

DO PRIVATIZATION IPO FIRMS OUTPERFORM IN THE LONG-RUN?

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Abstract

This paper investigates the long-run stock returns of privatization initial public offering (IPO) firms using a sample of 261 privatization IPOs from 46 countries during the period 1981-1999. We compare one-, three-, and five-year holding period returns of the privatization IPOs to those of the domestic stock market indices and to those of size and size-and-book-to-market equity ratio (BM)-matched firms of respective countries. Consistent with previous studies, privatization IPOs significantly outperform their domestic stock markets in the long-run. However, they do not show any significant abnormal long-term stock performance relative to their size- or size-and-BM-matched benchmark firms. The results in the paper suggest that previous results on the long-run stock performance of privatization IPOs should be interpreted with caution. In addition, being different from private companies' IPOs, the market seems to value privatization IPO firms without much systematic bias after the IPO. This is consistent with privatization IPOs having less information asymmetry problems compared to private IPOs.

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Do Privatization IPO Firms Outperform in the Long-Run?

I. Introduction

Since the early 1980s, privatization of state-owned enterprises has become very popular in many countries and has dramatically promoted development of capital markets around the world. According to Megginson and Netter (2001), the cumulative value of proceeds raised by privatizing governments exceeded \$1 trillion in 1999 and total market capitalization of privatized companies became 13 percent of the combined market capitalization of the firms in Business Week Global 1000 in 2000. By the end of 2005, cumulative privatization revenues reached almost \$1.5 trillion, and privatized companies represented over 30 percent of non-U.S. stock market capitalization worldwide—and a much higher fraction of these markets' total trading volume.

Reflecting the significance of these activities, numerous studies examine whether privatization improves the operating and financial performance of divested firms. Most studies document significant performance improvements for newly privatized firms in developing as well as developed countries. (Galal, Jones, Tandon, and Vogelsang (1994), Megginson, Nash, and van Randenborgh (1994), Boubakri and Cosset (1998), La Porta and López-de-Silanes (1999), D'Souza and Megginson (1999), Dewenter and Malatesta (2001)). This contrasts sharply with Jain and Kini (1994), Mikkelson, Partch and Shah (1997), and others who document poor subsequent operating performance for private IPOs,

Compared to the extensive literature on the operating performance of privatized firms, as summarized in Megginson and Netter (2001), relatively few studies examine these firms' long-run stock performance. In contrast to private companies' initial public offerings (IPOs), these studies generally show that privatization IPOs outperform in the long-run. Boardman and Laurin (2000) document significantly positive 34.7 percent three-year market-adjusted buy-and-hold abnormal returns (BHARs) for 99 privatization IPOs during 1980 and 1995. Dewenter and Malatesta (2001) also find statistically significant positive 88.2 percent five-year market adjusted abnormal returns for a sample of 102 privatization IPOs. Using a larger sample, Megginson, Nash, Netter, and Schwartz (MNNS hereafter, 2000) also report significantly positive long-run abnormal returns for a sample of 158 privatization IPOs conducted in 33 countries compared domestic market indices, the *Financial Times* World index, the S&P 500 index, and portfolios of American firms in the same industry. The long-run positive abnormal stock returns of privatization IPOs has been interpreted as consistent with documented improvement of operating performance and managerial efficiency of privatized firms. However, it is premature to conclude that the long-term stock abnormal performance of privatization IPOs is indeed superior because of potential problems in measuring long-term stock performance.

Since Ritter (1991) documented significant long-run underperformance of US IPO firms, there have been many studies that examine long-term stock performance of companies after important corporate events such as IPOs, seasoned equity offerings and share repurchases. However, no single long-term performance study methodology is supported by both theory and empirical evidence. In a study of long-run stock performance, it is very critical to use an appropriate benchmark since the results are quite different depending on benchmarks used. This is in contrast to an event study that focuses on a short window where the results are, in most cases, robust to the use of different benchmarks. In an event study, benchmark returns are oftentimes calculated using the Capital Asset Pricing Model (CAPM). However, there are potential problems in using the CAPM for the calculation of benchmark returns in a long-run stock performance study since, as Fama and French (1992) show, the CAPM does not successfully explain the cross-sectional distribution of stock returns. Instead, size and BM seem to explain the distribution well. However, there is no generally accepted theoretical reason why size and BM should matter in determining expected returns. Therefore, there have been a lot of debates on the usefulness of long-term stock performance studies and many follow-up papers frequently present different results using alternative methodologies. For example, Ritter (1991) and Loughran and Ritter (1995) document the significant long-run underperformance of IPOs, there have been many follow-up papers that document insignificant abnormal performance of IPOs using different approaches (e.g., Eckbo, Masulis, and Norli (2000), Gompers and Lerner (2003), and Brav, Geczy, and Gompers (2000)).

