Equities issues and long-term firm’s performances in Tunisian stock market

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Abstract: This paper investigates the long-run performance of seasoned equity offering (SEO) firms in Tunisia. We use event time and calendar time approach to measure the long-run performance of SEO firms. The results suggest that SEO firms underperform in the long-run, and this underperformance is robust according to alternative measures. In the cross-section, we show that the runup, market runup and the proceeds from SEO are significant determinants of the underperformance of SEO firms. These results are in accordance with both behavioural theories and real options theory. To distinguish between these two theories, we analyse the average systematic risk dynamics around SEO. The results suggest that there is an increase in risk before the offering, and a significant decrease of risk after the offering. The behaviour of risk around SEO appears consistent with real options predictions.

Keywords: SEO; seasoned equity offering; real options; long-run performance; timing.


Biographical notes: Hatem Mansali is an Associate Professor in Finance and Accounting at the University of Carthage Tunisia. He has published many papers in international peer-reviewed journals.
1 Introduction

The long-run underperformance of seasoned equity offering (SEO) firms is well documented in the literature. Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995), in the US context, document an underperformance of about 5% per year in the five years subsequent to issuance. This SEO underperformance has been confirmed in several studies, including Cai and Loughran (1998) and Kang et al. (1999) in the Japan context, and by Levis (1995) for the UK firms. In France, Jeanneret (2005) provides evidence of underperformance for ‘Financing New Investment’ issuers in the long-run, while ‘Capital Structure’ issuers do not underperform. In the Spanish market, Farinós (2001) finds evidence that stock market performance following SEOs of small and medium firms is poor in the year after the issue, but large SEO firms do not underperform in the long-run. In the same context, Farinós et al. (2007) investigate the long-run performance of SEO firms; they find evidence supporting the contention that small SEO firms are overpriced at the time of the issue and attribute the post-underperformance to the arbitrage costs.

The most popular explanation for the underperformance of SEO firms in the long-run is the ‘windows of opportunity hypothesis’ advanced by Loughran and Ritter (1995). According to these authors, managers “take advantage of transitory windows of opportunity by issuing equity when, on average, they are substantially overvalued” (Loughran and Ritter, 1995).

The predictable returns of SEO firms are in contradiction with the efficient market hypothesis (EMH). However, recent studies including Brav et al. (2000), Eckbo et al. (2000) and Mitchell and Stafford (2000), present a new evidence: the SEO firms do not underperform in the long-run. Fama (1998) suggests that evidence of long-run underperformance of SEO firms is merely a reincarnation of bad-model problems. These problems are of two types: first is that any asset pricing model does not completely describe the systematic patterns of average returns and second is that underperformance of seasoned equity offering (SEO) firms is due to chance, even if we use a true model. Fama (1998) suggests also that long-run returns are sensitive to the way the tests are done.

A recent study by Carlson et al. (2006) provides another explanation for the new issue puzzle. Carlson et al. (2006) develop a rational theory of observed stylised facts around seasoned equity offerings. In fact, in the survey of Ritter (2003), SEO firms typically present an average stock return of about 72% in the 12 months prior to SEO, an announcement effect of –2%, and underperformance of about 5% per year in the five years subsequent to issuance. The model proposed by Carlson et al. (2006) attribute the decrease in expected returns to a change in total firm (or asset) risk. For these authors, firms issue equity when they are in expansion. New equity shares are issued to exercise the firm’s growth options. The timing of real investment associated with the equity offering occurred after growth options move into the money and stock prices increase.
The long-run underperformance can be attributed to the exercising (or deleveraging) growth option which causes an immediate reduction in asset risk.

This study aimed to investigate long-horizon stock price performance of SEO firms in the Tunisia context. The Tunisian stock market is considered a ‘frontier’ market by rating agency Standard and Poor’s. The survey of Eckbo et al. (2007) concern essentially SEOs made in developed markets. To our knowledge, there is no study in the literature concerning the long-run performance of SEOs in a ‘frontier’ market. Examining an out-of-sample, e.g., a ‘frontier’ market, becomes interesting, not only to fill a gap, but also to highlight differences in institutional characteristics (i.e., high volatility, high level of information asymmetry, high level of risk and frequent speculations).

Our study contributes to the literature in four ways. First, this paper is the first, to our knowledge, to investigate the long-run stock performance of SEOs in the Tunisian equity market. Next, firms listed in a ‘frontier’ market are characterised by great information asymmetry, which increases the cost of equity. The windows of opportunity hypothesis state that opportunist managers exploit information asymmetry: they decide to issue equity when their stock is overvalued. Our third contribution is to analyse the cross-section of SEO performance, introducing a number of ex ante variables. Finally, we test the behaviour of systematic risk around SEO in event time.

