“Post-issue operating performance of firms in Nepal”

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POST-ISSUE OPERATING PERFORMANCE OF FIRMS IN NEPAL

Abstract

This paper aims to examine the operating performance of firms after new issues. Using financial data of 43 initial public offering (IPO) firms from 2013/14 through 2022/23 with 215 observations, operating performance is evaluated. Both the independent samples t-test and the Wilcoxon signed-rank test were used to compare firms' operating performance between pre- and post-issue periods. Results reveal that operating performance after IPO for all indicators in different time windows from Year t+0 to t+3, has been negative compared to Year t–1. Sector-specific analysis shows that the decline in operating performance is significantly higher in the microfinance sector compared to hydropower firms. Underpricing has a positive effect on operating performance except in a few cases. Hot issue dummy has a negative, insignificant effect on both measures of operating performance, viz., operating return on assets and operating cashflow to total assets, for the first two-time windows, and it weakly supports the windows of opportunity hypothesis. On the other hand, the influence of promoter ownership on operating performance was positive except in few cases, which is contrary to the agency theory. Further, the results show that operating performance has a weaker influence on long-run IPO returns. Thus, it is proposed that IPO firms should strive to intensify their activities and effectively utilize capital raised through IPOs, considering the net present value of the projects to achieve better firm performance.

Keywords return, assets, cashflow, turnover, underpricing, hot issue, sales, capital expenditure, long-run

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INTRODUCTION

Initial public offerings' performance is one of the highly researched areas in finance, and the literature is overflowing with evidence of anomalies such as first-day underpricing, short- or medium-term outperformance, and long-run underperformance. However, international evidence on operating performance after a new issue is sporadic. The general notion is that firms' operating performance increases with the increase in size of capital after IPO. However, Jain and Kini (1994), who first examined the variation in firms' operating performance before and after new issues, found that there is a deterioration in the performance of firms after the issue. The deterioration in a firm's operating performance arises even if there is a larger progress in net sales and capital expenditure. In emerging markets, there is also a reduction in post-issue operating performance of firms. The decline in post-issue operating performance is against the expectations of high earnings growth in the future. IPO firms with high market-to-book value and price-earnings ratios went public but experienced a deterioration in operating performance after the IPO. Additionally, earnings per share also decline with time. Though investors expect earnings growth to continue, evidence shows that pre-issue profit margins are not sustained in reality. In the Nepali context, studies on IPO underpricing are well-documented (Pradhan & Shrestha, 2016; Gurung, 2020); however, to the best of the authors' knowledge, this study is the first of its kind, expecting to make a pioneering contribution to the literature of Nepali academia.

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1. LITERATURE REVIEW

In the post-issue period, it is generally found that firm performance tends to decline. There are several possible descriptions of the reduction in after-issue firms' operating performance, which depend on three basic hypotheses: windows of opportunity, window dressing, and agency problems. The Windows of Opportunity hypothesis postulates that firms may time IPO offer wishing to take advantage of new issues (Ritter, 1991; Loughran & Ritter, 1995). Shukla and Shaw (2018) found a decay in operating performance after an issue when firms go public in the bull market. Normally, firms have an inducement to go for IPO at the time of high valuation of the industry, consequently, get the highest possible level of return. But if the market does not comprehend the growth trend of earnings, the new issues will be highly valued, and the firm will perform weakly in the periods after issuance. Similarly, there is window-dressing of financial statements before a new issue (Jain & Kini, 1994). There is earnings management before issue, where the firm changes its discretionary current accruals, resulting in net income becoming high before issue, peaks during, and deteriorates after issuance (Teoh et al., 1996a; Andreas, 2021). This is known as the earnings management hypothesis, which explains the poor post-IPO performance.

As a result of the IPO, the stake of the original owner-managers decreases, which leads to the emergence of agency problems between the owner-managers and the new shareholders, causing a sharp increase in agency costs (Shukla & Shaw, 2018). Jensen and Meckling (1976) argued that due to 'separation of ownership and control,' agency costs arise in a public firm. Because of dispersed ownership between initial owner-managers and new shareholders after IPO, the conflict between owner-managers and new investors increases, and the performance of the firm could suffer. Another explanation for the relationship between managerial ownership and post-issue operating performance is the signaling hypothesis by Leland and Pyle (1977). This hypothesis predicts an attractive post-issue operating performance of firms with higher entrepreneurial ownership. Welch (1989), Grinblatt and Hwang (1989), and Allen and Faulhaber (1989) have advocated that IPO firms employ underpricing, for example, as a tool to signal their superiority to the market. They argue that quality firms underprice their IPO share assuming information asymmetry between IPO firms and investors, and sell a minor portion of the firm during IPO. Subsequently, IPO firms conduct seasoned equity offerings at a time when market prices become higher and reveal the information explicitly.

Several studies have been conducted in the area of post-issue operating performance of firms in developed and emerging markets. In this regard, Jain and Kini (1994) carried out a pioneering work on the operating performance of firms going public in US markets. They found that firms show deterioration in after-issue performance, calculated by the median operating return on assets (ROA), operating cash flow to total assets (CF/TA), and assets turnover (AT). The median changes in all these measures are negative for *Years t+0, t+1, t+2,* and *t+3* relative to Year *t–1*. The declining operating ROA, operating CF/TA, and AT have also been documented by Chan et al. (2001) in the Thai market and by Pereira and Sousa (2017) in the Australian market. Further, Shukla and Shaw (2018) revealed that the median operating ROA, AT, and return on sales (ROS) have declined significantly compared to Year t–1 in the Indian market. Pereira and Sousa (2017) also argue that the decline in operating performance is larger for firms from emergent European countries. Gao et al. (2021) also reported that firms issuing new equities are able to hold their growth opportunities during the first three years after public offering, but such potential is not continued after the three years in terms of return on assets, return on equity, and return on sales in the Chinese market. They advocated that this kind of exciting finding, which differs from preceding research, is probably due to the exceptional Chinese regulations that firm proprietors, as key insiders, have a three-year lock-up of their shares after IPOs. However, the decline in post-issue operating performance of firms indicates IPO firms were unable to utilize assets efficiently and maximize the value of the firms. Further, Jain and Kini (1994) documented that a median change in both sales and capital expenditure growth is positive for Years *t+0, t+1, t+2,* and *t+3* compared to Year *t–1*. In contrast, the growth patterns of net sales, capital expenditures, and operating income were significantly reduced

