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Extreme IPO underpricing and the legal environment in wealthy emerging economies

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ABSTRACT

This paper investigates IPO performance in the wealthy economies of the Gulf countries using restricted access data from regularity bodies. Contrary to asymmetric information theories, we find that IPO performance relies crucially on the unique institutional framework adopted by regulators. We also find that governance regulation in economies with weak regulation tends to provide better protection for investors in IPO markets. Finally, we find that underpricing is more severe when foreign investors are banned from sharing IPOs.

1. Introduction

The correlation between the short- and long-run stock returns of initial public offerings (IPOs) has been a subject of research for decades. The cumulative evidence shows that investors who purchase IPOs at the offer price and sell them on the listing day receive positive returns (Ritter and Welch, 2002). However, it is hazardous to buy IPOs at the listing day's closing price and hold them over a long period (Loughran and Ritter, 1995).

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In this paper we examine the short- and long-run performance of 139 initial public offerings (IPOs) between 2003 and 2010 in the Gulf Cooperation Council (GCC) region consisting of Saudi Arabia, Kuwait, Bahrain, Qatar, the United Arab Emirates (U.A.E.) and Oman. The region has recently experienced a hot issue market, with the number of IPOs in some markets exceeding the number of the originally listed firms, and with the IPOs raising a combined total of more than US$55 billion. This huge amount of capital is greater than that raised by 2476 U.S. IPOs (Ritter, 1991), 445 Canadian IPOs (Kooli and Suret, 2004) and many others. This implies that IPOs in the GCC have been priced extremely highly without any intention of leaving money on the table.

IPOs issued in the GCC were significantly underpriced by an average of 227.36%. This is consistent with global evidence, but is much larger in magnitude (Loughran et al., 1994). This raises the important question of whether underpricing is a deliberate discount by the issuer. We investigate reasons behind this high degree of underpricing and such a great deal of money being left on the table. Evidence suggests that there is no such thing as "money left on the table", as it is actually capital brought to the market by speculators on the listing day. The widespread underpricing observed in the GCC can be explained by the behavior of investors (flippers and speculators). One might argue that this analysis is only valid in the GCC region, given its unique degree of underpricing compared to other countries. In this regard, it is imperative to realize that similarly large degrees of underpricing have been observed in other countries. For example, underpricing in the U.S.A. was 65% during the internet bubble period (Loughran and Ritter, 2004) and in China it is usually over 200% (Ritter, 2011).

We conclude that underpricing in the GCC is caused by the unique institutional framework adopted by the GCC capital market authorities. The GCC institutional arrangement promotes strong demand during the subscription period and shapes investor behavior on the listing day. As opposed to all other markets, IPOs prices in the GCC are only allowed to freely fluctuate on the listing day, and from the second day onward the price is restricted to a 10% increase or decrease, similar to other listed companies. While GCC authorities justify this policy based on the need to establish a market price for the IPO on the listing day, the policy attracts aggressive speculators. Those speculators participate heavily on the listing day in hopes of an unlimited potential profit if the price increases. If the price moves adversely, however, there is a loss limit of 10% that acts as protection from the second day onward. Therefore, underpricing in the GCC is a governmental choice managed by the capital market authorities. Consistent with Ekkayokkaya and Pengniti (2012), we conclude that governance regulation in an economy with weak regulations tends to provide better protection for investors in the IPO markets.

In GCC, IPOs are used as a strategy for distributing wealth among citizens. In all GCC countries foreign investors are prohibited from sharing IPOs. This restriction leads to shallow market and severe underpricing. Also, the authority regulations prohibit foreign underwriter to lead the IPO in favor to local underwriter.[1] Consistent with Hopp and Dreher (2013) we conclude that the underpricing is more severe when foreign investors are banned from sharing IPOs.

In most GCC countries, mainly Saudi Arabia, the capital market authority requires firm's evaluations by a star analyst. Consistent with Liu and Ritter (2011) we document severe underpricing in countries when the lead underwriter provides all-star analyst coverage.

As opposed to IPO asymmetric and symmetric literature, we explain underpricing as a function of four major factors: firm characteristics, subscription period outcome, investors' behavior on listing day, and market conditions. Secondly, we provide evidence of the long-run performance of these IPOs. We measure IPO performance relative to the offering price as well as by the traditional listing day closing price (Ritter, 1991; Aggarwal et al., 1993; Levis, 1993; Lee et al., 1996). These measures the underpricing of IPOs beyond the listing day, including the second day, first week, first month, first six months and first year post-listing. The relevance of the long-run performance is highlighted by Ritter and Welch (2002) who state "Still, we hope to see further work to tell us which subsamples are particularly prone to poor post-IPO performance, both in the United States and in other countries" (p. 1822).

[1] Fung et al. (2014) investment bank has an incentive to set the IPO high to gain experience and keep customers.

We reject many theories about underpricing in GCC countries. In particular, most asymmetric information-based theories fail if issuers do not deliberately underprice. For example, the signaling theory is not valid in an environment that adopts a fixed-price offering method. This is especially true when issuers choose to price their shares extremely high without any underlying justification. It is difficult to believe that a company that offered only 30% of its stock at a value exceeding the company's total revenues, assets and authorized capital will underprice just to please investors. Furthermore, theories based on symmetrical information fail in environments characterized by a weak legal framework. For example, the insurance theory of Tinic (1988) is not valid in the GCC, given the weak legal framework surrounding markets in developing nations.[2]

We also examine the aftermarket performance relative to the listing day closing price over one-, two- and three-year windows. The evidence shows that IPOs in the GCC underperform their financial markets indices over all periods. The observed pattern of underperformance varies between countries and industries. Omani and Emirati IPOs outperform their market indices, while other GCC IPOs underperform. This variation in aftermarket performance is consistent with international evidence that IPOs in some countries, such as Korea, outperform the chosen benchmark, while others underperform, such as in the U.S.A., U.K. and Latin America (Kim et al., 1995; Ritter, 1991; Levis, 1993; Aggarwal et al., 1993).

Also, we measure IPO's long-run performance relative to the offering price. This measures underpricing beyond the first day by including the second day, first week, first month, first six-months and first year returns. We compare the aftermarket performance relative to the listing day closing price with the aftermarket performance relative to the offering price. Most authors use only the listing day closing price, and little attention has been given to underpricing beyond day one. The argument in the literature is that investors are rationed and cannot receive their desired allocation. Although, this is a logical argument from the point of view of the listing day buyers, it is not logical from the point of view of issuers and other investors with large allocations such as institutions and founders. The evidence indicates that IPOs are underpriced over the long-run as much as they are on the listing day. One year post-listing, the IPOs examined here are significantly underpriced by 197%.

The rest of the paper is structured as follows. Section 2 presents background information on the GCC economies, capital markets and IPO institutional arrangements. Section 3 presents the data, explains the methodology, and discusses the theoretical frameworks of underpricing and aftermarket performance. Section 4 presents the empirical results, and Section 5 concludes the paper.

2. The Gulf Cooperation Council region

2.1. Economies and capital markets

The GCC region is an oil-based economy with the largest proven oil reserves in the world (486.8 billion barrels). It is ranked as the largest oil-producing region and plays a significant role in the worldwide oil market. The economies of GCC countries are among the fastest growing worldwide. According to an economic note released by Dubai International Financial Centre Authority, the current value of oil and gas reserves for the six countries is estimated at US$18.3 trillion, larger than the 2008 U.S. GDP. This figure assumes a conservative price of US$50/barrel. If the figure doubled, then the value of GCC energy reserves would be US$37.7 trillion, equal to the total worldwide total stock market capitalization in 2008.

Following the rise in oil prices in 2003, the region enjoyed a substantial economic boom until late 2008, just before the Global Financial Crisis (GFC) hit. Consequently, the GCC economy tripled in size to $US 1.1 trillion. The billions of dollars introduced into the region ignited the capital markets in this jurisdiction. This is similar to what has been observed previously in developed markets such as the U.S. (see Gao et al., 2013a,b for the impact of economic conditions on IPOs). Doidge et al. (2013a,b) state that IPO market plays a critical role in facilitating entrepreneurship and venture capital in the U.S. economy.

[2] All IPOs in the region state clearly in the distributed prospectus that the company is not liable for adverse price movement and that the decision about whether to buy the offered shares is the investor's sole responsibility.

Table 1
The GCC stock exchange markets and IPO summary statistics.

