ritter, 2014).

The JSE allowed access to the secondary data used in this study via electronic and paper-based databases on its website and in its offices located in Kingston, Jamaica respectively. This data are accessible to the public, and therefore did not require permission to access. The final sample included all the IPOs issued in the defined research period after screening to remove preference shares and U.S. dollar-denominated issues. The time-saving justification put forward by Fanning (2014) and the straightforward and inexpensive access rationale from Bhaskar and Manjuladevi (2016) for using secondary data helped to substantiate the use of this type of data in this study.

Research Method and Design

The methodology is a fundamental component of the research process which reflects researchers' common views, philosophies, norms, and principles and provides a framework through which to address the research questions (Garg, 2016; Murshed & Zhang, 2016). Ngulube (2015) indicated that the purpose of the research defined by the research question(s), determines the appropriate research methodology. Further, understanding the methodology is key to obtaining reliable outcomes (Garg, 2016).

Research Method

Researchers can choose one of three methods for their research: quantitative, qualitative, or mixed methods (Raich, Müller, & Abfalter, 2014). Each of these methods differs in the type of data and process involved and has limitations (Delost & Nadder, 2014; Turner, Cardinal, & Burton, 2015). The comparison of the quantitative and qualitative research methods typically suggest that the quantitative method offers hard, factual data, while the qualitative method presents softer and deeper insights (Barnham, 2015). Given the purpose, primary research question and related hypotheses for this study, the quantitative method was appropriate.

According to Delost and Nadder (2014), qualitative research methods work best for research topics with limited understanding and very little documented work. Murshed and Zhang (2016) supported this position and added that it illuminates relative unknown phenomenon through active entanglement with human subjects and in-depth chronicling about their unique settings and perspectives. Ngulube (2015) added that the qualitative research method is inductive and exploratory. This method provides the researcher with

insights from the research participants' perspectives of the human experience, points of view, and motivations associated with a social problem, allowing the researcher an opportunity to decipher or demystify previously unexplained issues (Bernard, 2013; Delost & Nadder, 2014). Qualitative research methods also provide the researcher with a mechanism to develop new theories or validate existing ones using a conceptual framework (Delost & Nadder, 2014; Pinder, Prime, & Wilson, 2014). The objective of this study was not to understand IPO stakeholders' perspective on whether a relationship exists between IPO underpricing, share retention, and underwriter reputation. Therefore the qualitative research method was not aligned to the objectives of this study.

In some instances, neither the quantitative nor qualitative method is appropriate to fully address the research question and as such researchers employ the mixed method approach (Delost & Nadder, 2014). Turner et al. (2015) believed that the mixed methods approach, which combines quantitative and qualitative methodologies, can mitigate the limitations inherent in each of the individual method. The mixed method is a multi paradigm approach using the predictive and the exploratory strengths of the quantitative and qualitative research methods respectively to produces a model that addresses a wider range of research questions and in increased detail (Ngulube, 2015). The mixed method allows the researcher to strengthen the quantitative findings or obtain an expanded insight into the research statistics by incorporating the qualitative perspective which focuses on a social issue or personal experience (Van Griensven et al., 2014; Venkatesh, Brown, & Sullivan, 2016).

Venkatesh et al. (2016) opined that the time and effort required to collect,

analyze, and validate both quantitative and qualitative data are significantly greater than

that of a single method. Complexities associated with the examination of some topics

may require a more comprehensive understanding, and therefore require the strengths of

quantitative and qualitative methods in a mixed methods study (Van Griensven et al.,

2014). For example, Bassous (2015) used quantitative research to assess the extrinsic

impact of independent variables and the qualitative research to examine the patterns of

behavior. This condition did not exist for this study, and the time and implied cost

impediments that Venkatesh et al. (2016) associated with this approach reinforce the

decision not to adopt the mixed method for this study.

According to Murshed and Zhang (2016), the objective of the quantitative

methodology is to seek clarifications and stress independence, generalizability and

consistency and rigor. The quantitative approach is numerically oriented, involves well-

defined numerical measurements of theories and models and typically uses a statistical

framework to assess the strength and significance of prescribed hypotheses (Murshed &

Zhang, 2016). The quantitative method, through the use of experimental or non

experimental procedures, involves the collection, and analysis of quantifiable statistical

data summarized in numerical indices (Delost & Nadder, 2014). Accordingly, Ngulube

(2015) concluded that the quantitative method is theory led, tends to be confirmatory, and

can support the testing and enhancing of existing theories from a deductive perspective.

In line with precedence set by previous researchers on this topic and as recommended by

Roos, Thakar, Sultan, Leeuw, and Paulus (2014), I adopted a quantitative research

method to examine the relationship between IPO underpricing, share retention and underwriter reputation.

Research Design

The appropriate research design is essential to ensure the best and most reliable outcomes and the research design provides indications about key attributes of the research which may differ depending on whether the overall method is qualitative, quantitative or mixed methods (Alavi, 2016; Garg, 2016). Quantitative research designs contemplated for this study included experiment, case study and cross-sectional and longitudinal surveys. However, I did not use any of these designs because the primary research question in this study did not align with the purpose, research procedure, and the data specifications associated with these research designs.

The first quantitative design considered was the experimental research design According to Delost and Nadder (2014), the experimental research design exists in three forms. In the pre-experimental form, the intervention applies to an additional subject group but does not involve a control group (Delost & Nadder, 2014). The quasi-experimental design also does not use randomization or control groups but involves manipulation of the independent variable with the cause-and-effect option. The third type is the true experiment which applies experiment or statistical control methods to effect full control of the variables (Delost & Nadder, 2014). The true experiment approach is the most effective design for hypothesis testing because of the opportunity for the researcher to establish causality (Delost & Nadder, 2014). In the experiment approach, there is an equivalent control group that replicates the features of the treatment group

with the only exception being the introduction of the treatment (Crane et al., 2017).

Independent of the forms, the procedure of determining an outcome by using a control

variable or subjecting participants to specific conditions or a controlled environment

(D'Onofrio et al., 2013), made this approach inappropriate for this study.

The second research design contemplated for this study was the case study. Case

studies provide the description of a phenomenon, the testing, or generating of a theory

and can help to bridge the gap between inductive and deductive research (Ngulube,

2015). In case studies, the researcher's objective is to understand the uniqueness of

individual cases (Park & Park, 2016). Additionally, the sample size can be very small; in

extreme cases, one particular entity is worth investigating (Park, & Park, 2016). These

situations do not exist in this study; rather the objective was to investigate whether a

relationship exists between predetermined dependent and independent variables using

secondary data. Further, the purpose of this study was not to understand the uniqueness of

any single IPO company, hence the qualitative case study was not the best fit for this

research.

Survey design, categorized, as part of the non experimental group of quantitative

research designs, was the third option considered for this study (see Garg, 2016). In the

case of cross-sectional survey design, the data are static covering the research variables at

a single point in time (Watson, 2015), and is not considered ideal to investigate dynamic

management theories (Stritch, 2017). For longitudinal studies, the research includes the

examination of a data set of the same variable(s) to obtain information on how they

change over time (Stritch, 2017; Watson, 2015). In this study, the sample size spanned

the period January 1986 to July 2018, and various companies issued IPOs during this

period. The purpose of this study did not require the tracking of the IPO of any single

company over time, and the sample mix included entities with diverse company

fundamentals (size, ownership, industry, etc.). For these reasons, neither the cross-

sectional nor the longitudinal approach was not adopted for this study.

When the objective of the study was to determine and explore the relationship that

exists (or not) between two or more quantifiable variables, as was the case for this study,

then the correlational research design is the most appropriate methodology (see Curtis et

al., 2016). As demonstrated by Alsulaiman, Forbes, Dean, and Cohen (2015), Bassous

(2015) and Pinder et al. (2014) correlational studies help the researcher to explore the

presence and extent of relationships among variables or conduct an exogenous

assessment of the impact of independent variables on dependent variables. The

expectation is that the variables move simultaneously whether in the same or opposite

direction (Delost & Nadder, 2014). The research may improve the effectiveness of a

correlational study by introducing statistical control variables to better estimate the

relationships among predictor and response variables (Becker et al., 2016). However

control variables were not a part of the statistical analysis plan for this study.

The correlational research design was appropriate for this study for the following

reasons. First, correlational studies apply when the objective of the researcher is to

determine if a relationship exists among variables as well as to ascertain the prevalence of

such relationships (Curtis et al., 2016). The objective of this study was to determine the

relationship between IPO underpricing and share retention and underwriter reputation.

Second, the use of this tool dates back to the origin of the Pearson's correlation technique in the late 19th century and the flexibility of this design to indicate directional relationships legitimize the arguments that correlational research design is a reasonable tool of measurement (Wiedermann & Hagmann, 2016). Third, the common use of the correlational research design in the literature as an analytical tool indicates that the correlational design is the preferred option for researchers examining topics similar to that of this study (Curtis et al., 2016). As demonstrated by Park and Park (2016), review of previous research on a topic can help to influence the approach adopted for a research project and this example helps to support the decision to use the correlational design in this study. Finally, when compared to the other quantitative research designs the correlational approach best aligns to the purpose and research questions of this study.

Population and Sampling

The preference for researchers such as Ammer and Ahmad-Zaluki (2015), Deb (2014), and Wu and Wan (2014) who studied IPOs and IPO performance, was to use secondary historical data. Secondary data represent information previously documented and exposed to some rigor of the statistical process (Bhaskar & Manjuladevi, 2016). In this study, I used secondary data to assess whether a relationship existed between initial first-day returns (IPO underpricing) and IPO share retention ratio and reputation of the IPO underwriter for companies that issued IPOs in Jamaica and who remain trading on the JSE. Similar to previous researchers who examined this topic, I restricted the data points to a specific period (see Miloud, 2014; Ritter, 2015).

While instances exist where previous researchers studied multiple markets (Boulton et al., 2017; Chen et al. (2017); Kesten & Mungan, 2015), the precedence is for researchers to focus on a single market. For example, Indriani and Marlia (2015) in the Indonesian market, or a specific industry as demonstrated by Kesten and Mungan (2015) who studied the life science industry and Morriconea, Munari, Orianic, and de Rassenfosse, (2017) the U.S. semiconductor industry. This study replicated some of the practices adopted by Ritter (2015) who examined the relationship between variables by applying the correlational research design to historical data. Despite studying similar topics, the population or sample used by previous researchers varied across studies because the purpose and demographics of study determine sample size (Donaldson, 2015).

The population of IPOs issued in Jamaica spans a period dating back to the start of the JSE in 1969. Typically companies that trade on all stock exchanges would have gone through the IPO process at some time, and this outcome is also true for Jamaican companies trading on the JSE. However, to ensure that the sample size for this study adequately captures the most recent IPOs, I extended the sample date from January 1986 to July 2018. Additionally, the companies issuing the IPOs must engage the services of an underwriting firm to support IPO either as lead underwriter or broker, and internal stakeholders must retain a portion of the shares instead of offering 100% for sale.

