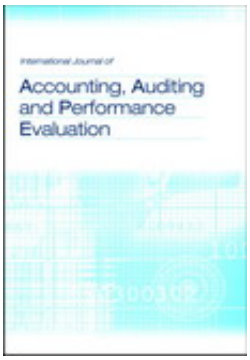

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Operating performance of initial public offerings: empirical evidence from Oman

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Abstract: This study tried to examine the operating performance of companies as they moved from private to public on Muscat Stock Exchange between 2007 and 2018. Three regression models were developed to measure the association between the three dependent variables (return on equity, return on sales and return on assets) of the operating performance of IPO companies and the ten independent variables. Regression model results revealed that there exists a significant impact of more than one identified independent variable on sample companies operating performance. The paired sample results revealed no significant difference in the operating performance of sample companies during the pre- and post-IPO periods. The findings of this study contribute a new insight for the literature in the Middle East region to understand the factors influencing the operating performance of companies as they move from private to public. The findings may be useful to policymakers, decision-makers, investors, and researchers.

Keywords: IPOs; initial public offerings; operating performance; ownership retention; MSX; Muscat Stock Exchange; Oman.

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1 Introduction

There has been a significant increase in the raising of capital through IPOs by firms across the globe in recent times (Whitecase.com, 2021). The increasing number of IPOs is predominantly due to the benefits such as raising capital from many investors on more competitive terms within a short time span; unlocking the hidden value of stocks through listing and to provide greater liquidity for shareholders (Zamri and Lim, 2005). Once a company moves from private to public, significant changes are made in the company's ownership retention structure and managerial control as sufficient capital is available for research and development, innovation, and acquisition of new technology (Alanazi and Liu, 2015). Efficient utilisation of these funds deployed through IPOs can enhance the growth of the company. Moreover, going public creates publicity and credibility for a company and its products. For a public company executing a merger and acquisition strategy will be more achievable and many new investment opportunities are available because of cash inflows from the issue of shares. As a result, IPO companies gain the confidence of investors as listed companies are required to comply with stock exchange regulations (Wang, 2005). Moreover, listed companies are in a better position to expand and diversify their operations locally and globally.

The capital market plays a vital role in the process of economic development by channelising savings toward investments in developmental projects. In Oman, the capital market and insurance sector are regulated and supervised by the Capital Market Authority (CMA). The CMA aims to upgrade the financial sectors and maximise domestic and foreign investors' confidence in the local market. The CMA's actions and measures have resulted in the development of sustainable financial markets contributing economic value to the Sultanate. Moreover, MSX allows trading in joint stock companies, government bonds, corporate bonds, investment funds as well as other local and international financial instruments approved by MSX thereby encouraging saving, spreading

investment awareness, and protecting investors creating a climate conducive for the mutual interest of investors and the national economy. Considering the growth and efficient services of CMA as well as MSX, the study sought to examine the factors that could be associated with a consequential change in the operating performance of IPO companies. Even though numerous studies on IPOs performance across the globe have been undertaken, yet only a few studies have been conducted in the Gulf region. Many prior studies focused on stock-based and accounting-based measurement for assessing the operating performance of listed companies post-IPO period, However, due to some degree of inefficiency and as the stock prices do not reflect all available information as stated by Lo and MacKinlay,1988, profit-based measurement is more reliable.

Al-Hassan et al. (2010) document the phenomenon of underpricing of initial public offerings (IPOs) for 47 Gulf firms that went public between 2001 and 2006, results revealed underpricing of 290%, as well as poor long-run return. AlShiab (2018) examined a comprehensive set of 162 Middle East and North Africa (MENA) Initial Public Offerings for the period 2001–2015. The results confirmed that IPO performances were mixed among MENA countries classified into three groups and overall, when compared to the short-term performance the IPOs went through cycles of price corrections around the fundamental value over the long term. Nevertheless, the studies did not examine the operating performance by applying accounting-based measures. Alanazi and Liu (2015) investigated the financial and operating performance of IPOs made in the Gulf Cooperation Council (GCC) region for the period 2003 to 2010.

In the context of the Oman stock market, there is no empirical literature on the performance of listed companies in the post-IPO period. Although the Oman stock market is small in terms of market capitalisation as well as volume, still there is a need to explore the key factors that could significantly influence the post-IPO operating performance of companies and to identify any significant change in operating performance during post-IPO periods.

This study is an attempt to fill the existing gap and contribute to the existing literature. The purpose of this study is twofold. First, to examine the factors that could be associated to a consequential change in IPO companies operating performance during the study period with the accounting-based measures. Second, to identify any significant change in companies operating performance in post -IPO periods by comparing the pre- and post-performance. The result of this research may be useful for current and potential investors for making informed decisions. The findings may benefit company owners and management to have the acumen of key factors that could have a significant influence on companies post IPO operating performance, to explore ways to reduce the adverse impact of factors and to gauge the sustainability of companies post IPO.

2 Literature review

Several studies on performance of IPOs based on accounting measures have been conducted by various authors worldwide (Jain and Kini, 1994; Cai and Wei, 1997; Mikkelson et al. (1997); Pagano et al., 1998; Kutsuna et al., 2002; Chan et al., 2003; Balatbat et al., 2004; Ahmad and Lim, 2005; Wang, 2005; Hai et al., 2021. Ahmed, 2021). The initial study conducted by Jain and Kini (1994) has examined 682 IPOs of companies in US between 1976 and 1988. The study found that the performance of IPO companies declines significantly relative to their pre-IPO level as per several profitability

measures. This occurs despite the companies displaying high post-issue growth in sales and capital expenditures during the post IPO period.