Panel A: statistics for the GCC stock exchange markets

Country	Stock exchange market	No. listed firms	Market cap. ($US billion)	Exchange rate ($US1)
Saudi Arabia	Tadawul	146	353.4	3.7 SAR
Kuwait	Kuwait stock exchange	230	36.3	0.29 KWD
Qatar	Qatar stock exchange	42	122.1	3.6 QAR
Bahrain	Bahrain stock exchange	50	20.9	0.37 BHD
U.A.E. (Dubai)	Dubai financial market	77	54.2	3.6 AED
U.A.E. (Abu Dhabi)	Abu Dhabi securities	68	78.8	3.6 AED
Oman	Muscat securities market	126	20.3	0.38 OMR

Panel B: IPO summary statistics in the GCC region categorized by country

Country	No. IPOs	Gross proceeds ($US million)	No. shares (million)	Over-subscription (%)
Saudi Arabia	76	25,759.2	63	608
Kuwait	9	1587.4	384.8	596
Qatar	12	4807.8	130.7	775
Bahrain	7	1592.7	119	1240.7
U.A.E.	24	6098.3	919	10,566
Oman	11	16,067.5	714	19,832
Total	139	55,913	62	1157

Notes: This table reports summary statistics for the six countries of the GCC. Panel A shows the official name of each country's stock exchange, the number of listed companies, the market capitalization as of the end of 2010 and the equivalent exchange rate between the currency of each country and the $US. Panel B shows the number of IPOs that took place between 2003 and 2010 in each country. Gross proceeds are the aggregated amount of capital raised by the IPOs in each country, reported in $US. The number of shares is the average number of shares offered by all IPOs in each country. Over-subscription is the total capital offered from subscribers divided by the capital requested by the IPO, expressed as a percentage.

Although the Gulf countries share similar histories and cultures, Panel A of Table 1 points to a substantial variation in the financial market size and IPO arrangements. By the end of 2010, the aggregated market capitalization for the GCC region stood at US$ 685.8 billion. This represents a sharp decline of approximately 40% from the 2005 peak of $US 1.14 trillion. This decline was caused by major corrections that swept the region in early 2006 and the GFC in 2008. Saudi Arabia alone constitutes more than 50% of the total market capitalization, followed by the U.A.E. with 19%. This is not surprising given that Saudi Arabia and the U.A.E. are the largest two economies in the Middle East. In contrast, the combined market capitalization of Oman and Bahrain makes up only 6% of the total. Kuwait has the greatest number of listed companies with 230, and Qatar has the fewest with 42. Saudi Arabia and the U.A.E. have similar numbers of listed companies, with 146 and 145, respectively.

The domestic currencies of all GCC states have been pegged to the American dollar for decades due to the heavy reliance of these countries on oil exports. The exception to this rule is Kuwait, which abandoned this policy in 2007 in an attempt to control inflation. Kuwait currently pegs its domestic currency (the Dinar) to a basket of currencies. On June 7, 2009, the four countries of Saudi Arabia, Kuwait, Qatar and Bahrain signed an agreement to work toward a unified currency similar to the Euro; the U.A.E. and Oman are expected to join in at a later stage. Panel A shows the exchange rates between each GCC country and the U.S. dollar.

2.2. IPO institutional arrangements

The GCC has had a high level of IPO activity during the last decade. In some countries, such as Saudi Arabia, the number of IPOs in this period was larger than the number of originally listed companies (IPO clustering). Thousands of GCC citizens crossed the border from one country to another chasing IPOs. Media coverage (news agencies and newspapers) provided daily information on the subscription

outcome through the entire subscription period. In some cases, almost the entire nation participated in the offering.[3]

Panel B of Table 1 shows the number of IPOs that took place in each country between 2003 and 2010. The largest number of IPOs took place in Saudi Arabia with 76, followed by the U.A.E., with 24. The gross proceeds of these 139 IPOs amount to US $55.9 billion, a figure larger than the amount raised by the 2476 IPOs that offered in the U.S. (Ritter, 1991).

Two types of IPOs have been offered to the public: established and under-establishment IPOs. The former category includes companies that have some length of operating history including family firms, State Owned Enterprises (SOEs) and joint stock companies. The latter category consists of under-establishment companies that did not exist as independent entities prior to the IPO. These under-establishment companies are newly established firms where issuers and investors participate in the subscription together to raise the required capital.[4]

GCC authorities adopted a pre-announced fixed-price offerings procedure in which the issuer and its investment banker set whatever price they believe is fair based on the company's financial performance, reputation and potential growth. It was therefore, a common practice in the area for IPOs to be priced at very high levels. In some cases, the gross proceeds of only 30% of the offering of the company far exceeded the total revenues, authorized capital and even the firm's total assets. Consequently, the gross proceeds of the 139 IPOs in the region are larger than the gross proceeds of thousands of IPOs in other countries. In early 2008, in an attempt to overcome the IPO pricing problem, the GCC authorities converted to the international book-building procedure in which the issuer and investment banker set the offering price based on bidding by institutions.

Inspecting the average offer price of these IPOs in each country shows that IPOs in the U.A.E. are different by a factor of 10 compared with Saudi Arabian and Qatari IPOs, even though these three countries have comparable exchange rates with the U.S. dollar.

The average number of shares offered is highest in the U.A.E., where the price is lowest. Policies governing IPO subscription eligibility and the distribution of shares vary between the six countries. In general, IPOs in GCC countries are restricted to the citizens of that country. This is always the case in Saudi Arabia due to its large population compared with its neighboring countries. In other GCC countries, some IPOs are restricted to the citizens of that country and some are open to other GCC and international investors, especially when the offering is large in size.

There are also minimum and maximum limits for subscriptions, and investors cannot apply for shares outside these limits. After the subscription period closes, shares are distributed on an even-handed basis. The allocation of shares is simply calculated by dividing the number of offered shares by the number of subscribers. After allocating the conditional minimum number of shares to all subscribers, any remaining quantity will be distributed in proportion to subscriber requests, so those who apply for larger quantities receive larger allocations. However, given the heavy oversubscription observed in the GCC region as shown in Panel B, the majority of IPOs distribute their shares by dividing them equally among subscribers, with the result that the minimum subscription limit is not satisfied and investors are strongly rationed.

The excess capital of subscribers with no allocation must be refunded fully to subscribers prior to admission to the stock exchange. On the listing day, IPO shares are open for free fluctuation without restrictions. From the second day onward, IPO shares are restricted for movement within a certain percentage range up or down similar to all other listed companies.[5] The capital market authorities justify this unique policy as an attempt to establish a market price for a new company on the first day of trading. This particular unique feature of IPOs in the GCC has critical implications for underpricing, as it motivates both flipping activities by the general public and severe speculation at the same time. The vast majority of shareholders with tiny allocations have incentives to sell immediately to capture

[3] For example, the new Bank Alinma, which went public in 2007, received applications from over 10 million Saudi citizens.

[4] The subscription for an under-establishment IPO is carried out in two phases. In the first phase, the founders of the IPO have to subscribe to their portion of the authorized capital. After successful completion, the general public will be invited to subscribe to the remaining portion.

[5] For example, in Saudi Arabia, IPO shares from the second day are restricted by 10% up or down. In the Dubai financial market, this restriction is 15% and it is determined regularly based on the companies' trading activities.

quick profits. However, speculators are motivated to exploit the free fluctuation feature that will not be available the next day.

Finally, the oversubscription percentages of the GCC IPOs also reveal similar large variations, which in a large part reflect the differences in openness to foreign investors. The Saudi Arabian market is still closed to foreign investors.

3. Data and methodology

3.1. Data sources

The data in this paper are highly constrained by the information that is available. This implies that one of the problems faced is that of using a highly constrained and specific data set in a manner which allows hypotheses to be tested, results produced and conclusions reached that fit within the pre-existing literature. This is an especially important methodological point in relation to capital markets in emerging financial systems. It is to be expected that data from emerging countries do not always conform to desirable standards. The standards are not designed with statistical procedures in mind; therefore methods for dealing with them need to be developed.

To locate all IPOs in the GCC, we inspected the GCC stock exchange markets and the capital market authorities for each country to identify newly listed companies. The sample is composed of 139 initial public offerings made in the six GCC countries between 2003 and 2010. This period represents the hot market of IPOs where oil prices sharply increased and investment in the region plunged, accordingly. Of the 139 offerings, 76 IPOs are listed on the Saudi stock exchange (Tadawul), 9 on the Kuwait stock exchange, 12 on the Qatar stock exchange, 7 on the Bahrain stock exchange, 10 on the Abu Dhabi stock exchange, 14 on the Dubai financial market and 11 on the Omani Muscat stock exchange. The sample is unbalanced, with the majority of sampled IPOs coming from Saudi Arabia and the Emirates. We drop five IPOs from the sample because no long-run performance data were available. Therefore, the analysis of long run performance relied on data from 134 IPOs.