These prerequisites remain consistent with the precedence set by Kumar (2017) to ensure that each firm in the population has all the available data points for both the independent and the dependent variables. The approach used by previous researchers who

studied IPOs and IPO underpricing was to define a study period and use all the IPOs issued during that period as the sample (Cao et al., 2013; Donaldson, 2015; Jeribi et al., 2014; Ritter, 2015). The definition of the population for this study, both in terms of period range and size, aligns to this precedence and supports its appropriateness for this study.

Similar to the approach taken by Donaldson (2015), this study used a non-probabilistic purposive sampling technique to determine the sample. As implied by Garg (2016), this technique has an important disadvantage because each population participant does not have an equal and non-zero opportunity of being selected; therefore, the sample may not be representative of the population (Delost & Nadder, 2014). Despite this weakness, the non-probabilistic purposive sampling approach allows the researcher to use a defined criterion aligned to the research question to create a manageable cost efficient sample that typifies a representative group (Barratt, Ferris, & Lenton, 2014; Delost & Nadder, 2014). In the process, the researcher may reject data points outside the scope of this defined criterion or selected subject profile (Barratt et al., 2014). This approach worked for this study because the researcher was able to define criteria for sample boundaries. For example, this study sample included only IPOs listed during the stated period with a first day closing price that is greater than the IPO offer price. Not all firms that issued IPOs during this period qualified, hence the non-probabilistic purposive sampling approach was optimal for this study.

The simple random sampling approach in which each firm would have an equal and independent chance of being selected has attractive advantages relating to ease of

sampling and generalizability to the population (Delost & Nadder, 2014). This sampling technique allows the researcher to draw conclusions regarding the general population from the research outcomes (Delost & Nadder, 2014). Additionally, the selected sampling technique must align with the research question(s) (Delost & Nadder, 2014). Using a simple random sampling in this study would violate both the requirement for alignment to the purpose of this study, as well as the need for each firm to have an equal chance of being selected. For example, I eliminated sample firms that issued U. S. dollar-denominated IPOs; therefore, the simple random sampling technique was not the best fit for this study.

The size of the sample is an important consideration for researchers (Delost & Nadder, 2014). Samples should be sufficiently large to be representative of the population (Garg, 2016) and to permit a rigorous testing and subgroup analyses (Delost & Nadder, 2014). However, selecting too large a sample amplifies the risk of increased noise associated with the heterogeneous population (Garg, 2016). In contrast, small samples, though they may be appropriate for homogenous populations (Delost & Nadder, 2014), may not adequately address the research question (Garg, 2016).

In this study, the goal was to define the sample as the universe of IPOs issued from January 1986 to July 2018 and to follow the precedence established by other researchers such as Zeligman, Varney, Grad, and Huffstead (2018) by using the G*Power software to estimate the sample size for this study. The sample size was 52 which is within the range of 43 and 68 estimated by the G*Power software version 3.1.9.2, at the 95% confidence level (Faul, Erdfelder, Lang, & Buchner, 2009). This sample size

represents the post-screening position after omitting preference shares and U. S. dollar-denominated issues. All the data points in this final sample spanned the same period and the sample includes for each IPO firm, the first-day initial return, the percentage of shares retained (i.e., shares not offered for sale), and the underwriter reputation as reflected by the market share of IPOs supported.

Ethical Research

According to Ngulube (2015), researchers must observe and maintain ethical standards and concerns at each stage of the research process, and an important part of this practice is the need to obtain participants' informed consent. Bhaskar and Manjuladevi (2016) believed that the researcher of studies involving human participants must obtain informed written consent from participants about their unintimidated willingness to participate in the research. The researchers must safeguard information relating to these participants from unauthorized access and disclose only under special and prescribed conditions (Bhaskar & Manjuladevi, 2016). Doctoral studies under the supervision of Walden University must withstand the scrutiny of the institutional review board (IRB) that ensures that studies (both in terms of process and outcomes) conform to professional standards, the university mandates, and all appropriate laws.

In line with previous research (Alcaniz et al., 2015; Darmadi & Gunawan, 2013; Deb, 2014; Hidayat & Kusumastuti, 2014; Ritter, 2015), this study used secondary data to investigate the relationship, if any between IPO underpricing, share retention ratio, and underwriter reputation. The publicly available data used in this study did not include any human participants. Accordingly, the informed consent protocol, the related

confidentiality agreements, and consent forms referenced by Bhaskar and Manjuladevi (2016) did not apply to this study. However, I retained the data for the customary five years , allowing access to myself and authorized Walden personnel only and scrubbing to remove all identifiable information relating to specific companies.

Instrumentation

Hagan (2014) suggested that researchers can find valid and reliable research instruments by scrutinizing previous works in their area of focus. Many of the studies on IPOs, IPO underpricing, and related areas such as Abu Bakar and Uzaki (2013), Bédard, et al. (2016), Donaldson (2015), and Jeribi et al. (2014), used secondary data and as such, in this study I applied secondary data archived from publicly accessible sources. According to Bhaskar and Manjuladevi (2016), secondary data represent information compiled by someone other than the current user and exposed to aspects of the statistical process. The use of secondary data saves time, is easy, and inexpensive to execute (Fanning, 2014; Bhaskar & Manjuladevi, 2016) and may also help to mitigate concerns relating to instrument reliability and validity.

Despite not using the typical research instruments, the secondary data measured the dependent and predictor variables for this study which are IPO underpricing, IPO share retention, and underwriter reputation. IPO underpricing measures the return on the first day of trading of IPO stock, the IPO share retention ratio compares the amount of share retained by the firm's internal stakeholders relative the total number of shares outstanding, and the underwriter reputation represents the market share of the value or number of IPOs supported. The secondary data that measured these variables came from

the JSE. Companies listed on the JSE must adhere to information disclosure and governance standards approved by the JSE, thus improving the reliability of their published information (JSE, 2009). Additionally, the JSE collaborates with and provides information to entities at both the local and global levels and is an affiliate of the World Federation of Exchanges (WFE). Accordingly the JSE must adhere to international best practices, professional and compliance standards relating to data collection, husbandry, and governance (see JSE, 2018; WFE, 2018).

The secondary data from the JSE's electronic and paper-based sources provided information in the required format for the research variables in this study or the data points necessary to calculate the required ratios for the variables. For example, for each IPO company listed in the sample, the information from the JSE included the IPO offer price, closing price on the first day of trading, number of shares offered to the public by the firms, the total number of share outstanding, and the IPO underwriter or broker. The JSE also provided, by way of the firms' prospectuses, key demographic, economic, and financial data on the sample IPO firms such as firm size and type, industry, and profitability.

In line with the definition stated in the research work of Leong and Sundarasen (2015), as well as Wong et al. (2014), the dependent variable for this study, that is, IPO underpricing represents a ratio expressed in percentage form. Similarly, the measurement scale for IPO share retention the first of two independent variables is in ratio format, as wasthe case of the research conducted by He et al. (2015). As demonstrated in the work of Indriani and Marlia (2015) in Indonesia and that of Wu and Wan (2014) in China,

underwriter reputation, the second independent variable in this study reflected a

dichotomous variable. I collected the secondary data for this study directly from the

JSE's electronic and paper-based files. Therefore, except for organizing the data using an

Excel spreadsheet, no additional calculations or coding of the data collected was

necessary. Appendix C includes a sample of the raw data.

Data Collection Technique

The data collection technique is an important consideration for any research

because of the ability to become an avenue through which bias and error enter the

research (Garg, 2016). Before communicating the research findings, it is important to

espouse information related to procedural reliability and data collection methods and

procedures (Hott et al., 2015). Using secondary data from existing (electronic and non-

electronic) sources is inexpensive and unobtrusive relative to primary sources (Bhaskar &

Manjuladevi, 2016). According to Ellram and Tate (2016), secondary data refer to the

quantitative or qualitative data not collected by the researcher and usually for a purpose

other than the one intended by the researcher. Similar to the precedence set by Abu Bakar

and Uzaki (2013), Bédard et al. (2016), Donaldson (2015), and Jeribi et al. (2014), I used

secondary data in this study. The primary source for the data was the JSE's main and

junior markets.

Bhaskar and Manjuladevi (2016) indicated that one of the disadvantages of using

secondary data is the risk of omission that is, missing data points. To address this

challenge required the omission of the sample points for which the required information

was not available. Ellram and Tate (2016) indicated that the provision of precise

guidelines for reporting data can help to prevent distortion in secondary data, resulting from variations in accounting policies and internal company practices. Ellram and Tate further cautioned that in using secondary data, the researcher must assess for data reliability, that is, is the data consistently reported over time and data validity, that is, can the secondary data address the research purpose and question.

The JSE provided strict directives regarding the content, quality, and frequency of the reports submitted, as well as mandatory compliance rules regarding governance and operational procedures to address the data reliability (JSE, 2018b). The credibility of the operations of the JSE is evident in the increased use of the JSE data by global companies, international agencies, and associations. For instance, the information on Jamaica's trading and market activities published by Bloomberg comes directly from the JSE (JSE, 2018b). Bloomberg also tracks the performance of the JSE and reported recently that for the last five years, the JSE's market rally was the largest globally (McDonald, 2018).

The database for the JSE, which is the primary source for this study's data, contains all the market and trading activities for the companies listed on the exchange. For each firm, the JSE database houses information such as market capitalization, offer price, offer volume, the percentage of total shares offered in the IPO, name of underwriter/broker, closing price at the end of the first day of trading and other historical prices, and trading volume (JSE, 1986- 1994; JSE, 2018a). The JSE also houses annual reports and prospectuses for all companies that issued IPOs and listed companies on the exchange.

The sample data for this study included all IPOs issued from January 1986 to July 2018, except for adjustments. The data from the JSE were adequate to address the purpose and research question for this study and as such resolved the data validity question. I started the data collection process after receiving IRB approval (IRB approval number: 06-01-18-0341619). For each company included in the sample, I collected information on the offer price, offer volume, the percentage of total shares offered in the IPO, name of the underwriter/broker, and closing price at the end of the first day of trading. The market share of total IPOs (both volume and value) supported by each IPO underwriter was the proxy for underwriter reputation, one of the predictive variables in this study.

Watson (2015) suggested that an Excel spreadsheet is an option for data entry and according to Peng (2015), consensus exists that Excel can be extremely helpful in its application to financial analyses. Further, Makwana and Rathod (2014) recommended that Microsoft Excel is an effective data husbandry, organization, and comparative tool. Therefore, I used an excel spreadsheet to achieve similar objectives for this study.

Data Analysis

Data analysis is the process of estimation that investigates associations among variables and generates a sample statistic that corresponds to the population's parameter (Watson, 2015; Zyphur & Pierides, 2017). The purpose of the data analytical framework adopted for this study was to explore the relationship between share retention ratio (i.e., the percentage of shares retained by internal stakeholders in an IPO), the reputation of the IPO underwriter (represented by market share of IPOs underwritten), and IPO

underpricing (i.e., as measured by the stock percentage returns on the first day of

trading). The two independent variables occurred frequently in the existing body of

literature on IPO underpricing as predictor variables and Butler et al. (2014) concluded

that these two variables were among the 16 robust determinants of IPO underpricing

identified after testing a total of 48 variables. The following primary and support

questions encapsulated the purpose of this study, as well as contextualized the related

data analyses.