after the offerings in Japanese IPO firms (Cai & Wei, 1997), as well as reduced sales growth in Malaysian IPO firms (Chi & Padgett, 2005). They argue that the reason for the decline in sales and CE can be attributed to greater variation in specific firms' growth rates of operating measures than in the industry.

The cross-sectional analysis of post-issue operating performance, showing a theoretical relationship, documented several explanations. One of the early empirical works by Jain and Kini (1994) reported that managerial ownership retention is positively related to after-issue firm performance. On the other hand, the after-issue decline in operating performance could not be attributed to weaker managerial ownership in Japanese IPOs, and this finding provides strong support for the windows of opportunity hypothesis (Cai & Wei, 1997). Similarly, managerial ownership has a positive relation with the AT and ROE of firms, but there is a negative relation with net income to assets, ROA, and debt to total assets (Boubaker & Mezhoud, 2011). Further, Bruton et al. (2010) found a positive relationship between ownership concentration and the adjusted ROA and ROS in UK IPOs compared to French markets. Further, Jain and Kini (1994) reported that there is a weak relationship between after-issue changes in performance with underpricing at the time of IPO in the US market. While Chan et al. (2001) documented that the one-year and two-year abnormal returns are absolutely related to changes in ROA, operating CF/TA, and growth in sales of IPO firms. They imply that the effect of underpricing on post-issue performance is controversial and inconclusive to the signaling hypothesis. Boubaker and Mezhoud (2011) reported that firm size, firm age, and leverage have a negative relationship with AT and net income to total assets, but a positive relationship with ROA, total debt to total assets, and ROE.

Additionally, several studies documented the relationship between long-run IPO stock returns and the performance of firms after issuance. In this regard, Chan et al. (2001) and Singh and Jain (2018) carried out studies about the association of long-run IPO stock returns and firms' after-issue operating performance. Chan et al. (2001) documented that long-run IPO stock returns, such as one-year and two-year cumulative abnormal returns, are positively related to operating performance, such as changes in ROA, changes in operating CF/TA, and changes in sales growth. This indicates that the price performance of the share is a fractional replication of operating performance over the period. Singh and Jain (2018) also reported that operating performance, such as sales and growth rate of sales, shows a positive influence on the long-run market returns of 36 firms listed on the National Stock Exchange. This implies that better post-issue performance of firms is assumed to have increased long-run market returns. Thus, the long-run return and operating performance of firms after the issue have a linear relationship with each other. Hossain and Khan (2021) documented that the age of a firm, debt ratio, sales, and CE describe the disparity of firm performance over the period. Moreover, the deterioration in after-issue performance is further noticeable for firms issuing their equities at a premium compared to firms issuing equities without a premium.

The extant literature has shown ample but inconsistent evidence on post-issue operating performance, along with apparent discrepancies between various explanatory variables influencing firms' post-issue performance. The findings related to theoretical explanations of various IPO characteristics were not similar, and very limited studies were found, especially in the South Asian Region in this context. Further, the findings of such studies have yet to be documented in the IPO literature from a Nepali perspective. Similarly, no studies are documented regarding the relationship between long-run IPO stock returns and firms' operating performance after going public.

Thus, this paper aims to examine the operating performance of firms after new issues in Nepal.

2. METHOD

2.1. Data and sources

Data employed in measuring after-issue operating performance of firms were completely secondary. The study covered the period from 2014/15 to 2019/20. The sample emphasized measuring operating performance over the long term, using post-issue data from three years. Therefore,

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Table 1. Summary statistics of sample IPO firms

Panel A: Number of issues by sector			Panel B: Number of issues by year		
Sector	**n**	**Observations[1] (n x 5)**	**FY[3]**	**n**	**Observations[1] (n x 5)**
Commercial banks	1	5	2014/15	3	15
Development banks	1	5	2015/16	2	10
Microfinance institutions	14	70	2016/17	4	20
Hydropower	19	95	2017/18	10	50
Hotel and tourism	1	5	2018/19	18	90
General insurance	2	10	2019/20	6	30
Life insurance	3	15	Total	43	215
Investment companies	1	5			
Manufacturing & processing[2]	1	5			
Total	43	**215**			

Panel C: Characteristics of IPO sample		
Descriptive measure	**Mean**	**Median**
Underpricing (%)	177.83	182.17
Offer price (Rs.)	104.65	100
Alpha[4] (%)	67.47	70.0
Size of issue (Rs. In million)	451.38	86.6

Note. (1) 'n' represents the number of IPOs as samples. Numbers such as '5' refers the 5-year data to Year t-1, Year t+0, Year t+1, Year t+2, and Year t+3. (2) Manufacturing and processing (MP) includes Shivam Cements Ltd., having an offer price of Rs. 300/- (Premium)[2]. (3) The study period from 2014/15 to 2019/20 covers the performance evaluation of firms one year before the issue, IPO year, and three consecutive years after the issue. It starts from 2013/14 and goes up to 2022/23. (4) Alpha represents the percentage of firm ownership reserved by the initial shareholders after IPO.

