



THE DETERMINANTS OF IPO UNDERPRICING IN THE GCC COUNTRIES

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This paper documents the phenomenon of underpricing initial public offerings (IPOs) for 194 firms that went public between 2000 and 2013 in the markets of the six Gulf Cooperation Council (GCC) countries. It investigates factors that potentially influence abnormal returns on the first day trading and focuses on assessing the most prominent determinants of the underpricing of IPOs in the GCC region. In addition to previously tested variables such as firm age and offer size, additional variables and external factors such as Seasonal Affective Disorder have been added. Financial crisis and cultural aspects such as the month of Ramadan have been embedded to measure Islamic seasonality. The empirical findings show that firm age and offer size are clearly significant and both negatively related to underpricing. Results show that a relationship does exist between financial and non-financial firms, and there are significant differences between banking versus insurance firms. In addition, the difference between the month of Ramadan and the month IPO was carried out appeared to be significant. The models carried out involving the financial crisis period almost all appeared to be significant.

Keywords: Financial crisis, GCC, IPOs, Seasonal Affective Disorder, Underpricing.

Introduction

An Initial Public Offering (IPO) is defined as the initial sale of stock by a private company to the general public. Once such sale occurs, the private company transforms into a public company. IPOs are generally used by companies to raise capital, and are often issued by small firms that are seeking capital in order to expand their business. However, IPOs can also be carried out by large, privately-owned companies that are looking to enter the market so their shares can be traded publicly. A company that is willing to engage in an IPO must seek the assistance of an underwriting firm, which is thereafter responsible for determining the best offering price for the company's stock at the initial trading period, and also when to introduce the stock to the public market. IPOs are usually, maybe mistakenly, interpreted by seemingly uninformed investors as successful investment opportunities given the abnormal returns they generate. However, IPOs can be quite risky; since the stock is being traded for the first time, there is often little or no historical data with which to analyze the company's past performance.

An ongoing puzzle regarding IPOs is the fact that after the stock is introduced to the public, the closing price on the first day is usually higher than the initial offered price (Florin and Simsek, 2007), meaning that the stock was initially 'underpriced' by the underwriting firm. Underpricing refers to the closing price of the share on the first day of trading being higher than the issue price initially paid by subscribers. Underpricing is also commonly referred to as the initial return. If investors were to get allocations in IPOs, and were to flip these shares on the day the firm is listed, then on an average their

returns would be higher than the market price. There is, however, an element of risk here. Rock (1986) demonstrated that uninformed retail investors might suffer from a winner's curse problem; that is, they might get all the IPO allocations they have asked for, but generate very low returns on the day of listing, while other IPOs will produce very high returns on the day of listing because of the high demand that such offerings tend to generate, which the uninformed investor did not participate in. Thus, uninformed investors might not be able to utilize the underpricing factor in IPOs to their advantage. Most IPOs are traded at a higher price on the listing day, which means that the firm could have raised more money if they had set a higher offer price than what they had actually set. Such discrepancy shows that investors have different beliefs when it comes to the future of the company, such as the belief that the firm has been incorrectly valued and deserves a higher price. This leads to increase in both demand and price of the stocks in the secondary market. The higher the amount of underpricing, the more money the firm could have generated through a higher offer price. On the other hand, the higher the underpricing, the more profit can be made by investors, who got allocations in the IPO and are thus able to sell these shares on the day of listing. This phenomenon is referred to as 'money left on the table' (Pande and Vaidyanathan, 2007).

IPOs yield economically and statistically significant initial abnormal returns, which is in line with the underpricing phenomenon of IPOs. However, overall performances tend to yield negative returns once initial returns are excluded. The initial abnormal returns overcompensate for the negative returns over the one-year period, resulting in overall positive abnormal returns. In general, Gulf Cooperation Council (GCC) equity markets underperformed compared to other equity markets, until 2003. From 2003 onwards, performance in this market improved due to increasing oil prices, record corporate profits, and sustained structural reforms, which led to the rapid increase of stock prices in most GCC markets. This increase was mainly driven by the bullish Saudi market. The substantial increase in the number of IPOs in 2005 in some GCC equity markets was one of the warning signals that confirmed the development of a speculative bubble. According to Deloitte's GCC Equity Capital Markets Confidence Survey (2013), 42% of the challenges experienced during IPO processes are due to the mismatch of valuation expectations. The underpricing phenomenon is explained by various theories such as investment banking conflicts, managerial conflicts, litigiousness and regulations. But the most prominent explanation, and the one with the most empirical support, is that IPO underpricing occurs because of informational asymmetry.