2 Theoretical background

There are two main theories that explain the long-run underperformance of SEO firms: behavioural theories and a rational theory (real options theory).

2.1 Behavioural theories

Behavioural theories that can explain the long-run underperformance of SEO firms include Daniel et al. (1998) [Hereafter DHS] theory which rely on investors’ overconfidence and on changes in confidence resulting from biased self-attribution of investment outcomes, windows of opportunity and market timing theories developed by Loughran and Ritter (1995) and Baker and Wurgler (2000). All these theories suppose that investors are not completely rational and subject to cognitive biases.

In the Tunisian context, Aliani et al. (2016) find robust evidence of a positive relationship between CEO overconfidence and the propensities to minimise corporate taxes.

Based on evidences established in research in psychology, DHS develop a theory of mispricing. In fact, it is well documented in research in psychology, that individuals tend to be overconfident about their own abilities, and that individuals seem to be overweighting evidence that confirm their prior beliefs, and seem to be underweighting contradictory evidence. This is known as self-attribution biases. The model of DHS supposes that investors overreact to private information signals and underreact to public signals. If investors receive a public signal that confirms their private signal, then, due to biased self-attribution, overconfidence will increase. As a consequence, the model can explain both short-term momentum and long-term reversal in stock returns.
DHS theory helps to unify a number of stylised facts around the SEO episode. In their model, the manager, which is more informed about prospects of the firm, will take advantage of overvalued shares by deciding to issue new shares. In the same vein of adverse selection model of Myers and Majluf (1984), DHS assumes that investors care about the decisions made by managers. We can resume the SEO episode as characterised by DHS theory as follows: investors receive a positive private signal before the SEO, overconfidence in this private signal causes the security price to overreact to this new information. The private signal is confirmed by a public signal that causes overreaction and stock price will deviate from rational expected value. Managers will decide then to issue shares, this public signal information is contradictory to private signal, and investors underreact to it due to biased self-attribution. They partially correct the stock price but remain overvalued. The flow of public information is sufficient to convince investors on the fair value of the stock, which tends to drive prices down. Then we observe underperformance of SEO firms in the long-run. Regarding the behavioural theories, we can postulate the following hypothesis:

\[ H_1: \text{SEO firms underperform in the long-run.} \]

While behavioural theories explain return dynamics: the runup before SEO, the announcement effect of SEO, and post-issue underperformance, they don’t give predictions about the dynamic risk around SEO.

2.2 Rational theory: real options theory

As mentioned by Carlson et al. (2005, 2006), the investments in risky projects will increase asset risk. However, this assumption is difficult to fit with observation that the post-issue long-run stock returns are low compared to the stock returns of similar non-issuing firms. Carlson et al. (2006) argue that this observation is conceivable when projects are viewed as options on the cash flow potentially generated by the project.

Many investments in real assets present opportunities, such as abandonment, expansion, and deferment, may alter the investment’s future cash flows and thus its value. These options generally involve project execution flexibility in time: a project becomes a real option.

The timing of the project by managers can maximise the value of the firm. An option to grow the firm through execution of the project is a levered claim. The required return on the levered claim is higher than the required return on an unlevered claim on the same assets. By exercising the real option, i.e., making the investment necessary to start the projects, managers unlever the claim. Thus, when firms grow they convert real options into assets in place. When the underlying cash flows are riskier, the reduction in exposure from delivering is larger. Real options theory also explains the substantial pre-issuance price runup. In fact, growth options are only exercised when they move sufficiently into the money. According to Carlson et al. (2006), the apparent long-run underperformance of SEO firms occurs because exercising (or deleveraging) a growth option causes an immediate reduction in asset risk. We can formulate the following hypothesis:

\[ H_2: \text{The systematic risk of SEO firms decrease after the offering.} \]
3 Seasoned equity offerings on the Tunisian market

3.1 The Tunisian institutional setting

The seasoned equity offerings in Tunisia have to be approved by the Extraordinary General Shareholder Meeting. The shareholders have the right to purchase the newly issued shares. The Extraordinary General Shareholder Meeting can delegate to the board of directors the necessary authority to make an offering in one or several steps, set the terms and conditions. The approval of the issue is given within a maximum delay of five years. In a delay of six months, investors have to pay 25% of the total proceeds.

Tunisian law grants shareholders a right to purchase new shares. While rights issues have become a rarity and general cash offers are the norm in the US, in the Tunisian context the rights issues are commonplace. When the Extraordinary General Shareholder Meeting votes an offering without rights, the Extraordinary General Shareholder Meeting approve necessarily the report of the board of directors and the report of auditor related to the SEO and to the removal of rights.