What is the relationship between the IPO share retention ratio, the reputation of

the IPO underwriter, and IPO underpricing? The following secondary questions support

this primary research question.

RQ-1: What is the relationship, if any, between a firm's IPO share retention ratio

and IPO underpricing?

RQ-2: What is the relationship, if any, between the reputation of the IPO

underwriter and IPO underpricing?

RQ-3: What is the impact of underwriter reputation on the relationship between a

firm's IPO share retention ratio and IPO underwriting?

RQ-4: What is the relationship, if any, between firm's IPO share retention ratio,

the reputation of the IPO underwriter and IPO underpricing?

From the perspective of the quantitative researcher, creating and designing

variables to measure theoretical concepts is an unavoidable aspect of hypothesis testing

(Morgan, 2015). Accordingly, the related null and alternative hypotheses that

operationalized these research questions are:

$H_0 1$: There is no statistically significant relationship between firm's IPO share retention ratio and IPO underpricing.

$H_a 1$: There is a statistically significant relationship between firm's IPO share retention ratio and IPO underpricing.

$H_0 2$: There is no statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing

$H_a 2$: There is a statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing.

$H_0 3$: The reputation of the IPO underwriter has no statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing.

$H_a 3$: The reputation of the IPO underwriter has statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing.

$H_0 4$: The firm's IPO share retention ratio and the reputation of the IPO underwriter do not jointly explain IPO underpricing.

$H_a 4$: The firm's IPO share retention ratio and the reputation of the IPO underwriter jointly explain IPO underpricing.

Screening the data is an important prerequisite for the analysis phase of the research, and many researchers in the IPO space use this procedure. For example, in the research on Canadian IPOs issued from 1982 to 2002, Bédard et al. (2016) screened for IPOs that did not develop any market; Donaldson (2015) screened out limited partnerships, mutual funds, and American Depository Receipts (ADRs) in his study of IPOs listed on NASDAQ and NYSE between 2007 and 2007, and Liu (2014) removed

from the sample of IPOs issued between 1987 and 2007, companies that did not have at least two years of data prior to the IPO. From the data set collected for this study, I eliminated all IPOs for preference shares, U.S. dollar-denominated IPOs and firms for which all the data points were not available.

As demonstrated by Kumar (2017), the data screening process exposed missing and incorrect data. This approach also worked for this study. Where unavailable missing or incorrect data existed, the examples of omission illustrated by Jeribi et al. (2014) and Kumar (2017) applied. Watson (2015) opined on the importance of using the appropriate statistical method to analyze quantitative data. From the basket of statistical methods available for analyzing quantitative data and specifically IPO data and in line with the precedence set by previous researchers such as Gonzalez (2014), I adopted, for this study an analytical framework that includes the OLS multiple regression analysis including descriptive statistics, and the Spearman ranked correlation matrix.

In deciding how to measure the association between the variables in this study, I considered a number of options including systems of equations/econometrical models as well as the Pearson and Spearman correlation matrices. As demonstrated by Cao et al. (2013) in their assessment of venture capital support for IPOs, econometric models apply in situations that require a series of complex regression equations (linear or non-linear) and span qualitative or quantitative data (Low & Meghir, 2017). Schaub, M. (2015) applied a system of equations to estimate excess returns in their effort to determine the short-term wealth effects accrued to American Depository Receipt (ADR) investors.

These scenarios do not exist for this study, accordingly I did not consider econometric modeling/system of equations appropriate for analyzing the data in this study.

I also considered the use of either the Pearson or Spearman correlation matrix to as part of the analytical framework of this study. According to Alfons, Croux, and Filzmoser, (2017) both these measures of correlation are standard tools used in statistical practice to measure association among variables. The Pearson correlation coefficient is a parametric test which requires the non-violation of the normality and linearity assumptions and measures the strength of the relationship between two variables (Donaldson, 2015).

Unlike Pearson's correlation tool, the Spearman rank order correlation is a non-parametric test that can apply to skewed non-normal distributions and does not assume any special conditions about data normality (Donaldson, 2015). Given that the sample for this study violated the normality assumption, the Spearman ranked correlation matrix was the better option. By deciding to adopt the Spearman ranked correlation, I incorporated an approach similar to that of Donaldson (2015) who used the Spearman correlation coefficient to assess the extent of the relationship among the research variables. With the strength of not requiring the normality assumption (Bishara, & Hittner, 2014), the Spearman correlation allows the researcher to examine the strength of the relationship between independent and dependent variables, when paired individually (Zhang et al., 2015). Accordingly, I used the Spearman correlation to evaluate the relationship between IPO share retention ratio, the reputation of the IPO underwriter, and the first-day market return on the IPO stock price (IPO underpricing).

According to Zhang et al. (2015), multiple regression analysis is a popular go-to analytical tool for prediction purposes and supports the determination of causality between independent and dependent variables. The OLS regression is the primary analytical tool for this study. The following assumptions must hold for the results of the multiple regression analysis to be reliable: (a) normality (i.e., normal distribution of the error terms), (b) linearity (i.e., a linear relationship exists between the explanatory and explained variables), (c) multicollinearity (i.e., the independent variables are not highly correlated), (d) homoscedasticity (evenly distributed variances of the error terms around the independent variables), and (e) autocorrelation. (i.e., the error terms are independent and uncorrelated for any two observations (Mooi & Sarstedt, 2014; Zhang et al., 2015).

Violation of these assumptions may require adjustments in the data or the application of other types of analyses to improve the reliability and robustness of the multiple regression outcomes (Hopkins & Ferguson, 2014; Willis & Hyde, 2014). Where the assessment of the regression assumptions revealed violation of some assumptions, I applied corrective measures in line with precedence set by researchers. For example, I imitated the approach used by Darmadi and Gunawan (2013) and applied the heteroscedasticity-consistent standard error (HCSE) multiple regression instead of the standard regression analysis because of theviolated the homoscedasticity assumption.

In its generic form, the multiple regression model, typically presented as an algebraic expression is:

$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_i x_i + e_i$

where Y represents the dependent variable and the Xs the independent variables α is the

constant and the βs are coefficients of the independent variables, and the sample

generates both α and β (Zhang et al., 2015).

In line with the precedence set by Abu Bakar and Uzaki (2013) who investigated

420 IPOs listed on the Malaysian Stock Exchange, the definition of IPO underpricing in

this study was

$$UP_i = \frac{CP_i - OP_i}{OP_i}$$

where UP_i represented underpricing in firm i,

CP_i: closing price in firm i

OF_i: offering price in firm i

Similarly, in line with the generic multiple regression equation above and the format used

by Abu Bakar and Azaki, I defined the relationship between the independent variables in

this study, share retention, and underwriter reputation, and the dependent variable IPO

underpricing as

$$UP_i = \alpha + \beta_1 SR_i + \beta_2 UR_i + e_i$$

where UP_i represents IPO underpricing in firm i, (i.e., the first day return on the IPO

stock)

SR_i: Share retention ratio, that is, the percentage of shares retained by internal

stakeholders of IPO firm i

UR_i: the reputation of the IPO underwriter for firm i (measured as the market share of

IPOs underwritten)

The data analysis plan details the various statistical methods used in this study (see Appendix A). In addition to the evalution of assumtions, the execution of this plan also iincluded descriptive statistics. Using an approach consistent with that of Gao et al. (2013), Long (2016), and Ritter (2015), I included descriptive statistics in the analytical frame of this study. According to Delost and Nadder (2014), descriptive statistics allow the researcher to scrutinize, categorize as appropriate, and document the key features of the data such as variable similarities and differences. Ritter (2015) demonstrated this approach by applying mainly descriptive statistics to a sample of 340 IPOs issued from 1980-2012 to investigate the impact of growth capital-backed IPOs. Based on the precedence set by previous researchers, I used descriptive statistics in this study because, as indicated by Long (2016), this strategy allowed for sample-to-population generalizations.

Finally, coupled with the regression analysis, the analysis of variance analysis (ANOVA), represented in algebraic form by the F-statistic value (Mishra, 2016) also forms a part of the analytical framework. As demonstrated by Brycz, Dudycz, and Kowalski (2017) and Vijay Kumar and Gupta (2014) who investigated IPOs in the Polish and Indian markets respectively, ANOVA assesses the overall significance of the regression analysis model and in the case of this study examined the joint impact of share retention and underwriter reputation on IPO underpricing. Therefore, the F-test was used to evaluate whether the independent variables jointly explain the dependent variable in this study.

Of the available software packages with capabilities to conduct the type of data analyses required by this study, I used primarily the Statistical Package for the Social Sciences (SPSS) version 24.0., an approach that is consistent with the actions of previous researchers who used SPSS to conduct quantitative studies (Banerjee, 2015; Banerjee & Rangamani, 2014; Casero-Ripollés, 2017; Zeligman et al., 2018). The SPSS software helped to conduct the in-depth analyses required to test the hypotheses that translate the purpose of this study and operationalize the related research questions..

Study Validity

According to Claydon (2015), rigor in quantitative research is a function of research quality, and poor quality may signal concerns about the accuracy and validity of the research outcomes. Further, the research tool selected must meet the validity, reliability, and practicality tests (Bhaskar & Manjuladevi, 2016). Validity indicates whether the research measures the desired variable(s) (Bhaskar & Manjuladevi, 2016; Delost & Nadder, 2014), whether the research is credible, true, and its assessment aligns to the stated objectives (Zohrabi, 2013). Researchers can establish the validity of their work by building an evidence-driven argument on the effectiveness of the research tool (Bhaskar & Manjuladevi, 2016; Hagan, 2014), to ensure that each type of validity equally supports this evidence-building process (Hagan, 2014).

Bhaskar and Manjuladevi (2016) described three broad validity assessment, (a) content validity assesses the extent to which the research tool appropriately aligns to the purpose of the study, (b) construct validity questions whether the measurement conforms to the theoretical frame and are the expected and actual relationships aligned, and (c)

criterion validity evaluates the degree to which a new approach compares to existing established approaches (Bhaskar & Manjuladevi, 2016).

Internal and External Validity

External validity exists where the research outcomes allow for generalization from one specific experiment to other population groups or subjects, settings, or treatments (Claydon, 2015; Vargas, Duff, & Faber, 2017; Zohrabi, 2013). Similar to Hagan (2014), Lancsar and Swait's (2014) description of external validity highlights the importance of the predictive power of the research, and Zohrabi (2013) implied that external validity exists if the research design generalizes beyond the sample of current investigation to a wider population. According to Lancsar and Swait, external validity refers to the capability of a model to generate sufficiently accurate forecasts or consistent inferences extrapolated beyond the current frame to other populations or time periods.

