

LONG-RUN PERFORMANCE

of backdoor-listed firms

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We examine the long-run performance of a sample of firms going public through backdoor listing on the ASX during the 1994–2013 period. When benchmarked with a control sample of IPOs, backdoor-listed firms underperformed in the aftermarket. Over the three years after listing, they raised less equity capital and were less profitable and more financially distressed than their IPO counterparts. They also performed poorly in terms of buy-and-hold returns against the matched IPO firms and broad-based market indices. Our results tend to corroborate findings in the US and Canada but are inconsistent with their assertion that lax regulatory oversight is the major cause of underperformance since Australian backdoor listings have to comply with essentially the same listing requirements as IPOs.

Backdoor listings (BDL), in which a private firm achieves a listing status via the corporate shell of an already listed company, have been highly prevalent in capital markets around the globe including in Australia in recent decades. Evidence presented by Ferguson and Lam (2015) shows BDLs represent 13 per cent of all firms going public during the 1994–2014 period. Indeed, BDLs accounted for close to 30 per cent of all going-public transactions at the height of the global financial crisis in 2009, making them a real alternative to listing through the front door (via an initial public offering, IPO).

Despite their popularity, backdoor listings have been met with scepticism, and widely seen as being high risk and inferior in quality. For instance, the recent surge in high-tech BDL activity using the shells of failing junior explorers has attracted warnings from the corporate regulator.¹ Anecdotal evidence on the poor performance of backdoor-listed firms also abounds in the media, urging investors to be cautious.² Empirical studies on the US market (e.g. Gleason et al. 2006; Adjei et al. 2008) and Canadian market (e.g. Carpentier et al. 2012) have found BDLs underperform their IPO counterparts in the aftermarket. They generally attribute this underperformance to the lax regulations and oversight over the backdoor listing process in those markets.

In contrast to other markets, Ferguson and Lam (2015) find the vast majority (roughly 75 per cent) of Australian BDLs are required by the Australian Securities Exchange (ASX) to re-comply with the listing requirements, including Listing Rules Chapter 1 and 2 and a long-form prospectus, before the merged entity can be re-admitted to quotation. This unique regulatory setting makes backdoor listings in Australia very similar to the IPO process. Because of the more stringent requirement imposed on BDLs in Australia, it is conceivable that their aftermarket performance would be comparable to that of the front-door listed firms. After all, they also have to meet either the profit or asset test as their IPO counterparts do. This paper examines the long-run performance of ASX-listed BDLs to shed light on this issue.

Data and method

In defining backdoor listings, it is critical that the owners of the private firm gain control of the listed shell entity through a reverse takeover; otherwise, the transaction is merely a change in the nature or scale of the business of the shell (Brown et al. 2013). We adopt the same procedures as Ferguson and Lam (2015) in identifying an initial sample of completed BDLs over the 1994–2013 period through newspaper search and examination of related corporate announcements made by the listed shell companies. Because of the need to examine long-run (three years) performance after listing, we exclude BDLs that were completed after December 2013. We further restrict our sample to firms in the non-financial sector as financial firms typically have distinctive

characteristics and financial statement items. Pooling them together with non-financial firms would render the interpretation of results difficult. Applying these procedures leaves a total of 251 BDLs in our final sample. For benchmarking purposes, we construct a control sample of IPOs based on information available on the Connect4 database. Specifically, we match every BDL case in the sample with one IPO based on year of listing, industry sector (2-digit GICS code) and size (total assets).³

Table 1 presents the distribution of our BDL sample by year and industry sector. The annual number of non-financial BDLs has largely been maintained at double-digit figures over the 20-year period, except for the earlier years before the dotcom era. The number peaked in 2000 with a total of 29 BDLs in that year alone. By industry breakdown, Materials (20.3 per cent of all cases), Information Technology (18.3 per cent) and Health Care (13.5 per cent) are the three most popular sectors for backdoor listings while Utilities (0.4 per cent) and Consumer Staples (3.2 per cent) are the least popular. It is interesting to note while the Materials sector is the largest supplier of shells for technology companies to go public through the backdoor, it is also the largest user of shells in the backdoor-listing process.