3.2 Sample selection

Our sample consists of 24 SEOs that were conducted in Tunisia between July 2005 and December 2012. The data come from the registered offering statistics of the Conseil du Marché Financier (CMF). There are 18 different firms represented in this sample; 13 firms of these make only one equity issue during the sample period, four firms make two issues, and one firm makes three issues. Prices, Market to Book and Market Value of the firm are extracted from Thomson Financial database. We use this database because prices published on the Tunis Stock Exchange (BVMT4) site are not adjusted.

4 Abnormal performance measure

4.1 Event-time approach

To measure the long-run performance of issuing firms, we use the buy and hold abnormal returns (BHAR). The BHAR measure the average multiyear return from a strategy of investing in issuing firms and selling at the end of the holding period vs. a comparable strategy in the benchmark (Mitchell and Stafford, 2000). The advantage of the BHAR is that capture the investor’s experience from buying and holding stocks for three years. However, this measure tends to magnify the mean abnormal performance in holding period when there is abnormal return during any period of time series returns due to compounding (Mitchell and Stafford, 2000). Formally, the BHAR is calculated as follows:

$$\text{BHAR}_{i,\tau} = \prod_{t=1}^{\tau} (1+r_{i,t}) - \prod_{t=1}^{\tau}(1+E(r_{i,t})),$$

where BHAR$_{i,\tau}$ is the buy and hold abnormal return for the sample firm $i$ for horizon $\tau$ months, $r_{i,t}$ is return for sample SEO $i$ in month $t$, and $E(r_{i,t})$ is the return in month $t$ of the Tunindex.
To measure the long-run performance of issuers we use also the CAR. For each firm of the sample, we compute the CAR as follows:

\[ AR_{i,\tau} = r_{i,t} - E(r_{i,t}) \]

\[ \text{CAR}_{i,\tau} = \sum_{t=1}^{\tau} AR_{i,t} \]

where \( AR_{i,\tau} \) and \( \text{CAR}_{i,\tau} \) are respectively abnormal return and cumulative abnormal return for the sample firm \( i \) for horizon \( \tau \) months, \( r_{i,t} \) is return for sample SEO \( i \) in month \( t \), and \( E(r_{i,t}) \) is the return in month \( t \) of the Tunindex.

### 4.2 Calendar-time approach

#### 4.2.1 Fama and French (1993) model

To alleviate concerns that the techniques for BHARs and CARs produce the wrong benchmark for measuring the true systematic risk of issuing firms, tests of long-run performance using factor model regressions are also used. Another problem rises with BHARs and CARs technique is that overstates the statistical inferences as it does not control for correlation among offering firms. It is well known that cross-correlations of event returns pose a particular problem in studies of long-term returns (Fama, 1998). Fama (1998) recommend the use of the rolling calendar-month portfolio methodology to reduce the problem of cross-correlation of issuers returns.

The SEO long-run performance is measured in calendar-time using Fama and French (1993) three-factor rolling portfolio regressions. The following model is estimated:

\[ r_{pt} - r_{f,t} = \alpha_p + \beta_p (r_{m,t} - r_{f,t}) + s_p \text{SMB}_t + h_p \text{HML}_t + \epsilon_{p,t} \]

where \( r_{pt} \) is the SEO portfolio return in month \( t \), \( r_{f,t} \) is the 10-year Bons du Trésor Assimilables (BTA) observed at month \( t \), and \( r_{m,t} \) is the monthly return on the value-weighting portfolio of all firms listed on the Tunis Stock Exchange. The second factor SMB is the return on a zero investment portfolio formed by subtracting the return on a large firm portfolio from the return on a small firm portfolio. Similarly, the third factor HML is the return of another mimicking portfolio defined as the return on a portfolio of high book-to-market stocks (This portfolio represents the top 30% of all listed Tunisian firms on the Tunis Stock Exchange which have available data on Thomson Financial), less the return on a portfolio of low book-to-market stocks (This portfolio contains firms in lowest 30% of the Thomson Financial universe Tunisian firms).

We follow the procedure used in Fama and French (1993) to construct the mimicking portfolios for size and book-to-market equity (BM) factors. Size is the market value of equity on Thomson Financial which is the price multiplied by the number of ordinary shares, while the book-to-market ratios are defined as the balance sheet value of the common equity in the company divided by the market value of the common equity. In June of each year, all firms listed on the Tunis Stock Exchange, which have available data on the Thomson Financial database, were ranked by size. The median size value was then used to rank stocks into two groups, ‘small’ and ‘big’ (S and B). Independently, the stocks were also ranked into three book-to-market equity groups: the bottom 30% (low: L), middle 40% (medium: M), and to 30% (high: H) of the ranked values of BM.
We then compute the monthly value-weighted returns of six portfolios, (S/L, S/M, S/H, B/L, B/M, B/H) as the intersections of the size and book-to-market ratio groups. The monthly value-weighted returns on the six portfolios were calculated from July of year $t$ to June of year $t+1$.