Given that the sample date for this study includes current periods that is, up to July 2018, the outcomes may have provided insights about future trends in underpricing of IPOs in Jamaica and possibly other territories with similar economic and developmental features. To the extent that the findings of this study provide these insights, these results could help to alleviate concerns about external validity in this study. On the other hand, the regulatory environment which governs the issuance of IPOs continues to change, and therefore the possibility exists that future regulatory changes could cast doubt on the generalization capability of this study's research outcomes and hence negatively impact the external validity of this study.

Threats to external validity can surface if the sample is not sufficiently representative of the population, if there is insufficient information on the sample (Neall, & Tuckey, 2014) or, if the researcher applies specific stimuli to or administers the experiment in a unique environment (Vargas et al., 2017). In either of these circumstances, generalizations become problematic according to Vargas et al. (2017). The sample of secondary data for this study included all IPOs issues during the study period (i.e., 1986 to 2018) and an experimental design applying stimuli and treatments was not adopted. Therefore, the threats to external validity highlighted was not be a concern for this study.

Internal validity, which includes the evaluation of the relationship between research components and the underlying theoretical or conceptual frame (Hagan, 2014), occurs when noticeable differences between subsamples exist as a result of the research treatment (Bhaskar & Manjuladevi, 2016). Bertossa, Harvey, Smith, and Chong (2014) implied that retesting is one way to provide evidence of internal validity. Soliño, Farizo, and Campos (2017) demonstrated that internal validity exists where no differences occur in the estimated parameters across multiple subsamples. Neall and Tuckey (2014) reported that internal validity allows for the drawing of causal inferences from the sample and that in circumstances where the level of internal validity is high, there is credibility to the argument that one variable has a causal effect on the other variable.

According to Venkatesh et al. (2016), threats to internal validity exist in three forms - history, selection, and maturation. Additionally, Vargas et al. (2017) believed that threats to internal validity are active if there are alternative explanations for the research

outcomes because of (a) a change in the variables not initiated with the research, (b) maturing in the research participants, (c) unplanned drop-outs of participants from the research, and (d) participants becoming sensitized to the research. Many of these threats imply the use of experimental or quasi-experimental research design with human participants. As demonstrated by Venkatesh et al., a demographic comparison between subsamples can help to identify threats to the internal validity of the research. I neither employed an experimental nor included human participants in this study. The sample included secondary data collected from archived, publicly available sources. Accordingly, no expectation exists that these threats may impair the outcomes of the research.

Statistical Conclusion Validity

Statistical conclusion validity (SCV) refers to the use of appropriate statistics to draw inferences about the covariation between dependent and independent variables, which may be vulnerable to incorrect statistical conclusions (Lachmann, Trapp, & Trapp, 2017). Neall and Tuckey (2014) implied that SCV relates to aspects of the sampling processes, statistical power, and analytical procedures employed in the research and that the SCV underpins the quality of and the users' confidence in the research outcomes. The measurement of statistical conclusion validity involves the use of an appropriate data analysis framework and testing for statistical assumption violation (Venkatesh et al., 2016).

Neall and Tuckey (2014) argued that over reliance on one data source can present a threat to SCV. Lachmann et al. (2017) believed that SCV increases over time and

therefore, the threat to SCV increases in quantitative non-experimental research designed such as surveys because the data collection process typically occurs at a single point in time. Threats to SVC can occur via the reliability of the research instrument, data assumptions, and sample size (Long, 2016).

Given that SCV can be an indication of the quality of quantitative inferences (Venkatesh et al., 2016), it is critical that researchers should test for specific threats to SCV such as endogeneity issues which may surface in instances of omitted correlated variables, faulty associations among variables, and erroneous conclusions about actual relationships (Lachmann et al., 2017). Researchers can address the threat from the use of a single data source by triangulating with multiple data sources (Neall & Tuckey, 2014).

Additionally, Lachmann et al. (2017) recommended the consideration of the following additional factors: (a) reverse cause and effect (i.e., causality running counter to normal expectation), (b) multicollinearity (occurs when independent variables are highly correlated), (c) heteroscedasticity (variances of the error terms distributed unevenly around the independent variables) and (d) sample outliers (Lachmann et al., 2017). Researchers can improve this type of validity by using multiple sources of data (Lachmann et al., 2017).

Data assumptions. Data must conform to some underlying assumptions if multiple regression analysis is to produce reliable results and meaningful interpretation of statistical tests (Miranda, 2015; Mooi & Sarstedt, 2014). These assumptions include normality which requires normal distribution of the error terms and linearity where a linear relationship should exists between the explanatory and explained variables (Zhang

et al., 2015). Other assumptions reported by Lachmann et al. (2017) as threats to SCV are multicollinearity, which exists in cases of highly correlated independent variables and heteroscedasticity that is, dissimilar distribution of the variances of the error terms around the independent variables. I used multiple regression as part of the analytical framework, therefore the pre-analysis process of this study included the detection and correction of any violation to these assumptions. The measures listed in the literature for testing these assumptions include scatter diagrams and deviation from linearity statistic for linearity, Shapiro-Wilk test for normality, variance inflation factor (VIF) for multicollinearity, and Durbin Watson test for autocorrelation and Breusch-Pagan test heteroscedasticity (Nunes, Alvarenga, de Souza Sant'Ana, Santos, & Granato, 2015).

Sample size. The matter of sample size is a significant concern for researchers (Delost & Nadder, 2014) because a sample size that is too small results in low statistical power and this increases the likelihood of accepting the null hypothesis when it is false that is, a Type II error as well as threatens SCV. According to Fugard and Potts (2015), the primary goal of the researcher is to select a sample size that balances the need for manageability with that of addressing the research question. Boddy (2016) indicated that small samples have a place, can provide reliable information, and are appropriate for homogenous populations but if too small, these samples may not adequately address the research question (Delost & Nadder, 2014; Garg, 2016). Ilieva, Hook, and Farah (2015) opined that researchers must meet the significance level requirement if the goal is to generalize research outcomes from a small sample to a population. The sample used in

this study is 52 which complies with the estimated range of 43 and 68 generated the

G*Power software version 3.1.9.2, at the 95% confidence level (Faul et al., 2009).

Transition and Summary

According to Bhaskar and Manjuladevi (2016), when conducting a study, the researcher should adopt a systematic approach to fulfill the purpose of the research, select a research design, collect and analyze the data. Further, the adopted research framework should be able to withstand scrutiny relating to ethical implications, validity, and reliability (Bhaskar & Manjuladevi, 2016). In Section 2, I reproduced and expanded aspects of Section 1 and discussed some of the components highlighted in Bhaskar and Manjuladevi's article cited above.

Specifically, this section of this study comprises the purpose statement, research questions, and hypotheses, additional details on and justification for the quantitative research method and correlational research design. Section 2 also contains a description of the sampling process, techniques for data collections and data analyses, as well as a discussion on ethical considerations, study validity, and reliability. Included in section 3 are the research outcomes, interpretations, implications for professional practice and social change, recommendations for action and further research, as well as the research summary and conclusions.

Section 3: Application for Professional Practice and Implications for Change

Introduction

The purpose of this quantitative correlational study was to examine the relationship between the IPO share retention ratio, the reputation of the IPO underwriter, and IPO underpricing. The predictor variables were share retention ratio and underwriter reputation, while the response variable was IPO underpricing. The analyses conducted on a sample of IPO firms specific to the Jamaican market was to elucidate the specific business problem that some company executives may not be aware of the relationship between these variables. Despite the partial support for the alternate hypothesis that represented the relationship between underwriter reputation and IPO underpricing, the overarching evidence from the analyses revealed no statistically significant relationship for either the individual variables or joint impact of the overall model. However, the overall insignificance of the relationship indicated by the research outcomes does not abrogate the value-added benefits of this study to investors and firm stakeholders or the contribution to the existing pool of literature on this topic.

Section 3 is principally about of the findings of this quantitative correlational study. Accordingly, this section contains the outcomes from the data analyses, application of the findings to professional practice and the implications for social change. Section 3 also encompasses recommendations for actions and further study, as well as personal reflections and study summary and conclusions.

Presentation of Findings

Assumptions Evaluation and Outcomes

As a prerequisite to conducting the data analysis for this study, I completed a series of tests to ascertain whether there were violations of the key assumptions underlying ordinary least squares (OLS) regression. The assessment of the assumptions is a necessity in the process given that violation of any of these assumptions could lead to bias and distorted outcomes, as well as flawed interpretations and inferences (Miranda, 2015; Mooi & Sarstedt, 2014). The assumptions tested include outliers, normality, linearity, homoscedasticity, autocorrelation, and multicollinearity.

Outliers. An outlier is a data point such that the value of the response variable is unusual (e.g., an abnormal distance from or very different from other observed values) and contains high residual (Miranda, 2015). As recommended by Zygmont and Smith (2014), I created using SPSS, boxplots to assess the extent of the outliers. Figure 1 shows the boxplot for underpricing that is, the dependent variable, while Figure 2 represents the boxplot with the extreme values for share retention, one of the two independent variables. In both instances the asterisks indicate the presence of outliers.

When outliers, that is, observations substantially different from the other observations exist, it may have a significant negative impact the results of regression analysis (Regression with SPSS, 2014). Similar to the approach adopted by Li (2018) and Mwangi (2016), I removed the outliers from the sample, which reduced the final sample size to 48. As was the case for Mooi and Sarstedt (2014), the omitted observations had complete information for both the dependent and independent variables,