Given the difficulties of finding an agreed upon long-term stock performance study methodology, several studies addressing potential problems of traditional methodologies used in the literature began to receive attention. For example, Lyon, Barber, and Tsai (1999) argue that the commonly used methods for computing long-run abnormal returns tend to yield misspecified test statistics. Barber and Lyon (1997) recommend the use of BHAR based on a size-and-BM matched firm approach since it eliminates the biases in test statistics designed to detect long-run abnormal returns. However, Fama (1998) points out that BHARs tend to yield statistical artifacts because a distribution of long-horizon returns is positively skewed and has very fat tails. This leads to an inflated significance level for lower tailed tests and a loss of power for upper tailed tests. Mitchell and Stafford (2000) also indicate that the BHAR method ignores the problems arising from calendar time or industry clustering which inflate the statistical significance of economically trivial events. They strongly recommend the use of cumulative abnormal returns (CARs) and a calendar time regression approach used by Fama-French (1993). On the other hand, Loughran and Ritter (2000) show that the Fama-French approach is the uniformly least powerful test of market efficiency. In short, there are still great debates on what is the best way to examine long-run stock performance.

Therefore, it is important to check whether previously documented results on long-run

performance of privatization IPOs are robust to the methodologies used. This will be critical in understanding the role of privatization in improving efficiency and/or profitability of firms and in contributing to the economic development of each country. In addition, the robustness check will also provide further information about whether the stock market values privatization firms without any systematic bias after IPOs. Even though there are many disputes, one popular explanation for the underperformance of private IPOs is that investors are overoptimistic about the future of IPO firms and managers optimally time their IPOs to take advantage of overoptimism (e.g., Loughran and Ritter (1995)). However, given the fact that privatization IPO firms are typically larger with a longer history than private IPO firms and the timing of IPO is typically determined by government policies rather than by management, it is less likely to observe long-run abnormal performance of privatization IPOs based on the explanation of long-run underperformance provided for private IPOs. However, if long-run outperformance of privatization IPOs is robust to benchmarks used, it is likely that the stock market in general underestimates the efficiency gains achieved by privatization. To address these issues, this paper examines the long-term stock performance of 261 privatization IPOs from 46 countries during 1981 and 1999 using a novel approach in the privatization literature, i.e., the size-and-BM matched control firm approach using domestic firms.

Previous studies of the long-run stock performance of privatization IPOs have mostly used market-adjusted abnormal returns because it is hard to have access to required data for the use of alternative benchmarks. In spite of the difficulties, there have been some attempts to improve benchmarks being used. For example, Boubakri and Cosset (2000) use size-and-BM-adjusted benchmarks in their study. However, they select control firms from the entire universe of the Emerging Market Data Base (EMDB), rather than from domestic markets. MNNS (2000) also calculate industry-adjusted abnormal returns using only American firms in the same industry. Even though these studies try to control for firm characteristics in selecting benchmarks, they do not use matched firms from domestic markets. Due to different legal and institutional environments and stages of capital market developments, the use of characteristic matched firms from domestic markets is likely to be more relevant in evaluating the efficiency gains from privatization.

Using the *Datastream* data, this paper identifies up to five size-and-BM matched firms from domestic markets and calculates abnormal returns relative to the returns of these matched firms. To select these matching firms, domestic firms the market capitalization and BM of which are in between 70 and 130 percents of those of the issuer are first identified. Among those, a maximum of five firms with the closest BM is selected and used as matching firms. This method is analogous to the methods used in Barber and Lyon (1997) and Lee (1997). Out of 261 privatization IPOs, size-and-BM matched firms are identified for 108 privatization IPOs.

The results show that equally-weighted average market-adjusted abnormal returns are significantly positive, which is consistent with previous studies. However, size-and-BM-adjusted BHARs are not statistically significant over three or five years horizons. This indicates that compared to the domestic firms with similar size and BM, privatization IPOs do not outperform in the long-run. This questions the conclusions made by previous studies that privatization indeed improves efficiencies and profitabilities, and lead to outstanding stock performance in the long-run after IPOs.