The intercept is interpreted in the three-factor time series regressions as a measure of the abnormal performance adjusted for risk. This measure has a role analogous to Jensen’s alpha in the CAPM framework.

Fama and French (1993) model was also used in Tunisian context by Triki and Omri (2010).

4.2.2 Calendar time abnormal return

The first SEO in our sample occurred in July 2005 and the last in December 2012. The calendar-time period, therefore, starts in August 2005 (the month after the first issue) and ends in December 2014 when the 24-month post-issue horizon is considered. In August 2005, we form a portfolio of SEOs and rebalance it each following month in order to include recent SEOs that occurred during the previous month, and remove the SEOs that have been in the portfolio for the past 24, 36 or 60 months, depending on the horizon chosen.

For each calendar month, we calculate the abnormal ($AR_n$) for each security using the returns of the Tunindex:

$$AR_n = r_n - r_{mt}.$$  

In each calendar month $t$, we calculate a mean abnormal return across firms in the portfolio:

$$CTAR = \frac{1}{n_t} \sum_{i=1}^{n_t} AR_i.$$  

A grand mean monthly abnormal returns ($\overline{CTAR}$) is calculated over the $T$ months defining the calendar-time period:

$$\overline{CTAR} = \frac{1}{T} \sum_{t=1}^{T} CTAR_t.$$  

5 The long-run stock performance of SEO

5.1 Results of the event-time approach

In Table 1, we report buy-and-hold returns and wealth relatives for the 24 sample firms issuing stocks between 2005 and 2012 for windows of three and five years after the offerings. In the year prior to the offering, the average buy-and-hold return on issuing firms is 21.6%. In the five years after an SEO, the average buy-and-hold return on issuing firms is 8.4%, while the average buy-and-hold return on the Tunindex is 49.5%, with a wealth relative of 0.72. Firms conducting seasoned equity offerings in the Tunisian context underperform just as severely as firms in the US context. Loughran and Ritter (1995) report for the same horizon (5 years) a wealth relative of 0.69.
Table 1  The long-run performance of SEOs by cohort year, 2005–2012

<table>
<thead>
<tr>
<th>Cohort year</th>
<th>Number of SEOs</th>
<th>Prior return (%)</th>
<th>Mean buy-and-hold returns (%)</th>
<th>Wealth relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2</td>
<td>50.7</td>
<td>−76.7</td>
<td>97.0</td>
</tr>
<tr>
<td>2007</td>
<td>3</td>
<td>−7.6</td>
<td>17.0</td>
<td>63.8</td>
</tr>
<tr>
<td>2008</td>
<td>4</td>
<td>10.9</td>
<td>145.8</td>
<td>44.5</td>
</tr>
<tr>
<td>2009</td>
<td>6</td>
<td>44.5</td>
<td>41.4</td>
<td>30.7</td>
</tr>
<tr>
<td>2010</td>
<td>4</td>
<td>26.6</td>
<td>−9.5</td>
<td>−10.2</td>
</tr>
<tr>
<td>2012</td>
<td>5</td>
<td>5.6</td>
<td>−11.6</td>
<td>13.2</td>
</tr>
<tr>
<td>2005–2012</td>
<td>24</td>
<td>21.6</td>
<td>26.4</td>
<td>34.66</td>
</tr>
</tbody>
</table>

The sample consists of 24 seasoned equity offers (SEOs). The percentage buy-and-hold return for firm $i$ is

$$BHR_{it} = \prod_{t=1}^{\tau} \left( 1 + r_{it} \right) - 1 \times 100\%,$$

where $\tau$ is the holding period considered (3 or 5 years), and $r_{it}$ is return for firm $i$ on date $t$, and the summations are over the $n$ observations in a cohort year.

The average buy-and-hold returns are computed as

$$\overline{BHR}_{\tau} = \frac{1}{n} \sum_{i=1}^{n} BHR_{it},$$

where $\overline{BHR}_{\tau}$ is average buy-and-hold returns for issuing firms and $BHR_{me}$ is average buy-and-hold returns for Tunindex.

The results in the Table 1 imply that 10.00 TND invested in Tunindex at the first postissue closing price will grow to 14.95 TND five years later, whereas an investment of 13.79 TND in issuers would be required to grow to this same 14.95 TND, since the average total return for these issuers is only 8.4% ([1 + 0.084] × 13.79 TND = 14.95 TND). Thus, the required investment in SEOs at the first postissue closing market price is 37.9% higher than the required for Tunindex to achieve the same terminal wealth level.