but the researcher removed these extreme values because of the possible adverse impact on research outcomes. The removal of the outliers improved the quality of the sample as reflected by the reduction in the difference between the original mean (with outliers) and the trimmed mean (without outliers) from 4.24 to 1.72 and from 1.52 to 0.49 for the underpricing and share retention variables respectively.
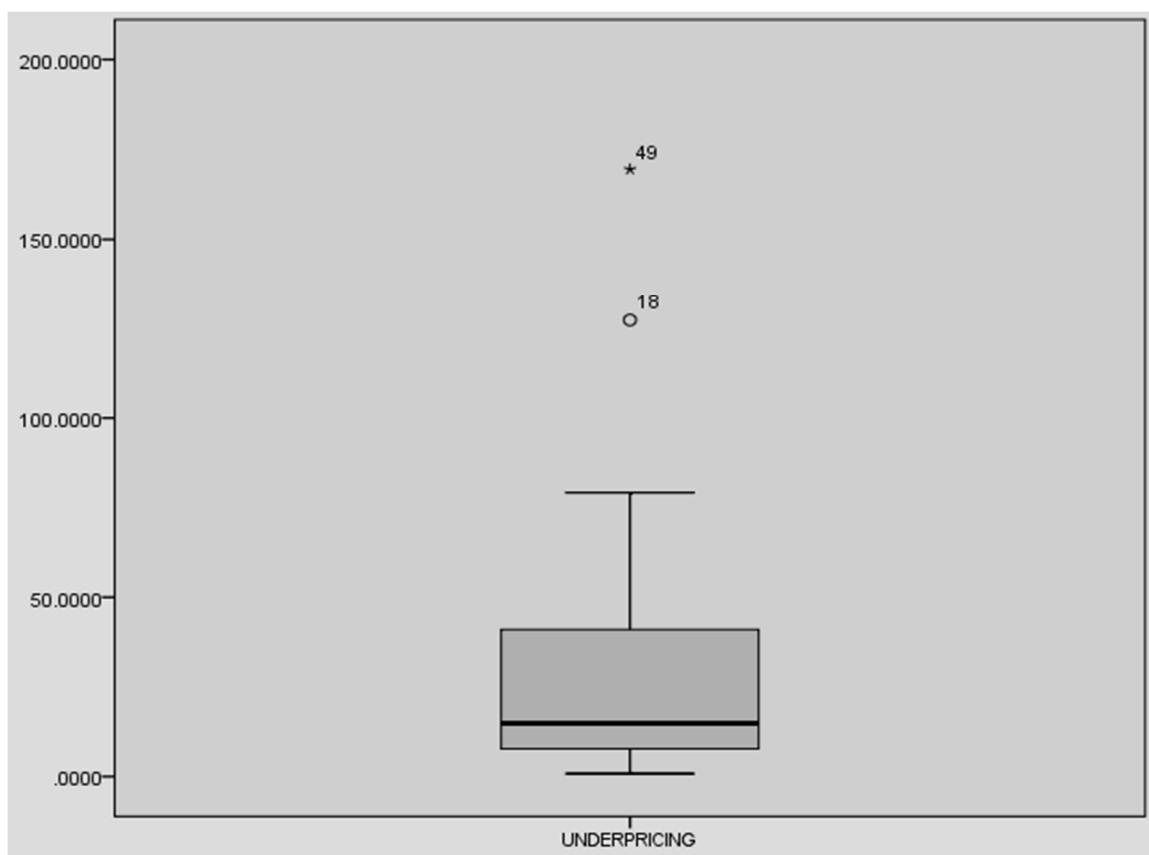
Figure 1. Boxplot for underpricing.
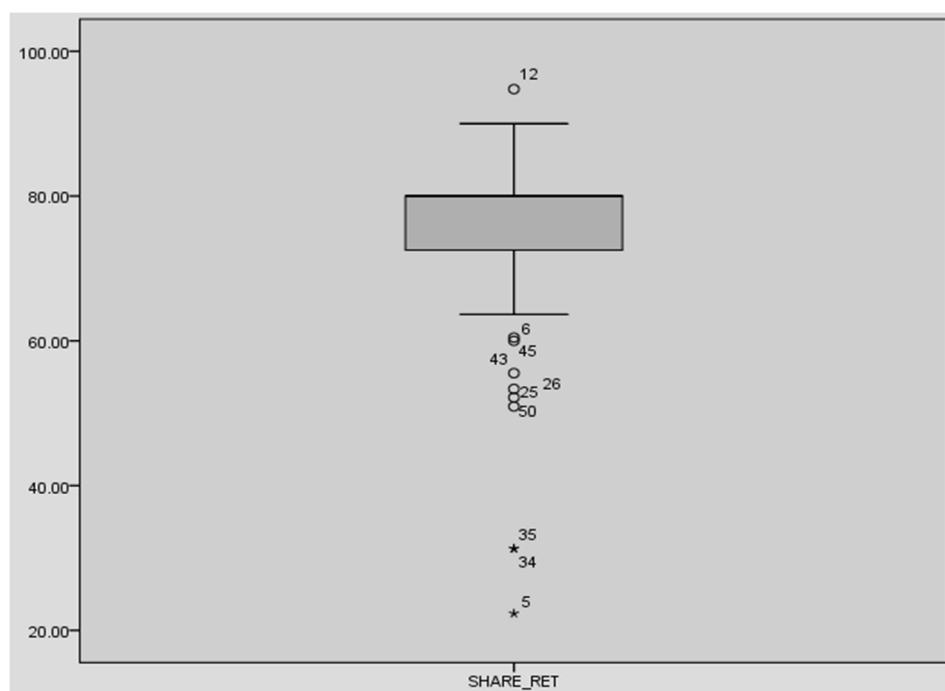
Figure 2. Boxplot for share retention.

Normality. For the outcomes of the regression analysis to be valid, the sample

residuals should display a normal distribution and while the violation of the normality

assumption does not affect the quality of the estimated coefficients it can generate flawed

t-tests results (Mooi & Sarstedt, 2014). Adopting the approach applied by Miranda

(2015), as well as Zygmont and Smith (2014), I used the normal predicted probability (P-

P) plot and the Shapiro-Wilk (SW) statistic to assess whether this assumption holds. As

shown in Figure 3, the P-P plot indicates a non normal distribution and the outcome in

Table 3 is consistent with this conclusion with the SW statistic of .837 that is, significant

at the 5% level.

Table 3

Shapiro-Wilk Test of Normality

Variable	Test Statistic	*df*	Sig
Underpricing	.837	48	.000

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: UNDERPRICING

Figure 3. A normal P-P plot of regression standardized residuals.

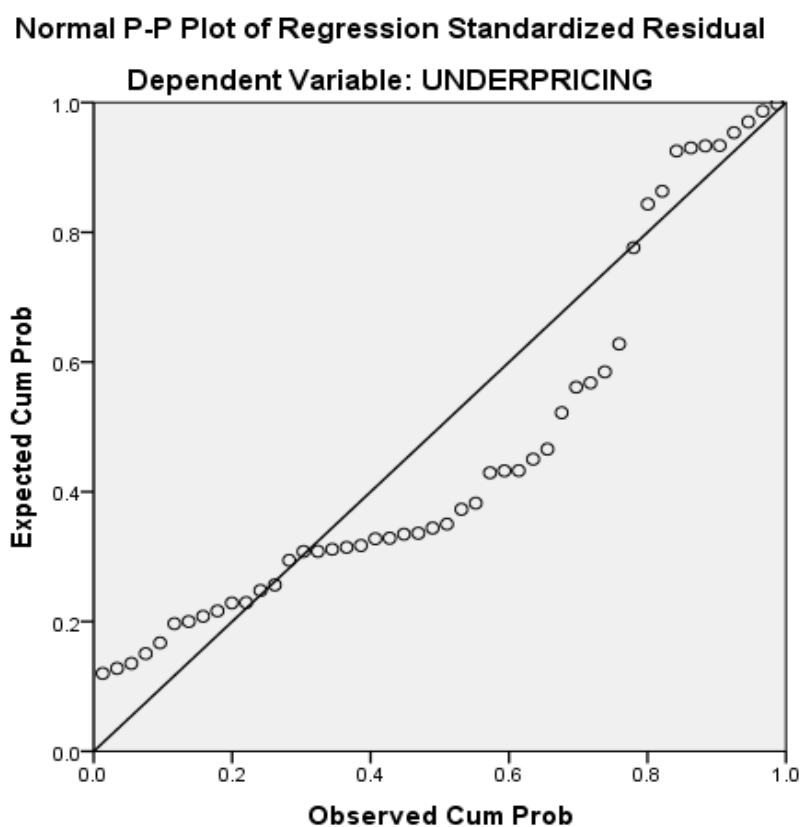**Linearity.** The assumption of linearity requires a straight line relationship between the independent and dependent variables; if this relationship does not exist, the results of the regression analysis will not provide the best fit for the data (Mooi & Sarstedt, 2014). Similar to approach adopted by previous researchers who used the

deviations from linearity (DL) test to assess the linear deviations in models (see Balcilar, Gupta, & Miller, 2015; Hew & Kadir, 2016), I applied the DL statistic to evaluate the status of the linearity assumption. If the DL statistic is greater than the level of significance α then the researcher accepts the null hypothesis that there is a linear relationship between the independent and dependent variables. As detailed in Appendix B, the deviation from linearity estimate for this study, $DL = 0.985$, is greater than $\alpha = 0.05$ and hence the linearity assumption holds for this sample.

Homoscedasticity. The homoscedasticity (equality of variances) assumption holds if the residual variances appear randomly distributed, that is, residuals are equally distributed (Miranda, 2015; Regression with SPSS, 2014). In addition to applying the scatter plot to assess whether homoscedasticity is a concern for this sample, I also used the Breusch-Pagan (BP) test statistic in the assessment process, and this is in line with the suggestion by Nunes et al. (2015) and the technique used by Mwangi (2016). The results of both measures confirmed that heteroscedasticity is a concern for this sample. The scatter plot shows areas of concentration and areas of dispersion of the residuals (see Figure 4). The violation of this assumption is also evidence from the statistically significant BP test statistic, $BP = 33.99$, $P = .0000 < .05$.
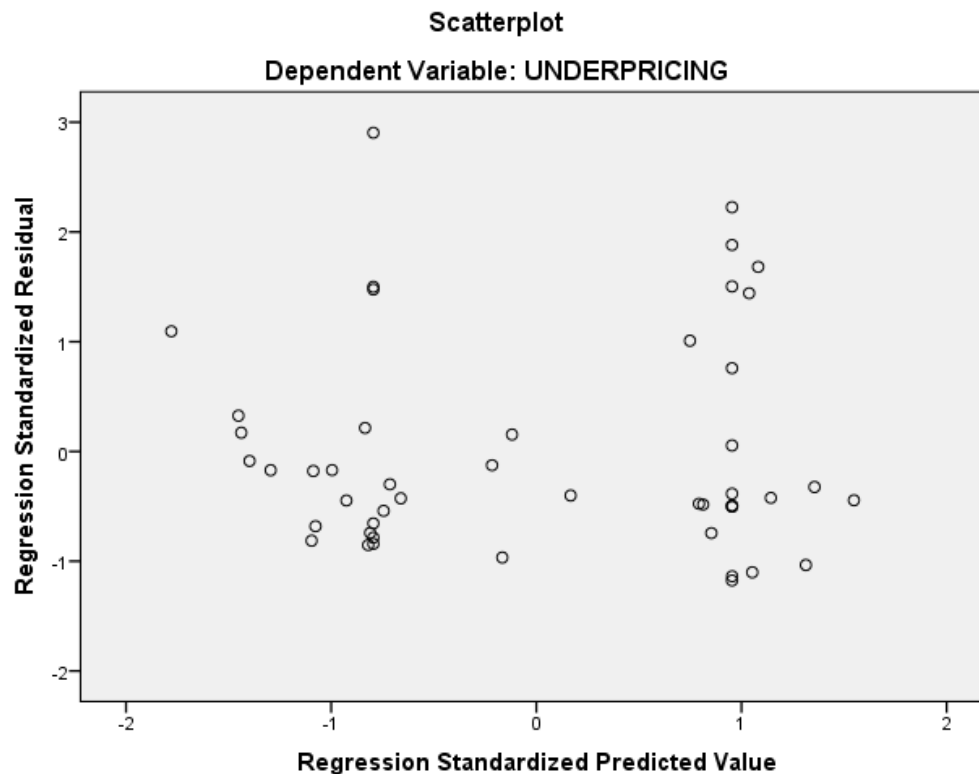
Figure 4. Scatter plot of regression standardized predicted value against the residuals.