Each individual stock exchange is used as the benchmark for the corresponding IPOs. Therefore, we match Saudi IPOs with the Saudi Tadawul All Share Index (TASI), Dubai IPOs with the Dubai financial general index and so on. Where applicable, index values were gathered from the stock market itself. When such data were not available, such as for Bahrain and Qatar, we get the data from the Zawya database, which provides information on the GCC and other Middle Eastern market indices. The Zawya database also contains information on IPO oversubscription percentage, issue size, date of issue and retained ownership. Where possible, we double-checked for accuracy with each IPO's disclosed prospectus. We could not trace the prospectuses of the Kuwaiti IPOs despite several attempts to obtain the data.[6] Thus, we rely on the Zawya database for information on the Kuwaiti IPOs.

3.2. Underpricing measures

The IPO raw initial return (underpricing) is conventionally calculated by taking the difference between the IPO listing day closing price and the IPO subscription offer price as follows:

$$r_{ipo} = \frac{(P_1 - P_0)}{P_0} \times 100 \tag{1}$$

where P_1 is the closing price of the IPO on the listing day and P_0 is the offer price of the IPO.

The initial market-adjusted return is calculated as the difference between the initial raw return of the IPO and the return on the corresponding index for the period from the IPO subscription closure to the listing day. The market-adjusted return is computed as follows:

$$ar_{ipo} = r_{ipo} - r_{index} \tag{2}$$

[6] Unlike other GCC markets, the difficulty in obtaining data from Kuwait is due to the lack of supervision by an independent authority.

where r_{ipo} is the raw return on the IPO on the listing day and r_{index} is the return on the market index for the corresponding period. Hence, the underpricing for a group of IPOs is calculated as

$$\text{Underpricing} = \frac{1}{n}\sum_{ipo=1}^{n} ar_{ipo} \tag{3}$$

where n is the number of IPOs included in the sample.

3.3. Underpricing theoretical framework and measurements

Regulators in the GCC exert strong control over all parties involved in IPOs. We classify IPO parties into five categories:

- The market regulator: the capital market authority that supervises the IPO process and the stock market.
- The issuer: the company offering shares.
- The underwriter: the banker marketing and selling the IPO shares.
- Flippers: the general public shareholders that receive allocation.
- Speculators: the market participants buying on the listing day.

In the GCC is better informed than the others. IPO shares are distributed fairly, where all subscribers have the opportunity to receive an equal quantity. In this regard, most existing theories based on asymmetric information might be inappropriate. The first theory we consider is the winner's curse of Rock (1986). Rock proposes a model based on the assumption that one group of investors has superior knowledge compared with the issuer and other investors. In this sense, this powerful group is expected to participate only in hot issues and abstain from other less attractive offerings. In contrast, the less informed groups would participate in all offerings both hot and cold, with the result that they earn only a nominal return. Koh and Walter (1989) find support for the winner's curse argument based on available rationing information from Singapore.

Although Rock's theory is widely cited and used in the literature, especially in markets where underwriters guard the information regarding the allocation of shares, this scenario is not possible in the GCC because informed and uninformed investors receive the same treatment. In the GCC, the general public is the main target for IPOs. Therefore, the only way to obtain the desired quantity of shares is to buy them at market. Therefore, the winner's curse assumption is irrelevant in this market-place.

Another theory based on asymmetric information is the signaling theory, which suggests that issuers are better informed than the other parties. Thus, high quality issuers deliberately underprice their shares to distinguish themselves from the pool of low quality issuers. However, these high quality issuers may return to the market at a later stage to conduct a follow-on offering to recoup the earlier capital sacrifice. Welch (1989) finds that issuers go public with the intention to conduct follow-on offerings.

Despite its plausibility, the signaling theory is also not valid in the GCC region. Most issuers have priced their shares far too expensively, and it is hard to believe that such issuers have any intention of leaving money on the table. In other words, signaling models cannot explain underpricing of above 200%. As Ritter and Welch (2002) ascertain, it is not clear why issuers do not signal their quality by donation or another method. Another important point here is that my dataset contains a large number of IPOs that are under-establishment companies in which both issuers and investors subscribe together to raise the required capital for operation. As these IPOs are not even companies at the time of the offering, signaling models cannot explain the underpricing of these entities in the GCC.

The Benveniste and Wilhelm (1990) book-building theory suggests asymmetry between the underwriter and the issuer, with the underwriter possessing superior knowledge to the issuer. This is a logical argument given the information that the underwriter can obtain during the IPO pricing negotiation with potential investors. However, all book-building theories naturally fail when fixed-price offering

mechanism or another method is used. In my sample, the majority of IPOs are preannounced fixed-price offerings, with very few book-built offerings beginning early in 2008. Therefore, we disregard the book-building theories in explaining the underpricing in the GCC.

With regard to Ljungqvist (2005) institutional explanation of underpricing, One could realize that the institutional framework in the GCC region is unique compared with that of other countries. In particular, IPO shares are distributed equally among subscribers, which create severe herding and rationing. Additionally, IPO shares are only open for free fluctuation in the listing day, while the movement is restricted from the second day onward to a certain percentage up or down. In other countries with restrictions on the fluctuation, such as in Finland some years ago, these restrictions also apply to IPOs. This unique policy encourages both speculation and flipping activities at the same time. Flippers of IPO shares (the general public) with very limited allocations have incentives to sell immediately to capture profits, whereas speculators have a golden opportunity of free fluctuation that will not be available at a later time. Additionally, those speculators have a loss limit of 10% per day if they are caught with high priced shares on the listing day. Therefore, this limitation percentage acts as price protection.

Theories based on symmetric information such as the insurance (legal liability) theory of Tinic (1988) do not apply in the GCC region due to the weak legal framework that characterizes the stock markets in most developing countries. In other words, investors cannot sue the issuer in case of overpriced IPOs. Therefore, we reject this explanation in the GCC.

We try to explain underpricing by four major factors. The first factor is the firm characteristics, meaning the size and type of the IPO firm. IPO characteristics have been always used in the literature to proxy the ex-ante uncertainty explanation of underpricing (Beatty and Ritter, 1986). However, these remain proxies and not direct measures. Large and old IPOs typically should be underpriced less, while small and new IPOs require greater underpricing. In other words, large and old IPOs could have a lower degree of underpricing because they have a larger quantity of shares and their shares have been priced initially more expensive. In the GCC, established IPOs are priced much higher than the new under-establishment IPOs.

The second factor is the subscription period outcome. This is linked to the degree of demand for the IPO shares and the degree of rationing. According to the economic law of supply and demand, it is logical to expect greater underpricing for IPOs with stronger demand and rationing. Fishe (2002) states that if there is sufficient excess demand at the offer price to absorb the shares of flippers, the after-market price is likely to rise. Agarwal et al. (2008) find that the underpricing magnitude in Hong-Kong is associated with the level of demand of the pre-listing period.

The third factor we consider is the investors' behavior during the listing day, and this factor is actually the most important. On the listing day, subscribers (flippers) become the only suppliers because other non-offered shares are locked-up for some time (often 6 months). Therefore, if those flippers choose to hold onto their shares, no trading will occur at all. However, the evidence suggests that an enormous amount of trading occurs on the listing day, far more than any other trading day. This strong trading suggests the existence of both sellers (flippers) and buyers (speculators). We expect both variables to be strongly associated with the degree of underpricing. However, it is vital, to note that the sign of the relationship is not as important as the association itself, as we examining the cross-sectional variation between IPOs. In fact, the expected signs for both variables are negative because IPOs that are more frequently flipped and speculated should be underpriced to the lower degree. This situation of the strong flipping and speculation reflects the degree of the matching between available buyers and sellers on the listing day.

The last factor that could explain the underpricing is the market conditions, in terms of whether the market in general is in hot or cold year and the market sentiment during the subscription period from the beginning of subscription to the admission day. Derrien (2005) states that individual investors' demand is positively related to market conditions. Therefore, we make the following hypothesis regarding GCC underpricing:

Hypothesis 1. Underpricing in the GCC can be explained by the four major factors of firm characteristics, subscription period outcome, listing day investor behavior and market conditions.