In Table 2, we present CAR and BHAR of Tunisian SEO. The equally-weighted abnormal returns are negative and significant over the 24-month, 36-month and 60-month horizons (~16.24%, ~35.53% and ~52.48% for the CAR and ~18.47%, ~40.26 and ~57.27% for the BHAR). The medians are also significantly negative, ~9.56%, ~22.93% and ~37.18% for the CAR and ~12.66%, ~27.01% and ~43.74% for the BHAR. Hence, the results of Tunisian SEO are similar from what is observed in US, UK and Japan.
Table 2: Long-run performance of SEO

<table>
<thead>
<tr>
<th></th>
<th>Cumulative abnormal ReturnsCAR (%)</th>
<th>Buy-and-hold abnormal ReturnsBHAR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24-month</td>
<td>36-month</td>
</tr>
<tr>
<td>Mean</td>
<td>–16.24(^c)</td>
<td>–35.53(^b)</td>
</tr>
<tr>
<td>t-stat</td>
<td>–1.87</td>
<td>–2.39</td>
</tr>
<tr>
<td>Median</td>
<td>–9.56(^c)</td>
<td>–22.93(^b)</td>
</tr>
<tr>
<td>Z(_W)</td>
<td>–1.77</td>
<td>–2.04</td>
</tr>
</tbody>
</table>

Cumulative abnormal returns (CAR) are computed as

\[
\text{CAR}_\tau = \sum_{t=1}^{\tau} \left[ \frac{1}{n} \sum_{i=1}^{n} (r_{it} - r_{mt}) \right].
\]

where \( \tau \) is for 24, 36 and 60 months, \( r_{it} \) is the return on SEO firm \( i \) at month \( t \), \( r_{mt} \) is the return of the Tunindex and \( n \) is the number of firms in the sample. The \( t \)-stat for the CAR is computed as:

\[
\text{CAR}_\tau \sqrt{n} / \left[ \sqrt{\tau \text{ var} + 2 \cdot (\tau - 1) \text{ cov}} \right]^{1/2}.
\]

The average buy-and-hold returns (BHAR) is calculated as

\[
\text{BHAR}_\tau = \frac{1}{n} \sum_{t=1}^{\tau} \prod_{i=1}^{n} \left( 1 + r_{it} \right)^{-1} \cdot \prod_{i=1}^{n} (1 + r_{mt}) \]

\( Z\(_W\)\): the Wilcoxon signed rank test for a median.

\(^a\)significant at 1%; \(^b\)significant at 5%; \(^c\)significant at 10%.

5.2 Results of the calendar-time approach

Contrary to the event-time approach, the calendar-time approach, which advocated by Fama (1998), is robust to the most serious statistical problems. This approach accounts for all cross-correlations of event-firm abnormal performance in the portfolio variance. Furthermore, the distribution of estimators is better approximated by the normal distribution, allowing for classical statistical inference.

Table 3 also shows that the underperformance of Tunisian SEOs, estimated by the alpha coefficient, is statistically significant regardless of the horizon considered. When we consider 24-month horizon, the average abnormal return for issuing firms is –0.4% per month, which compounds to about –21.37% for 5 years.

According to the calendar time abnormal return results presented in Table 4, Tunisian firms which issued equities during 2005–2012 period have generated a negative abnormal returns in the long-run. Overall, regardless of the horizon, the underperformance estimated by CTAR is similar to the results obtained via the event-time approach. The CTAR, which are obtained by averaging monthly calendar-time abnormal performance over 24 months (respectively 36 and 60 months) defining the calendar-time period, is –1.45% (respectively –1.47% and –1.43%) per month, which compounds to about –58.37% (respectively –58.87% and –57.86%) in 5 years.
Equities issues and long-term firm’s performances

Table 3 Abnormal returns from three-factor model on seasoned equity offerings

<table>
<thead>
<tr>
<th></th>
<th>24-month</th>
<th>36-month</th>
<th>60-month</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \alpha_p )</td>
<td>-0.004(^b)</td>
<td>-0.005(^b)</td>
<td>-0.006(^b)</td>
</tr>
<tr>
<td>(–1.99)</td>
<td>(–2.01)</td>
<td>(–2.10)</td>
<td></td>
</tr>
<tr>
<td>( \beta_p )</td>
<td>0.648(^a)</td>
<td>0.659(^a)</td>
<td>0.668(^a)</td>
</tr>
<tr>
<td>(6.41)</td>
<td>(7.49)</td>
<td>(7.39)</td>
<td></td>
</tr>
<tr>
<td>( s_p )</td>
<td>0.310(^a)</td>
<td>0.269(^a)</td>
<td>0.256(^c)</td>
</tr>
<tr>
<td>(3.16)</td>
<td>(3.01)</td>
<td>(2.71)</td>
<td></td>
</tr>
<tr>
<td>( h_p )</td>
<td>0.121</td>
<td>0.171(^b)</td>
<td>0.152(^c)</td>
</tr>
<tr>
<td>(1.14)</td>
<td>(2.03)</td>
<td>(1.76)</td>
<td></td>
</tr>
<tr>
<td>Adj. ( R^2 )</td>
<td>0.65</td>
<td>0.63</td>
<td>0.62</td>
</tr>
<tr>
<td>( F )</td>
<td>14.30</td>
<td>19.00</td>
<td>18.52</td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The Fama and French (1993) model is specified as