Mikkelson et al. (1997) also reported a decline in post-issue performance of 283 IPOs in the period between 1980 and 1983 in the United States. However, they found that the post-IPO decline in operating performance is unrelated to managerial ownership. Instead, study found that the variation in operating performance after going public is explained mostly by the size and age of the companies.

The post-IPO operating performance and pre-IPO factors relationship was examined by Ahmad and Lim (2001) with a sample of 162 IPOs from varied industries. The results of the study indicated that when ROA and ATO were used as measures of operating performance 'Size of firm' has a significant negative relationship on post-IPO operating performance. Whereas when ROA and ROS were used as measures of operating performance a significant negative relationship between pre-IPO and post-IPO operating performance were established.

Another study on the JASDAQ IPOs by Kutsuna et al. (2002) investigates the financial performance for 247 Japanese companies that went public in 1995–1996. The study compares the operating performance for JASDAQ IPO companies for 5 years before IPO and 4 years after the floatation. They found evidence that JASDAQ companies showed sharply decreasing sales, ordinary profits, and net profits growth after flotation for both raw and industry median-adjusted operating performance. The similar results were also found in the study conducted by Matsuda et al. (1994) from Japan and US context.

The operating performance of Chinese listed companies was investigated by Wang (2005) indicates a sharp decline in post-issue operating performance for 747 IPOs for the period between 1994 and 1999. This study has adopted return on assets (ROA), operating ROA and sales to assets as measures of operating performance in the study. The author compared the average three years pre-IPO performance to the average three years post – IPO for both raw and industry adjusted data. The author also found that the level of declines varies between industries. Legal-entity ownership and concentration of non-state ownership is found to be significantly associated with performance changes. In addition, companies with high leverage are associated with better monitoring and thus superior performance.

Alanazi and Liu (2015) investigated the financial and operating performance of IPOs made in the Gulf Cooperation Council (GCC) region for the period of 2003 to 2010. The results suggest that IPO firms' performance declined after going public. As the firm's growth in sales and capital expenditure in the pre-IPO period were higher than the post-IPO period. The authors found evidence that supports the lack of opportunity theory. The study also found that the size of the firm is positively significant to IPO firm performance. Results of most of the previous research on the topic of operating performance of IPO companies had revealed a decline in post-IPO operating performance (Jain and Kini, 1994; Mikkelson et al., 1997; Kutsuna et al., 2002; Cai and Wei, 1997; Balatbat et al., 2004).

Laokulrach (2019) investigated the pre and post IPO operating performance in terms of efficiency and profitability of SMEs listed in the Market for Alternative Investment (MAI) during 2001–2014 in Thailand. Also, a cross-sectional analysis was used using different measurements to examine the impact of ownership retention and underpricing on operating performance. The results of 82 Thai SMEs revealed a decline of the operating performance for post-IPO issuance compared to a year prior IPO and their

revenue significantly improved their growth but was lower than the assets' growth rate. After going public, original owners of SMEs maintain relatively high managerial ownership resulting in less agency cost problems and the original ownership retention registered no significant impact on the operating performances.

Long et al. (2021), examined a database of 200 IPO firms from the Growth Enterprise Market of China, using time-series data of each firm's post-IPO operating performance from 2015 to 2019. The authors have employed a regression model to investigate the significance of IPO capital expenditure to firms' operating performance. Results revealed that to promote operating performance a major part of pre-IPO money was spent on business development. After the IPO, most of the money is transferred to equity investments to increase the firms' MV quickly, which leads to operating performance decline and deterioration.

Anup et al. (2022) have conducted a study on US VC-backed IPOs between 1996 and 2018 to explore the factors that influence the venture capital firms re-invest in portfolio companies after the IPO. The study found that the companies are taken public earlier due to lower post-IPO returns. A study by Kiridaran et al. (2022) has been conducted using a sample from 36 countries of IPO firms and the result of the study indicates that societal trust is negatively associated with the degree of IPO underpricing.

Based on the evidence of the above literature review, the following hypotheses were framed for this study:

H_1: No identified independent variables endure a significant influence on the ROE of listed companies.

H_2: No identified independent variables endure a significant influence on the ROS of listed companies.

H_3: No identified independent variables endure a significant influence on the ROA of listed companies.

H_4: There exists no significant difference in pre and post -IPO periods operating performance as measured by ROE, ROS and ROA of listed companies.

The conceptual framework depicting the factors that could be associated to a consequential change in IPO companies operating performance and the relevant hypothesis is presented in Figure 1.