This paper investigates factors that may potentially influence abnormal returns on the first day trading in order to provide deeper insight about how the market works to issuers, underwriters and investors. The study will focus specifically on assessing the most prevalent determinants of the underpricing of IPOs in the GCC region. Some of the determinants such as *offer size, reputation of underwriters, firm age and ownership structure* have previously been tested by researchers such as Sharma and Seraphim (2010), and have proven to be either positively related or negatively related to underpricing. This paper will test similar previously-tested variables in addition to new, as-yet untested variables on the GCC market: *external factors* such as Seasonal Affective Disorder (SAD) and Islamic seasonality. What differentiates this research from other studies related to the GCC is the breadth of scope it achieves with the inclusion of external factors (SAD) in its analysis, rather than focusing only on firm specific characteristics, which has been the standard approach. It will test how significant certain independent variables are in relation to the dependent variable known as 'underpricing' using the subsampling technique. Testing the significance of variables in the underpricing of IPOs will be useful in mitigating, lessening or controlling the potential negative effects that these variables might have, such as the effect of SAD, which is an external variable and refers to the effect of seasonal depression on investor behavior in the financial world. This paper applies the concept of SAD in a unique way by separating the winter and fall months from summer and spring months and examining the performance of IPOs during those periods respectively. In addition, cultural factors such as the month of Ramadan will be embedded in order to measure Islamic seasonality. The use of the subsampling method to include countries such as Bahrain and the introduction of new, previously untested external variables are both factors which will help fill the gap between this research and previously conducted research.

Literature Review

There is a great deal of literature covering the phenomenon of underpricing and the reasons behind it. According to Ritter (1987), the occurrence of IPO underpricing depends on the period a firm chooses to go public. Rock's model of "underpricing" as an expected equilibrium result is supported by Beatty and Ritter (1986), who in turn propose that underpricing is related to *ex ante* uncertainty. Following up on these studies of IPOs underpricing, McDonald and Fisher (1972), Reilly (1978), and Dawson (1987) maintained that there are significant returns to the investors in the short run. Many studies examining the determinants of underpricing, such as Ferretti and Meles (2011), Florin and Simsek (2007), Ljungqvist and Wilhelm (2002), rely on either information asymmetry or signaling theory to identify potential factors that influence investor behavior. Loughran et al. (1994) investigates the phenomenon of underpricing by gathering data from various countries around the world. Although results varied from one country to the next, on average, every country ultimately recorded large first day returns. While the majority of the information used to signal investors is based on firm-level characteristics, research shows that external factors can subconsciously impact investor behavior as well. A prominent external factor which has proven to affect investors' behavior is SAD, which is a documented psychological condition that produces increased pessimism and risk aversion during the fall and winter months. SAD is a condition that afflicts a large segment of the world's population. Scientists have found that SAD's depressive symptoms are linked to the diminished hours of daylight in the fall and winter months. In relating this medical condition to the financial market, early studies led by Kamstra et al. (2003) have found that SAD generally results in lower market returns during the fall and winter months. There has also been research that confirms the influence of SAD on IPO underpricing, in that underpricing is, on average, more severe for those firms that undergo an IPO during seasons in which there is less daylight (Dolvin and Pyles 2007). They examined the influence of SAD on IPOs between 1986 and 2000 and found support for this notion, as issues going public during fall and winter are associated with higher levels of underpricing. This draws into a question whether or not certain firm-level or industry-level characteristics alleviate or further exaggerate the influence of SAD. In particular, it suggests that if a reluctance to accept risk is the key driver in the relationship between SAD and IPO underpricing, IPO firms that are in the highest risk categories may experience even higher levels of underpricing during periods when SAD is prevalent. Given that SAD is a type of depression, people impacted by it are generally more risk averse, and their willingness to take risks decreases (Zuckerman 1994). In contrast to the widespread findings of initial short run positive returns for IPOs, mixed results have been found regarding their long-term performance, where insignificant or negative abnormal results for IPOs have been found in most studies, including but not limited to studies by Loughran and Ritter (1995) and Purnandam and Swaminathan (2004). According to Ljungqvist (2005), theories of underpricing can be grouped under four broad headings: asymmetric information, institutional reasons, control considerations and behavioral approaches. Of these categories, the most widely-recognized would be the asymmetric information based models. Rock's (1986) "winner's curse" hypothesis addresses information asymmetry between different classes of investors. The "winner's curse" hypothesis suggests that some investors are more informed about the true value of an IPO than other investors. While uninformed investors subscribe to every IPO, informed investors only buy new shares if the issue price is less than the fair value. This causes a "winner's curse" that negatively affects the uninformed investors¹. Rock (1986) also suggests that informed investors are interested in and bid only for IPOs which are attractively priced, whereas the uninformed investors bid somewhat randomly. Although the uninformed investor receives all that was bid for, it comes at a lower, often underpriced offering with less profit, thus creating a "winner's curse" problem. The informed investor, on the other hand, bids only for the favorable (profitable) offerings, crowding out the uninformed investors' bids. If companies have more information about the present value or risk of their future cash flow than investors, then underpricing may be used as a signal that reveals the company's true value. This is a costly move, but if successful, signaling may allow the issuer to return to the market at a later date to sell equity