the data up to the end of 2019/20 allow evaluation of performance up to 2022/23. The sample observations include IPOs of equity shares that fulfil the criteria, such as: (1) the offer price was based on the fixed price method[1]; (2) the issue is not an IPO of a mutual fund or a unit issue; and (3) IPOs listed in the Nepal Stock Exchange Ltd. Post-issue operating performance was examined for *Years t+0, t+1, t+2, and t+3 after the IPO,* relative to *Year t–1*. Thus, the study considered a) one-year pre-issue data, b) IPO year data, and c) three consecutive years after-issue data, altogether five years of data. A total of 43 IPO firms with financial data for the immediate three years post-listing period were considered for the evaluation. Therefore, the total sample observations remained 215 observations for the period under study. The pre-issue year was marked as "*t–1* " and the IPO year as "*t+0*", and the after-issue years were marked as "t+1, t+2, and t+3" for the evaluation. The summary statistics for sample firms are exhibited in Table 1.

Panel A of Table 1 presents sector-wise numbers of firms, where the largest number of IPOs remains in the hydropower sector, followed by the microfinance sector. Similarly, Panel B reports that the majority of IPOs come out in the market during the year 2018/19. Panel C outlined the features of the IPO sample. The mean underpricing for the sample is 177.83 percent with a median of 182.17 percent. Mean issue proceeds by firms are Rs. 451.38 and median Rs. 86.6 million. The factor alpha signifies the proportion of firm ownership reserved by the initial shareholders after IPO, which is based on the postulation of over-allotment choices exercised. Mean (median) alpha is 67.47 percent (70.00 percent), indicating that the initial owners remain to hold a considerable ownership in the firm after the IPO.

The IPO firm-related data were collected using the following sources: (1) annual reports of IPO firms, for financial statement data; (2) the website of Share Sansar financial portal, for IPO price data; and (3) the website of Securities Board of Nepal (SEBON), for prospectus information. Further, macroeconomic data like gross domestic product were collected from the quarterly economic bulletin of the Central Bank of Nepal, and economic surveys of the Ministry of Finance. The study used original data obtained by the author from various sources mentioned above, and are available with the authors upon request.

1 The Securities Registration and Issuance Regulation, 2016 (2073 BS) Rule 42 states that the face value of securities shall, generally, be Rs. 100 per unit for a share. Thus, the study considers IPOs with a fixed offer price of Rs. 100 a share as per the existing regulation.

2 According to the Securities Issuance and Allotment Directives 2017 (Fifth amendment 2019), Rule No. 36 (2) states that the premium price of a public issue shall be the price which is two times the net worth per share of a firm based on its latest audited financial statements.

2.2. Variables measuring operating performance

Following Jain and Kini (1994), this study used proxies such as operating ROA, operating CF/TA, AT, sales growth, and the growth rate of CA as operating performance measures. Similarly, it followed ROS (Bruton et al., 2010; Hossain & Khan, 2021) as other measures of firms' operating performance used in this study.

Operating return on assets measures the efficiency of asset utilization by IPO firms. Similarly, operating cash flows deflated by total assets are a primary element in net present value calculations used to value a firm (Jain & Kini, 1994). The third measure is assets turnover, which measures the efficiency of asset utilization. Sales growth and growth rate of capital expenditure are the fourth and fifth measures of operating performance (Jain & Kini, 1994). Finally, the sixth measure is return on sales, which measures a firm's operational efficiency to generate operating profits (Bruton et al., 2010; Hossain & Khan, 2021). As the study analyzes both asset-scaled and sales-scaled variables, Shukla and Shaw (2018) argued that it controls for the natural bias in measurements.

This study has measured the mean and median changes in operating performance for pre- and post-periods. According to Jain and Kini (1994), the measures of operating performance may be skewed, where the mean is predominantly responsive to outliers; as such, the median is also used as a measure of summary statistics in the study.

2.2.1. *Independent samples t-test*

This test was used to test whether firms' operating performance after issuance has improved. The test was carried out by using both MS Excel and SPSS.

$$t = \frac{\overline{x_1} - \overline{x_2}}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}, \quad (1)$$

where $\overline{x_1} - \overline{x_2}$ are sample means, n_1 and n_2 are sample sizes, and s_p is the pooled standard deviation.

2.2.2. *Wilcoxon signed-rank test*

The Wilcoxon signed-rank test, a non-parametric test, is commonly employed in market-based studies. This test relaxes the assumption of symmetrical distribution of the mean operating performance (Becher, 2000). The Wilcoxon signed-rank test can be calculated as follows:

$$z = \left[T - \mu_T\right] / \sigma_T, \quad (2)$$

where $\sigma_T = \sqrt{\left[n(n+1)(2n+1)\right]/6}$, i.e., the standard deviation; T = the sum of the signed-rank values; μ_T = the population mean; and n = the number of positive and negative mean operating performance in the sample.

Table 2. Operating performance variables and measures

Variable	Measure
1. Operating return on assets	$\frac{Operating\ income\ before\ depreciation\ and\ tax}{Total\ assets}$
2. Operating cash flows to assets	$\frac{Operating\ income - Capital\ expenditures}{Total\ assets}$
3. Assets turnover	$\frac{Sales\ revenue}{Total\ assets}$
4. Sales growth	$(Ending\ sales - Beginning\ sales) / Beginning\ sales$
5. Capital expenditure growth	$(Ending\ cap\ \exp - Beginning\ cap\ exp) / Beginning\ cap\ exp$
6. Return on sales	$\frac{Net\ income}{Sales\ revenue}$

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2.2.3. Cross-sectional variations of post-issue operating performance of firms