Therefore, underpricing becomes a function of four factors as follows:

$$\text{Underpricing} = f\left(\begin{array}{ll}\text{Firm characteristics}, & \text{Subscription period outcome},\\ \text{Listing day investor behavior}, & \text{Market conditions}\end{array}\right) \tag{4}$$

We measure the impact of firm characteristics through the size (large vs. small) and type of the company (established vs. under-established). Subscription period outcome in the GCC is mainly determined by the degree of demand, which leads to the rationing of shares. Rationing of shares can be measured by the level of oversubscription (demand for IPO shares) and allocation. Listing day investors' behavior is measured from both the subscribers (flippers) and the speculators. Market conditions are measured by differentiating between hot and cold years and by adjusting the raw returns according to the market index. Thus, we propose the following cross-sectional regression:

$$\begin{aligned}\text{Underpricing} = {} & \beta_0 + \beta_1\,\text{Size} + \beta_2\,\text{Type} + \beta_3\,\text{Rationing} + \beta_4\,\text{Speculation} + \beta_5\,\text{Flipping}\\ & + \beta_6\,\text{Hot} + \varepsilon\end{aligned} \tag{5}$$

Here, the dependent variable 'underpricing' represents the returns adjusted by the market index. Size is the natural logarithm of either the IPO authorized capital or the number of offered shares. We avoid the use of gross proceeds because of the high valuation given to some companies. Type is a dummy variable that takes on 1 for under-establishment IPOs and 0 otherwise. Rationing of IPO shares is measured by either the oversubscription or the allocation of shares to individuals. IPO shares are distributed in an even-handed manner in the GCC, so the oversubscription and the number of shares allocated reflect the degree of demand and the subsequent rationing of shares. We measure these variables as follows:

$$\text{Rationing}_{ipo} = \text{Oversubscription}_{ipo} = \frac{\text{COS}_{ipo}}{\text{C}_{ipo}} \tag{6}$$

$$\text{Rationing}_{ipo} = \text{Allocation}_{ipo} = \frac{\text{NOSH}_{ipo}}{\text{NOS}_{ipo}} \tag{7}$$

where COS is the capital offered by subscribers to the IPO, C is the capital requested by the IPO (gross proceeds), NOSH is the number of shares offered by the IPO and NOS is the number of subscribers that applied to buy IPO shares.

We construct the measure of speculation on the IPO as follows:

$$\text{Speculation}_{ipo} = \left\{\left(\frac{V_{ipo,1}}{V_{market,1}}\right) - \left(\frac{\sum_{t=2}^{22} V_{ipo}/21}{\sum_{t=2}^{22} V_{market}/21}\right)\right\} \tag{8}$$

where $V_{ipo,1}$ is the volume of the IPO on the listing day, $V_{market,1}$ is the total market volume on the listing day, $\sum_{t=2}^{22} V_{ipo}/21$ is the average daily volume of the IPO during the first month of trading, excluding the listing day volume, and $\sum_{t=2}^{22} V_{market}/21$ is the average daily market volume during the first month following IPO admission, excluding the market volume on the listing day. Thus, speculation is measured as the difference between the ratio of the IPO volume to the total market volume on the listing day and the ratio of the average IPO volume for the remaining days of the month to the average total market volume over the same period.

We measure the flipping degree by the following ratio:

$$\text{Flipping} = \frac{V_{ipo,1}}{\sum_{t=2}^{22} V_{ipo}/22} \tag{9}$$

where $V_{ipo,1}$ is the trading volume of the IPO on the listing day, and $\sum_{t=2}^{22} V_{ipo}/22$ is the average IPO volume during the first month of trading, excluding the listing day volume. Thus, flipping is expressed as the ratio of the total volume of an IPO on the listing day to the average volume of the IPO for the subsequent 21 business days, excluding the listing day.

Finally, 'hot' is a dummy variable that takes on 1 for companies that went public between 2005 and 2008 and 0 for other years.

3.4. Aftermarket performance measures

There is no consensus regarding which measure is best for long-run IPOs performance. As Barber and Lyon (1997) document, cumulative abnormal returns (CARs) are biased predictors of buy-and-hold abnormal returns (BHARs).[7] Therefore, in this paper we tend to use cumulative abnormal returns, buy-and-hold returns and the wealth relatives. Following Ritter (1991) and Levis (1993), this paper defines long-run performance as one-, two- and three-years of IPO performance post-listing, excluding the initial returns. Therefore, the aftermarket period includes 12, 24 and 36 months, where a month is defined as 21 business days following the IPO listing day. Monthly market-adjusted returns (MARs) are defined as the month t return on an IPO minus the monthly return on the matching market index for the corresponding 21-business-day period, as follows[8]:

$$\mathrm{MAR}_{ipo,t} = r_{ipo,t} - r_{index,t} \tag{10}$$

where $r_{ipo,t}$ is the raw return of an IPO for the aftermarket month t and $r_{index,t}$ is the raw return on the market index for the corresponding month t. The average market-index-adjusted return on a portfolio p of n IPOs for the event month is the equally weighted arithmetic average of the market-index-adjusted returns:

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} MAR_{ipo,t} \tag{11}$$

Hence, the cumulative market-index-adjusted aftermarket performance from event month s to event month e is the summation of the average market index-adjusted returns:

$$\mathrm{CMAR}_{ipo,s,e} = \sum_{t=s}^{e} AR_t \tag{12}$$

We compute the cumulative average returns (CARs) over one-year, two-year and three-year periods. As an alternative to the CARs method, which assumes monthly portfolio rebalancing, we also consider the one-year, two-year and three-year buy-and-hold returns as

$$BHR_{ipo,T} = \left[\prod_{t=1}^{\min(T)} (1 + r_{ipo,t}) - 1\right], \quad T = 12, 24, 36 \tag{13}$$

where BHR represents the raw buy-and-hold returns on the IPO in event month t. This measures the total returns from a buy and holds strategy, where an IPO is bought at the closing price of the second day of listing and held until the earlier of either the first-year, second-year or third-year anniversary or its last day of trading. For a group of IPOs, we follow Ritter (1991) and Levis (1993) with the wealth relative defined as

$$WR = \frac{1 + \left(\sum_{ipo=1}^{n} BHR_{ipo,t}/n\right)}{1 + \left(\sum_{index=1}^{n} BHR_{index,t}/n\right)} \tag{14}$$

If the wealth relative returns a result greater than 1, this indicates that IPOs have outperformed the benchmark, while a result less than 1 indicates the opposite (IPOs underperformed the market benchmark).

[7] Barber and Lyon also find that CARs yield positively biased test statistics, while BHAR yields a negatively biased test statistic. They also discuss various issues regarding the new listing bias, rebalancing bias and skewness bias.

[8] While the use of matching firms would be a better matching strategy, this is not possible in the GCC due to the limited number of listed companies. In some extreme situations, IPOs represent the whole industry, such as the insurance industry in Saudi Arabia.

3.5. Aftermarket performance theoretical framework

The aftermarket performance of IPOs is a highly complicated function of several issues. Contrary to the underpricing phenomenon, which has been the subject of a considerable amount of research, aftermarket performance has received less attention. Part of the reason for this obstacle is the lack of observed variables that can be used to examine aftermarket performance. Furthermore, many other issues arise over the long-run such as the expiration of the lock-up period and the variability of company operating performance. In general, two major explanations have been proposed in the literature to explain the IPO aftermarket performance.

The first explanation is the divergence of opinions explanation proposed by Miller (1977). Miller proposes that investors tend to be over-optimistic initially regarding the value of the IPO, which drives the price up. Over time, as the difference of opinions decreases, the IPOs price declines to the intrinsic value causing poor long-run performance.

The second explanation for poor-long run performance is offered by Schultz (2003). Schultz suggests that the majority of IPOs are those poor IPOs that came late to the market in response to the success of a few other IPOs. As these late IPOs compromise the bulk of the IPO sample, they make the overall performance of the IPO pool appears to be poor. However, the evidence in the literature does not offer much support for this explanation given that the poor long-run performance of IPOs is evident even when some studies measure IPOs over different time periods and weight them equally (Ritter and Welch, 2002).

Another set of authors attempt to link the long-run performance with IPO operating performance. For example, Jain and Kini (1994) and Mikkelson et al. (1997) measure the operating performance of a sample of U.S. IPOs and find that the IPOs operating performance declines after the IPO compared to the pre-IPO accounting performance. Recently, Brau et al. (2012) investigate the link between the desire of IPOs to acquire and long-run performance and find evidence supporting that IPOs that acquire within a year significantly underperform in the next five years.