\[ r_{ij} - r_{fij} = \alpha_p + \beta_p (r_{mij} - r_{fij}) + s_p SMB_i + h_p HML_i + \epsilon_{pi} , \]

where SMB is the difference between average return on the small-stock portfolios and the average return on the big-stock portfolio. HML is the difference between the average return on the high-BM portfolios and the average return on the low-BM portfolios. \( r_{mij} \) is the monthly return on the value-weighting portfolio of all firms listed on the Tunis Stock Exchange. \( r_{fij} \) is the 10-year Bon du Trésor assimilable (BTA). The dependent variable is the monthly return on a portfolio of SEOs that gone public during the prior 24 months (respectively 36 and 60 months). In parentheses are \( t \)-statistics based on White’s heteroskedastic-consistent standard errors.

\(^a\)significant at 1%; \(^b\)significant at 5% and \(^c\)significant at 10%.

6 Cross-sectional regression analysis

We have established that Tunisian SEOs underperform as a whole. We present now evidence on the cross-section of return dynamics. We regress the adjusted performance of Tunisian SEOs on a variety of variables that were known to investors at the time of the offering. We use three specifications, in the first one, we use CAR as a dependent variable, in the second specification, we use BHAR and finally, we use alphas which are obtained from regressions portfolio returns for each issuing firms on the three factors of Fama and French model.

We introduce the following independent variables in our analysis:

- **RUNUP**: Buy-and-hold return on issuing firms in the year prior to the offering. According to the behavioural theory, SEO firms have high past returns prior to issuing which reflects mispricing. In the real options theory, firms issue equity when they are in expansion. New equity shares are issued to exercise the firm’s growth options. We would expect a negative coefficient on this variable.

- **MKTRUN**: Buy-and-hold return of Tunindex in the year prior to the offering. This variable captures the market conditions prevailing at SEO date.
• **SEO_PROCEEDS**: SEO proceeds as a percent of capitalisation. If companies waste the proceeds of the sale of new shares in a manner not anticipated by investors, we would expect a negative coefficient on this variable.

• **MTB**: Market-to-book prior to the announcement. We introduce this as a control variable. Based on previous studies (Brav et al., 2000), we would expect the coefficient on market-to-book to be negative.

• **SIZE**: Logarithm of capitalisation prior to the announcement. We would expect the coefficient on size to be positive.

### Table 4  Calendar-time average abnormal return post-SEO

<table>
<thead>
<tr>
<th></th>
<th>24-month</th>
<th>36-month</th>
<th>60-month</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTAR (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–1.45a</td>
<td>–1.47a</td>
<td>–1.43a</td>
<td></td>
</tr>
<tr>
<td>(–3.35)</td>
<td>(–3.84)</td>
<td>(–3.89)</td>
<td></td>
</tr>
</tbody>
</table>

We calculate the abnormal (\( AR_t \)) for each security using the returns of the Tunindex:

\[
AR_t = r_t - r_{mt}.
\]

In each calendar month \( t \), we calculate a mean abnormal return across firms in the portfolio:

\[
CTAR = \frac{1}{n_t} \sum_{i=1}^{n_t} AR_{it}.
\]

A grand mean monthly abnormal returns (\( \overline{CTAR} \)) is calculated over the \( T \) months defining the calendar-time period:

\[
\overline{CTAR} = \frac{1}{T} \sum_{t=1}^{T} CTAR_t.
\]

\( CTAR \) are respectively reported on a 24, 36 and 60-month basis. In parentheses are \( t \)-statistics.

*significant at 1%; \( b \)significant at 5%; \( c \)significant at 10%.