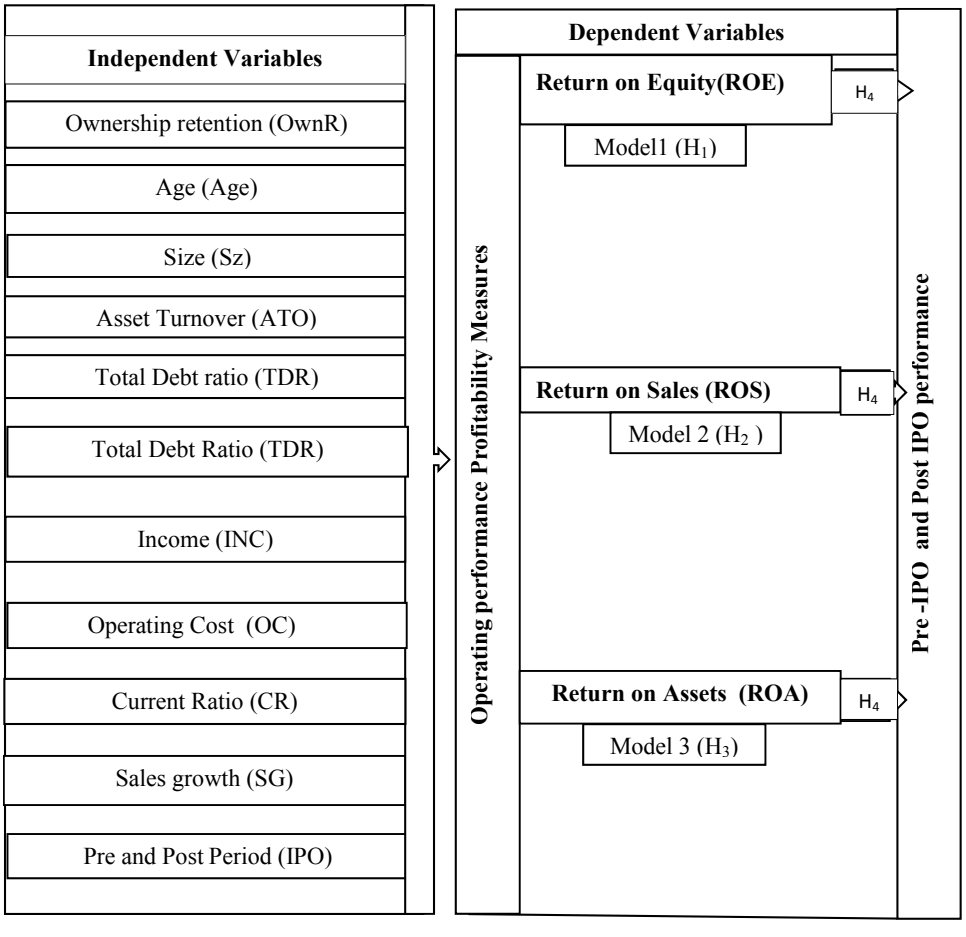
3 Research methodology

3.1 Sample and data collection

The dataset of companies that went for IPOs on MSX during the periods 2007 and 2018 were considered in this study. The secondary data is extracted from the database of MSX, the CMA portal for prospectus of IPO companies, and Ikon DataStream. Out of 15 IPOs made on MSX during the sample period, only 12 IPOs were considered for which complete data was available for two pre-period and four post-period IPOs including IPO year. This study excludes the IPOs of new companies that went public, companies with no pre-IPO data as well as banking and finance companies. Banking and finance companies are excluded as the study focused on business firms that went public. The sample companies were belonging to the construction, telecommunication, power and

utilities, and industrial manufacturing sectors. Out of the 12 sample companies, 3 have offered 40% while 6 companies have offered 35% of shares to the public through IPOs.

Figure 1 Conceptual framework



3.2 Variables of the study

Research variables to test the operating performance of listed companies during the study period are presented in Table 1.

3.3 Methods for empirical analysis

The matched pairs' method is used to compare the changes in the firms' operating performance between before and after the IPO (Alanazi et al., 2011). The time convention used in this study is depicted in Table 2. The data for each IPO company is collected and analysed for 6 years, two years of pre-IPO, and four years post IPO including the IPO event year. As pre-IPO data are not available for all sample companies for more than 2 years, hence, pre-IPO data is restricted to 2 years.

Table 1 Variables and measures

Profitability measures and factors		*Description*
Dependent variables (measures)		
1	Return on equity (ROE)	Net Income ÷ Shareholders Equity
2	Return on sale (ROS)	Earnings Before Interest and Taxes ÷ Net Sales
3	Return on assets (ROA)	Earning After Interest and Tax ÷ Total Assets
Independent variables (factors)		
1	Ownership retention (OwnR)	The proportion of shares retained by the original owners after the IPO
2	Age (Age)	Log of the length of operating history.
3	Size (Sz)	Log of Total Assets.
4	Asset turnover (ATO)	Net Sales ÷ Total Assets
5	Total Debt Ratio (TDR)	Total Liabilities ÷ Total Assets
6	Income (INC)	Total Income
7	Operating Cost (OC)	Expenses Before Interest and Tax
8	Current Ratio (CR)	The ratio of current assets to liabilities
9	Sales growth (SG)	The sales rate is the growth in sales from the prior year and is calculated as the percentage increase in annual sales
10	IPO	Predictor variable (0 for the pre-IPO period, a value of 1 for the years of the IPO event and subsequent years)

Table 2 IPOs time convention

Pre-IPO period		*IPO year*	*Post-IPO period*		
$-Y_2$	$-Y_1$	Y_0	$+Y_1$	$+Y_2$	$+Y_3$

3.4 Regression models

Three models as specified below are developed to measure the association between the three dependent variables of listed companies operating performance and ten independent variables of profitability factors using multiple regression analysis. The three models tested are:

Model 1: Companies' performance as measured by ROA

$$\beta_0 + \beta_1 \text{OwnR}_{it} + \beta_2\, \text{Age}_{it} + \beta_3\, \text{Sz}_{it} + \beta_4\, \text{ATO}_{it} + \beta_5\, \text{TDR}_{it} + \beta_6 \text{INC}_{it} + \beta_7\, \text{OC}_{it} + \beta_8 \text{CR}_{\text{i}} + \beta_9 \text{SG}_{\text{i}} + \beta_{10} \text{IPO}_{it} + \varepsilon$$

Model 2: Companies' performance as measured by ROE

$$\beta_0 + \beta_1 \text{OwnR}_{it} + \beta_2\, \text{Age}_{it} + \beta_3\, \text{Sz}_{it} + \beta_4\, \text{ATO}_{it} + \beta_5\, \text{TDR}_{it} + \beta_6 \text{INC}_{it} + \beta_7\, \text{OC}_{it} + \beta_8 \text{CR}_{\text{i}} + \beta_9 \text{SG}_{\text{i}} + \beta_{10} \text{IPO}_{it} + \varepsilon$$