Autocorrelation. This assumption requires that regression model error terms are independent and uncorrelated for any two observations (Mooi & Sarstedt, 2014). The Durbin–Watson (DW) statistic, which ranges from 0 to 4 with a midpoint of 2, can indicate the presence of autocorrelation, that is, positively or negatively correlated regression errors (Regression with SPSS, 2014). The DW table suggests that at the 5% level of significance with a sample size of 50 and two regressors (predictor variables), the critical values for the DW are 1.490 and 1.641. The DW statistic for the analysis from this study is 2.095 and falls within the range of $d^U = 1.641$ and $4\text{-}d^U = 2.359$, therefore, autocorrelation is not a concern for this sample.

Multicollinearity. A violation of the multicollinearity assumption occurs if the independent variables show signs of significant correlation. Violation of this assumption presents a concern because the estimated coefficients for the regression model may be unstable as a result of overstated variances and standard errors (Regression with SPSS, 2014; Winship & Western, 2016). Even though the Spearman correlation matrix presented in Table 6 indicated that the independent variables in this study are correlated, I patterned Li's (2018) approach and used the variance inflation factor (VIF) values as the primary reliance to assess the extent of multicollinearity in this study. The VIF values is the preferred option because it not only specify that multicollinearity is present but it also show the extent of the impact on the variances of the estimated coefficients (see Pardoe, 2018). The presence of multicollinearity requires further investigation if the VIF values exceed 4 and signals acute multicollinearity if the VIF values exceed 10 (Pardoe, 2018). Table 4 indicates that the VIF values for each independent variable are within the acceptable range, with VIF =1.1014 significantly less than 4. Therefore, multicollinearity between the two independent variables is not a concern for this sample.

Table 4

VIF Statistic: Test of Multicollinearity

Variable	Collinearity Statistics	
	Tolerance	VIF
Share retention	.986	1.014
Underwriter Reputation	.986	1.014

The assessment of the regression assumptions revealed mixed results. The conclusions from these results are that the sample used in this study does not violate the

linearity, multicollinearity, and autocorrelation assumptions, but violates the normality, autocorrelation, and homoscedasticity assumptions. Based on precedence by previous researchers Darmadi and Gunawan (2013) and Donaldson (2015), I mitigated the impact of the violated assumptions by applying robust (heteroscedasticity-consistent standard errors) OLS regression analysis and replacing the traditional parametric tests for example, Pearson coefficient matrix with nonparametric tests such as the Spearman rank correlation.

Descriptive Statistics

According to Hu (2014), market sentiment is a significant driver of the number of IPOs which, in turn indicates firms' demand for capital and investor sentiments. The increase in the number of IPOs issued in Jamaica in the last 5 years relative to previous years could provide evidence to support Hu's position. The sample of IPO firms included in this study retained a percentage of their total outstanding shares, used the underwriting and/or brokerage services of an investment bank, and currently trade on the JSE. Additionally, the IPO stock for each firm had a positive market return on the first day of trading relative to the offer price (i.e., underpriced). Accordingly, the number of data points are uniform across all three variables. Share retention and underpricing, independent and dependent variables respectively, expressed in ratio form while the underwriter reputation is a dichotomous variable that is expressed in binary form. After removing the four extreme values indicated by the boxplot for the share retention and underpricing variables, the final sample declined to 48. Table 5 includes a summary of the descriptive statistics for the research variables investigated in this study.

Table 5

Descriptive Statistics for Primary Research Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Underpricing	48	.796	79.199	21.729	20.674
Share Retention	48	50.935	94.776	76.215	9.497
Underwriter Reputation	48	1	2	1.542	0.504

For this sample, the percentage of shares retained internally by the companies (share retention) varied from 50.94% to 94.78%, with a standard deviation of 9.50% and a mean of 76.22%. In line with the precedence set by previous researchers, Ammer and Ahmad-Zaluki (2015), Jeribi et al. (2014), Song et al. (2014), and Wu and Wan (2014), underwriter reputation, the other independent variable, is defined as a dichotomous variable assuming a value of one or two. The value two indicates that one of the top three underwriters or lead brokers in the Jamaican market brought the IPOs to market while the value one denotes otherwise. The ranking of the underwriters in the sample reflected a combination of the Carter and Manaster (1990) approach that is market share based the number of IPOs underwritten as well as the Meggesson and Weiss (1991) method of market share based on dollar value of IPOs underwritten. The high-reputation underwriters were the top three underwriters, based on their combined scores, while the others assumed the designation of low-reputation. As a result of the categorization of this variable, the descriptive statistics are restrictive but included in the table for completeness.

For the firms sampled for this study, the minimum and maximum values for IPO underpricing were 0.80% and 79.20% respectively, while the standard deviation was 20.67%. Additionally, IPO underpricing averaged 21.73% suggesting that the first-day closing price for the IPO stock was on average, 21.73%, higher than the offer price. According to Kubícek, Strouhal, and Stamfestová (2017), underpricing could mean that secondary investors, who bought shares on the first day, had access to more information and responded positively to the market price based on their assessment of the available information. This level of underpricing was similar to the 23.8% that Choi and Nam (1998) found from their sample of two IPOs in the Jamaican market from 1986 to 1991 but lower than the average of 41.33% estimated for the 15 developing countries (see Ritter, 2017; United Nations–OHRLLS, 2015). After adjusting for the extreme values of 114%, 88% and 149% for China, India and Jordon respectively, IPO underpricing for the remaining 12 countries from this same sample, averaged 22.5% which was close to Jamaica's mean estimated in this study.

Inferential Results

Research hypotheses 1 and 2. In research hypothesis 1, I postulated that there a no statistically significant relationship between the percentage of share retained by the IPO firm (share retention) and the level of first-day return on the IPO stock (underpricing). Similarly, the prediction in research hypothesis 2 was that the relationship between the reputation of the underwriter who brought the IPO to market (underwriter reputation) and IPO underpricing is not statistically significant. To test these hypotheses,

I conducted the Spearman rank correlation test and reported the outcomes in the matrix in

Table 6.

Table 6

Spearman Correlation Matrix for Primary Research Variables

Variable	1	2	3
1. Share Retention	1.00		
2. Underwriter Reputation	.257**	1.00	
3. Underpricing	.059	.234*	1.00

*$p < 0.1$. ** $p < 0.05$.

For Hypothesis 1, there was no statistically significant relationship between share

retention and IPO underpricing at neither the $\alpha = .1$ and $\alpha = .05$, $r = .059$, $p = .35$.

Accordingly, I accepted the null hypothesis. For Hypothesis 2, there was a statistically

significant relationship between underwriter reputation and IPO underpricing at $\alpha = .1$, r

$= .234$, $p = .055$, but not $\alpha = .05$, providing partial support for the alternate hypothesis.

Research hypothesis 3. According to null hypothesis 3, the reputation of the IPO

underwriter has no statistically significant effect on the relationship between share

retention and IPO underpricing. To evaluate this hypothesis, I applied the HCSE

regression with IPO underpricing and share retention as the predicted and predictive

variables respectively for each group of underwriters, those categorized as high-

reputation versus low-reputation. Table 7 outlines the key descriptive statistics for each

group of IPO firms based on the underwriter that supported their IPOs.

Table 7

Descriptive Statistics for Primary Research Variables by Underwriter Reputation

Variable	N	Minimum	Maximum	Mean	Std. Deviation
High-Reputation Underwriters					
Share Retention	26	50.93	94.78	77.23	10.98
Underpricing	26	.80	71.50	24.82	21.27
Low-Reputation Underwriters					
Share Retention	22	55.53	83.33	75.01	7.45
Underpricing	22	.7958	79.20	18.07	19.80

The total sample of 48, approximately evenly divided, includes more prestigious underwriters accounting for 54.17% of the IPOs brought to market over the period 1986 to July 2018 and the remaining 45.83% by less prestigious underwriters. The mean underpricing was 37.35% higher for the IPOs supported by the high-reputation underwriters. This outcome is inconsistent with the findings and argument presented by Gumanti et al. (2017) and Darmadi and Gunawan (2013) who indicated that the use of prestigious underwriters should communicate to the market the confidence the firm's principals have in their firm, thereby leading to lower underpricing.

The results presented in Table 8, indicate that the explanatory and predictive power of share retention on IPO underpricing was not statistically significant for either group of IPO firms and therefore I accepted the null hypothesis. Despite the statistically

zero difference between the impact of share retention on underpricing for both groups, the outcomes suggest that share retention has a stronger influence on underpricing for the firms supported by the more prestigious group of underwriters versus those supported by the less prestigious underwriters, with R^2 slightly higher at .02, $p = .31$ versus $R^2 = .01$, $p = .75$, respectively.

Table 8

Model Summary and Regression Coefficients by Underwriter Reputation

Variable	B	Robust Std. Error	T	Sig (t)	R^2	F	Sig(F)
High-Reputation Underwriters							
Constant	3.23	19.91	.16	.87			
Share Retention	.28	.27	1.03	.31	.02	1.06	.31
Low-Reputation Underwriters							
Constant	32.53	42.44	.77	.45			
Share Retention	-.19	.59	-.33	.75	01	.110	.75

Dependent Variable: Underpricing

Research hypothesis 4. To determine if, as stated by Research Hypothesis (null) 4, share retention and underwriter reputation do not jointly explain IPO underpricing, I conducted an OLS regression based on HCSE. The use of a HCSE regression is consistent with analysis applied by Darmadi and Gunawan (2013) and Song et al. (2014) who found heteroscedasticity to be a concern in their samples IPO firms operating in the Indonesian market. Table 9 includes the results of the HCSE regression analysis with share retention and underwriter reputation as the independent variables and underpricing as the dependent variable.

Table 9

Overall Model: Regression Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Robust Std. Error	Beta		
Constant	0.56	20.19		0.03	.98
Share Retention	0.15	0.26	0.07	0.57	.57
Underwriter Reputation	6.42	6.17	0.16	1.04	.30

Dependent Variable: Underpricing

The individual relationship between share retention and IPO underpricing with a beta = .07, p = .57 as well as underwriter reputation and IPO underpricing with a beta = .16, p= 1.04, were not statistically significant at the .05 level. Based on the results of the HCSE regression the equation from the model is

IPO underpricing$_i$ = 0.56 + 0.07share retention$_i$ + 0.16 underwriter reputation$_i$

The outcome from this model, as seen in table 10, supports the results obtained at the individual variable level and indicates no statistically significant relationship between the independent and the dependent variables with $F(2, 45) = 0.78$, $p = 0.455$, $R^2 = 0.032$. This result provided support for the null hypothesis indicating that the percentage of shares retained by the IPO firm and the reputation of the underwriter engaged by the firm to bring the IPO to market do not jointly explain IPO underpricing experienced by the IPO firms in the Jamaican market. Additionally, the R^2 value of 0.032 indicated that the combined effect of share retention and underwriter reputation (the predictor variables) only account for about 3% of variations in IPO underpricing (the response variable).