In this study, we restrict the analysis of long-run performance to the Saudi IPOs for consistency with the underpricing data. We examine the aftermarket performance relative to both the offering price and the listing day closing price. This is an essential issue in understanding long-run IPO performance. Investigating the performance based on the listing day closing price takes on the speculators' point of view and ignores the issuers' and subscribers' points of view. Therefore, this section tackles two major questions. First, are IPOs as underpriced over the long-run as they are on the listing day? Second, can underpricing determinants explain long-run returns in the same way as they explain short-run returns?

Another important element of the GCC is the restrictions on fluctuations imposed on the IPOs beginning on the second day. As explained earlier, this acts as a barrier or a protection against a price decrease. Therefore, we formulate the following hypothesis regarding the aftermarket performance relative to the offering price:

Hypothesis 2. IPOs are underpriced in the long-run relative to the offering price as much as on the listing day.

We measure the IPO returns by comparing the offering price to the price on the second day, one-week, one-month, six-months and one-year after the IPO. Therefore, the return for each period is calculated as follows:

$$r_{ipo,t} = \frac{(P_t - P_0)}{P_0} \times 100, \quad t = 2, 5, 21, 126, 252 \tag{15}$$

where P_t is the IPO share price on day 2, 5, 21, 126 or 252; P_0 is the IPO offer price. We adjust all these returns according to the market index for the corresponding period.

Similarly, the returns from the first day closing price are calculated as follows:

$$r_{ipo,t} = \frac{(P_t - P_1)}{P_1} \times 100, \quad t = 2, 5, 21, 126, 252 \tag{16}$$

where P_t is the IPO share price on day 2, 5, 21, 126 or 252; P_1 is the IPO listing day closing price. We adjust all these returns with the market index for the corresponding period.

We then employ the same underpricing model proposed earlier to examine whether the determinants are still capable of explaining the returns beyond day 1. Thus, the model is as follows:

$$\text{Aftermarket} = \beta_0 + \beta_1 \text{Adj} + \beta_2 \text{Size} + \beta_3 \text{Type} + \beta_4 \text{Rationing} + \beta_5 \text{Speculation} + \beta_6 \text{Flipping} + \beta_7 \text{Hot} + \varepsilon \quad (17)$$

In this model, the dependent variable is the aftermarket performance relative to the listing day closing price. This captures the adjusted returns in the second-day, one-month and one-year after the IPO. The independent variables are the same as those explained in Eq. (5). We only add the adjusted underpricing (Adj) as another explanatory variable. Aggarwal and Rivoli (1990) postulate that the IPO market is inefficient in valuing shares and that the underpricing is a result of overvaluation in the early stage, which diminishes overtime. Consistent with the overvaluation theory, the fads hypothesis of Shiller (1990) and; De Bondt and Thaler (1985) suggests that the greater the initial returns of IPOs the greater the poor performance over the long-run. This careful assessment of the determinants over time could help to understand how the association between variables changes over time.

Ritter (1991) finds that large IPOs tend to perform better than small, speculative IPOs. Therefore, we include the offer size to control for any variation. We also add the type to control for the variation between companies with operating histories and those without. Furthermore, we include the rationing of IPO shares that occurs during the subscription period. The investor behavior of both flippers and speculators are key determinants of underpricing and we expect the same impact over the long-term, but rather less powerful. Finally, to distinguish between hot and cold IPOs, we include the hot dummy variable that takes on 1 for the hot years and 0 otherwise.

4. Empirical results

4.1. Underpricing in the GCC

Panel A of Table 2 reports the raw and market index adjusted underpricing for the 139 IPOs in the six countries of the GCC between 2003 and 2010. The results show that the underpricing varies from one country to the other, in line with evidence from the rest of the world. The U.A.E. has the largest raw and adjusted underpricing at 288.6% and 270.10%, respectively.

Saudi Arabia has the second largest adjusted underpricing at 265.5%. Kuwait and Qatar exhibit similar results, with significant underpricing of over 200%. However, the underpricing in these four countries is lower than that observed in China. Ritter (2011) documents underpricing in China, at a maximum average of 600% in 1990 and a minimum average of 40% in 2010. Also, Chan et al. (2004) document a large underpricing in China of 178%.

In contrast, Oman and Bahrain show only moderate degrees of underpricing of 50% and 24.4%, respectively. The underpricing of these two countries is similar to those documented in Thailand of 17.6% (Chorruk and Worthington, 2010). The last row of the table reports underpricing for the whole sample of 139 IPOs in the GCC. GCC IPOs are underpriced by 234.3% (raw) and 227.4% (adjusted). Al-Hassan et al. (2010) report 290% underpricing for 47 IPOs in the GCC.

To investigate the pattern of initial returns over time, Panel B of Table 2 reports the underpricing for each of the eight years under consideration. The results indicate large year-to-year variations in average underpricing. The largest underpricing is documented during the hot issue years of 2005 and 2007 (347.47% and 303.2%, respectively). In 2006, the underpricing declined to 172.3%, which can be attributed to the major corrections that occurred in the region that year. Underpricing is moderate in other years, with 2010 reaching a low of only 62.6%. These results are in line with the U.S.-based findings that there is a positive relationship between the volume of issues and underpricing (Loughran and McDonald, 2011). Moreover, Chinese IPOs underpricing was highest during the hot issue years as documented by Ritter (2011) and declined to a minimum in recent years.

Table 2
Raw and market index adjusted initial returns for 139 initial public offerings made between 2003 and 2010 in the GCC.

Panel A: underpricing of 139 IPOs in the GCC made between 2003 and 2009 categorized by the country of issuance

Country	Number of IPOs	Raw underpricing (%)	Adjusted underpricing (%)
Saudi Arabia	76	264.5	265.5
Kuwait	9	229.9	182.6
Qatar	12	225.1	215.1
Bahrain	7	25.5	24.4
United Arab Emirates	24	288.7	270.1
Oman	11	53.1	49.6
GCC	139	234.3	227.4

Panel B: underpricing of 139 IPOs in the GCC made between 2003 and 2010 categorized by the year of issuance

Year	Number of IPOs	Raw underpricing (%)	Adjusted underpricing (%)
2003	2	138	125.8
2004	6	163.9	146.3
2005	22	379.1	347.5
2006	19	170.7	172.3
2007	38	308.7	303.2
2008	25	201.9	196.5
2009	13	178	188.1
2010	14	61.1	62.6
Total	139	234.3	227.4

Panel C: underpricing of 139 IPOs in the GCC made between 2003 and 2010 categorized by the type of IPO

Type	Number of IPOs	Raw underpricing (%)	Adjusted underpricing (%)
Under-establishment IPOs	71	353.1	345.3
Established IPOs	68	110.1	104.1
Total	139	234.3	227.4

Panel D: underpricing statistics for 139 GCC IPOs made between 2003 and 2010

Statistic measure	Mean	25th percentile	Median	75th percentile	Max	Min	Std. dev	*t*-Stat
Raw underpricing (%)	234.3	33.7	110	324.7	1770	−27.5	307.9	8.97***
Adjusted underpricing (%)	227.4	34.7	112.3	293.6	1767.6	−37.4	298.4	8.97***

Notes: Raw return is calculated as $((\text{Closing price of an IPO}_i - \text{Offer price of an IPO}_i)/\text{Offer price of an IPO}_i) \times 100$. Market-adjusted return is calculated by taking the difference between the raw return and the return on the market index for the period from the closure of subscription to the listing day. Panel A shows the unadjusted and adjusted underpricing categorized by country and the number of IPOs. The last row reports the results for all GCC IPOs. Panel B categorizes the underpricing by the year of issuance. In Panel C, the underpricing results are reported based on the type of IPO, with 68 established IPOs and 71 under-establishment IPOs. Panel D shows distributional statistics for the 139 IPOs.
t-Statistic indicates that the mean return equals zero.
*** Significance at the 1% level.

In Panel C, we split the GCC IPOs into established IPOs with an operating history and under-establishment IPOs with no operating history. Consistent with Beatty and Ritter's (1986) concept of ex-ante uncertainty, but with different interpretation we find that the under-establishment IPOs were underpriced by 345.42%, a figure much larger than the 104.08% underpricing for the established IPOs. We interpret this as that under-establishment IPOs have been offered initially at lower prices than established IPOs; thus they show larger underpricing. Similar underpricing variations within the same country are obtained in other markets such as in China (Chan et al., 2004).