Model 3: Companies' performance as measured by ROS

$$\beta_0 + \beta_1 \text{OwnR}_{\,it} + \beta_2\, \text{Age}_{\,it} + \beta_3\, \text{Sz}_{\,it} + \beta_4\, \text{ATO}_{\,it} + \beta_5\, \text{TDR}_{it} + \beta_6 \text{INC}_{it} + \beta_7\, \text{OC}_{it} + \beta_8 \text{CR}_{\text{i}} + \beta_9 \text{SG}_{\text{i}} + \beta_{10} \text{IPO}_{it} + \varepsilon$$

4 Empirical results and discussion

4.1 Descriptive statistics

The descriptive statistics for 12 companies for which IPOs materialised in MSX during the sample periods are presented in Table 3.

Table 3 Descriptive statistics

Characteristics	*Mean*	*Median*	*Minimum*	*Maximum*	*SDEV*
Ownership retention (OwnR)	0.76	0.65	0.60	1.00	0.18
Age (Age)	7.92	6.00	2.00	19.00	4.95
Size (Sz)	367.90	287.65	11.54	5545.90	652.40
Asset turnover (ATO)	0.37	0.22	0.00	1.24	0.33
Total Debt Ratio (TDR)	0.74	0.78	0.20	1.12	0.23
Income (INC)	114.14	62.74	0.00	751.70	155.75
Operating Expense (OE)	88.14	31.86	–18.50	639.40	128.81
Current Ratio (CR)	0.92	0.85	0.01	3.83	0.56
Sales growth (SG)(%)	18.37	6.35	0.00	99.00	5.66
IPO	0.67	1.00	0.00	1.00	0.47

The descriptive statistical values for ten independent variables are shown in Table 3. The mean (median) ownership retention (OwnR) for these companies is 76 (65)%; however, the minimum ownership retention is 60%. Age (Age) for these firms is 8 (6) years; however, the maximum and minimum age are between 2 years old firms to 19 years old firms. The mean and median for the size of IPO companies as measured by log of total Assets, the mean (median) are 367.90 (287.65)%, however the maximum and minimum size are 5545.90 and 11.54 respectively with a standard deviation of 652.40. The asset turnover ratio, the efficiency of a company's assets in generating revenue with ATO, the mean (median) are 37 (22)%, however, the maximum and minimum ATO is 0% and 124% respectively with a standard deviation of 0.33. The mean (median) for the variable Total Debt Ratio for these companies is 74 (78)%; however, the maximum and minimum percentage of Total Liabilities to Total Assets are 112% and 20% respectively with a standard deviation of 0.23. Total Income during the study period for IPO companies the mean (median) is 114.14 (62.74). The mean (median) for operating expenses mean and median are 88.14 (31.86), the current ratio means, and median are 18.37% (6.35), and the mean and median sales growth are 18.37 (6.35)%.

4.2 Changes in the operating performance of companies post-IPO

Table 4 presents empirical results for 12 companies for which IPOs materialised in MSX during the periods 2007 and 2018. For each dependent variable of operating performance, the mean and median values, and the change in these values from before to after the IPO event are reported in Table 4. Panel A depicts a comparison between a year before the IPO event (Y–1) and the year after the IPO event (Y + 1). Panel B depicts a comparison between a year before the IPO event (Y – 1) and the second year after the IPO (Y + 2).

Finally, Panel C depicts a Comparison of Operating Performance between the average Y – and the average Y +.

Table 4 Comparison of operating performance pre and post-IPO periods

Panel A: Comparison of operating performance between Y–1 and Y + 1

Variables	*N*	*Mean before*	*Mean after*	*Mean change*	*Median before*	*Median after*	*Median change*
Return on equity (ROE)	12	0.28	0.31	–0.03	0.24	0.18	–0.06
Return on sale (ROS)	12	0.41	0.18	–0.23	0.33	0.29	–0.05
Return on assets (ROA)	12	0.09	0.06	–0.03	0.05	0.03	–0.02

Panel B: Comparison of operating performance between Y–1 and Y + 2

Variables	*N*	*Mean before*	*Mean after*	*Mean change*	*Median before*	*Median after*	*Median change*
Return on equity (ROE)	12	0.28	0.14	–0.14	0.24	0.14	–0.10
Return on sale (ROS)	12	0.41	0.27	–0.14	0.33	0.28	–0.05
Return on assets (ROA)	12	0.09	0.05	–0.04	0.05	0.03	–0.02

Panel C: Comparison of Operating Performance between the average Y – and the average Y

Variables	*N*	*Mean before*	*Mean after*	*Mean change*	*Median before*	*Median after*	*Median change*
Return on equity (ROE)	12	0.24	0.15	–0.09	0.23	0.13	–0.10
Return on sale (ROS)	12	0.32	0.27	–0.05	0.29	0.27	–0.02
Return on assets (ROA)	12	0.06	0.05	–0.01	0.04	0.03	–0.01

Operating Performance measures are reported in Table 4 for 12 companies for which IPOs materialised in MSE during the periods 2007 and 2018. Panel A result reveals a decline in the operating performance of companies from the pre-IPO to the post-IPO year. The mean (median) deteriorates in all three measurements (ROE, ROS, and ROA). The mean (median) change in ROE revealed a decrease by 3 (6)%, the mean (median) change in ROS revealed a decrease by 23 (5)%. The mean (median) ROA revealed a drop from 9% to 6% (5 to 3%), which is a decline of approximately 33% in mean and 40% in median. However, the results of this present study are consistent with Wang (2005) reports 20.9% deterioration between Y – 1 and Y + 1, and Kim et al. (2004) document a 44.12% decline for 133 IPOs made in Thailand. Alanazi and Liu (2015) reported a sharp decline in the profitability of IPOs from the pre-IPO to the post-IPO year of approximately 43%.