Several factors relate to the firms' after-issue operating performance. Based on the review of literature, the relationship between operating performance changes in the after-issue and affecting factors has been established as follows:

$$\begin{aligned} OperPRF_{it} &= \alpha + \beta_1 \left(UnderPRI\right)_{it} \\ &+ \beta_2 \left(FirmSIZ\right)_{it} + \beta_3 \left(HOT\_DUM\right)_{it} \\ &+ \beta_4 \left(Alpha\right)_{it} + \beta_5 \left(FinLEV\right)_{it} \\ &+ \beta_6 \left(P/BVRatio\right)_{it} + \beta_7 \left(lnGDP\right)_{it} + e_{it}, \end{aligned} \quad (3)$$

where the *operating performance (OperPRF)* measures how well assets are used to generate revenue and thereby earnings. A firm's good operating performance can generate higher sales with few resources, and also a high level of cash inflows. It is measured based on the operating ROA *(OperROA)* and operating *CF/TA (OperCF/TA)* for Year t+ compared to the Year before IPO (Jain & Kini, 1994; Kim et al., 2004; Pereira & Sousa, 2017). *OperROA* and *OperCF/TA* are measured in percentage, and are the dependent variables in the study. *Underpricing (UnderPRI).* It is simply the first-day return of IPOs. More specifically, underpricing is defined as market-adjusted abnormal return. It is computed by the return from the IPO offer price to the first-day trading closing price, less the market return, in percentage (Kim et al., 1995). *Firm size (FirmSIZ)* indicates the scale on which a company operates. It is computed as the natural logarithm of total assets of the firm *(lnFirmSIZ)* at the time of IPO, as a percentage. *Hot market (HOT_DUM).* The IPO market is recognized as an extraordinarily large volume of offerings, severe underpricing, and oversubscription of IPOs, which is known as a hot market (Helwege & Liang, 2005). Hot market is a dummy variable, which is equal to "1" if a particular firm goes public during a hot issue period, or "0" if the firm goes public in a cold period. *Promoter ownership (Alpha).* The ownership of original shareholders after the issue in a company is known as promoter ownership. It is defined as the post-issue percentage of ownership held by the initial shareholders (Teti & Montefusco, 2021). *Financial leverage (FinLEV)* is an investment strategy using borrowed capital. A highly leveraged firm has more debt than equity. It is measured by the ratio of long-term debt to the market value of equity. The market value of equity is measured as the offer price multiplied by the number of shares outstanding after IPO, as a percentage. *Price-to-book value ratio (P/BVRatio)* assesses the relative valuation of a firm's stock. A price-to-book value ratio less than one refers to undervaluation of stocks in the market. It is measured by dividing the offer price by the book value per share (Sahoo & Rajib, 2010). *Gross domestic product (GDP)* is the market value of final goods and services produced within a country in a given time. It represents a country's economic health. Gross domestic product, measured as the natural logarithm of a country's nominal gross domestic product *(lnGDP)* before going public, in percentage. *e* refers to the unexplained residual error terms. Similarly, α is the intercept term, and β_1, β_2, β_3, β_4, β_5, β_6, and β_7 are the respective parameters of the explanatory variables to be estimated.

Operating performance and IPO stock performance relation. Following Chan et al. (2001), Singh and Jain (2018), Hossain and Khan (2021), and Zulfikar (2022), the present study tries to appraise the relationship between operating performance and IPO stock performance of firms. For IPO stock performance, buy-and-hold abnormal returns (BHAR) have been computed and considered as the dependent variable. All the post-issue operating performance indicators were employed as explanatory variables in the study. The estimated model is as:

$$\begin{aligned} BHAR_{iT} &= \alpha + \beta_1 \left(OperROA\right)_{it} \\ &+ \beta_2 \left(OperCF/TA\right)_{it} + \beta_3 \left(AssTurn\right)_{it} \\ &+ \beta_4 \left(SalesG\right)_{it} + \beta_5 \left(CE\_G\right)_{it} \\ &+ \beta_6 \left(ROS\right)_{it} + e_{it}, \end{aligned} \quad (4)$$

where $BHAR_{iT}$ = Buy-and-hold abnormal returns on offer price of firm *i* in period *T; T = 12-, 24-*, and *36*-month time period (months are defined as successive 18 trading-day periods relative to the IPO date); *OperROA* = operating return on assets, *OperCF/TA* = operating cash flows to assets, *AssTurn* = assets turnover, *SalesG* = sales growth rate, *CE_G* = growth rate of capital expenditures, *ROS* = return on sales, and *e* = unexplained residual error terms. Similarly, α is the intercept

term, and β_1, β_2, β_3, β_4, β_5, and β_6 are the respective parameters of the explanatory variables to be estimated.

The investment plan assumes that an IPO stock is received both at i) the offer price (O) and ii) the first-day closing price (C) (Bhatia & Singh, 2013; Jain & Kini, 1994) and is reserved in the portfolio over a period of 'T' months. The BHARs were found to be positive in the three years of the aftermarket. Following Sahoo and Rajib (2010), Perera (2014), and Killins (2018), BHAR can be measured by using the following equation:

$$BHAR_{iT} \prod_{t=1}^{T}\left(1+r_{it}\right)-\prod_{t=1}^{T}\left(1+r_{mt}\right), \quad (5)$$

where r_{it} = raw return for IPO stock i in the event month t; and r_{mt} = return for market m in month t.

3. RESULTS

Changes in firm operating performance. Panel A of Table 3 presents the t-stat (mean) and z-stat (median) values, presenting the change in operating ROA after IPO for diverse time windows. Values of t-stat and z-stat were all negative, and z-stat were all significantly different from zero at different levels, for *Years t+0* to *t+3* with respect to *Year t–1*. It indicates that there is a deterioration in operating performance of the firms by likening the year prior to IPO with the four successive years, including the IPO year, after the IPO event, both in mean and median comparisons. Hence, the substandard performance of IPO firms can be attributed to inefficient use of assets after going public. In Panel B, a similar pattern of noticeable decline in operating CF/TA for the IPO firms is observed, indicating that IPO firms cannot generate pre-issue levels of net present value (NPV) of projects. Another possibility is that if management is unable to sustain the mandatory levels of capital expenditures investing in growth opportunities. Alternatively, projects with positive NPV may have negative earnings initially; as a result, operating performance deteriorates while the investment is taking place.