TABLE 1: Distribution of BDL sample by year and industry sector

Year	GICS Sector									All sectors
	Energy	Materials	Industrials	Consumer discretionary	Consumer stable	Health care	Information technology	Telecom-munication	Utilities	
1994	0	2	2	1	0	0	1	2	0	8 (3.2%)
1995	0	0	2	0	0	0	3	0	0	5 (2.0%)
1996	0	0	2	0	1	0	2	0	0	5 (2.0%)
1997	1	2	0	0	0	1	1	0	0	5 (2.0%)
1998	0	2	2	1	1	0	0	1	0	7 (2.8%)
1999	0	0	1	4	0	1	6	1	0	13 (5.2%)
2000	1	0	2	5	0	3	13	5	0	29 (11.6%)
2001	0	2	2	1	2	3	2	2	0	14 (5.6%)
2002	0	1	3	3	1	6	3	2	0	19 (7.6%)
2003	0	3	3	2	0	4	5	2	0	19 (7.6%)
2004	1	3	1	2	0	7	3	1	1	19 (7.6%)
2005	1	1	3	2	0	1	2	1	0	11 (4.4%)
2006	2	1	2	1	0	2	1	1	0	10 (4.0%)
2007	2	4	0	2	1	0	0	0	0	9 (3.6%)
2008	2	5	1	1	0	1	0	0	0	10 (4.0%)
2009	4	6	2	1	0	0	1	0	0	14 (5.6%)
2010	4	4	1	2	0	1	1	1	0	14 (5.6%)
2011	7	5	1	0	0	1	1	1	0	16 (6.4%)
2012	2	5	0	0	2	1	0	0	0	10 (4.0%)
2013	3	5	1	2	0	2	1	0	0	14 (5.6%)
All years	30	51	31	30	8	34	46	20	1	251
	(12.0%)	(20.3%)	(12.4%)	(12.0%)	(3.2%)	(13.5%)	(18.3%)	(8.0%)	(0.4%)	(100%)

To gauge their aftermarket performance, we examine four facets of these backdoor-listed firms, including their access to capital, operating performance, survival status, and stock market performance. Data on capital raisings and survival status are manually collected from Morningstar's *DatAnalysis* database. Data on accounting variables for computing operating performance are retrieved from Morningstar's *Aspect Financials* database, while stock price data are from the *Share Prices and Price Relatives (SPPR)* database of SIRCA.

Access to capital

Companies need capital for growth and expansion. Being able to access the market for equity capital is one of the major reasons for private firms to go public. Since capital is relatively scarce, the ability of firms to attract capital can be used as a gauge of their underlying performance and future prospects as perceived by the market. Table 2 reports the aggregate access to equity capital by the sample of BDL firms in the three years following going public. Both the frequency and dollar amount of the capital raisings are reported, with details partitioned by the type of issue and year.⁴ For comparison purposes, similar data for the matched IPO sample is also reported.

At the time of the going-public transaction, BDL firms raised a lot less equity capital than their IPO counterparts. A total of 165 BDL firms (out of 251) conducted one or more forms of equity issue, raising aggregate cash proceeds of \$1,468 million (an average of \$5.8 million per firm). The median BDL firm raised \$2.2 million at listing. By issue type, public offers (\$692 million) and private placements (\$663 million) are the predominant forms of capital raisings. Shareholders participated in 13 rights issues conducted by the BDL firms, contributing a total of \$112 million. Two BDL firms also raised capital through share purchase plans (\$0.7 million) from their existing shareholders. In contrast, 250 matched IPO firms raised an aggregate of \$5,749 million from public offers at the time of going public,⁵ with average proceeds of approximately \$22.9 million per offer and a median offer size of \$10.5 million. This amount raised is roughly 3.9 times the total capital raised in BDL going-public transactions from all issue types.

Over the three-year period after listing, BDL firms seem more active in accessing capital, raising a total of \$5,726 million as compared to \$3,885 million by the matched IPO sample. Moreover, this difference in capital raising activity is mainly observed in the first year after going public. Counting all capital raised during the going-public transaction and the subsequent three years in the aftermarket, the BDL sample still raised less capital (\$7,194 million) than the control sample of IPO firms (\$9,634 million). By issue type, private placements made up close to 70 per cent of all proceeds raised by BDL firms, followed by rights issues (16.1 per cent) and public offers (12.2 per cent). For the matched IPO sample, public offers accounted for 60.9 per cent of all proceeds raised. Private placements are also a significant component of capital raisings for the IPO sample in subsequent years (31.6 per cent), with rights issues accounting for 5.5 per cent of all proceeds raised.

Overall, results suggest BDL firms tend to raise the bulk (42.5 per cent) of their equity capital in the year following their going-public transaction, predominately through private placements. In contrast, the matched IPO firms raised the majority of their proceeds (59.7 per cent) during their initial public offers. This evidence is consistent with the claim (e.g. Kuo and Humphrey 2002) that BDLs generally lack the publicity and marketing event associated with an IPO, making them less able to raise capital in the going public process.