In Table 4, Panel B reveals a higher decline in the mean (median) change in ROE, ROS, and ROA in the second year of post-IPO by 14 (10), 14 (5) and 4 (2)% respectively. This finding is consistent with those of Jain and Kini (1994), Kim et al. (2004) Alanazi and Liu (2015), findings that revealed decline in the second year was much higher.

Comparison of operating performance between the average of Y– and the average of Y+ for 12 companies (Table 4 Panel C) revealed a decline in post-IPO period ROE and ROS. The mean (median) measures of change for ROE and ROS were declined by 9 (10) and 5 (2) respectively. Similarly, ROA also registered a decline, an average ROA before the IPO was 6%, while this value is 5% after the IPO, with a mean (median) change of decline by 1(1)% post IPO. Overall, it is concluded that the operating performance of 12 companies for which IPOs materialised in MSX during the periods 2007 and 2018 declined in the post-IPO period.

4.3 Regression analysis of operating performance

Regression analysis using the least squares method applied to test hypothesis 1, 2 and 3 respectively.

The results of regression models 1, 2 and 3 are presented in Table 5. The results indicate the impact of more than one independent variable in ROE, ROS and ROA on operating performance of listed companies.

Table 5 Regression analysis using ordinary least squares regression method

	Model 1	*Model 2*	*Model 3*
Variables	*ROE*	*ROS*	*ROA*
Constant	–0.851	0.089	0.256
	(0.42)	(0.92)	(0.38)
Ownership retention_OwnR	0.630	0.239	–0.132
	(0.54)	(0.77)	(0.64)
Age_Age	–0.014	–0.015	–0.003
	(0.10)*	(0.03)**	(0.23)
Size _Sz	7.92E-05	2.69E-05	3.50E-05
	(0.13)	(0.53)	(0.02)**
Asset turnover _ATO	0.650	0.002	0.168
	(0.00)***	(0.98)	(0.00)***
Total Debt Ratio _TDR	0.262	0. 010	–0.145
	(0.09)*	(0.94)	(0.00)***
Income _INC	0.003	0.003	0.001
	(0.020)**	(0.03)**	(0.02)**
Operating Expense _OE	–0.004	–0.003	–0.002
	(0.02)**	(0.03)**	(0.01)**
Current Ratio _CR	0.065	0.032	0.002
	(0.17)	(0.41)	(0.90)
Sales growth _SG	0.001	0.001	0.001
	(0.46)	(0.15)	(0.25)
IPO	0.222	0.121	–0.063
	(0.55)	(0.69)	(0.55)

Table 5 Regression analysis using ordinary least squares regression method (continued)

Variables	*Model 1*	*Model 2*	*Model 3*
	ROE	*ROS*	*ROA*
R^2	0.436	0.435	0.704
Adjusted R^2	0.344	0.343	0.655
F-statistic	4.73	4.71	14.48
Prob(F-statistic)	0.000	0.000	0.000

P-value in parentheses (significant at 10% level*, significant at 5% level** and significant at 1% level***).

Table 5 result shows a significant positive association between ATO and ROE. A unit change in the ATO of the listed company resulted in about 0.650 increase in companies' performance as measured by ROE. Thus, results confirm that efficient use of the company's assets, increase in sales revenue and thus positively impacted operating performance. Further from the data analysis, the result reveals an increase in return on equity (ROE) as the degree of leverage and financial risk increases. Model 1 results reveal the implication that every unit increase in total debt resulted in about 0.262 increase in ROE. The result also shows that Income has a significant and positive impact on a company's ROE, a unit increase in Income results in about 0.003 units of increase in ROE. Therefore, for a sound and long term sustainability the companies after the IPO event should continually strive at increasing its income to generate good returns on the investment. Age and operating expenses variables of listed companies were found to have a negative significant impact on companies' performance as measured by ROE. Result reveals that young, listed companies under study are generating higher ROE and the older the firm the lower the ROE. Every one-unit change in the age of the firm results in about 0.014 decrease in companies' performance as measured by ROE. This is contrary to the results of the study conducted by David (2002) who found a statistically significant positive relationship between age of the firm at IPO and aftermarket performance. Further, a unit decrease in companies operating expenses results in about 0.004 units of increase in ROE and vice versa. The other variables were found to have no significant impact on ROE. Tight control of operating expenses by companies in the post IPO period will increase returns on capital employed by shareholders. Other variables ownership retention, size, current ratio, sales growth, and IPO event regression result exhibits no significant influence on operating performance. Moreover, the findings revealed that an increase in total liabilities during the study period resulted in an increase in ROE, a one unit increase on firm TDR variable results in about 0.262 unit increase in ROE. The result reveals that an increase in dependence on total liabilities and its efficient utilisation generates a positive impact on the returns to equity shareholders due lower cost of debt as compared to equity financing, tax benefits and efficient utilisation of debt resources. Thus, operational efficiency and effective utilisation of borrowed funds is required to avoid impending financial troubles. Other variables like ownership retention, size, current ratio, sales growth, and IPO have registered a positive but insignificant impact on ROE.