¹http://www.ipo-underpricing.com/UP/Underpricing/Modelle/GG/e_Winners%20Curse.html

on better terms. Ibbotson (1975) was the first to investigate the use of signaling in the primary market, and suggests that issuers underprice in order to leave “a good taste in the investors’ mouths” so that future equities can be priced higher. Welch (1989) further formalized this in a two period model where high quality firms can underprice but low quality firms are not be able to do so because of high imitation costs. Grinblatt and Hwang (1989) added to this body of literature by saying that the issuers signal higher quality in IPOs by underpricing as well as by retaining some of the firms’ shares in their personal portfolio. Allen and Faulhaber (1989) found that in some circumstances, good firms want to “signal” to their investors that they have good future prospects, and therefore underprice their IPOs. Grinblatt and Hwang (1989), Welch (1989) and Allen and Faulhaber (1989) have all contributed research that supports the views of Ibbotson (1975). Welch (1989) expanded this study, exploring the nature of timing between IPOs and further equity issues. His work suggests that the longer a firm waits, the more likely that its true value will be revealed to the market.

Information asymmetries between issuers and underwriters create the potential for agency problems; this phenomenon is explored by Loughran and Ritter (2004) in their “corruption” hypothesis. Initial returns represent a wealth transfer from the issuer to investors. Loughran and Ritter (2004) suggest that this can lead to discouraged behavior, such as side payments to underwriters from subscribing investors, or underwriters “spinning” shares. Institutional theories focus on two features of the market: litigation and the price stabilizing activities undertaken by underwriters once trading commences. Lowry and Shu (2002) estimate that roughly 6% of IPOs that occurred between 1988 and 1995 fell victim to litigation for violations relating to the IPO. The damages awarded to investors averaged at 13.3% of IPO proceeds. The level of underpricing is suggested to be a trade-off between minimizing the probability of litigation and maximizing the gross proceeds of the issue. Hughes and Thakor (1992) provide a theoretical link between litigation risk and IPO underpricing, but they do not attribute this to be the sole cause of underpricing as underpricing is observed even in countries where the legal systems are not strong. Control theories argue that underpricing helps shape the shareholder base, with the objective being to reduce intervention by outside investors once the company is public. Underpricing has been proven to create excess demand for IPOs. Booth and Chua (1996) argue that this ensures that the shares are dispersed among many shareholders, and therefore reduces the possibility of large investors capturing a majority, or large proportion, of the shares. In essence, it acts as a defense against external bodies acquiring control over the company, Brennan and Franks (1997) support this theory.

Behavioral theories assume either the presence of “irrational” investors who bid up the price of IPO shares beyond their true value, or that issuers suffer from behavioral biases that cause them to put insufficient pressure on the underwriting banks to reduce underpricing. Welch (1992) shows that some types of IPOs are susceptible to “informational cascades,” which can only develop when investors are able to make their investment decisions sequentially, allowing later investors to condition their bids according to the bids of earlier investors. He suggests that this causes investors to rationally disregard their own information. However, going public marks a turning point in the life cycle of a company. While increased equity can support the firm’s future plans for growth, the tradeoff for the firm is increased public scrutiny. In their study of Italian firms, Pagano et al. (1998) found that generally, firms that are going public are not seeking money for growth, but are rebalancing their accounts after a period of high investment and growth. Lerner (1994) found that there are times (windows of opportunity) when the markets could be extremely optimistic about a particular industry, and it may be a good time for the firms in that industry to go public.