The rest of this paper is organized as follows. Section II describes data and methodology. Section III provides empirical results and Section IV concludes.

II. Data and Methodology

A. Data

We initially collect privatization IPO samples from two sources. The primary source is the July 1997 edition of the *Privatisation International* database, which provides a comprehensive listing of 618 initial equity offerings of former state-owned enterprises from February 1981 through June 1997. This datafile also provides information on offer size (in U.S. dollars), issue date, offering type (initial or unseasoned versus seasoned), fraction of capital sold, currency of issue, and exchange where the new issue will be traded. The second source of data is appendix to Jones, Megginson, Nash, and Netter (1999) and the privatization database maintained by the World Bank.

We then collect stock returns and financial statements data from *Datastream*. For an issue to be included in our final sample of privatization IPOs, it must have at least one year of post- issue return data available on the *Datastream* and the first price in the *Datastream* must be available no later than three months after the issue date provided in the *Privatisation International* file.

Our final sample of initial privatization IPOs consists of 261 IPOs from 46 countries. Table 1 reports the distribution of our sample across countries and the average proceeds for each country. The proceeds are expressed in terms of 2000 U.S. purchasing power using the U.S. consumer price index (CPI) and relevant exchange rates. Total amount of proceeds raised at these sample IPOs is \$333 billion, which is much larger than the aggregate amount of \$164 billion (in 1997 purchasing power) in MNNS (2000) that use a sample of 158 privatization IPOs from 33 countries. The average proceeds of our sample IPOs is \$1.3 billion and this is much greater than the average size of typical U.S. private companies' IPOs. Ritter and Welch (2002) report that the aggregate gross proceeds raised at 6,249 IPOs of U.S. firms during 1980 and 2001 is \$488 billion in 2001 US purchasing power.

****** Insert Table 1 about here ******

The United Kingdom is the country with the largest number of privatization IPOs in our sample.

There are 27 U.K. privatization IPOs in our sample and these raise \$56 billion in total. However, the largest total proceeds (\$62 billion) were raised in Japan, even though there were only five privatization IPOs. Nippon Telegraph & Telephone raised \$18.7 billion in its IPO in November 1986, which remains the world's largest IPO after adjusting for inflation (Italy's \$18.9 billion IPO of ENEL in 1999 is the largest in absolute terms). China has the second largest number of sample firms even though the average proceeds of 24 Chinese IPOs is small (\$166 million).

Table 2 reports yearly distributions of our sample IPOs. It also reports distributions across five industries, financial, manufacturing, natural resources, services and utilities. The industry classification is based on the two-digit U.S. standard industry classification code. Initial returns and average proceeds are also reported in Table 2. The number of privatization IPOs increased sharply during the late 1980s, but then declined after 1994. The total number of IPOs dropped from 120 between 1990 and 1994 to 93 during 1995-99, though the average size of the issues was much larger during the latter period. The number of privatization IPOs decreased even during the Internet Bubble period; there were only seven privatization IPOs in 1999.

****** Insert Table 2 about here ******

Utilities and financial firms are well represented in our privatization IPO sample. There are 45 financial companies and 76 utilities firms in the sample. This proportion of financial and utilities firms is much higher than in typical private IPO study samples, though Ljungqvist, Jenkinson and Wilhelm (2003) report that 56 percent (24 percent) of energy and utilities (banking and financial services) offerings in their sample of 2,143 IPOs from 65 countries outside the U.S. between January 1992 and July 1999 are in fact privatization IPOs.

Consistent with previous studies that document high initial returns for private IPOs (e.g., Choi and Nam (1998)), the average initial return is 24.5 percent. Privatization IPOs do not show any significant increases in initial returns during the internet bubble period; indeed, the average initial return of 11.2 percent in 1999 is lower than the average initial returns of most years during our sample period. This is in sharp contrast to private IPOs. The average initial return was 71.7 percent for 457 U.S. private IPOs in 1999 (Ritter and Welch (2002)).

The average market capitalization of our privatization IPO firms is \$5.3 billion, which is far greater than the average market capitalization of private IPO firms. For example, Corwin, Harris and Lipson (2004) show that the average market capitalization of 220 IPOs listed on the New York Stock Exchange (NYSE) from January 1995 to September 1998 is \$689 million. Considering the fact that NYSE IPO firms are typically much larger than Nasdaq IPO firms, privatization IPO firms are significantly larger than typical private IPO firms. The average stake sold in privatization IPOs is 44 percent, which is similar to the 40 percent average stake sold in NYSE IPOs documented in Corwin,

Harris and Lipson (2004).