In Model 2 with ROS as the measure for operating performance, the age and operating expenses of the companies is negative and significantly associated with the operating performance (ROS) of the listed companies, while the income exhibits a positive and significant association with ROS. Every one-unit change in operating expenses of the company resulted in about a 0.003 decrease in companies' performance as measured by ROS. Tight control of operating expenses by companies in the post IPO period will increase ROS. Model 2 result also confirms that young, listed companies under study are generating higher ROS and the older the firm the lower the return on sales (ROS), a unit change in the age of the firm results in about 0.015 decrease in companies' performance as measured by ROS. The result also exhibits a positive and significant association of Income with operating performance, a unit increase in Income results in about 0.003 units of increase in ROS. Therefore, companies with an increase in Income registered an increase in ROS, but a tight control and effective utilisation of increase in operating expenses is required by companies. Other variables have registered a positive but insignificant impact on ROS.

Model 3 with ROA as the measure of the operating performance of listed companies under study. The result reveals that the size of a company is positively and significantly associated with operating performance, a company with higher total assets enjoys a positive impact on operating performance. This finding is in line with Alanazi and Liu (2015) study results that revealed the size of the firm is positively significant to IPO firm performance but contrary to the study conducted by Chi and Padgett (2006) which confirmed that smaller companies enjoy higher IPO returns. ATO and Income variables of the companies were found to have positive significant relationships in determining the operating performance as measured by ROA. One unit increase in the ATO variable results in a 0.168 unit increase in the company's operating performance as measured by ROA. Further a unit increase in Income results in about 0.001 units increase in ROA. Both the total debt ratio and operating expenses exhibits a negative and significant impact on the operating performance of the listed company. The result reveals that the greater degree of leverage and financial risk resulted in a decrease in return on assets (ROA), with the implication that every unit increase in total debt resulted in about a 0.145 decrease in ROA. Companies with low dependence on borrowed funds are efficiently utilising funds and generating good returns on assets. Companies with higher dependence on debt finance require efficient utilisation to generate a sufficient increase in financial performance to avoid impending financial troubles.

The adjusted R-Square model 1 is 0.344, indicating 34.4% variability in listed companies' performance is well explained by the changes in ROE (F statistics of 4.73). Model 2 adjusted R-Square is 0.343 (F statistics of 4.71) and Model 3 adjusted R-Square is 0.655, indicating 65.5% of the variability in listed companies' performance and well explained by the changes in ROA (F statistics of 14.48) with P-values of 0.000 in all three models, indicating the models are well fitted at 1% significance level as it indicates that independent variable can jointly exert significant influence on dependent variables.

Overall, the regression analysis results (model 1, 2 and 3) infer that there exists a significant impact of more than one identified independent variable on companies operating performance as measured by ROE, ROS and ROA and hence the hypotheses H_1, H_2 and H_3 were rejected.

4.4 Paired sample t-test and independent sample test

Hypothesis 4 was examined by applying a paired sample t-test (for two pre and two post periods for which the pairs were available) and an independent sample t-test. Tables 6–8 provide the results of a paired sample t-test for ROE, ROS and ATO.

Table 6 Group statistics

	IPO	*N*	*Mean*	*Std. deviation*	*Std. error mean*
ROA	Pre-IPO	24	0.0648	0.11115	0.02269
	Post-IPO	48	0.0548	0.06006	0.00867
ROE	Pre-IPO	24	0.2357	0.32051	0.06542
	Post-IPO	48	0.1670	0.11698	0.01688
ROS	Pre-IPO	24	0.3195	0.23461	0.04789
	Post-IPO	48	0.2903	0.12376	0.01786

Table 6, Group statistics results for two pre and three post-periods revealed a decrease in ROA, ROE and ROS in the average of post -IPO period of study.

Table 6(A) Y – 1 to Y + 1, paired samples statistics

	ROE	*Mean*	*N*	*Std. deviation*	*Std. ERROR MEAN*
Pair 1	ROE_y + 1	0.1796	12	0.09737	0.02811
	ROE_y-1	0.2774	12	0.23598	0.06812
Pair 2	ROS_y + 1	0.3062	12	0.12499	0.03608
	ROS_y-1	0.4082	12	0.23902	0.06900
Pair 3	ROA_y + 1	0.0623	12	0.06361	0.01836
	ROA_y-1	0.0932	12	0.09412	0.02717

Table 6(B) Paired samples correlations

	ROE	*N*	*Correlation*	*Sig.*
Pair 1	ROE_y + 1 and ROE_y-1	12	0.558	0.059
Pair 2	ROS_y + 1 and ROS_y-1	12	0.360	0.250
Pair 3	ROA_y + 1 and ROA_y-1	12	0.817	0.001

Table 6(A), paired sample statistics results for 12 listed companies for a year before IPO event and a year after IPO revealed a decline in the mean of operating profit as measured by ROE, ROS and ROA. Table 6(B), paired sample correlation result depicts that ROA and ROE have a positive significant correlation between a year before IPO event and a year after IPO for 12 listed companies under study, while ROS result insignificant positive relationship exists between y – 1 and y + 1 period.

Table 6(C), results of paired sample test as measured by ROE, ROS and ROA for a year before IPO and a year after IPO event (ROE t11 = –1.704, $p > 0.05$, ROS t11 = –1.562, $p > 0.05$ and ROA t11 = –1.914, $p > 0.05$) revealed a decline in post operating performance no significant difference in the operating performance of listed companies

under study. On average, ROE, ROS and ROA post IPO Y+ period scores were ROA 0.309, ROE 0.0977, ROS 0.102 points lower than respective pre-IPO period scores (95% CI [ROA –0.06643, 0.00463, ROE –0.22408, 0.02855, ROS –0.24585, 0.04176].