Offer size and the age of a firm (Megginson and Weiss, 1991; Logue, 1973; McDonald and Fisher, 1972; Singh et al., 2003) have been associated with IPO underpricing. Reside et al. (1994) found the evidence for negative correlation between a firm’s age and level of underpricing, which is attributed to greater availability of information when dealing with older firms. In the study of the Indian market by Shelly and Singh (2008), it was found that increased firm age is positively correlated to over-subscription, which implies that higher confidence in firm prospects results in higher underpricing. This was also supported by Islam et al. (2010). The justification behind this is that the younger a firm, the less transparent it will be in terms of reporting and less information will be available to investors, resulting in

a lack of confidence on the part of investors in the firms' future performance; whereas when a firm is well-established and has maintained a stable, positive reputation over a period of time, the investor's confidence will tend to be higher. When the firm engages in an initial public offering, investors will be able to access a greater store of information about the firm, and will thus be keener to purchase the stock, leading to oversubscription, and a higher degree of underpricing.

The phenomenon of IPO underpricing has been and continues to be studied across the industries by many researchers to examine the implications of industry classification. The most important difference is the difference between the financial and non-financial industries (Alli et al., 1994; Cagle and Porter, 1997; Tinic, 1988). Since financial institutions are controlled by regulatory bodies, there is less initial uncertainty about the firm value compared to non-regulated industrial firms trying to launch IPOs. Due to greater restrictions, there is less information asymmetry in the market. Alli et al. (1994) examined the difference using two samples from 185 financial and 1361 non-financial institutions that went public within the period of January 1983 to December 1987. Their study found that IPOs of financial institutions were underpriced less frequently than the IPOs of non-financial institutions because of the greater regulatory disclosure requirements imposed on financial institutions result in less uncertainty about the value of issuing firm. Cagle and Porter (1997) also supported that financial institutions exhibit a lower rate of underpricing (4.8% less) compared to other non-financial industrial institutions, but no significant differences were found between the underpricing of commercial banks and other financial institutions. Contrary to this, Tinic (1988) found that underpricing occurs more frequently among regulated financial institutions than among non-regulated firms because underwriters and issuers tend to underprice IPOs to avoid future legal liabilities for misrepresenting a firm's true value.

Several studies have examined the relationship between underpricing and the financial crisis of 2007 – 2008. Zhu (2012) examined US stocks in the financial sector during the financial crisis period, and concluded that because the American government made efforts to reduce the effects of the financial crisis by setting comprehensive and mature regulations, accelerated decline of the whole market was averted. Due to this large-scale prevention, the effect of the financial crisis in 2008 was not significant; the fiscal measures the US government took offset any serious negative effects of the crisis. However, results also indicate that IPOs that were announced during the financial crisis period appeared to have lower rates of underpricing, illuminating a negative relationship between underpricing and IPOs carried out during the financial crisis period. According to Zhu (2012) the reason behind that is the low confidence of the public in the market, which caused investors to invest less or to cease investing altogether. Gunturkun et al. (2012) studied the IPOs during the period of 2006-2011 in the Istanbul Stock Exchange and concluded that global financial crisis had an obvious impact on the initial returns. When considered as a whole, this five-year period displayed a positive but weak correlation between the consumer price index and initial returns. When the years were divided and assessed separately as pre and post crisis periods, it was found that the consumer price index had a greater effect on initial returns. World oil price was not a determinant in the pre-crisis period, but it was a determinant in the post-crisis period, implying that it was a hugely significant factor in determining the investment criteria after the crisis.

Methodology

As the literature review demonstrates, many variables have been tested to determine their relationship to underpricing. Such variables include firm age, offer size, reputation of underwriters, and the timing of going public, among others. The variables tested in this paper include initial return, which is the degree of underpricing, as the dependent variable, and offer size and firm age as the main independent variables. Uncharted territory, such as industry type and the time of year during which an IPO was offered, will also be incorporated into the study. The list of the variables is shown in Table 1. The following main null hypotheses (H_0) will be tested and decomposed further into sub-analysis.

1. Underpricing is not determined by age of the firm and size of the offer.
2. There is no significant difference between industry type and underpricing.

3. There is no significant difference between seasonal differences at the time the IPO was announced and underpricing.
4. Financial crisis has no influence on IPO announcement and underpricing.