Table 5 reports the results from multivariate regressions on the firm and offering characteristics for three different abnormal return measures: CAR, BHAR and intercept from the three-factor model. In all regressions, the coefficient estimates of the variable RUNUP are negative and significant at 5% confidence level, suggesting that higher runups prior to the SEO predict more underperformance, which is consistent with the predictions of either real options or behavioural theories. The regression coefficient estimate on market runup (MKTRUN) is negative and significant for the three specifications. Thus, underperformance is more severe when the market runup is higher. In the spirit of behavioural theory, this may reflect the market sentiment. After all, on average, the stock price of issuer rises to 21.6% in the year prior to issue (see Table 1). Managers might be timing the issue when the market is, on average, too optimistic. Generally, issuers tend to be firms that have recently outperformed their counterparts in
their industry, in a rising market (Ritter, 2003). In the spirit of the real options theory, this result can be interpreted by the fact that issuers invest when the cost of capital is low.

Table 5  Cross-section regression

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th>BHAR</th>
<th>$e^{\delta T}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>–1.412</td>
<td>–0.310</td>
<td>0.117</td>
</tr>
<tr>
<td></td>
<td>(–0.81)</td>
<td>(–0.16)</td>
<td>(0.44)</td>
</tr>
<tr>
<td>RUNUP</td>
<td>–0.404b</td>
<td>–0.505b</td>
<td>–0.056b</td>
</tr>
<tr>
<td></td>
<td>(–1.97)</td>
<td>(–2.20)</td>
<td>(–2.20)</td>
</tr>
<tr>
<td>MKTRUN</td>
<td>–0.377a</td>
<td>–0.815a</td>
<td>–0.029b</td>
</tr>
<tr>
<td></td>
<td>(–2.88)</td>
<td>(–5.60)</td>
<td>(–2.08)</td>
</tr>
<tr>
<td>SEO_PROCEEDS</td>
<td>–0.931a</td>
<td>–0.954a</td>
<td>–0.103b</td>
</tr>
<tr>
<td></td>
<td>(–2.91)</td>
<td>(–2.69)</td>
<td>(–2.15)</td>
</tr>
<tr>
<td>MTB</td>
<td>0.104</td>
<td>0.116</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(1.28)</td>
<td>(1.27)</td>
<td>(0.90)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.072</td>
<td>0.018</td>
<td>–0.006</td>
</tr>
<tr>
<td></td>
<td>(0.74)</td>
<td>(0.17)</td>
<td>(–0.43)</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.60</td>
<td>0.75</td>
<td>0.38</td>
</tr>
<tr>
<td>F</td>
<td>9.49</td>
<td>18.32</td>
<td>4.47</td>
</tr>
<tr>
<td>$P$-value</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

This table reports regression results for five-year sample abnormal performance. We use three specifications, in the first one, we use CAR as a dependent variable, in the second specification, we use BHAR and finally, we use alphas which are obtained from regressions portfolio returns for each issuing firms on the three factors of Fama and French model. The regressors are the one-year runup, the market runup, the SEO proceeds as a percent of market capitalisation, the prior market to book, the prior logarithm of market capitalisation. In parentheses are $t$-statistics based on White’s heteroskedastic-consistent standard errors.

*a significant at 1%; b significant at 5%; c significant at 10%.

Also, the coefficient estimate on SEO proceeds is negative and significant. This result suggests that the proceeds are not affected to finance positive Net Present Value (NPV) projects. Heaton (2002) provides evidence that managers of issuing firms have the tendency to overinvest. In general, managers of issuing firms seem to be very confident about the prospects of their firms (Lee, 1997).

7 Average beta dynamics

Denis and Kadlec (1994) investigate systematic risk surrounding equity offerings. They find no evidence of changes in systematic risk following equity offerings after correcting for biases caused by infrequent trading and price adjustment delays. According to the standard view, investment in risky projects after SEO should increase asset risk. Ritter (2003) argue "It is however entirely conceivable that lower leverage is more than offset by increased operating risk, if issuing companies embark on aggressive expansion plans
with the money raised in an SEO.” However, the model of Carlson et al. (2006), show that the riskier the expansion opportunity, the larger the decrease in risk upon optimally timed option exercise. This can be justified by the fact that a growth option is a levered claim, investment (or option exercise) unlevers the position, and when underlying cash flows are riskier, the reduction in exposure from delivering is larger.

To distinguish between behavioural or real options theories as a possible explanation of average risk dynamics around SEO, we estimate systematic risk in event time. We use daily data to estimate betas. To estimate systematic risk, we use the method of Dimson (1979) to account for potential illiquidity in SEO stocks. First, we estimate betas by regressing SEO returns on 5 leads and lags of market returns, in addition to the contemporaneous market return. Second, we sum the regression coefficients across all leads and lags. Hence, we obtain the Dimson (1979) ‘sum’ beta. We calculate annuals betas in event time, 3 annual periods before the issuance and 5 years after the issuance.