Finally, Panel D reports detailed statistics for the underpricing of GCC IPOs. The mean and median underpricing are clearly skewed. Therefore, the median adjusted underpricing of 112.42% is more representative of the level of underpricing.

Table 3
Pooled OLS models explaining underpricing.

Variable	Univariate	Model 1	Model 2	Model 3	Model 4
Intercept		1339.4**	803.4	298.5***	199.3*
Firm characteristics (1)					
Size (authorized capital)	−151.5***	−145.4***			
Size (offered shares)	−176.1***		−97.7		
Type	363.6***	214.4***	366.3***	320.5***	242.6***
Subscription period outcome (2)					
Oversubscription (%)	14.3**	21.3**			22.2**
Allocation	−5.1**		−2.2	−6.4***	
Investors behavior (3)					
Speculation	−19.8**	−18.6***		−25.1***	−488.8**
Flipping	−14.2**		−10.4*		−25.6***
Market conditions (4)					
Hot	175.1**	170.1***	155.1**	132.7**	143.2**
f-Stat		15.1***	12.4***	14.3***	15.3***
Adjusted R^2		0.54	0.43	0.47	0.55

Notes: The sample contains 61 IPOs made between 2003 and 2010. The data represent IPOs on Saudi market only. We were unable to get all data in some countries. For example, Bahrain has three IPOs in that period but the authority did not disclose data about oversubscription and allocation.
This table presents the underpricing determinants as a function of (1) firm characteristics, (2) subscription period outcomes, (3) investors' behavior and (4) market conditions. Underpricing $= f\begin{pmatrix}\text{Firms characteristics,} & \text{Subscription period outcome,}\\ \text{Listing day investors behavior,} & \text{Market conditions}\end{pmatrix}$. Size is either the natural logarithm of the IPO authorized capital or the number of shares in offer. Type is a dummy variable that takes 1 for under-establishment IPOs and 0 otherwise. Oversubscription as a percentage is the total capital offered by subscribers divided by the gross IPO proceeds. Allocation is the number of shares distributed to individual subscribers. Speculation is the change between the ratio of IPO volume to market volume on the listing day and the ratio of IPO monthly average volume to the monthly average market volume, excluding the first day. Flipping expresses the ratio of IPO volume on the listing day relative to the monthly IPO average volume, excluding the listing day. Hot is a dummy variable that takes on 1 for the hot years between 2005 and 2007 and 0 otherwise. In model 4, the speculation variable transforms from a ratio into a difference.

* Significance at 1% level.
** Significance at 5% level.
*** Significance at 10% level.

The maximum and minimum underpricing figures are extreme at 1767.6 and −37.5%, respectively. Approximately 25% of the sample has been underpriced by more than 290%, and 25% of the sample was underpriced by 35%.

4.2. Underpricing explanations

Table 3 reports the estimates of Eq. (5). As hypothesized, underpricing is a function of four major factors: (1) firm characteristics, (2) subscription period outcome, (3) investors' behavior and (4) market conditions.

Focusing first on firm characteristics, we find that the size of the IPO is negatively associated with the underpricing in that large IPOs generally have lower degrees of underpricing. This is consistent with the ex-ante uncertainty explanation of Beatty and Ritter (1986). However, the explanation of this is linked to the fact that large IPOs have a greater supply of shares, which of course leads to lower underpricing according to the economic law of supply and demand. Additionally, the under-establishment IPOs without operating histories exhibit greater underpricing than the established IPOs. These variables are significant at the 1% level as shown by the univariate and several multivariate cross-sectional models.

We next focus on the impact of the subscription period. We find that both the level of subscription (oversubscription) and the distribution of shares (allocation) are significantly linked with underpricing. IPOs that received more capital during the subscription (larger demand) show greater underpricing. This is consistent with Derrien (2005) findings that IPOs that exhibit large demand

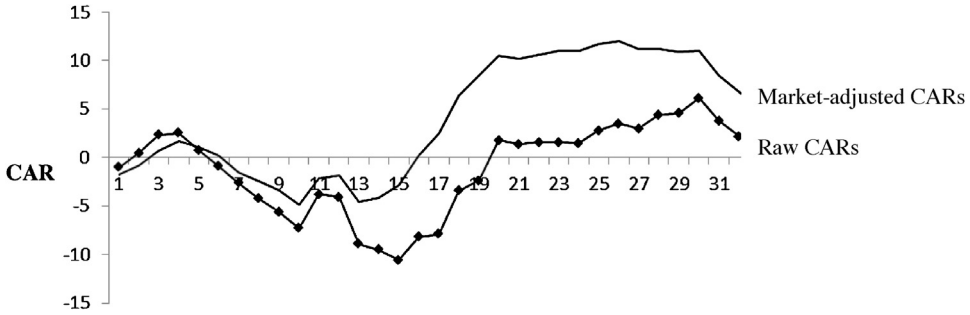

Fig. 1. Cumulative average returns for an equally weighted portfolio of 134 IPOs made in the GCC between 2003 and 2010, with monthly rebalancing.

show greater degree of underpricing. Additionally, IPOs that distributed more shares to investors (large supply) show lower underpricing. Actually, both variables reflect the degree of rationing of IPO shares.

Oversubscription reflects the degree of demand, while the allocation reflects the degree of supply. Thus, high demand leads to a high price, while high supply leads to a lower price. This is a unique feature of markets in which the allocation of shares is determined in a pro-rata even-handed policy. This is different from the discretionary policies applied in some industrial economies such as the U.S. where underwriters can allocate shares in a discriminatory way to favor their clients. Such methods of allocation are not available in most countries (Ljungqvist and Wilhelm, 2002; Ritter and Welch, 2002).

Most importantly, we investigate the impact of the investors' behavior on underpricing. The results show that both speculators and flippers are key players in underpricing. This result is in line with Costa et al. (2013a,b) that culture impacts IPO underpricing.

As expected, the sign of the relationship is negative. In fact, the model represents a cross-sectional analysis in which IPOs that experienced more flipping and speculation activities should provide lower underpricing. Therefore, we are more interested in the observed association, regardless of the sign. As hypothesized, both flippers (sellers on the listing day) and speculators (the buyers on the listing day) exert significant impacts on underpricing.

Finally, the market conditions variable suggests that IPOs that went public during the hot years have greater underpricing than other IPOs. One noteworthy observation is the explanatory power of the framework. For example, model 4 exhibits a 55% explanatory power with all variables being significant and providing the expected signs. Therefore, the overall conclusion is in line with Ritter and Welch (2002) that explaining underpricing is not a question of which theory is right or wrong, but rather the relative importance of several theories.

We believe that underpricing in the GCC is a governmental strategic choice used to achieve several goals at the same time. One goal is to distribute wealth among the citizens and another is to increase the efficiency of capital markets by increasing the number of listed companies.

4.3. Aftermarket performance

Fig. 1 plots two series of the cumulative raw and cumulative market index adjusted returns (CARs) for a portfolio of 134 GCC IPOs, excluding the initial returns. Following the average underpricing of 234.27%, the average monthly raw returns vary between −4.5% and 8.5%. The cumulative average raw return peaks at 6.12% in month 31. This increase can be associated with the hot issue market that took place in the GCC region between 2005 and 2007.

When these monthly raw returns adjusted to the appropriate GCC country index, the monthly averages vary between −2.69% and 3.7%. The adjusted CARs peak at 12.1% in month 27. This result reflects the fact that GCC IPOs outperformed their benchmarks using the CARs measure. The figure also shows that GCC IPOs outperformed the GCC indices across all three years' post-listing. The figure clearly shows the high level of volatility, different from the patterns observed in other countries such

Table 4
Holding period returns for 120 IPOs with the corresponding wealth relatives classified by country of issuance.