TABLE 2: Capital raisings by BDL and matched IPO firms

Panel A: Breakdown by issue type												
	BDL					IPO						
	Go public	Year 1	Year 2	Year 3	Years 1-3	Total	Go public	Year 1	Year 2	Year 3	Years 1-3	Total
Public offer	692.0	167.0	1.1	15.5	183.6	875.5	5748.7	29.2	76.1	14.6	119.9	5868.6
N > 0	(100)	(17)	(2)	(6)			(250)	(5)	(2)	(2)		
Private placement	663.3	2539.8	951.4	849.7	4340.9	5004.2	0	965.8	822.1	1255.4	3043.3	3043.3
N > 0	(77)	(125)	(118)	(107)			(0)	(50)	(105)	(82)		
Rights issue	111.8	321.2	108.7	613.8	1043.7	1155.5	0	170.5	228.5	132.4	531.4	531.4
N > 0	(13)	(25)	(29)	(31)			(0)	(10)	(27)	(24)		
Share purchase plan	0.7	27.0	39.4	55.3	121.7	122.4	0	17.1	16.2	58.5	91.8	91.8
N > 0	(2)	(14)	(15)	(23)			(0)	(11)	(9)	(19)		
Dividend reinvestment plan	0	3.0	15.9	17.2	36.1	36.1	0	10.6	14.4	73.7	98.7	98.7
N > 0	(0)	(4)	(9)	(9)			(0)	(15)	(18)	(13)		
Total	1467.7	3058.0	1116.6	1551.4	5726.0	7193.7	5748.7	1193.2	1157.3	1534.5	3885.0	9633.7
N > 0	(165)	(146)	(135)	(126)			(250)	(74)	(124)	(107)		
Panel B: Summary statistics by year												
	BDL					IPO						
	N > 0	Mean	Median	SD	Min	Max	N > 0	Mean	Median	SD	Min	Max
Go public	165	5.8	2.2	12.4	0	141.6	250	22.9	10.5	44.3	0	409.6
Year 1	146	12.2	0.9	75.7	0	1177.0	74	4.8	0	37.2	0	560.4
Year 2	135	4.5	0.5	13.9	0	171.5	124	4.6	0	12.2	0	114.3
Year 3	126	6.4	0.2	25.8	0	294.1	107	6.2	0	30.5	0	332.9
All	229	28.7	10.9	84.6	0	1191.4	250	38.4	16.4	69.6	0	562.8

Notes: Capital raisings are expressed in millions of dollars, converted to 2015 constant dollar terms using the Consumer Price Index (all capital cities) published by the Australian Bureau of Statistics. Numbers in parentheses represent the number of firms with capital raisings in a particular issue type or year.

Operating performance

We employ two measures of firm size (market value of equity and total assets) and a total of eight accounting-based metrics to gauge the operating performance of BDL firms for up to three financial years after listing. Various performance attributes, including growth potential (*MTB*), profitability (*ROA*, *ROE* and *NPM*), balance sheet liquidity (*CASH*), leverage (*LEV*), retained earnings (*RE*) and financial distress (Altman's *Z*-score), are explored. Market-to-book ratio (*MTB*) is measured as market capitalisation divided by book value of equity. Return on assets (*ROA*) is income before interest and tax divided by total assets. Return on equity (*ROE*) is net income divided by book value of equity. Net profit margin (*NPM*) is net income divided by sales revenue. *CASH* is cash and cash equivalents divided by total assets. *LEV* is total debt divided by total assets. *RE* is retained earnings divided by total assets. Altman's *Z*-score is a proxy for financial distress, as discussed in Altman (1968).

Table 3 presents results on the operating performance of the backdoor-listed firms, along with the corresponding measures for the matched IPO sample. In almost all of the measures examined, the large discrepancy observed between the mean and median values indicates the distribution of these metrics is highly skewed and non-normal. Because of this reason, our analysis and inference are based primarily on the median value, instead of the mean, as the measure of central tendency for the two samples.

TABLE 3: Operating performance of BDL and matched IPO firms

	Level			Year-on-year change		
	BDL Mean Median (1)	IPO Mean Median (2)	BDL – IPO <i>t</i> -stat Wilcoxon <i>Z</i> (3)	BDL <i>t</i> -stat Wilcoxon <i>Z</i> (4)	IPO <i>t</i> -stat Wilcoxon <i>Z</i> (5)	BDL – IPO <i>t</i> -stat Wilcoxon <i>Z</i> (6)
Panel A: Post-listing year 1						
MVE (\$m)	67.58	80.96	-0.55			
	17.19	21.81	-2.19**			
Assets (\$m)	79.26	70.42	1.20			
	19.76	20.79	-0.71			
MTB	2.35	2.75	-0.55			
	1.12	1.44	-3.11***			
ROA	-2.94	-0.61	-0.96			
	-0.17	-0.07	-4.74***			
ROE	-1.27	-0.41	-1.38			
	-0.22	-0.08	-4.68***			
NPM	-65.45	-279.28	1.26			
	-0.95	-0.10	-2.73***			
CASH	0.21	0.29	-3.66***			
	0.12	0.19	-3.52***			
LEV	0.40	0.39	0.05			
	0.22	0.25	-0.08			
RE	-5.00	-1.26	-1.50			
	-0.73	-0.13	-7.54***			
Altman's <i>Z</i>	-4.82	9.58	-1.25			
	1.96	3.61	-3.31***			
Panel B: Post-listing year 2						
MVE (\$m)	68.60	83.74	-0.99	-0.01	0.30	-0.13
	14.09	20.62	-2.53**	-0.24	0.43	-0.39
Assets (\$m)	79.57	81.28	-0.20	-0.61	2.73***	-1.99**
	18.10	21.84	-2.23**	-2.23**	2.34**	-2.76***
MTB	1.84	3.04	-1.06	-0.47	0.65	-0.74
	1.22	1.39	-2.21**	0.20	-0.10	-0.51
ROA	-30.64	4.06	-1.15	-0.93	0.90	-1.07
	-0.18	-0.11	-2.16**	-0.36	-3.90***	1.56