Table 6(C) Paired samples test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	*Std. deviation*	*Std. error mean*	*Lower*	*Upper*	*t*	*df*	*Sig. (2-tailed)*
Pair 1	ROE_y + 1 – ROE_y-1	–0.09777	0.19880	0.05739	–0.22408	0.02855	–1.704	11	0.117
Pair 2	ROS_y + 1 – ROS_y-1	–0.10204	0.22633	0.06534	–0.24585	0.04176	–1.562	11	0.147
Pair 3	ROA_y + 1 – ROA_y-1	–0.03090	0.05591	0.01614	–0.06643	0.00463	–1.914	11	0.082

Table 7(A), paired sample statistics results for 12 listed companies for a year before IPO event and two years after IPO revealed a decline in the mean of operating profit as measured by ROA, ROE and ROS. Table 7(B), paired sample correlation result depicts that ROA has a positive significant correlation between a year before IPO event and two years after IPO for 12 IPO companies, while for ROS revealed an insignificant positive relationship exists between y–1 and y + 2 period. ROE in result revealed a negative insignificant relationship between y–1 and y + 2 period.

Table 7(A) Y–1 to Y+2, paired samples statistics

		Mean	*N*	*Std. deviation*	*Std. error mean*
Pair 1	ROE_y-1	0.2774	12	0.23598	0.06812
	ROE_y + 2	0.1413	12	0.07159	0.02067
Pair 2	ROS_y-1	0.4082	12	0.23902	0.06900
	ROS_y + 2	0.2703	12	0.11397	0.03290
Pair 3	ROA_y-1	0.0932	12	0.09412	0.02717
	ROA_Y + 2	0.0524	12	0.05667	0.01636

Table 7(B) Paired samples correlations

		N	*Correlation*	*Sig.*
Pair 1	ROE_y-1 and ROE_y + 2	12	–0.061	0.851
Pair 2	ROS_y-1 and ROS_y + 2	12	0.306	0.333
Pair 3	ROA_y-1 and ROA_Y + 2	12	0.761	0.004

Table 7(C) Paired samples test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference Lower	Upper			
Pair 1	ROE_y + 2 -ROE_y-1	–0.13607	0.25074	0.07238	–0.02325	0.29538	1.880	11	0.087
Pair 2	ROS_y + 2-ROS_y-1 –	–0.13796	0.23115	0.06673	–0.00891	0.28482	2.067	11	0.063
Pair 3	ROA_Y + 2-ROA_y-1	–0.04080	0.06284	0.01814	0.00087	0.08073	2.249	11	0.046

The paired sample test results as measured by ROA, ROE and ROS for a year before IPO and two years after IPO event (ROA t11 = 2.249, $p < 0.05$, ROE t11 = 1.880, $p > 0.05$, ROE t11 = –2.067, $p > 0.05$) is presented in Table 7(C). The ROA declined significantly (at a significance level of 5%) in operating performance of listed companies post IPO, while ROE and ROS results revealed significant differences at 10% level of significance. On average, ROE and ROS post IPO Y + 2 period scores were ROA 0.408, ROE.136, ROS.137 points lower than respective pre-IPO period scores (95% CI [ROA 0.0008, 0.0807, ROE –0.0232, 0.2953, ROS –0.0089, 0.2848]. Therefore, overall ROA in the 2nd year post-IPO period registered a significant decline at a significant level of 5% and ROE and ROS results demonstrated a significant decline at a significant level of 10%. This finding is consistent with those of Jain and Kini (1994), Kim et al. (2004) and Alanazi and Liu (2015), however, the decline in Thai IPOs in the second year was much larger than those, which are documented in this study.

4.5 Paired sample test

Table 8(A), paired sample statistics results for 12 IPO companies for pre and post IPO period revealed a decline in the mean of operating profit as measured by ROA, ROE and ROS. Table 8B, indicates the results of paired sample test as measured by ROA, ROE and ROS for pre and post IPO period (ROA t23 = –401, $p > 0.05$; ROE t23 = –0.112, $p > 0.05$; ROE t23 = –0.568, $p > 0.05$). On an average, ROE, ROS and ROA declined in post IPO period Y0, Y + 1, Y + 2 period and the scores were ROA 0.014, ROE.029, ROS.006 points lower than respective pre-IPO period scores (95% CI; ROA –0.06486, 0.03650, ROE –0.18024, 0.12173, ROS –0.11833, 0.10615]. Even though the Post IPO period registered a decline in operating profit, the result revealed no significant difference in Post IPO operating performance as measured by ROE and ROS. Thus, accepting the hypothesis H4 that there exists no significant difference in pre and post -IPO periods operating performance as measured by ROE, ROS and ROA of companies. The results of this study are contrary to the result of most previous research on the topic of the operating performance of IPO companies that revealed a decline in post-IPO operating performance (Jain and Kini, 1994; Mikkelson et al., 1997; Kutsuna et al., 2002; Cai and Wei, 1997; Balatbat et al., 2004 and Alanazi and Liu, 2015). Therefore, the result of this study gives some insight that post-IPO companies' operating performance did not deteriorate

significantly and hence the decision of going public has no adverse impact on the operating performance of listed companies.