Panel C of Table 3 shows assets turnover in a declining trend, which can be attributed to a slow increase in sales relative to the increase in firms'

Table 3. Parametric and non-parametric tests of operating performance measures after the completion of IPO

Measures of operating performance	Year relative to completion of IPO			
	From t–1 to t+0	From t–1 to t+1	From t–1 to t+2	From t–1 to t+3
Panel A: Operating return on assets				
t-stat	–0.526	–1.337	–1.416	–1.299
z-stat	–2.173**	–2.500**	–1.884*	–2.596***
Panel B: Operating cash flow to assets				
t-stat	0.935	–0.939	–1.533	–0.933
z-stat	–1.727*	–2.053**	–1.847*	–2.306**
Panel C: Assets turnover				
t-stat	–4.097***	–1.890*	–2.309**	–2.231**
z-stat	–4.226***	–3.505***	–2.624***	–2.723***
Panel D: Sales growth				
t-stat	–1.173	0.107	0.202	0.322
z-stat	–3.319***	–3.011***	–4.013***	–3.259***
Panel E: Growth in capital expenditures				
t-stat	1.305*	–0.918	1.281	–0.620
z-stat	–1.731*	–0.405	–1.004	–0.269
Panel F: Return on sales				
t-stat	–0.670	1.351	–0.059	–0.075
z-stat	–1.684*	–0.37	–1.351	–1.727*

Note: *** p < 0.01, ** p < 0.05, * p < 0.1. Values of t-stat are the values of the independent samples t-test, and z-stat values are the Wilcoxon signed-rank test for the samples of 43 IPO firms.

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assets. This can also be due to the failure in generating required levels of positive NPV from investment projects (Jain & Kini, 1994) and may be due to the underutilization of assets of IPO firms. Panel D reports the sales growth for Years t+0 through t+3, compared to Year t-1, in which test statistics are negative except in a few cases. Non-parametric test statistics clearly provide negative sales growth, which can be attributed to a decrease in revenue compared to pre-issue levels. This indicates that IPO firms were not able to maintain their operating efficiency as intended. Panel E also presents growth in capital expenditures relative to pre-issue levels, and the results advocate a substantial decline during post-issue periods. The decline in growth in capital expenditures can be attributed to spending less money on acquiring assets, implying a decrease in investments for future growth. In other words, a decline in capital expenditure growth rate can be attributed to a lack of growth opportunities for IPO firms. Alternatively, IPO firms may utilize proceeds from new issues in some other areas, such as paying down debt, or due to economic uncertainty. Decline in return on sales can be attributed to higher administrative costs, increased public scrutiny, and perhaps, the 'window dressing' of financials before the IPOs. Thus, if IPO firms begin with higher operating performance, they cannot continue to outperform after the IPO.

Sector-specific operating performance measures. Out of 43 firms, the microfinance and hydropower sectors consist of 14 IPOs and 19 IPOs, respectively, and the rest are from other sectors. For the purpose of assessing industry-specific operating performance, IPO firms from the microfinance and hydropower sectors have been measured separately, as presented in Table 4.

Microfinance sector firms have shown a declining operating performance after issuance. The declines in operating performance from *Year t+0* to *t+3* are all statistically significant, while the decline in capital expenditures growth is insignificant. This evidence implies that IPO firms from the microfinance sector are found to be weak in their operating performance, though they are comparatively smaller in size and have been operating continuously in the market. Additionally, the operating performance of hydropower sector firms is declining except in a few cases. But the deterioration in performance is not statistically significant except in a few cases.

Table 4. Parametric and non-parametric tests of operating performance measures after the completion of IPO for the microfinance and hydropower sectors

Panel A: Post-issue operating performance of microfinance firms (n = 14)

Measures of operating performance	Year relative to completion of IPO			
	From t–1 to t+0	From t–1 to t+1	From t–1 to t+2	From t–1 to t+3
Panel A: Operating return on assets				
t-stat	–3.173**	–1.961**	–1.521	–3.252***
z-stat	–2.417**	–2.668***	–1.664*	–2.731***
Panel B: Operating cash flow to assets				
t-stat	–3.820***	–1.943*	–1.658	–3.361***
z-stat	–2.856***	–2.731***	–1.726*	–3.045***
Panel C: Assets turnover				
t-stat	–4.847***	–1.512	–3.042***	–2.736**
z-stat	–3.296***	–3.296***	–2.605***	–2.291**
Panel D: Sales growth				
t-stat	–2.195**	–10.253***	–7.906***	–7.906***
z-stat	–3.296***	–3.296***	–3.296***	–3.296***
Panel E: Growth in capital expenditures				
t-stat	0.202	–0.264	–0.613	–1.384
z-stat	–0.459	–1.475	–0.973	–1.287
Panel F: Return on sales				
t-stat	–2.438**	–2.559**	–3.216***	–2.453**
z-stat	–2.417**	–2.605***	–2.542**	–2.417**

Table 4 (cont.). Parametric and non-parametric tests of operating performance measures after the completion of IPO for the microfinance and hydropower sectors

Panel B: Post-issue operating performance of hydropower firms (n =19)