The results in Table 2 indicate that privatization IPO firms are typically much bigger than private IPO firms and raise substantially larger amounts than private IPO firms. However, the initial returns are on average very high, which is not expected from asymmetric information based explanations of IPO underpricing. The common prediction of various asymmetric information based explanations is that as information asymmetry increases, initial returns are likely to increase as summarized in Ritter and Welch (2002). Since privatized firms are on average bigger, with a longer operating history, and are from more stable industries, we would expect there to be less information asymmetry in privatization IPOs. Choi and Nam (1998) indeed show that the initial returns of privatization IPOs are better explained by the theories provided by Perotti (1995) and Biais and Perotti (2002) that are specific to privatization IPOs, and asymmetric information based explanations do not work well. Perotti (1995) argues that privatization IPOs are underpriced to signal the government's determination to eliminate policy uncertainties regarding privatization plans and Biais and Perotti (2002) propose that underpricing is used in privatization IPOs to widely distribute shares among public investors. If high initial returns of privatization IPOs are not due to asymmetric information, but are instead due to deliberate government policies, there are no compelling reasons to expect long-term abnormal returns of privatization IPOs unless the market systematically under or overestimate the efficiency and/or profitability gains of privatization firms even when there is not much information asymmetry. The reexamination of long-run stock performance will give us some additional clues on this issue.

B. Methodology

We use various measures to estimate long-run abnormal stock returns of privatization IPOs. First, we use three different benchmarks: 1) domestic market index; 2) control firms matched on firm size in the domestic market; and 3) control firms matched on firm size-and-BM in the domestic market. Second, we use both BHARs and CARs to check the sensitivity of the results. Finally, in calculating average abnormal returns, we use both equally- and value-weighted averages. Various national stock indices are collected from *Datastream*. In particular, the return index of the *Datastream Total Market Index* which is a value-weighted index is used to calculate the market index returns. The return index defined in *Datastream* includes dividends and adjusts for stock splits and other relevant events. We compute long-run returns from the IPO's closing price after the first full day's trading to the end of one, three, and five-year holding periods.

For the selection of control firms, we use the following procedures which are based on Barber and Lyon (1997) and Lee (1997). First, for each privatization IPO in our sample, we calculate the market capitalization by multiplying the price and the number of shares outstanding at the end of the first month

available on the *Datastream* after IPOs. Then, BM is calculated by dividing the book value of equity at the end of fiscal year right before the IPO date by the market capitalization calculated above. In determining the book value of equity we use at least six months of lag, and collect the information required to calculate sizes and BMs from *Datastream*. Next, we calculate the market capitalization and BM of all firms in the domestic market, excluding those in our privatization IPO sample, that are available in *Datastream*. We calculate size and BM for these firms on the date when the corresponding IPO firm's market capitalization is calculated. Among those domestic firms with available size and BM, we identify all the firms the size and BM of which are between 70 and 130 percent of those of the corresponding IPO firms. Finally, we choose a maximum of five firms with the BM ratio closest to the IPO firm's BM as our size-and-BM matching firms. We use a similar approach to select size matching firms. We are able to identify at least one matching firm for 108 (185) IPOs from 29 (36) countries for size-and-BM (size) matching.⁴

Table 3 reports some firm characteristics of our sample firms that belong to each subsample. Fortunately, our sample construction technique yields no substantial differences among the firms in each subsample. However, the privatization IPO firms with available size-and-BM matching firms tend to be larger, and to raise more proceeds by selling a larger stake. They also tend to have lower initial returns than other privatization IPOs.

****** Insert Table 3 about here ******

To calculate BHAR, we first calculate monthly buy-and-hold return (BHR) by compounding daily returns calculated using total return index in *Datastream* over each calendar month. We then calculate annual BHRs by compounding monthly BHRs over each corresponding 12-month horizon. If a sample firm is delisted before the end of time horizon of interests, the BHR of that particular firm over that time horizon is calculated over the period from the first to the last dates when return index data are available in *Datastream*. We then calculate BHRs of each matching firm over the same time horizon as the one used for the calculation of BHRs of the corresponding IPO. The equally-weighted average annual BHRs of five (or less) matching firms for each IPO are used as BHRs of a matching portfolio. If a matching firm is delisted before the end of the time horizon used, we splice domestic market index returns into the calculation of annual BHR over the year of delisting starting from the day after the delisting date until the end of the year. This matching firm's annual BHRs are used only until the year of