	Level			Year-on-year change		
	BDL Mean Median (1)	IPO Mean Median (2)	BDL – IPO <i>t</i> -stat Wilcoxon <i>Z</i> (3)	BDL <i>t</i> -stat Wilcoxon <i>Z</i> (4)	IPO <i>t</i> -stat Wilcoxon <i>Z</i> (5)	BDL – IPO <i>t</i> -stat Wilcoxon <i>Z</i> (6)
Panel B: Post-listing year 2 (cont.)						
ROE	-2.734	4.43	-1.13	-1.19	0.90	-1.01
	-0.27	-0.13	-2.36**	-1.28	-4.09***	0.90
NPM	-45.22	-140.19	0.02	0.88	1.26	-0.85
	-0.63	-0.22	-2.01**	2.40**	-0.49	1.19
CASH	0.23	0.25	-1.43	0.70	-3.33***	2.56**
	0.12	0.18	-1.55	-0.90	-4.08***	1.97**
LEV	3.08	0.76	1.09	1.32	0.91	1.08
	0.25	0.27	1.36	4.32***	4.02***	1.37
RE	-91.38	-5.06	-1.45	-1.45	-1.47	-1.39
	-1.24	-0.31	-6.19***	-5.92***	-7.38***	-1.27
Altman's <i>Z</i>	-214.29	17.67	-1.36	-1.23	0.47	-1.27
	1.16	3.25	-3.80***	-3.16***	-2.99***	-1.01
Panel C: Post-listing year 3						
MVE (\$m)	69.82	102.11	-1.46	-0.18	2.28**	-2.09**
	13.03	19.70	-1.74*	-0.38	0.18	-0.84
Assets (\$m)	93.21	101.64	-0.55	1.95*	1.91*	-0.59
	17.84	20.76	-0.61	1.17	0.98	0.76
MTB	120.62	3.69	0.98	0.98	0.78	0.98
	1.19	1.34	-2.32**	-0.83	0.34	-1.19
ROA	-2.38	-0.61	-0.49	0.95	-0.91	1.13
	-0.17	-0.14	-1.07	-0.48	-3.00***	1.41
ROE	-0.07	-2.05	1.16	0.70	-1.23	1.26
	-0.24	-0.17	-0.76	-0.70	-2.50**	0.43
NPM	-194.48	-77.12	-1.03	-0.46	-0.54	-0.19
	-0.48	-0.32	-2.26**	-0.23	-0.06	0.01
CASH	0.24	0.24	0.62	0.79	-1.41	1.89*
	0.15	0.13	0.16	0.99	-2.18**	1.67*
LEV	1.94	0.46	1.67*	-0.36	-0.73	-0.42
	0.33	0.34	0.40	3.04***	3.79***	-0.34
RE	-263.84	-2.95	-1.18	-0.94	0.88	-0.93
	-1.52	-0.42	-4.40***	-4.75***	-6.23***	-1.00
Altman's <i>Z</i>	-365.52	5.85	-1.20	-0.53	-0.71	-0.46
	0.71	2.47	-3.55***	-2.45**	-2.89***	-0.32

Note: The dollar amount for market value of equity (MVE) and total assets (Assets) have been converted to 2015 constant dollar terms. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Levels analysis

Table 3 shows firms going public through the backdoor are relatively small in size, with a mean (median) market capitalisation of \$67.6m (\$17.2m) and total assets of \$79.3m (\$19.8m) by the end of the first financial year after listing. Compared with the matched IPO sample, BDL firms have a significantly lower median MVE (at the 5 per cent level) in year 1, which persists into the second and third year. In terms of total assets, firms from the two samples are not statistically different in both the mean and median value of ASSETS in the first year. This suggests we have a reasonable matching of BDL and IPO firms in terms of total assets. In year 2 after listing, the BDL sample exhibits a significantly smaller median value of ASSETS than the IPO sample, but the difference disappears in the third year after listing.