Measures of operating performance	Year relative to completion of IPO			
	From t–1 to t+0	From t–1 to t+1	From t–1 to t+2	From t–1 to t+3
Panel A: Operating return on assets				
t-stat	1.021	–0.967	–0.896	–1.041
z-stat	–0.926	–0.684	–1.569	–1.972**
Panel B: Operating cash flow to assets				
t-stat	1.004	0.560	–0.914	–0.559
z-stat	–0.201	–0.604	–0.966	–0.926
Panel C: Assets turnover				
t-stat	–1.179	0.938	0.009	–0.098
z-stat	–1.244	–0.445	–0.549	–0.594
Panel D: Sales growth				
t-stat	1.007	1.148	–0.501	0.148
z-stat	–0.734	–1.274	–0.622	–1.245
Panel E: Growth in capital expenditures				
t-stat	1.313	–0.915	1.312	–0.611
z-stat	–1.274	–0.738	–1.444	–0.781
Panel F: Return on sales				
t-stat	–0.497	1.306	0.230	–0.008
z-stat	–0.663	–1.223	–0.784	–1.712*

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5. Multivariate regressions of post-issue operating performance of firms

Panel A: Dependent variable: Operating return on assets

Variable	Model 1	Model 2	Model 3	Model 4
	From –1 to 0	From –1 to +1	From –1 to +2	From –1 to +3
(Constant)	–0.482	–3.317	–5.444***	–4.272***
	(–0.029)	(–0.234)	(–3.624)	(–3.627)
UnderPRI	0.002	0.001	–0.003	–0.006
	(0.724)	(0.568)	(–0.508)	(–0.426)
HOT_DUM	–0.586	–0.451	0.088**	0.061*
	(–1.261)	(–1.138)	(2.090)	(1.861)
Alpha	0.006	0.009	–0.008	0.005
	(0.325)	(0.544)	(–0.095)	(0.040)
FinLEV	–0.001	–0.003	0.001	0.002
	(–0.037)	(–0.099)	(0.318)	(0.707)
P/BV Ratio	–0.063	–0.037	0.004	0.008
	(0.326)	(–0.224)	(0.215)	(0.553)
lnFirmSIZ	0056	0.032	–0.006	–0.006
	(0.362)	(0.244)	(–0.447)	(–0.546)
lnGDP	–0.019	0.176	0.365***	0.288***
	(–0.016)	(0.178)	(3.512)	(3.528)
R-square	0.062	0.055	0.314	0.307
Std. error of the estimate	1.061	0.905	0.095	0.075
DW	2.178	2.156	2.011	2.062
F-statistic	0.333	0.292	2.292**	2.215**

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Table 5 (cont.). Multivariate regressions of post-issue operating performance of firms

Panel B: Dependent variable: Operating cash flow over assets

Variable	Model 1	Model 2	Model 3	Model 4
	From –1 to 0	From –1 to +1	From –1 to +2	From –1 to +3
(Constant)	20.239	–14.141	–5.269***	–4.338*
	(0.073)	(–0.953)	(–2.990)	(–1.921)
UnderPRI	0.059	0.001	0.001	0.000
	(1.544)	(0.172)	(0.053)	(–1.570)
HOT_DUM	–8.370	–0.319	0.101**	0.080
	(–1.082)	(–0.771)	(2.048)	(1.266)
Alpha	–0.120	0.011	0.001	–0.001
	(–0.370)	(0.649)	(0.668)	(–0.222)
FinLEV	–0.069	0.003	0.002	0.002
	(–0.132)	(0.001)	(0.456)	(0.477)
P/BV Ratio	–1.029	0.036	0.001	0.028
	(–0.597)	(0.206)	(0.020)	(1.068)
lnFirmSIZ	1.398	0.006	–0.003	–0.006
	(0.547)	(0.040)	(–0.196)	(–0.288)
lnGDP	–2.274	0.893	0.343***	0.294*
	(–0.18)	(0.869)	(2.812)	(1.879)
R-square	0.107	0.078	0.289	0.161
Std. error of the estimate	17.664	0.945	0.112	0.143
DW	2.310	2.078	1.957	2.024
F-statistic	0.596	0.421	2.031**	0.957

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.

Cross-sectional regression of post-issue operating performance. Following Jain and Kini (1994), Kim et al. (2004), Pereira and Sousa (2017), and Hossain and Khan (2021), after-issue operating performance indicators such as operating ROA and operating CF/TA were taken as dependent variables. Underpricing, hot issue market, promoter ownership, financial leverage, price to book value ratio, firm size, and gross domestic product have been considered as explanatory variables.

The cross-sectional regressions show that the coefficient associated with underpricing is consistently positive using either measure of operating performance and insignificant in all regressions. However, with operating ROA as a dependent variable, the coefficient associated with underpricing is negative in *Year t+2* and *Year t+3* and generally insignificant. The present study further finds that the coefficient associated with the hot issue dummy is negative and insignificant in regression models 1 and 2, using either measure of operating performance. This result thus supports the windows of opportunity *hypothesis* of long-run IPO returns. However, the decline in firm operating performance can be sustained from *Year t+3*, rather than increasing.

Higher operating performance of firms is expected with higher ownership retained by the original shareholders (alpha) after the issuance relationship was established by the agency theory of Jensen and Meckling (1976) and the signaling hypothesis of Leland and Pyle (1977). The present study finds that the coefficients associated with alpha are inconsistent, both positive and negative, and all are insignificant, under either measure of operating performance[3]. The conflict between owner-managers and new investors increases, and then the performance of a firm could suffer. To sum up, the results do not provide evidence against agency theory. Another explanation of the linear relation between alpha and operating performance after issuance is that original entrepreneurs can *signal the quality* of the project by holding a major stake in the firm, since wrong representation can be troublesome (Leland & Pyle, 1977). Thus, the result of the present study can weakly support the signaling hypothesis. However, with operating

3 The lack of a positive and significant coefficient on alpha could be due to the absence of a linear relation between ownership retention (alpha) and operating performance, as well as different levels of agency problems, such as technological differences (Jain & Kini, 1994).