Table 1. List of Variables

Variable	Explanation
Initial Return (R)	It is measured by the initial day returns ($R_{j1} = [P_{j1} - P_{j0}]/P_{j0}$), where R_{j1} is the return of stock j at the end of the first trading period (list price), P_{j1} is the price of stock j at the end of first trading period, and P_{j0} is the offer price of stock j . Islam et al. (2010).
Age of Firm (AGE)	It is measured as the difference between the offer year (year the security was priced), and the year of incorporation of the firm (David, 2002)
Size of Offer (SIZE)	It is measured as the total number of shares offered multiplied by the offer price (total amount to be raised through IPO).
Log Size of Offer (LOGsize)	The natural logarithm of offer size.
Timing of Offer (MONTH)	Months are given numerical values starting with 1 for January...up to 12 for December.
Size of Offer	Dummy variable: Offer size \geq median of offer size = 1, 0 otherwise.
Dummy Variables:	1) Financial vs Non-Financial Industry - Financial = 1, 0 otherwise.
	2) Banking vs Insurance Industry - Banking = 1, Insurance = 0.
	3) Offer timing (Ramadan): absolute value of the difference between Ramadan month and IPO month
	4) Offer timing: between October to February (SAD) = 1, 0 otherwise
	5) Offer timing: during 2007-2008 = 1, 0 otherwise.
	6) Offer timing: during 2007-2008 = 1, 0 timing pre crisis.
	7) Offer timing: during 2007-2008 = 1, 0 timing post crisis.
	8) Offer timing: post crisis period = 1, 0 timing pre crisis.

The Model

The model used is primarily based on the model constructed by Islam et al. (2010) as such:

$$UND = \alpha_0 + \alpha_1 AOF + \alpha_2 SOF + \alpha_3 SOFF + \alpha_4 TIME + \alpha_5 TYPE + \varepsilon$$

Where: *UND* = Underpricing/Overpricing, *AOF* = Age of the firm, *SOF* = Size of the firm, *SOFF* = Size of the offer, *TIME* = Timing of the offer, *TYPE* = Type of industry.

The above model suggests that initial return (underpricing/overpricing) is mainly determined by the age of the firm, size of the firm, size of the offer, timing of the offer and the type of industry. Based on the hypotheses developed for this paper, multiple regression has been applied to determine what factors significantly explain underpricing in the GCC market. The model will be quite similar to the one mentioned above, with slight changes as follows:

$$R_i = \alpha_0 + \beta_1 AGE_i + \beta_2 SIZE_i + \beta_3 MONTH_j + \beta_4 D_i + \varepsilon_i \quad (1)$$

Where: R_i = Initial Return; Underpricing/Overpricing for firm i , AGE_i = Age of firm i , $SIZE_i$ = Size of the offer for firm i , $MONTH$ = Timing of the offer, D_i = Different Dummy variables.

Data and Sample

The data was collected from FactSet database. The data selection included IPO issuers in all sectors, and then the data was filtered as follows: The offer type selected was Initial Public Offering only, meaning all follow-on equity issues were excluded. In addition, the only offer status selected was the *Priced* status, which includes the offerings that have been closed and purchased by investors. The remaining offer statuses such as *In registration*, *Postponed* and *Withdrawn* were all excluded. Once the filtrations took place, the sample was produced, comprising 194 companies in total. Table 2 shows a summary of sample data segregated by country. Kuwait's sample size was significantly small because 74 out of its 82 companies' offer prices were not available.

Table 2. The sample data by country

Country	Total Offerings	Sample (<i>Priced IPOs</i>)	%
Bahrain	14	12	85.70
Kuwait	82	8	9.70
Oman	19	19	100
Qatar	27	18	66.60
Saudi Arabia	98	95	96.90
United Arab Emirates (UAE)	87	42	48.20
Total	327	194	59.30

Findings and Discussion

The descriptive statistics in Table 3 show that the underpricing variable has a mean of 1.53, which means that based on the data gathered, the average initial day returns is 153% higher than the offer price; it can thus be inferred that the majority of the companies in the sample size were initially underpriced. The average offer size was 330.38, which falls somewhere in the middle of the distribution. The mean age of firms undergoing IPOs is approximately 12 years. The underpricing variable has a small standard error of 0.23, meaning that the sample size is indeed a representation of the population. The median of the underpricing variable is 0.47, which is less than the mean of 1.53, and indicates that there is a large difference between the returns of the companies. The positive skewness of all variables is clearly apparent.

Table 3. Descriptive statistics

Measures	Mean	Standard Error	Median	Skewness	Minimum	Maximum
Underpricing	1.53	0.23	0.47	4.33	-0.95	28
Offer size	330.38	46.62	112.86	4.15	3.98	4810
Log Offer size	2.03	0.05	2.05	0.12	0.60	3.68
Firm age	12.34	1.15	4	1.72	0*	101
Month	6.29	0.24	6.00	0.19	1.00	12.00

*Offer year and year of incorporation is the same

Table 4 shows the correlation coefficients among the independent variables. All correlations are relatively weak, with the highest being negative between underpricing and firm age (-0.272). This indicates that the older the firm's age, the lower the level of underpricing. Offer size is also negatively correlated with underpricing (-0.19). These results are in line with several prior studies, including Islam et al. (2010).