Based on median values, all eight performance measures of the BDL firms (column 1) are consistently lower than those of the matched IPO firms (column 2). This indicates BDL firms generally have lower growth potential and are less profitable, less liquid, and more financially stressed than their IPO counterparts. The Wilcoxon signed-rank test of difference in median values (column 3) confirms that in the first year post-listing, all of the operating performance measures, except for *LEV*, are significantly different (two-tailed test) at the 1 per cent level. In year 2 after listing, the median value of all but the *CASH* and *LEV* measures are significantly different between the two groups. In year 3, BDL firms are significantly lower than the IPO control sample in terms of *MTB*, *NPM*, *RE* and Altman's *Z*-score only but not the other measures. Overall, BDL firms seem to have underperformed their IPO counterparts consistently on growth potential (*MTB*), profitability measures (*ROA*, *ROE* and *NPM*), retained earnings (*RE*) and financial distress measure (Altman's *Z*-score). The only favourable sign is they tend to be comparable with their IPO counterparts in terms of leverage (all three years) and balance sheet liquidity (in years 2 and 3), consistent with relatively more capital raising activity conducted by BDL firms in subsequent years.

Year-on-year changes

We conduct additional tests to investigate the year-on-year changes in these accounting measures over time. Results from Table 3 (column 4) show in the second year post-listing for the BDL sample, the change in both *ROA* and *ROE*, though still negative, is no longer significant at conventional levels. Moreover, the change in *NPM* becomes positive and statistically significant (at the 1 per cent level). BDL firms are experiencing an increase in *LEV* and a deteriorating *RE* and Altman's *Z*-score. In year 3, except for a significant increase in *LEV* and worsening *RE* and financial distress measure, no significant decline in the other operating measures can be detected.

Compared with their BDL counterparts, IPO firms tend to exhibit a different pattern of changes in operating performance. Column 5 of Table 3 reveals that in both the second and third year of operations, IPO firms suffer a significant drop in *ROA* and *ROE*, increase in leverage, and a worsening accumulated losses and Altman's *Z*-score measure. There is also a significant drop in balance sheet liquidity, which is not seen in the BDL sample. This declining trend in *ROA*, *ROE* and *CASH* is in contrast to the trend observed for the BDL firms. In column 6, we report results for testing differences in the year-on-year change in accounting measures between the BDL and IPO control firms. The only statistically discernible difference is the improvement in balance sheet liquidity for the BDL sample relative to the IPO firms in both years 2 and 3. This is again consistent with the findings that BDL firms are more active in accessing the equity market for capital in the post-listing years.

In sum, results from Table 3 show BDL firms underperform in terms of operating measures in the aftermarket when compared to the IPO control firms. Nevertheless, evidence also suggests the operating performance of BDL firms tends to improve (or at least stop deteriorating) over longer horizons, as compared to their IPO counterparts. The year-on-year results are in contrast to those reported by Gleason et al. (2006), which indicate a continued significant decline in *ROA*, *ROE* and balance sheet liquidity of US reverse takeover firms over the two years after going public. One implication of our results is that the poorer operating performance of the BDL firms in the years post-listing is partly a reflection of the performance gap that exists at the time of going public. Judging from the year-on-year changes, the operating performance of IPO firms deteriorates more than that of the BDL firms in the aftermarket.

Survival status

We report the long-run survival status of the BDL and IPO sample firms in Table 4. Within the three-year period after listing, the same number (19 or 7.6 per cent) of BDL and matched IPO firms were de-listed from the official list of ASX. A breakdown of the reasons for de-listing indicates one firm from each of the two groups was taken private, three (two) of the BDLs (IPOs) de-listed were related to financial distress, with the remaining de-listing cases occurring following compulsory acquisition by or merger through a scheme of arrangement with other firms. This is in sharp contrast to Adjei et al. (2008), who report a de-listing rate of 31 per cent (4 per cent) by the end of the 12-month and 43 per cent (27 per cent) by the end of the 36-month period (for negative reasons) from their US reverse mergers (IPO) sample. The evidence seems to suggest the more stringent regulatory requirement for backdoor listing on the ASX has resulted in a lower failure rate in terms of de-listing from the exchange.