Based on these results I accepted the null hypothesis and concluded that share retention and underwriter reputation jointly or individually do not explain IPO underpricing.

Table 10

Model Summary

R	R Square	Robust Std. Error	Change Statistics				
			R Square Change	F Change	*df1*	*df2*	Sig. F Change
.18	.03	20.79	.03	.78	2	45	.47

The primary research question for this study was to ascertain if a relationship existed between IPO underpricing, the dependent variable, and share retention and underwriter reputation, the independent variables by examining IPOs issued during the period 1986 to 2018 in the Jamaican market. The percentage of shares retained by the IPO firm relative to the number of shares outstanding represented the measurement for share retention. The other independent variable, underwriter reputation, operationalized as a dichotomous variable with two and one denoting high-reputation and low-reputation underwriters respectively. The combined market share of the number and value of IPOs brought to market by the underwriter represented underwriter reputation. While IPO underpricing, the dependent variable, referred to the return on the IPO stock on the first day of trading relative to offer price.

The analysis involved both the treatment of all the IPOs in the sample as single group, as well as dissecting the sample in two categories based on the underwriter reputation variable defined above. The overall results of the study indicated no

statistically significant relationship between share retention, underwriter reputation, and underpricing at both the full sample and segment levels. Generally the results at the singular variable level was consistent with the overall outcomes, except for the limited significance found between underwriter reputation and IPO underpricing at the $\alpha = 0.1$.

The result which indicated limited relationship between underwriter reputation and IPO underpricing could imply that within the efficient market framework the reputation of the underwriter selected for the IPO may potentially assuage the information asymmetry associated with the newness of the IPO firm and the concerns of prospective investors. Given the reputational capital that the underwriter brings to the IPO process, IPO firms who engage high-reputation underwriters receive significant incremental benefits, (Bangsund, 2014; Fernando et al., 2015). The investors may interpret the reputation of the underwriter and the related credibility to IPOs as a signal of the strength and quality of a firm especially young firms (Bangsund, 2014; He et al., 2015).

Given this position, as well as the results of this study, investors may benefit from paying attention to the firm's choice of the underwriter. Moreover, executives/owners of IPO firms and investors could contemplate the possibility that underwriter reputation may provide some insights into the quality of the IPO firm. Under these circumstances, the choice of a high-reputation may mitigate the extent of information asymmetry associated with the liability and related risks of the market newness of the IPO firm (see Handa & Singh, 2014; Imam & Jaber, 2014; Peterle & Berk, 2016)

Regarding share retention, the one of the premises of the signaling argument is that the greater portion of the shares retained by an IPO firm , the lower the degree of information inequity between investor and firm and by extension the lower the underpricing (Darmadi & Gunawan, 2013; Jiang et al., 2015; Miloud, 2014). This argument did not hold in the Jamaican market based on the outcomes of this study. A possible explanation may be that the percentage share offered to the public is typically low, satisfying only the minimum requirement, in many cases so as not to relinquish control of the firm. To retain controlling interest, firms issuing IPOs in the Jamaican market tend to offer to the public the mandatory minimum percentage of shares outstanding stipulated by the JSE. Accordingly, investors may want to avoid sole reliance on the percentage of shares retained by the firm (i.e., share retention) as a signal of quality particularly if the firm adheres to the minimum requirement.

There is no consensus in the literature about the impact of share retention and underwriter reputation on IPO underpricing and as such evidence exists that both supports and refutes the results of this study. Both Gumanti et al. (2017) and Darmadi and Gunawan (2013) obtained results similar to that of this study when they investigated IPOs in Indonesia. From the results of their distinct studies, Gumanti et al. and Darmadi and Gunawan found an insignificant relationship between the shares retained and the level of underpricing. As is the case for this study, Kumar (2017) found a positive coefficient for share retention as a predictor variable. The findings from the research, on whether concentrated or dispersed ownership among French IPOs, impacted IPO underpricing, led Miloud (2014) to conclude that French investors do not appear to

interpret the level of share retention by pre-IPO owners as worth contemplating in their investment decisions. This finding may be one of the possible explanations for the results of this study which indicated no statistically significant relationship between share retention and IPO underpricing.

On the other hand, there are also findings that run counter to those of this study. Deb (2014) investigated IPOs issued in the U.S. market and found evidence to indicate that the level of share retained can help to reduce underpricing. Similarly, Ammer and Ahmad-Zaluki (2015) investigated Malaysian companies that issued IPOs and found that a negative relationship existed between management ownership and IPO underpricing. The result from the research conducted by Jiang et al. (2015) indicated a negative relationship between the number of shares retained by an IPO issuer and the level of underpricing.

Boulton et al. (2017) suggested that the use of reputable financial intermediaries, such as underwriters, is one way for firms to reduce information asymmetry, and Banerjee and Rangamani (2015) argued that informal certification infused by the reputation of the lead investment banker is a pivotal signal for investors. In their research on IPOs issued in the Indonesian market, Indriani and Marlia (2015) found evidence of a significant negative correlation between underwriter reputation and underpricing. These results contradicted the results from this study, which indicated no significant relationship between underwriter reputation and IPO underpricing. The outcomes from the research by Gumanti et al. (2015) supported the findings of Indriani and Marlia, as well as position that reputable underwriters could lead to lower underpricing because their

support reduces the need to underprice (Darmadi & Gunawan, 2013; He et al., 2015). The results of this study do not support these findings.

However, the literature also provided support for the outcomes of this study. Ammer and Ahmad-Zaluki (2015) found a positive but insignificant relationship and suggested that IPOs supported by high-reputation underwriters had increased underpricing relative to those supported by the low-reputation underwriters. Chen et al. (2017) also found a positive but insignificant relationship when they incorporated underwriter reputation as part of their research on the relationship between IPO underpricing relative to economic freedom across 22 countries from 1993 to 2014. Wu and Wan (2014) in their research undertaken about IPOs issued by Chinese firms, found evidence to suggest an insignificant correlation between underwriter reputation and underpricing.

The outcome of the research conducted by Xu, Wang, and Long, J. (2017) in the same market supported the statistical insignificance relationship found by Wu and Wan (2014). Song et al. (2014) found, like this study, a positive coefficient representing underwriter reputation relative to IPO underpricing. An additional finding in this study was the higher underpricing for IPO stocks supported by reputable underwriters, underpricing for these IPOs averaged 37.35% higher than those supported by non-prestigious underwriters. The the higher underpricing for the prestigious group of underwriteres concurred with what Ammer & Ahmad-Zaluki (2015) found in the Malaysian market. Similar results also emerged from the research by Jeribi et al. (2014) in the Tunisian market where they found that the average return on stocks supported by

reputable underwriters was more than four times higher than that for low reputation underwriters.

Applications to Professional Practice

In this study, I sought to determine if a relationship exists between share retention, underwriter reputation, and IPO underpricing by examining IPOs issued during the period 1986 to 2018 in the Jamaican market. The results of the study at both the overall and segment levels, indicated no overall statistically significant relationship between share retention, underwriter reputation, and underpricing and that the independent variables are weak predictors of the dependent variable. However the statistically insignificant findings of this study do not compromise the potential contribution to the business and professional communities.

The outcomes from this study may be useful to investors in the Jamaican market to guide their expectations regarding first-day return on their investment in an IPO stock, as well as their general investment decisions. Specifically, the results may direct investors into considering alternate indications of IPO quality and firm performance other than share retention and underwriter reputation. Additionally, this study may lead to more informed investment decisions by forcing increased information disclosure from issuing companies and providing investors with greater access to information. Moreover increased access to information that may accrue to potential investors may materialize over and above the mandatory disclosures required by the JSE for firms seeking to list on the JSE's main or junior markets.

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This may study adds value to the business community. The results may guide executives and other principals of IPO firms in making key decisions about the IPO process including offer volume, offer price, and choice of underwriter. Furthermore, the findings may help company executives in Jamaica and other small developing countries to optimize the IPO process to obtain the necessary funding as well as force them to consider their choice of signals to communicate to investors. The finding that IPO underpricing averaged 21.73% may help IPO firms to factor in their strategic and financial plans possible funding shortfall as a result of underpricing. Knowledge of the extent of IPO underpricing in the Jamaican market may also allow companies and organizations lobbying on their behalf to frame, justify, and present arguments to minimize IPO underpricing and increase IPO proceeds.

The outcomes of this study may also help companies to more effectively plan for the IPO proceeds given that Gumanti et al. (2017) found that the purpose of the IPO proceeds matter. There is lower IPO underpricing and hence higher IPO proceeds from IPOs slated to finance investment or growth relative to IPOs designed to fund operations (Gumanti et al., 2017). Moreover, the expectations for firms when IPOs generate sufficient proceeds are that firm should transform production techniques and commit to CSP objectives (Luo et al., 2015).

Regulatory and government policymakers may also find the outcomes of this study useful in crafting polices, designing processes and procedures to create a business-friendly environment that will stimulate employment, growth and development in small economies. Ritter (2015) reported that from 1996 to 2010, the average U.S company

added 822 jobs after a successful IPO and Pandes and Robinson (2014) indicated that the reduction in IPOs in the United States from 2000 to 2012 resulted in the loss of millions of jobs. Finally, the academic community may find the contents and outcomes of this study to be relevant additions to their course material as well as prospective research projects.

Implications for Social Change

In addressing the implication for social change in section 1 of this study, I indicated that the results of this research may contribute to social change by improving the quality of life and overall standard of living across households. This potential social change is possible because, as suggested by Sappin (2016), new businesses and business growth can lead to increased employment and improved socioeconomic indicators such as health and education. The limited relationship between underwriter reputation and underpricing and the statistically insignificant correlation between share retention and underpricing indicated by the results of this study, do not adversely affect the relevance or importance of this study in fostering social change.

Even with no overall statistically significant relationship as indicated by this study, successful IPOs will result in some firms in a post-IPO scenario outperforming the pre-IPO status and achieving improved growth and profitability (Gonzalez, 2014). This improved post-IPO performance may help to enhance compensation and working conditions for existing firm employees, and generate growth and expansion which can increase employment opportunities for the communities served by these firms (see Gonzalez, 2014; Ritter, 2015). This scenario is particularly valid for small and medium

enterprise (SMEs) that use IPOs as avenues to attract investment including from venture capitalists (Heo et al., 2014). These smaller companies can exploit stock exchange listings to expand and create the opportunity to build their local communities and national economy (Pandes & Robinson, 2014). The JSE junior market is one such stock exchange.

The acceptance of most of the null hypotheses in this study will not negatively impact investors' expectations regarding their right to increased information disclosure about IPOs and signals of firm quality from IPO firms. If the tenets of the EMH are true, then increased information disclosure may improve market efficiency by reducing the information asymmetry among IPO stakeholders as well as the difference between the IPO issue price and first-day market price. The contents and findings of this research can expand the pool of existing literature on this topic, especially relating to small developing countries.