Table 4. Correlation matrix

Variables	Underpricing	Firm age	Log offer size
Firm age	-0.27	1	
Log offer size	-0.19	0.13	1
Month	0.04	0.01	-0.07

Table 5 provides an overview of the IPO underpricing according to sector. The highest average level of underpricing recorded for the GCC companies came from the Transportation sector, with the mean level as high as 322%. Seven out of the eight companies from the transportation sector exhibited underpricing. The next highest level of underpricing was found in the Finance sector (230%), and out of the 89 companies, 65 were underpriced. In the Health Services sector which recorded the third highest level of underpricing (160%), three out of the four companies listed were underpriced. The lowest level of underpricing recorded was for the Miscellaneous sector, which included six companies and had an average level of underpricing of 31%. On the other hand, two sectors leaned towards overpricing instead of underpricing when carrying out IPOs. The highest level of overpricing was in the Consumers Non-Durables sector, which exhibited an overpricing rate of 34%, two out of the three companies listed were overpriced. Retail Trade, which was the second overpriced sector, was overpriced at an average of 29%. This sector consisted of only two companies, one of which appeared to be highly overpriced (72%). The highest level of underpricing overall came from a company listed in the Finance sector, which was underpriced at 2800%, and the highest overpricing came from a company in the Non-Energy Minerals sector, overpriced at 100%.

Table 5. Sector analysis

Sector	Companies	Mean	Standard Deviation	Maximum	Minimum
Transportation	8	322%	6.41	1885%	-38%
Finance	89	230%	4.01	2800%	-95%
Health Services	4	160%	1.74	352%	-35%
Process Industries	16	118%	1.53	511%	-53%
Producer Manufacturing	5	105%	1.02	259%	10%
Non-Energy Minerals	12	102%	1.78	598%	-100%
Distribution Services	7	59%	1.67	331%	-87%
Communications	10	59%	1.04	296%	-82%
Utilities	10	55%	1.62	307%	-90%
Consumer Services	8	48%	1.05	241%	-47%
Industrial Services	12	46%	1.54	478%	-80%
Health Technology	2	41%	0.41	70%	12%
Miscellaneous	6	31%	0.65	155%	-19%
Retail Trade	2	-29%	0.60	14%	-72%
Consumer Non-Durables	3	-34%	0.78	54%	-95%
Total	194	154%	3.25	2800%	-100%

In addition to sector analysis, country analysis was carried out. Table 6 provides an overview of the IPO underpricing on a country-by-country basis. The highest average level of underpricing recorded was from the UAE as (235%). Thirty-five out of 42 companies were underpriced. The next highest level of underpricing was found in Qatar, where 13 out of 18 were underpriced reaching an average of 196%. Saudi Arabia recorded the third highest average (162%) underpricing, where 73 out of the 95 companies were underpriced. On the other hand, the IPOs carried out in Bahrain and Oman was overall overpriced instead of underpriced. The highest level of overpricing was in Bahrain, which showed an average of 26% in overpricing, with a standard deviation of 0.49. Seven out of the 12 companies listed were overpriced. Oman's average overpricing was at 13% with a standard deviation of 0.84. Nine out of 19 companies were overpriced. The highest level of underpricing recorded came from a company listed in the UAE, which was underpriced at 2800%, and the highest overpricing came from a company listed in the Saudi Arabia, and was overpriced at 100%.

Table 6. Country analysis

Country	Companies	Mean	Standard Deviation	Maximum	Minimum
Bahrain	12	-26%	0.488	51%	-92%
Kuwait	8	132%	1.386	331%	-19%
Oman	19	-13%	0.843	214%	-95%
Qatar	18	196%	2.982	1127%	-88%
Saudi Arabia	95	162%	2.545	1357%	-100%
UAE	42	235%	5.200	2800%	-86%
Grand Total	194	152%	3.236	2800%	0%