TABLE 4: Survival status of BDL and matched IPO firms

	Frequency counts				Cumulative unique firms					
	Year 1	Year 2	Year 3	Years 1-3	Year 1	Cum. %	Year 2	Cum. %	Year 3	Cum. %
Panel A: BDL firms										
De-listed	2	8	9	19	2	0.8%	10	4.0%	19	7.6%
Acquired	1	6	8	15	1	0.4%	7	2.8%	15	6.0%
RTO	0	2	3	5	0	0.0%	2	0.8%	5	2.0%
Administrator/receiver	4	3	7	14	4	1.6%	7	2.8%	14	5.6%
Going concern	61	74	83	218	61	24.3%	98	39.0%	120	47.8%
Distressed	118	130	124	372	118	47.0%	160	63.7%	183	72.9%
Panel B: Matched IPO firms										
De-listed	0	7	12	19	0	0.0%	7	2.8%	19	7.6%
Acquired	2	8	13	23	2	0.8%	10	4.0%	23	9.2%
RTO	0	4	8	12	0	0.0%	4	1.6%	12	4.8%
Administrator/receiver	3	3	6	12	3	1.2%	6	2.4%	12	4.8%
Going concern	46	55	52	153	46	18.3%	75	29.9%	90	35.9%
Distressed	72	83	83	238	72	28.7%	107	42.6%	129	51.4%

Notes: De-listed means being removed from the official register of ASX. Acquired is taken over by another company. RTO is reverse takeover. Administrator/receiver is when firms are under voluntary administration or receivership. Going concern is a qualified or modified audit opinion as to the continuation of a firm as a going concern. Distressed is financial distress based on a firm's Altman's Z-score falling below 1.81.

BDL firms seem to have a lower tendency than their IPO counterparts to be targeted in mergers and acquisitions activity. A total of 15 BDLs, versus 23 matched IPOs, were acquired in takeovers in the first three years. We note all the BDLs that were taken over proceeded to compulsory acquisition and de-listing while only 16 out of the 23 IPOs acquired did so. The higher rate of IPOs being takeover targets may indicate they are higher quality firms or in possession of more attractive assets than firms that went public through the back door. This conjecture seems to be supported by further data analysis which reveals the subsample of IPOs being taken over has higher profitability (ROA, ROE and NPM) and growth potential (MTB) than the subsample of BDLs acquired, both in terms of mean and median measures, though no formal statistical significance has been assessed because of the small sample size. IPO firms are also more active on the reverse takeover front, with 12 of them being targeted as shells in backdoor listings as compared with only five from the BDL sample.

We also examine how well firms survive in terms of their financial health in the aftermarket. A clear sign of financial trouble is when an administrator or receiver is appointed to a firm or its subsidiaries. In this regard, a total of 14 (or 5.6 per cent) cases from the BDL sample, in contrast to 12 (or 4.8 per cent) cases from the IPO control sample, were under administration or receivership at some point in time during the three-year period. Firms that are not under administration may still be subject to financial distress to various extents. Within the three years after listing, there were 120 (or 47.8 per cent) and 90 (or 35.9 per cent) unique firms in the BDL and IPO sample, respectively, which received at least one going concern qualification from auditors.⁶ In terms of the total number of qualifications, the BDL sample has an aggregate of

218 instances, while the IPO sample has 153. As another indicator of financial trouble, we follow Altman (1968) and classify firms with a Z-score of below 1.81 as being under distress. Table 4 shows a total of 183 (or 72.9 per cent) BDL firms fell under this category, as compared with 129 (or 51.4 per cent) firms in the matched IPO sample. Overall, the evidence tends to suggest a larger proportion of BDL firms are under financial distress than their IPO counterparts.

Stock market performance

As our last performance measure in the aftermarket, we examine buy-and-hold abnormal returns (BHARs) of backdoor-listed firms. Following Ritter (1991), Spiess and Affleck-Graves (1995) and others in the literature, long-run holding-period returns are calculated for each firm for up to three years (36 months) after the completion of the BDL transaction. Three performance benchmarks are employed for computing the BHARs. These benchmarks represent the corresponding holding-period returns on (1) the matched IPO firms, (2) the *SPPR* value-weighted market index or VMI, and (3) the *SPPR* equal-weighted market index or EMI. For each BDL firm i , the buy-and-hold abnormal return (benchmark-adjusted) for each holding interval T in the post-listing period is calculated as the difference between its buy-and-hold return and the corresponding buy-and-hold return of the benchmark:

$$BHAR_{i,T} = \prod_{t=1}^T \left(\frac{P_{i,t}}{P_{i,t-1}} \right) - \prod_{t=1}^T \left(\frac{B_t}{B_{t-1}} \right),$$

where $P_{i,t}$ is the closing stock price of firm i in month t , B_t is the closing price of the benchmark in month t , and T is the duration of the holding period ranging from 1 to 36 months after listing. Note that the matched IPO benchmark would be subject to the same missing observation problem as their BDL peers, but the two market-wide benchmarks are not affected.⁷ To compute an average buy-and-hold abnormal return across the sample of BDL firms, we employ both an equal-weighted (EW) scheme and a value-weighted (VW) scheme based on the market capitalisation of the BDL firms at the time of going public.