Recommendations for Action

Detailed scrutiny of the outcomes of this study provided a basis from which to highlight recommended actions for IPO stakeholders, particularly business owners and investors hoping to use the IPO option to raise funds and bolster the return on their investment portfolio respectively. Additionally, given that this study may be the first on this topic in the Jamaican context, the investment and business communities could benefit from its general information, the detailed findings and country specificity. The first action required is an acknowledgment by the market that share retention and underwriter reputation may not be reliable predictors of IPO underpricing. Therefore, considerations should be given to alternate market and company fundamentals as predictors of firm

quality and performance, information asymmetry between investors and firm, as well as IPO underpricing.

Second, investors, both institutional and private should consider replacement signals of firm quality to guide expectations about first-day return on an IPO stock. Company executives and other principals who have the strategic objective of optimizing IPO proceeds and reducing money left on the table could, given the outcomes of this study, adopt other signals to communicate IPO quality to prospective investors. Third, regulatory and government policymakers charged with framing relevant legislations, IPO governance policies, or even country-specific economic growth objectives may have to contemplate how the findings of this study can help to achieve their objectives.

Finally, academia may choose to augment their course material or assign expanded research using aspects of this study. As required, I will publish the results of this study in the ProQuest / UMI dissertation database, but will also explore additional opportunities in academic journal publications. I also hope to capitalize on opportunities to share findings at seminars and conferences targeted at the investment, business, and academic communities.

Recommendations for Further Study

In this segment of the study, I highlighted opportunities for additional future research. The possibilities for future research could span two broad areas, modification or expansion of the key components of this study including the variables, methodology, model, and possibly sample and geographic setting. Future research by way of modification of this study could include any of the following options. First, refining

variables, for example, defining share retention as the difference between actual share retention ratio and the mandatory maximum of 80%, instead of as currently defined in absolute terms or redefining underwriter reputation by another method for example, the approach advocated by Jeribi (2015). instead on the singular reliance on market share. Second, refitting the methodology and/or the model by introducing multiple categories for underwriter reputation instead of an all-or-nothing approach implied by a dichotomous definition used in this study. Another possibility is to fit another statistical model or analytical approach to the data and segregating the sample by firm indicators such as industry, company type, family-owned versus public owned, or classifying companies by the listing information that is, JSE's main or junior market. Third, additional research options could also include expanding the parameters and scope of the current study.

The expansion approach could apply in the following configurations. First, a future researcher could expand the list of variables by including control variables specific to company or market fundamentals such as firm type, size, performance, ownership structure, industry type as well as CSP factors. In the examination of the relationship between pre-IPO CSP and post-IPO performance in the Chinese market, Jia and Zhang (2014) found that CSP approach and actions by the IPO firm pre and post-IPO were strategic considerations for the investors. The addition of control variables could help improve the accuracy of variable estimates, remove some of the distortions and noise, as well as improve conservativeness of the hypotheses tests (Becker, et al., 2016; Bernerth et al., 2017). Moreover, including control variables would be in line with the approach

adopted by previous researchers such as Deb (2014), Darmadi and Gunawan, (2013); Yin et al. (2015).

Second, a prospective investigation could increase the sample size by stretching the sample dates for the study or applying a multi-country, instead of a single country, approach to the research. Third, given the implication of Deng and Zhou (2016) that there may be unique characteristics and determinants embedded in specific markets and the empirical differences that Ritter (2003b) found between the European and American IPO markets, one future research option may be to incorporate a proxy variable to represent social, cultural or economic differences. This recommendation is worth consideration given the evidence from this study that these traditional drivers of IPO underpricing were not significant in this small developing country compared to some of the findings of previous researchers in developed, emerging and larger developing economies.

Finally, the possibility also exists to research IPO market efficiency as well as post-IPO performance of the IPO firms in Jamaica. Murthy et al. (2016) indicated that in an efficient IPO market there should be low initial gains at listing, moderate gains in the short-run gain and improved gains in the long-run. Jia and Dairui (2014) found that the post-IPO performance and survivability dependent on the company's pre-IPO status and offering characteristics, healthy financial indicators including profitability, corporate ownership and governance structure other company and industry specifics. These proposed channels to future research could provide increased insights, improve the predictability of the independent variables, and enhance the signals relating to firm

quality and possible reduction in the level of information asymmetry between IPO stakeholders.

Reflections

The purpose of this study was to determine whether a relationship exists between share retention, underwriter reputation, and IPO underpricing. Despite finding no evidence of a statistically significant relationship, the lessons learned from having gone through this process are noteworthy. First, the outcomes of this study provide insights and indications where they previously did not exist with this level of details and country specificity, creating value to investors, firms and academic practitioners, and researchers. Second, the outcomes of no or restricted significance of the individual variables and the lack of joint impact of the variables on IPO underpricing suggest that share retention and underwriter reputation are not reliable predictors of underpricing in the Jamaican or a small developing country context. Accordingly, the relevant stakeholders will have to look to other predictors or drivers to understand, dissect, or interrogate IPO underpricing specific to small economies.

Finally, I benefitted from some personal lessons in research, perseverance, and patience. I spent an incalculable number of hours rummaging through old paper files of firm prospectuses and trading sheets to identify relevant data on IPO offer price, offer volume, number of shares outstanding, underwriter supporting the IPO, and first-day trading price. Additionally, the decision process for the appropriate statistical method and analytical tools was tedious. The regression assumption evaluation revealed a violation of critical assumptions that must be met for the results of ordinary least squares (OLS)

regression to be reliable. Consequently, I had to decide whether to transform the data, use an alternative methodology or tool, or both. A protracted contemplative process occurred because the preferred option of applying an alternative statistical tool presented a challenge to execute. The experience from both these scenarios will prove valuable should I decide to use this study as a launching pad for subsequent research.

Summary and Study Conclusions

An IPO is one of the most significant events in a firm's life cycle and often requires the IPO firms to undergo structural, policies, operational and procedural modifications and adjustments including IPO underpricing (Algebaly, Ibrahim, & Ahmad-Zaluki, 2014; Wu, 2014). IPO underpricing, a ubiquitous phenomenon well documented and demonstrated in many economies around the world, spans industries and time periods, still without an appropriate explanation (Ivanauskas, 2015). As implied by Dimovski, Ratcliffe, and Keneley (2017), the disparity between first-day trading price and initial offer price remains a pricing puzzle. The drivers of underpricing differences across and within markets remain essentially an unexplored question (Yaakob & Nazri Abd Halim, 2016).

Previous research work targeted the relationship between share retention and underwriter reputation and IPO underpricing in developed, emerging, and larger developing countries (Ammer & Ahmad-Zaluki, 2015; Darmadi & Gunawan, 2013; Gumanti et al., 2015; He et al., 2015) and yielded debatable outcomes. Additionally, the first-day returns earned by initial subscribing investors reported in many of these countries have, on average, been positive (Dimovski et al., 2017). However, studies

specific to small developing countries or island developing states did not occur frequently in the literature, and I found only one instance of Jamaica mentioned in any study on this topic (Choi & Nam, 1998). With a sample of two IPOs issued from 1986 to 1991, an average stake sold of 38% and total IPO proceeds of US $20 million, Jamaica was the only small developing country included in list of countries (see Choi & Nam, 1998).

The primary objective of this quantitative correlational study was to determine if a relationship exists between share retention, underwriter reputation, and IPO underpricing using a sample of IPOs firms listed on the JSE. To achieve this objective, I conducted isolated and joint assessment of the interrelatedness of the variables. The outcomes of the analyses provided no evidence of a statistically significant relationship even after segregating the sample by the reputation of the underwriting firm that supported the IPOs. The primary analytical tools employed in the assessment were the Spearman rank correlation matrix and OLS regression with heteroscedasticity-consistent standard errors.

At both the individual and global levels, share retention was insignificant at the α = .05 in predictive changes to underpricing, while there was a limited significance at the α = .1 but not at the α = .05 for the relationship between underwriter reputation and underpricing. The universal outcome that no statistically significant relationship exists between the independent and dependent variables in this study and that share retention and underwriter reputation were not strong predictors of IPO underpricing resulted in an acceptance of the null hypotheses at the α = .05 level of significance. However, the lack of overall significance of the model in explaining IPO underpricing does not contravene the relevance or importance of the study nor does it infringe on its role in expanding the

pool of literature on this topic or pointing others to the world of research possibilities that awaits.

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Appendix A: Data Analysis Plan

Research Questions	Related Null Hypotheses	Relevant Variables	Statistical Approach & Measure
1. What is the relationship, if any between a firm's IPO share retention ratio and IPO underpricing?	There is no statistically significant relationship between firm's IPO share retention ratio and IPO underpricing	Share retention & IPO underpricing	Spearman ranked correlation matrix
2. What is the relationship, if any between the reputation of the IPO underwriter and IPO underpricing	There is no statistically significant relationship between the reputation of the IPO underwriter and IPO underpricing	Underwriter reputation & IPO underpricing	Spearman ranked correlation matrix
3. Does the reputation of the IPO underwriter impact the relationship between the firm's IPO share retention ratio and IPO underpricing?	The reputation of the IPO underwriter has no statistically significant impact on the relationship between IPO share retention ratio and IPO underpricing	Share retention, underwriter reputation & IPO underpricing	HCSE multiple regression; t-test
4. What is the relationship, if any between firm's IPO share retention ratio, the reputation of the IPO underwriter and IPO underpricing	The firm's IPO share retention ratio and the reputation of the IPO underwriter do not jointly explain IPO underpricing	Share retention, underwriter reputation & IPO underpricing	HCSE multiple regression; (F-test)

Appendix B: Deviation of Linearity Statistic: Test of Linearity

ANOVA Table			Sum of Squares	df	Mean Square	F	Sig.
Underpricing Share Retention	Between Groups	(Combined)	9617.747	33	291.447	.390	.987
		Linearity	149.501	1	149.501	.200	.662
	Deviation from Linearity		9468.246	32	295.883	.396	.985

Appendix C: Sample of the Raw Data Used in the Study

Company ID (Assigned for the purpose of this research)	Independent variable (%)	Independent variable (dichotomous)	Dependent variable (%)
MO001	80.00	1	2.50
JM003	60.00	2	14.91
JR011	80.00	2	15.00
MH009	94.78	2	18.18
MM010	83.33	1	10.42
MF021	72.73	1	14.04
JR029	82.01	1	12.89
MF026	80.00	1	79.20
JO030	73.00	1	3.61
JI031	75.00	1	14.54
MO053	31.29	2	1.52
JO032	79.38	1	0.98
MF031	84.71	2	17.13
MF054	90.00	2	19.97
MC040	74.90	2	45.45
JO039	80.00	1	169.50
JM040	52.17	2	1.04
JO041	83.17	2	60.67