Table 7 summarizes the regression coefficients of the 10 models developed for the different hypotheses tested. Model 1, which is the general model, shows that the return is significantly determined negatively by 'firm age' and 'offer size' at 1% level. This indicates that the older the firm and the higher the offer size, the lower the underpricing level. The 'month' variable has a negative significant relationship with the level of underpricing, which means that the farther the IPO month is from the beginning of the year, the lower the level of underpricing. Using the dummy variable for size in Model 2, age and offer size are found to be significant at 1%; however the dummy variable of size appears to be insignificant, meaning that there is no significant differences between companies which belong to the large offer size group compared to the ones that belong to the small offer size group in their response to the level of underpricing. Model 3 assesses the significance of industry on underpricing, specifically whether an industry is financial or non-financial. Age and size are both found to be significant at a 1% level, and month is found to be significant at a 5% level. The industry dummy variable appears to be significant at a 10% level, which indicates that whether a firm belongs to the financial or non-financial sector is relevant in terms of underpricing. In order to further investigate the significance of industry, only companies which belong to the financial sector were chosen and subsequently divided into two groups; banking and insurance and the summary results are shown in Model 4. Size reported a negative significant coefficient while age of the firm turned out to be insignificant and month variable was significant at a 1% level. The dummy variable exhibits a significant positive coefficient, meaning that within the financial industry, it is indeed relevant whether a company belongs to the banking or insurance industry when carrying out IPOs. The data was further analyzed to take into consideration the effect of Ramadan on IPOs, for which Model 5 was developed. Then dummy variable of Ramadan was determined by taking the absolute value of the difference between the month number of Ramadan and the month number the IPO was carried out; the higher the difference, the higher the time until Ramadan. The model shows that age and size are both highly negatively significant at the 1% level, and the dummy variable

has proven to be positively significant at a 5% level. This means that the longer the period from IPO announcement until Ramadan, the higher the level of underpricing; i.e. the shorter the period between IPO announcement and month of Ramadan, the lower the level of underpricing.

In order to measure the significance of the Seasonal Affective Disorder on the IPO process, Model 6 was developed. Both age and size are found to be significant and negatively related to the returns. The dummy variable that represents the month (SAD or otherwise) during which the IPO was carried out appears to be insignificant. However, when regression was carried out on each sector separately, SAD appeared to bear significance in the Industrial Services, Transportation and Utilities sectors at 5%, 1% and 10% respectively.

The significance of the financial crisis was also measured several times, starting with Model 7 which shows whether or not IPOs carried out during the years of the financial crisis (2007 and 2008) show any significant difference from those carried out in the years preceding and following this period. This model has three noteworthy variables: age, offer size and the dummy variable crisis period, which are all equally significant at the 1% level. Both the firm age and the offer size appear to have significant negative relationships with the level of underpricing. In contrast, the dummy variable of crisis period appears to have a notably significant positive relationship with the level of underpricing, from which it can be inferred that the IPO process was significantly affected by the financial crisis. In order to measure the significance of the financial crisis period, only IPOs carried out during 2007 and 2008 were selected, which resulted in Model 8 with the significant variables being age, offer size and month. A third model (Model 9) concerning the financial crisis was developed, which took into consideration IPOs carried out in the pre- crisis period, and compared it against IPOs carried out during the crisis period. The significant variables in this model are age, offer size and the dummy variable which are all significant at the 1% level. Both firm age and offer size appear to have negative relationships with the level of underpricing. The dummy variable of pre-crisis period also appears to have a significant positive relationship with the level of underpricing, which implies that whether an IPO was carried out during the financial crisis years or prior to the crisis period is indeed pertinent. The fourth and final model developed (Model 10) concerning the financial crisis assessed data concerning IPOs carried out in the post-crisis against data collected in regards to IPOs carried out during the financial crisis. In this model, age, offer size and the dummy variable post-crisis period stand as the significant variables, at a shared significance level of 1% and adjusted R^2 of 32.6%. The dummy variable appears to have a significant positive coefficient, which suggests that highly relevant differences exist between IPOs carried out during the financial crisis years versus those carried out in the post-crisis period.

According to the regression results presented in Table 7, the firm age variable was significant in all models with the exception of banking vs. insurance sector. In all the models where the age variable appears as significant, it has a negative relationship with the level of underpricing, meaning that the older the firm, the lower the level of underpricing. This result corresponds to previous literature results such as Reside (1994). The offer size was consistently significant in all models once the natural logarithm was employed, albeit at different levels of significance, but the majority of levels were at 1%. In every model, log offer size had a negative relationship to the level of underpricing, indicating that the larger the offer size, the lower the level of underpricing, which is in line with previous literature such as Islam et al. (2010). The month variable appeared to be significant in all models except the ones relating to the financial crisis. This exhibits a significant negative relationship with the level of underpricing and can therefore be deemed a relevant variable.

Model 3, which consisted of banking and insurance companies only, appears to have significant age, offer size, month and dummy variables. This model has the highest Adjusted R^2 at 37.9%, which suggests that 37.9% of the variation in the dependent underpricing variable is explained by the independent variables.