ROA and operating CF/TA as dependent variables, the coefficients associated with alpha are statistically insignificant in all regressions. Thus, the alterations in the equity stake after IPO did not direct to change in the firms' operating performance. This evidence can be attributed to the lesser presence of established corporate houses in the mainstream of the IPO market in Nepal.

The study shows that the coefficients of *financial leverage* and *price to book value ratios* report mixed results in either measure of operating performance and are insignificant in all regressions. However, the negative coefficients of explanatory variables with operating performance could be due to management's attempt to *window-dress* their financial statements before new issues. Management is supposed to attempt to manipulate investors' views by boosting pre-IPO profitability, resulting in lower post-IPO performance of firms. For gross domestic product, a proxy for the growth of the economy, the results are consistent in either measure of operating performance. More specifically, the coefficients associated with gross domestic product are positive and significant for the last two-time windows, implying higher operating performance with an increase in the economy's GDP. However, this association could not be confirmed since the post-issue operating performance has been declining.

Relationship of long-run IPO returns and post-issue operating performance. It is exciting to evaluate whether the long-run outperformance of IPO is due to better post-issue firm operating performance. In this regard, buy-and-hold abnormal returns based on offer price for 12-, 24-, and 36-month have been regressed on six explanatory variables such as (i) operating return on assets; (ii) operating cash flows to total assets; (iii) assets turnover; (iv) sales growth rate; v) growth rate of capital expenditures; and vi) return on sales. The results are presented in Table 6.

Table 6 exhibits the cross-sectional regression results of long-run IPO stock returns and firm operating performance after issuance. Among six operating performance indicators, only assets turnover and return on sales have a significant and positive relation to abnormal long-run

Table 6. Estimated relationship from cross-sectional regression of long-run IPO returns on post-issue operating performance indicators

Variable	Model 1		Model 2		Model 3	
	BHAR_12(O)	BHAR_12(C)	BHAR_24(O)	BHAR_24(C)	BHAR_36(O)	BHAR_36(C)
(Constant)	464.469***	5.418**	263.292*	1.925	298.961**	3.481**
	(3.555)	(2.630)	(1.873)	(1.298)	(2.206)	(2.479)
OperROA	–213.488	–3.658	–3699.142	–19.8558	–6190.342	52.339
	(–0.401)	(–0.435)	(–1.486)	(–0.756)	(–0.745)	(0.608)
OperCF/TA	192.502	3.7762	–118.417	0.804	2771.200	–45.422
	(0.376)	(0.468)	(–0.067)	(0.043)	(0.300)	(–0.475)
AssTurn	244.313	5.281	2761.272***	15.869	2402.490*	–0.413
	(0.758)	(1.039)	(2.908)	(1.583)	(2.559)	(–0.042)
SalesG	6.398	–0.268	22.401	0.780	181.467	–1.100
	(0.140)	(–0.373)	(0.249)	(0.822)	(0.775)	(–0.454)
CE_G	0.005	0.001	6.827	0.017	0.245	–0.006
	(0.165)	(0.091)	(0.476)	(0.113)	(0.221)	(–0.514)
ROS	30.755	0.685	704.544**	4.785	585.730	0.821
	(0.568)	(0.803)	(2.289)	(1.473)	(1.504)	(0.204)
R-square	0.038	0.065	0.231	0.098	0.232	0.037
Std. error of estimate	687.991	10.846	607.213	6.409	605.940	6.278
DW	1.817	1.936	2.082	2.417	2.150	2.440
F-statistic	0.240	0.414	1.804	0.649	1.812	0.230

Note: *** p < 0.01, ** p < 0.05, * p < 0.1. BHART = Buy-and-hold abnormal returns on offer price of firm i, T = 12-, 24, and 36-month time period, O = offer price, C = first-day closing price, OperROA = operating return on assets, OperCF/TA = operating cash flows deflated by assets, AssTurn = assets turnover, SalesG = sales growth rate, CE_G = growth rate of capital expenditures, ROS = return on sales, and e = unexplained residual error terms.

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IPO returns, in Models 2 and 3, based on the offer price. Asset turnover measures a firm's efficiency in generating sales from per rupee investment in assets. Therefore, after the issue when assets of the firm rise, sales are also likely to increase, signifying higher efficiency. Hence, IPO firms with a higher asset turnover ratio, after issue, are expected to realize a higher long-run market return. But this kind of significant relationship between assets turnover and long-run stock returns, based on list price, is not observed. The R-square values have been found to be low in all models, signifying that the explanatory power of these models is observed to be low. It indicates that long-run IPO returns are a fractional replication of the operating performance of firms over the long-run. In addition, Hossain and Khan (2021) advocate that the decline in operating performance is more noticeable for firms issuing equities in premium. This evidence can be attributed to the fact that investors generally do not care about a firm's operating performance when they trade in stocks, but rather, they are subject to fads. Thus, these results are against the standard theory of investments.

4. DISCUSSION

The study results show that the after-issue operating performance, mainly operating return on assets and operating cash flow to total assets have been deteriorating, indicating IPO firms are not able to generate pre-issue levels of net present value (NPV) of projects. Similarly, the assets turnover is also declining over the period under study. These results are similar to the study findings of Jain and Kini (1994), Chan et al. (2001), Khurshed et al. (2005), Boubaker and Mezhoud (2011), Pereira and Sousa (2017), and Hossain and Khan (2021), among others. Sales growth for *Years t+0* through *t+3* compared to *Year t-1*, in which test statistics are negative except in a few cases. Further, there is a substantial decline in capital expenditures relative to pre-issue levels, which can be attributed to a lack of growth opportunities for IPO firms. These results, thus, do not corroborate the findings of Jain and Kini (1994), Shukla and Shaw (2018), and others. Additionally, a decline in the post-issue return on sales of IPO firms is similar to the findings of Hossain and Khan (2021), who found a sharp decline in performance after issuance.