BH (%)	1-Year BH	2-Year BH	3-Year BH	1-Year WR	2-Year WR	3-Year WR
Saudi	−8.92	−24.17	−28.15	0.92	0.97	0.79
Kuwait	−13.86	−28.15	−25.35	0.83	0.76	0.77
Qatar	−25.36	−18.52	−45.29	0.79	0.71	0.59
Bahrain	−19.14	−1.64	−42.39	0.77	0.88	0.81
Emirates	5.71	−7.15	−22.15	1.11	1.35	1.08
Oman	10.34	14.55	77.73	1.02	1.07	1.04
GCC	−7.04	−16.36	−21.09	0.94	0.98	0.85

Notes: BH indicates buy-and-hold returns, which is the return from buying the IPO at the second-day closing price and holding it over one, two or three years, computed as in Eq. (13). WR represents the corresponding wealth relatives, calculated by dividing the average holding period returns on IPOs by the holding period returns on the matching market index as in Eq. (14). Therefore, Saudi IPOs are matched with the Saudi market index, Emirati IPOs matched with the Emirati market index and so on. GCC results are reported by pooling all the IPOs from the six countries together. A total of 120 IPOs were traded over the one-year window, 108 IPOs over the two-year window and 76 IPOs over the three-year window. This number decreased over time primarily because of the IPOs that went public close to the cut-off of this study as of the end of 2010.

as in the U.S. and Australia. We believe that this variation results from the volatility in the global financial markets during the GFC.

4.4. Aftermarket performance categorized by the country of issuance

Table 4 reports the aftermarket performance of the GCC IPOs categorized by the country of issuance. Looking first at each country individually, it is clear that IPOs in Saudi Arabia, Kuwait, Qatar and Bahrain perform poorly. Moreover, there is a tendency for this poor performance to intensify in magnitude from the first to the third year. IPOs in Oman achieved positive returns of 77.73% by the third year. Emirati IPOs offered positive returns in the first year at 5.71% and then began to decline to approximately −22% by the third year of issuance. These are the raw returns from buying the IPO at the closing price on the second day of listing and holding them over one, two and three years.

The wealth relatives point to substantial differences in the long-run performance of individual countries. Again, Omani and Emirati IPOs perform better than their market benchmarks over all three years. This is consistent with the findings from other countries; IPOs in some countries such as Korea and Malaysia perform better than the benchmark, while others underperform such as those of most industrial economies. This is also in line with my argument that GCC markets generally differ from other markets in their institutional arrangements, possibly explaining the variation in performance among GCC countries.

In the last row, we report the raw returns and wealth relatives for all IPOs in the GCC region. The average returns over the three timeframes were −7.04%, −16.36% and −21.09% and the corresponding wealth relatives were 0.94, 0.98 and 0.85. Pooling all IPOs together to measure aftermarket performance clearly yields biased results because negative IPOs affect positive IPOs and vice versa.

Table 5
Distribution statistics of holding period returns for all GCC IPOs.

Buy-and-hold returns (%)	1-Year BH	2-Year BH	3-Year BH
Average	−7.04	−16.36	−21.09
25th percentile	−48.69	−55.78	−63.98
Median	−26.61	−29.89	−38.86
75th percentile	14.89	1.53	−3.92
Maximum	257.41	341.81	289.67
Minimum	−77.96	−86.87	−84.05

Notes: This table provides distributional statistics for the aftermarket performance of GCC IPOs. Buy-and-hold raw returns (BH) over one-, two- and three-years are used and reported independently. Buy-and-hold returns are calculated as in Eq. (13) and represents the return from buying the IPO at the second-day closing price and holding it over each of the three time windows.

Table 6
Aftermarket performance categorized by industry for GCC IPOs, excluding initial returns, with associated wealth relatives.

Industry	IPO	1-Year BH	2-Year BH	3-Year BH	WR1	WR2	WR3
Banking	11	15.16	10.49	−13.74	1.08	1.14	1.15
Insurance	31	−15.62	−23.39	−39.03	0.82	0.94	0.60
Telecommunication	6	12.99	6.91	89.92	0.91	0.74	0.80
Petrochemical	8	28.53	−9.11	42.44	1.28	1.21	1.61
Real estate development	11	−7.69	−20.82	−10.62	0.96	1.03	1.19
Agricultural and food	5	−6.91	−24.92	−47.84	0.84	0.68	0.51
Retailers	10	−4.26	−7.78	24.29	1.08	0.99	0.85
Industrial investment	9	−28.66	−34.42	−37.85	0.84	0.92	0.79
Media and publication	2	−38.81	−54.56	−64.14	0.64	0.54	0.51
Building and construction	10	−9.09	16.54	−21.64	0.91	1.37	0.90
Transportation	6	−9.47	−41.58	−25.99	0.92	0.96	1.03
Multi-investment	3	−46.43	−45.03	−61.94	0.57	0.58	0.47
Energy	5	−30.36	−37.88	−24.09	0.94	0.78	0.57
Financial services	2	93.70	50.14	10.33	1.54	1.51	2.20

Notes: Raw buy-and-hold returns (BH) over one-, two- and three-years calculated on the basis of buying the IPO at the second day closing price and holding the shares over one-, two- and three-years as in Eq. (13). Wealth relatives (WRs) are calculated by dividing the average returns of IPOs by the returns on the market general index for the corresponding period as in Eq. (14). Saudi industrial classifications were used because they provide the broadest classifications by firm business nature. For other GCC IPOs, we reviewed each firm type and placed it in the appropriate industry according to the Saudi classification system.

Table 5 shows distributional statistics over the one-, two- and three-year windows for aftermarket performance of all IPOs in the GCC, commencing from the second day of listing. The mean and median for all three sets of results are negative and again there is a tendency for the decline to increase in magnitude over time. By the third year anniversary, GCC IPOs have a mean return of −21.09% and a median return of −63.98%. This is consistent with observations from other markets. Approximately 25% of the sample, however, shows positive returns over the first and second year of trading.

The maximum return of 257.41% belongs to the Malath insurance company of Saudi Arabia, which went public in 2007. The second year maximum return was from the Emirati construction company Arkaan, which went public in 2007. The privatized Saudi telecommunication company had the largest return during the third year with 289.67%. The maximum and minimum returns over three years of trading show extreme values, though less extreme than the values typically seen in developed markets. For example, Lee et al. (1996) report a maximum of over 1035% and a minimum of −100%. Levis (1993) reports a 1780.03% three-year holding period return for the Body Shop, a British company, and a minimum of −94.48%.

4.5. Aftermarket performance categorized by industry

Table 6 reports the aftermarket performance results for the GCC IPOs categorized by industry. The Saudi Arabian industry classifications are used here because they offer the broadest classification among GCC countries. We reviewed each IPO in the other GCC countries to determine its business nature and then placed it in the appropriate Saudi industrial category. The buy-and-hold returns are reported over the one-, two- and three-year periods individually as well as in terms of the corresponding wealth relative to the market benchmarks.

Petro-chemical, financial services, and banking industries perform the best compared to other industries and relative to the GCC markets as a whole. Purchasing petro-chemical IPOs at the closing price on the second day and holding them over three years produced a return of 42.44% and outperformed the market by over 60%.

In contrast, the energy, agricultural and food, multi-investment, and publications and media industries are among the worst performers. For example, agricultural and food IPOs provided a return of −6.91%, −24.29% and −47.84% over one, two and three years, respectively. The decline in return increases in magnitude over time. By the end of the third year anniversary, the agricultural and food industry underperformed the general market index by almost 50%, as indicated by the wealth relative. The results vary substantially between industries, consistent with Ritter's (1991) study of the U.S. IPOs.

Table 7
Comparisons of first-day and aftermarket underpricing.

Return (%)	Second-day	First-week	First-month	Six-months	One-year
Panel A: return from offer price					
Average	265.77	275.33	260.09	242.48	196.88
25th percentile	38.23	40.52	37.06	49.34	38.94
Median	125	119.28	124.18	132.67	90.17
75th percentile	310.55	322.2	362.44	304.11	185.62
Max	1699.92	1646.96	1475.94	1348.25	1898.21
Min	−1.67	−3.21	−14.75	1.36	−84.06
Panel B: return from closing price					
Average	−0.08	0.02	0.43	−2.84	−6.71
25th percentile	−5.38	−8.91	−14.58	−32.64	−46.36
Median	−1.66	−3.59	−5.51	−7.84	−16.33
75th percentile	5.31	5.26	6.1	21.37	20.41
Max	20.15	43.81	276.67	177.93	198.21
Min	−20.81	−25.68	−39.97	−70.62	−86.22

Notes: The sample is 76 IPOs made between 2003 and 2010. This table compares the IPO return on the listing day with the returns on the second-day, one-week, one-month, six-months and one-year after the IPO. All returns are calculated as in Eqs. (15) and (16) adjusted according to the market index movement over the corresponding periods.

4.6. Aftermarket performance explanation

Table 7 compares the IPO aftermarket performance relative to the offer price with the aftermarket performance relative to the listing day closing price. Focusing first on Panel A, IPOs provide shareholders with the same returns up to six months post-listing. After one year post-listing the underpricing is still high with an average of 197%.