The models developed in relation to the financial crisis were useful as they exhibited the greatest number of significant variables. In all of these models, the dummy variables were significant at the 1% level, along with the independent variables firm age and offer size. All of the independent variables in model 8, which included IPOs only during the crisis period, were significant, albeit at different levels.

This highlights the difference in the level of underpricing between IPOs carried out in the financial crisis years versus those carried out in the pre- and post-crisis periods, proving that the financial crisis had a significant impact on the level of underpricing.

Table 7. Summary of the regression models

	Models	Constant	Age	LogSize	Month	Dummy	Adj-R ²
1	General	388.16	-2.59 (-2.83)***	-92.35 (-4.49)***	-8.16 (-2.03)**		0.151
2	Large vs small offer size	393.8	-2.58 (-2.81)***	-97.03 (-2.69)***	-8.16 (-2.03)**	7.47 -0.16	0.147
3	Financial vs non-financial	362.24	-2.37 (-2.56)***	-89.13 (-4.32)***	-7.63 (-1.90)**	41.62 (1.41)*	0.156
4	Banking vs insurance	337.02	-1.08 (-0.46)	-75.17 (1.58)*	-15.04 (-1.7)***	220.73 (2.95)***	0.379
5	Ramadan months	298.94 -6.18	-2.47 (-2.69)***	-95.57 (-4.64)***		11.93 (2.06)**	0.152
6	SAD	387.89 -7.73	-2.58 (-2.81)***	-92.72 (-4.48)***	-8.45 (-2.02)**	7.2 -0.25	0.147
7	Crisis vs non-crisis	343.72	-3.16 (-3.47)***	-88.88 (-4.41)***	-5.83 (-1.46)	89.07 (3.07)***	0.188
8	Crisis period only	629.71	-3.08 (-2.16)**	-166.01 (-5.36)***	-14.02 (-1.65)*		0.371
9	Pre-crisis vs during crisis	332.07	-3.58 (-3.18)***	-78.93 (-3.31)***	-6.27 (-1.24)	89.85 (2.6)***	0.177
10	Post-crisis vs during crisis	465.74	-2.58 (-2.46)***	-153.57 (-6.25)***	-7.4 (-1.42)	95.55 (2.88)***	0.326

*** = Significant at 1%, ** = Significant at 5%, * = Significant at 10%

Conclusion and Limitations

This paper examined the determinants of IPO underpricing of 194 companies listed in the GCC market from 2000 to 2013. The results show that the firm age, offer size and month variables were statistically significant in almost all models tested, which is a conclusion similar to those that have been widely documented in the existing literature. Results show that significant differences in the level of underpricing do exist between banking and insurance firms. Differentiating fall/winter months from spring/summer months to measure SAD did not appear to be significant except in Industrial Services, Transportation and Utilities sectors when regression was applied to each sector separately. Ramadan month turned out to be significant when measuring the difference between Ramadan month and IPO announcement month. The models assessing the levels of underpricing during the financial crisis period all appeared to be highly relevant. This study provided a comprehensive analysis of some of the determinants of underpricing, and took into consideration important factors such as the timing of the financial crisis and its influence on IPO issuance, in addition to the introduction of external factors such as SAD. Moreover, the month of

Ramadan was incorporated into this study to test whether or not Islamic seasonality has any significance on the underpricing of IPOs. Such studies have not been carried out in the GCC region before, and therefore can be considered a significant contribution to the literature.

The sample size used in this study could be considered small; which means that it would be difficult to find significant relationships from the data, as statistical tests normally require a larger sample size to ensure that the sample is a fair representation of the population. This limitation is relevant in this study given that it is a quantitative research. In addition, the method of calculating age of firm only took into consideration the year the IPO was announced and the year the firm was established. Therefore, if both the IPO announcement and date of establishment coincided in the same year, the firm age would be zero, regardless of how many months it was operating before the IPO was announced. That would put firms with different actual ages in the same category, which also might have altered results. A different way of measuring time could be implemented in order to observe and assess its significance in an approach different than the simplistic one used in this study to measure the significance of the timing of IPO. Earlier studies such as Singh et al. (2003) and Taufil (2007) measured the timing of an offer by measuring the time between the date of the listing and the offer date. Using this measurement of time might lead to more accurate results.

The results of this study included all six GCC countries; no country was subject to an independent analysis. Investigating each country independently could lead to different conclusions, as each country has its own unique characteristics which might be reflected in its firms. The results provided for country analysis include only an overview of how mean, standard deviation, and minimum and maximum results manifest in IPOs.

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