Figure 1 displays our average annual beta estimates, across all sample firms, for the eight-year period of event time centred on the SEO.

**Figure 1** Annual Dimson betas

This figure displays average annual beta estimates in event time. Figure 1 shows the plots for 5 leads and lags for beta estimates with Dimson (1979) method.

In this graph, we find that betas increase sharply in the year before the issuance and then decline after issuance until approximately five years. Thus risk changes considerably around SEO, which seems not to fit with the behavioural explanation of seasoned offerings. However, the general pattern of an increase in systematic risk before the issuance and a decline after the issuance perfectly fit with the predictions of the basic real options theory.

Table 6 reports cross-sectional descriptive statistics of beta estimates prior to and subsequent to the SEO. The equity offerings are associated with a significant decrease in betas. Beta estimates increase from a mean of 1.00 (median = 1.06) prior to the offering to a mean of 0.74 (median = 0.64) following the offering. These differences are all significant at the 0.05 level.
Table 6  Changes in systematic risk for the sample of equity offerings

<table>
<thead>
<tr>
<th>Preoffer period</th>
<th>Postoffer period</th>
<th>Change</th>
<th>t-Statistic</th>
<th>z-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta</td>
<td>1.00</td>
<td>0.74</td>
<td>–0.18</td>
<td>2.05</td>
</tr>
<tr>
<td></td>
<td>1.06</td>
<td>0.64</td>
<td>–0.31</td>
<td>2.56</td>
</tr>
</tbody>
</table>

Estimates of preoffer and postoffer systematic risk (beta) for the sample of 24 equity offerings over the period 2005 to 2012. Preoffer betas are estimated over the 250 trading-day period preceding the offers (year -1 in event time), while postoffer betas are estimated over the 250 days and 500 days following completion of the offering (year + 1 in event time). We use the method of Dimson (1979) to account for potential illiquidity in SEO stocks. First, we estimate betas by regressing SEO returns on 5 leads and lags of market returns, in addition to the contemporaneous market return. Second, we sum the regression coefficients across all leads and lags. Hence, we obtain the Dimson (1979) ‘sum’ beta. Means are listed with medians below. The significance of changes in betas is measured using standard t-test for means and the Wilcoxon signed ranks test for medians.

8 Conclusion

This paper examines the long-run performance of SEO firms on the Tunisian market between 2005 and 2012. Our results suggest a significant underperformance in the long-run of SEO firms in the Tunisian context. Using an event-time approach, we found CAR of –52.48% and BHAR of –57.27% over the 60-month horizon following the issue. To ascertain the robustness of event-time results, we compute the long-run abnormal performance using the calendar-time approach as well. The CTAR estimated with Tunindex as benchmark is close –1.43% per month, which compounds to about –57.86% in 5 years. When we use the model of Fama and French (1993), average abnormal return for issuing firms is 0.6% per month, which compounds to about 43.17% for 5 years.

The results from multivariate regressions on the firm and offering characteristics for three different abnormal return measures: CAR, BHAR and intercept from the three-factor model, show that the runup, market runup and the proceeds from SEO are significant determinants of the underperformance of SEO firms. These results are in accordance with both behavioural theories and real options theory. To distinguish between these two theories, we analyse the average systematic risk dynamics around SEO. The results suggest that there is an increase in risk before the offering, and a significant decrease in risk after the offering. The behaviour of risk around SEO appears consistent with real options predictions.

Furthermore, the finding of the long-run underperformance of SEO firms could be useful for investors. Is the fact to invest in firms issuing stock in the Tunisian stock market is hazardous to their wealth? The response to this question, regarding the real options theory, is negative. The observed long-run underperformance of SEO firms can be explained by behavioural theories, although this underperformance can be explained by a significant decrease of risk after the offering.

One potential extension of the research is to investigate the quality of governance of SEO firms and their impact on the long-run performance. It is possible, like Rossi et al. (2015) to create a Corporate Governance Quality Index (CGQI) in the Tunisian context and proceed to the analysis of the relationship between SEO firms performance and governance index.
References


Equities issues and long-term firm’s performances


Notes

1 See Rossi and Fattoruso (2017) for more details on the contrast between traditional economic theories that assume the absolute rationality of individuals (Fama, 1965) and behavioral finance, which considers the irrationality of the decision maker.

2 For more details on behavioral theories see Afi (2017).

3 The CMF plays the same role as the SEC in the US.

4 Bourse des Valeurs Mobilières de Tunis

5 The Tunindex is a value-weighted index adjusted for dividend and capital structure operations that contains 50 firms with the highest market value.

6 With –0.0145 per month, the 60-month compound return is \((1 – 0.0145)^{60} – 1 = –0.5837\) or 

\(-58.37\%\).\)