All statistical distributions follow the same pattern except for the maximum and minimum, which show extreme underpricing or overpricing for both directions. These findings have several important implications. First, the restrictions on the fluctuation of IPO price from the second-day onwards act like price protectors. Speculators participate in the listing day because they are guaranteed not to lose more than 10% in the worst-case scenario, with a unique opportunity for unlimited potential profit.

Panel B reports the aftermarket performance relative to the listing day closing price. This represents the returns for a buyer who purchases shares at the listing day closing price and holds them over any of the periods specified in the table. The results indicate that a buyer who purchases shares on the listing day and sells them on the second day does not lose much, less than 1% or −1.66% as indicated by the mean and median. This supports my argument that limiting the fluctuation by 10% up or down acts as price protection. Over one-week, the outcome is also a tiny loss or profit of −3.6% or 0.02%. However, approximately 25% of the sampled IPOs provide first day buyers with a gain of more than 5%.

Purchasers of IPOs on the listing day who sell after one-year lose 6.7% on average, although the median loss is more extreme at 16.33%. There are still 25% of the IPOs in this sample that provide investors with a gain of more than 20% over the listing-day closing price. This suggests that while most IPOs tend to perform poorly over long horizons, there are some IPOs that are good for long-term investment. These results make it clear that the selection of an IPO for long-term investment and speculation is an important issue.

Table 8 reports the cross-sectional OLS regression estimates for the aftermarket performance relative to the closing price.[9] Consistent with the initial over-optimism, the aftermarket performance is negatively associated with initial returns. IPOs with high underpricing have the worst performance over long periods. Ritter (1991) finds that small speculative IPOs are the worst performers in the

[9] We run cross-sectional regressions by taking the aftermarket performance relative to the offer price as the dependent variable, and including the same independent variables. The results indicate that factors that explain the underpricing on the listing day also explain the underpricing over the long-run. These results are not reported for the sake of space and are available from the author on request.

Table 8
Pooled OLS models of aftermarket performance explanation.

Dependent variable	Second-day return			First-month return			First-year return	
	Univariate	Model 1	Model 2	Univariate	Model 1	Model 2	Univariate	Model 1
Intercept		41.2**	40.5*		14.7*	166**		89
Adjusted underpricing	0	−0.01	−0.003	−0.01	−0.09**	−0.03***	−0.1**	−0.05*
Size (authorized capital)	−0.21	−4.3*		0.95		−18.7**	17	−11.6
Size (offered shares)	−0.11		−5.3	1.2			22.3**	
Type	2.6	3.9*		2.9	12.4*		−6.7	
Oversubscription (%)	−0.15	−0.2		−0.8			−2.9	
Allocation	0		−0.01	0.12		0.18	0.5	
Speculation	5.9	18.2*	28.1**	21.5	7.4	58*	112**	103.5
Flipping	−0.55**	−0.8***	−0.79***	−1.4*	−2.6***	−2.2**	3.4	
Hot	0.93	0.1	−0.13	7.3		9.8*	−6.3	
f-Stat		2.42**	2.1*		3.4**	3.1**		2.7*
Adjusted R^2		0.14	0.10		0.14	0.17		0.09

Notes: The sample comprises 61 IPOs offered in the GCC between 2003 and 2010. This table presents the aftermarket performance determinants. The dependent variables are (1) the second-day adjusted returns, (2) the 1st-month adjusted returns and (3) the one-year adjusted returns. The independent variables are the size as measured by the natural logarithm of either the IPO authorized capital or the number of offered shares; type is a dummy variable that takes 1 for under-establishment IPOs or 0 otherwise; oversubscription (%) is the total capital offered by subscribers divided by the IPO gross proceeds; allocation is the number of shares distributed to individual subscribers; speculation is the difference between the IPO volume relative to the market volume on the listing day and the IPO monthly average volume relative to the monthly average market volume, excluding the first day; flipping is the ratio of IPO volume on the listing day relative to the monthly IPO average volume, excluding the listing day and hot is a dummy variable that takes 1 for the hot years between 2005 and 2007 or 0 otherwise.

* Significantly different from zero at 1% level.
** Significantly different from zero at 5% level.
*** Significantly different from zero at 10% level.

long-run. In a recent study by Gao et al. (2013a,b), this poor performance can be attributed to the level of ex-ante uncertainty. However, this could also be interpreted from the supply and demand point of view, given that small IPOs have fewer shares outstanding. Therefore, these IPOs are more subject to speculator control than are large IPOs. Derrien (2005) reports that IPOs with large demand provide positive initial returns and poor long-run performance.

We next focus on the impact of investor behavior on the aftermarket performance. Speculative investors' behavior that negatively affects the underpricing in the listing day has a positive sign here. This suggests that IPOs with heavier speculation on the listing day tend to perform better over the long-run. This is not surprising, considering the premium that speculators will demand on these shares, which would result in upward price pressure. Additionally, flippers continue to have a significant negative impact beyond the listing day, up to the first month post-listing. This indicates that IPOs that were aggressively flipped perform worse over time. Flipping (selling) puts downward pressure on share price. However, this relationship gets weaker over time because IPOs reach a point where they become similar to any other listed company and the impact of the flippers disappears.

All other variables of oversubscription, allocation and market conditions show no link with aftermarket performance. This actually suggests that the bad luck theory of Ritter (1991) can explain the aftermarket performance in the GCC. There are a few identical IPOs that went public during the same time period, performed differently for unknown reasons. Future research on long-run IPO performance could address this and other issues by conducting a case study analysis, instead of focusing on enlarging the sample.

5. Summary and conclusions

This paper investigates the short- and long-run performance of 139 IPOs offered in the GCC between 2003 and 2010. Differing from other markets, the underpricing in the GCC is one of the largest in the world at 227.36%. Theories based on asymmetric (symmetric) information do not explain this severe underpricing. The evidence shows that underpricing in this marketplace is mainly caused by the unique

institutional arrangements that promote strong demand during the subscription period and heavy speculation during the listing day. We show how underpricing can be explained by four major factors: firm characteristics, subscription period rationing and demand, investors' behavior during the listing day and the market conditions. These factors have an important implication: the widely held belief that issuers deliberately leave money on the table is dubious.

Next, we examine the aftermarket performance of these IPOs. We find that GCC IPOs perform poorly relative to the listing day closing price, over the course of one, two and three years of post-listing. We classify these IPOs by the country of issuance and industry, documenting different results across each category. While the IPOs underperformed their corresponding GCC indices in all countries, the Emirati and Omani IPOs outperformed their markets. This result is consistent with international evidence; some IPOs, such as Korean IPOs, outperform the market, while others, such as U.S. IPOs, underperform. Additionally, IPOs listed in the banking, financial services, real estate development and petrochemical industries are among the best performers because large IPOs are mainly concentrated in these industries.

We also investigate the aftermarket performance relative to the offering price and document several important findings. First, while most IPOs tend to perform poorly relative to the listing day closing price, the performance relative to the offering price is completely different. IPOs are underpriced in the long run as much as they are underpriced on the listing day. Investors who choose to hold on to their allocation for longer periods of up to one year earn the same as those who sell immediately on the listing day. The restrictions on the price movement from the second day onward in the GCC act similar to price stabilization or protection. Second, in regard to the long-run performance relative to the listing day closing price, we find that approximately 25% of IPOs have returns of more than 20%. Therefore, it seems that IPO selection is a key issue for long-term investors.

We attempt to shed light on the aftermarket performance by examining the impact of underpricing determinants on the long-run performance. We find that the level of underpricing is the most powerful explanatory variable. The greater the underpricing of an IPO, the worse the long period performance tends to be. Moreover, we examine two new variables of flipping and speculation. We find that IPOs that are heavily flipped tend to provide lower underpricing and to perform worse over the long run. The speculation variable however, is negatively associated with the underpricing and positively associated with the aftermarket performance. Therefore, IPOs that are more heavily speculated provide less underpricing, but they perform better over the long run, though the evidence becomes weaker over time. We believe this is the premium speculators require after day one, which pushes the price further upward. The evidence suggests that some underpricing determinants could explain part of the aftermarket performance. However, it remains a puzzle as to why two IPOs that are exactly identical and go public at approximately the same time perform differently.

We suggest future studies to match IPOs that outperform the benchmark with those that underperform. New market trading related issues on underpricing might be developed and then used to investigate long-run performance. It seems that case study analyses are necessary to be introduced in the IPO literature.

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