Figures 1 and 2 plot, respectively, the EW and VW long-run buy-and-hold abnormal returns for the BDL firms in the sample. One striking pattern revealed is that all three measures of BHARs are predominantly negative over the three-year period, except perhaps for the first six (EW) and 15 (VW) months against the matched IPO benchmark. Benchmarking against the matched IPO sample and the EMI produces the least and most negative returns, respectively, with the VMI-adjusted BHARs lying in between. Specifically, by the end of the 36-month period, the equal-weighted BHARs are -22.9 per cent, -67.0 per cent and -86.1 per cent and the value-weighted BHARs are -13.4 per cent, -49.0 per cent and -65.0 per cent against the matched IPO, VMI and EMI benchmarks, respectively. Recall that the IPO control sample is constructed by matching on year, industry and size. In addition, both BDL and IPO firms represent firms that are newly listed. Thus a smaller BHAR would be expected using matched IPO firms as a control. Holding-period returns for the EMI are tilted towards smaller firms because of the equal-weighted scheme used. Due to the survivorship problem inherent in constructing market indices, the return on the EMI would tend to be biased upward, making it a tougher benchmark to beat. VMI, on the other hand, would be dominated by larger firms and so the benchmark return would tend to be more moderate.

FIGURE 1: Equal-weighted average buy-and-hold abnormal returns of backdoor-listed firms

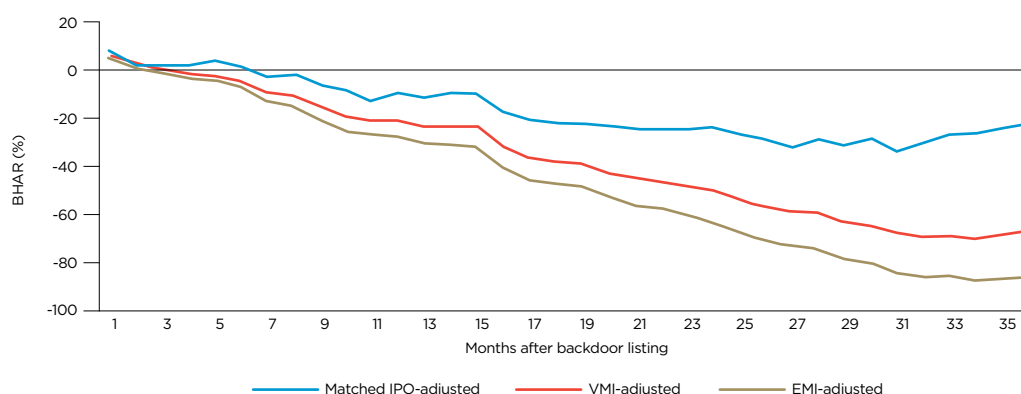
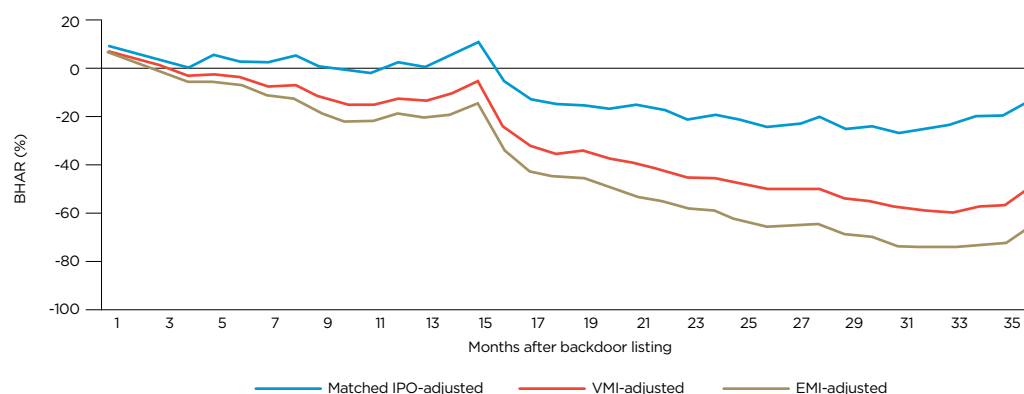


FIGURE 2: Value-weighted average buy-and-hold abnormal returns of backdoor-listed firms



Note: Value weights are based on the market capitalisation of backdoor-listed firms at time of going public.