Table 8(A) Paired sample statistics Y + to Y– {(Y0, Y + 1, Y + 2, Y + 3) to (Y–1, Y–2)}

		Mean	*N*	*Std. deviation*	*Std. error mean*
Pair 1	ROE_Post-IPO	0.2065	24	0.12732	0.02599
	ROE_Pre-IPO	0.2357	24	0.32051	0.06542
Pair 2	ROS_Post-IPO	0.3134	24	0.16021	0.03270
	ROS_Pre-IPO	0.3195	24	0.23461	0.04789
Pair 3	ROA_Post-IPO	0.0506	24	0.05074	0.01036
	ROA_Pre –IPO	0.0648	24	0.11115	0.02269

Table 8(B) Paired sample differences

		Paired differences							
					95% Confidence interval of the difference				
		Mean	*Std. deviation*	*Std. error mean*	*Lower*	*Upper*	*T*	*df*	*Sig. (2-tailed)*
Pair 1	ROE_ Post-IPO ROE_Pre-IPO	–0.02925	0.35756	0.07299	–0.18024	0.12173	–0.401	23	0.692
Pair 2	ROS_Post-IPO ROS_Pre-IPO	–0.00609	0.26581	0.05426	–0.11833	0.10615	–0.112	23	0.912
Pair 3	ROA_Post-IPO ROA_Pre-IPO	–0.01418	0.12003	0.02450	–0.06486	0.03650	–0.579	23	0.568

5 Conclusion

The operating performance and its contributing factors of Omani companies as they move from private to public on Muscat Stock Exchange (MSX) were examined in this study. To address the aims of the study, four hypotheses were established, and first three hypotheses were tested applying ordinary least squares regression analysis.

From the Model 1, it is concluded that profitability factors such as age, ATO, TDR, Income registered a positive and significant impact on ROE in determining listed companies operating performance. On the other hand, operating expenses registered negative and significant; and other variables were found to have no significant impact on ROE. Thus, the result concludes that new companies with higher leverage and its efficient utilisation of resources have a significant positive impact on ROE. The results also depicted that higher a ROA IPO companies generate from its assets the more positive impact it has on ROE.

In Model 2 with ROS as the measure for operating performance for companies, age and operating expenses variables of the companies registered a negative and significant impact in determining the operating performance. Increase in operating expenses of the company results in a decrease in companies' performance as measured by ROS. Thus, a tight control of operating expenses by companies in the post IPO period will increase

ROS. Model 2 result also confirms that young, listed companies under study are generating higher ROS and the older the firm the lower the ROS. The Income variable registered a positive and significant in determining the IPO's performance. Therefore, companies with an increase in Income registered an increase in ROS, but a tight control and effective utilisation of increase in operating expenses is required by companies. Other variables have registered a positive but insignificant impact on ROS.

Model 3 results reveal that the size of a company is positively and significantly associated with operating performance, a company with higher total assets enjoys a positive impact on operating performance. ATO and Income variables of the companies were found to have positive significant relationships in determining the operating performance as measured by ROA. Both the total debt ratio and operating expenses exhibits a negative and significant impact on the operating performance of the listed company. The result reveals that the greater degree of leverage and financial risk resulted in a decrease in ROA. Companies with low dependence on borrowed funds are efficiently utilising funds and generating good returns on assets.

Overall, the regression analysis results infer that there exists a significant impact of more than one identified independent variable on companies operating performance as measured by companies ROE, ROS and ROA.

Moreover, a comparison of pre-and post-IPO accounting-based operating performance has been made in this study. The findings of the study indicates that there exists no significant difference in pre and post -IPO periods operating performance as measured. The results of paired sample tests as measured by ROE, ROS and ROA for a year before IPO and a year after the IPO event revealed a decline in post-operating performance and the result revealed no significant difference in the operating performance of listed companies under study. Further, a paired sample correlation result depicts that ROA has a positive significant correlation between a year before IPO the event and two years after IPO for 12 IPO companies, while for ROS revealed an insignificant positive relationship exists between y–1 and y + 2 period. ROE in result revealed a negative insignificant relationship between y–1 and y + 2 period. The results of paired sample test results as measured by ROA, ROE and ROS for a year before IPO and two years post- IPO event ROA revealed a significant decline at a significance level of 5% in the operating performance of listed companies post-IPO, while ROE and ROS result revealed significant difference at 10% level of significance.

Overall, paired sample statistics results for 12 companies for the pre and post -IPO period revealed an insignificant decline in the mean of operating profit as measured by ROA, ROE and ROS. Thus, the findings of the study indicates that there exists no significant difference in pre and post -IPO periods operating performance as measured by ROE, ROS, and ROA of IPO companies. Therefore, the result of this study gives some insight that post-IPO companies' operating performance did not deteriorate significantly and hence the decision of going public has no adverse impact on the operating performance of listed companies.

The study inferences give an insight about the factors that could be associated to a significant change in companies operating performance that went public during the study period. The study results enable stakeholders to get an insight that no significant difference was observed in pre and post -IPO periods operating performance as measured by ROE, ROS and ROA of IPO companies during the study period. The results of the study prove that no deterioration on post operating profit and thus evinced that it has been a good decision by the management to move from private to public thereby reaping the

benefits of being listed in stock market. Companies can benefit in many ways by efficiently using an initial public offering to finance new investment opportunities, research and development, acquire new technology and a number of other possibilities to transform the effective growth trajectory of a company. Thus, the result of this study provides useful insights to various stakeholders involved in the IPO decision-making process, organisation policy makers, potential IPO companies, potential investors, financial institutions, stock markets and researchers.

As this research was conducted based on data collected only from MSX that went to the public during the study period. Hence, the data from a small sample size of 12 companies for which complete data was available for a minimum of two pre-period and four post-IPO periods including IPO event years were considered in this study. This was one of the main constraints in examining variables that could impact the operating performance during the study period and to examine the overall difference in pre- and post-operating performance. This study excludes the IPO offerings of new companies that went public, companies with no pre-IPO data, and IPOs of companies belonging to the banking and finance sector as well as an investment trust.

Future research may be conducted by incorporating some more contextual unique variables and with a large sample size including all sectors and deep analysis of each factor pre and post-effect on operating profit. The study may also be extended by including samples from other GCC countries for a comparative study. An independent study may also be conducted on market price reactions during post-IPO periods.

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