Microfinance sector firms have shown declining operating performance, and they are all statistically significant. The results imply that IPO firms from the microfinance sector are found to be weak in their operating performance after IPO, even if they are smaller in size. The operating performance of hydropower sector firms is also declining, but not statistically significantly. This evidence can be attributed to SEBON's approval of new issues of hydropower companies before their commercial production[4]. Consequently, some data is missing, for instance, revenue from operations for six IPO firms and the amount of capital expenditures in some cases, immediately after the IPO. International evidence shows an inferior operating performance relative to their pre-IPO levels, even if there is growth in sales revenue and capital expenditures over the time period studied (Jain & Kini, 1994). However, it is expected that operating performance will improve in the longer period because hydropower sector firms take some more time to commence their business operation.

Underpricing and operating performance show an insignificant association, indicating they provide evidence against the signaling hypothesis. This can be attributed to the conventional par value method[5] of IPO pricing in the Nepali stock market, which may or may not be below the intrinsic value[6]. Michaely and Show (1994) and Jain and Kini (1995) also found no support for the signaling hypothesis in their studies. The hot issue dummy and operating performance have a negative relation, which supports the *windows of opportunity hypothesis* of long-run

4 Securities Registration and Issuance Regulation 2016 Rule 9 3(j) states that "If it is a body corporate of manufacturing hydropower, it should have concluded a Power Purchasing Agreement" with Nepal Electricity Authority for the public issue of securities. It means hydropower firms go public before their commercial production in Nepal.

5 In Nepal, Securities Regulation and Issuance Regulation 2016 Rule 42 states the face value of a share is Rs. 100/-. Thus, it may not reflect or signal the quality of IPO firms.

6 Value of stock is measured based on an analysis of firm fundamentals such as financial performance, earnings potential, growth prospects, etc.

IPO returns. Ritter (1991) and Loughran and Ritter (1995) suggested that entrepreneurs who effectively issue IPOs over a high valuation period to take advantage of price swings in investor sentiment will not be able to continue in the future. They also argued that due to the existence of information asymmetry at the timing of IPO, naturally, there is a post-issue decline in operating performance. Additionally, the ownership retained by the original shareholders (alpha) after IPO is inconsistent; sometimes it is positive and negative too. Negative coefficients associated with alpha in either measure of operating performance lead to *agency costs* (Shukla & Shaw, 2018). Jensen and Meckling (1976) argued that due to 'separation of ownership and control,' agency costs arise in a public firm. Among six operating performance indicators, only assets turnover and return on sales have a significant and positive relationship with abnormal long-run IPO returns based on the offer price. Therefore, when assets of a firm rise, sales are also likely to increase, signifying higher operating efficiency. Hence, IPO firms with a higher assets turnover ratio are expected to realize a higher long-run market return after IPO.

CONCLUSIONS

The basic objective of this paper is to examine the operating performance of firms after their IPOs. Both parametric and non-parametric tests show a deteriorating operating performance of firms. Additionally, the operating performance of microfinance firms has significantly declined compared to hydropower firms. Explanatory variables such as the hot issue dummy and gross domestic product demonstrate a significant positive impact on the long-run returns of IPOs. The relationship between long-run IPO returns and the post-issue operating performance of firms is insignificant at all.

The major conclusion of this study is that IPO firms' operating performance went on decreasing irrespective of an increase in capital through IPO. This indicates the "window dressing" of firms' financials before IPO and inefficiency in utilizing their assets. Unlike international evidence, a decline in sales growth and capital expenditure indicates that the IPO firms do not utilize new issue proceeds for the main business to promote the operating performance of firms. Thus, IPO firms cannot maintain their pre-issue levels of performance in the aftermarket period. Compared to hydropower firms, there is a sharp decline in the operating performance of microfinance sector firms, which might be due to the weaker asset base of the firms, higher margin of default risks, and strict regulatory oversight of the central bank. Hydropower firms often receive policy incentives from time to time, since the government is promoting the hydropower sector in recent days. A negative relation between the hot issue market and operating performance suggests that entrepreneurs who successfully issue their IPOs over a high valuation period cannot continue in the future due to information asymmetry. In addition, the evidence of a weak relation between operating performance and long-run IPO returns, as in some earlier studies of emerging markets, suggests that stock returns in Nepal are also subject to fads. Policymakers, for example, SEBON should intervene for the effective utilization of issue proceeds from IPOs as per the claims made through their prospectuses that are publicly issued, ensure mandatory reporting of capital utilization, and incentivize transparency in post-issue operating performance of firms. Further, SEBON should reform IPO related policy of the hydropower sector, allowing it to go public only after the commercial production commences. Additionally, it is suggested to add the qualitative dimensions, like investor perceptions and management practices, in future studies of this kind.

This study has some limitations. Financial statements of merged or acquired IPO firms have not been found in the data sources, so the sample size is limited to 43. The government policy of new issue of shares prior to the commercial production of hydropower firms led to the absence of some important sales data in the financial statements. The study also excludes the effect of seasoned equity offerings, issued at a time when market prices become higher, which clearly observes and reveals firm performance.

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AUTHOR CONTRIBUTIONS

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Formal analysis: Jas Bahadur Gurung.
Funding acquisition: Jas Bahadur Gurung, Dilli Raj Sharma.
Investigation: Jas Bahadur Gurung, Dilli Raj Sharma.
Methodology: Jas Bahadur Gurung, Dilli Raj Sharma.
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