To ascertain if BDL firms underperform their IPO control firms in terms of buy-and-hold returns, we test if the BHARs (IPO adjusted) by the end of 12, 24 and 36 months are significantly different from zero. Table 5, which reports test results (two-tailed tests) on both the mean and median weighted BHARs, reveals all but the mean 12-month value-weighted BHAR are negative in sign. Tests of sample means indicate the equal-weighted BHAR is significantly different from zero for the 24-month (at the 1 per cent level) and 36-month (at the 10 per cent level) holding period while the value-weighted BHAR is only marginally significant (at the 10 per cent level) for the 24-month holding period only. On the other hand, median tests suggest BHARs are significantly different from zero for both equal- and value-weighted measures and for all three holding periods. These test results are, however, inconsistent with Gleason et al. (2006) who essentially find no significant difference in mean and median buy-and-hold returns between reverse takeover firms and IPO control firms in the US market. We interpret our results as evidence of long-run underperformance of Australian BDL firms relative to the matched IPO sample.⁸ Yet, there are also signs that the negative trend of the BHARs has started to reverse or, at least, level off towards the last six months of the three-year period.

TABLE 5: Tests of underperformance of long-run BHARs (matched IPO-adjusted) of backdoor-listed firms

Holding period	N	Equal-weighted BHARs				Value-weighted BHARs			
		Mean	Median	t-test	Wilcoxon Z	Mean	Median	t-test	Wilcoxon Z
12-month	246	-0.040%	-0.096%	-1.31	-3.64***	0.009%	-0.034%	0.18	-3.69***
24-month	222	-0.109%	-0.032%	-2.62***	-2.54**	-0.086%	-0.013%	-1.83*	-2.71***
36-month	195	-0.117%	-0.050%	-1.77*	-3.18***	-0.069%	-0.019%	-0.83	-3.61***

Note: The BHARs reported are the sample mean and median based on the distribution of equal- and value-weighted returns of individual firms. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Conclusion

Despite a very similar regulatory process for both backdoor and front-door listings in Australia, we document significant long-run underperformance for a sample of non-financial BDL relative to a controlled sample of IPO firms. Specifically, backdoor-listed firms tend to raise less equity capital and be less profitable and more financially distressed than their IPO peers. They also exhibit negative buy-and-hold returns when benchmarked against the matched IPO firms and broad-based market indices. This finding is not consistent with the assertion in the literature that lax regulatory oversight is the major culprit for the underperformance of backdoor-listed firms in the aftermarket. Nevertheless, our results suggest the negative image associated with backdoor listings may seem justified.

Despite a very similar regulatory process for both backdoor and front-door listings in Australia, we document significant long-run underperformance for a sample of non-financial BDL relative to a controlled sample of IPO firms. Specifically, backdoor-listed firms tend to raise less equity capital and be less profitable and more financially distressed than their IPO peers. They also exhibit negative buy-and-hold returns when benchmarked against the matched IPO firms and broad-based market indices. This finding is not consistent with the assertion in the literature that lax regulatory oversight is the major culprit for the underperformance of backdoor-listed firms in the aftermarket. Nevertheless, our results suggest the negative image associated with backdoor listings may seem justified.

Acknowledgement

The authors would like to thank Philip Brown, Andrew Ferguson and an anonymous referee for helpful comments.

Notes

1. 'ASIC raises red flag over "mining to tech" backdoor', by Tess Ingram published in the *Australian Financial Review* on 31 July 2014.
2. See, for example, 'Record numbers queuing up for backdoor listings' by Nick Abrahams published in the *Australian Financial Review* on 30 September 2014 and 'Tech backdoor listings surge but investor returns are mixed' by Yolanda Redrup published in the *Australian Financial Review* on 25 May 2015.
3. There are a few instances in which we cannot match a BDL firm with an IPO firm from the same industry sector. In such cases, we broaden the definition of industry sectors and collapse all the non-financial sectors into extractives and industrials only.
4. All amounts are expressed in millions of dollars, deflated to 2015 constant dollar terms using the Consumer Price Index (all capital cities) published by the Australian Bureau of Statistics.
5. There was one matched IPO firm which did not involve any public offer of shares at the time of going public.
6. For the purposes of auditor's going concern opinion, a qualified opinion and 'emphasis of matter', which explicitly makes reference to a going concern uncertainty, are treated as the same.
7. The number of firms included for calculating holding-period returns may vary over time. Firms may be excluded for a certain month because of suspension of trading by ASX or if they do not have a valid price due to a lack of trading. Where a BDL firm de-lists before its IPO control firm does prior to the end of the event window, we drop both firms from the calculation of average portfolio BHAR from the de-listing month onwards, and similarly if an IPO control firm de-lists before its corresponding BDL firm does. We note any portfolio of BDLs that we form does not represent an implementable investment strategy as the timing of the BDL transactions is widely dispersed in calendar time throughout the sample period.
8. One caveat of the results in Figure 1 and 2 is that the BHARs only provide a direct measure of 'investor experience' of investing in backdoor-listed firms. They are nonetheless subject to the bad-model problem as discussed by Fama (1998). To the extent that the IPO firm matching approach does not sufficiently control for all systematic risk factors in stock returns, the finding of long-run underperformance of BDL firms could be spurious.

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