⁴ Since the size of privatization IPO firm is typically very large, we are not able to find size matched firms in domestic markets for 78 privatization IPOs. This problem bedevils all privatization empirical studies that try to match divested firms with comparable domestic (or even international) companies. *Datastream* does not provide financial statements information for some countries such as Morocco and Israel and started to provide book value of equity information for China and Eastern European countries only from 1995. Due to this restriction, we could not find book values of equity for 60 privatization IPOs. Finally, we could not find size-and-BM matched firms for remaining samples since some countries have very thin markets.

delisting for the calculation of the average BHRs of five or less matching firms. From the year after the delisting year, the average BHRs of matching firms are calculated using the rest of matching firms.

After calculating annual BHRs of sample firms and matching firms, we calculate average annual BHRs for both sample firms and matching firms. We calculate the average annual BHRs using both equally-weighting and value-weighting methods. Weights used in value-weighting are calculated based on the market capitalization that is converted into U.S. dollars at the contemporaneous exchange rate, then normalized to reflect year 2000 U.S. purchasing power. We then calculate three- and five-year average BHRs by compounding average annual BHRs over the relevant number of years. This implies that we assume annual rebalancing in calculating multi-year average BHRs since we are changing weights of each stock every year. Finally, one-, three- and five-year BHARs are calculated by subtracting the corresponding average BHRs of matching firms from the relevant average BHRs of our sample firms.

For the calculation of CARs, we calculate daily abnormal returns by subtracting daily returns of matching firms (or market indices if matching firms are not available) from those of sample firms. We then cumulate daily abnormal returns over the corresponding number of days to calculate CARs over different time horizons. We then calculate both equally-weighted and value-weighted average CARs.

III. Empirical Results

Table 4 reports long-run BHRs of our sample firms and three different types of benchmarks. Panel A reports equally-weighted averages and Panel B reports value-weighted averages. Over the first year, our privatization IPO firms earned on average 30 percent while the market earned 14 percent of returns. This difference is significantly different zero, implying that privatization IPO firms significantly outperform the domestic market during the first year after IPOs. Even when size or size-and-BM matching firms are used to calculate BHARs, the first year BHARs are significantly positive and are greater than 10 percent. This is true even when value-weighted averages are used, even though the significance level decreases. This suggests that even though the average initial return is above 20 percent, the market on average underestimates the efficiency and/or profitability gains of privatizations right after IPOs. Alternatively, the market might be concerned about government policy uncertainties even after IPOs and hesitate to fully incorporate potential efficiency and/or profitability gains into stock prices for quite some time after IPOs. Perotti (1995) and Jones, Megginson, Nash and Netter (1999) argue that the price at which a competitive capital market will be willing to pay for the privatized shares is affected by policy uncertainty. The market seems to pay a great deal of attention to how governments behave after IPOs and slowly incorporate prospective performance improvements into stock prices as policy uncertainties disappear.

****** Insert Table 4 about here ******

When the horizon is extended to three years, we still observe significantly positive equally-weighted BHARs based on domestic market indices, which is consistent with previous studies. However, by using size-matched benchmarks, the average three-year BHAR drops from 34 percent to 20 percent which is not significantly different from zero. When size-and-BM matched firms are used, the average three-year BHAR drops further to 15 percent, which is again insignificant. These findings are similar to those of Brav, Geczy and Gompers. (2000) and Eckbo, Masulis and Nori (2000) who report that IPO firms have returns that are comparable to non-issuing size-and-BM-matched firms. Therefore, the use of domestic market indices as benchmark seems to overestimate the long-term stock performance of privatization IPOs. Figure 1 shows how privatization IPOs perform relative to three different benchmarks in three subsamples.

****** Insert Figure 1 about here ******

When value-weighted averages are calculated, even the average three-year BHAR calculated using domestic market indices is insignificant. This is similar to the results based on private IPOs. Brav, Geczy, and Gompers (2000) and Mitchell and Stafford (2000) document that IPO firms underperform broad market benchmarks by a wide margin on an equal weight basis, while value weighting IPO stock returns reduces the abnormal performance by more than half. The value-weighted average BHARs continue to be insignificant when size or size-and-BM matched firms are used to calculate BHARs. This clearly shows that the long-run stock performance results are very sensitive to the methods used to measure average abnormal returns. When more appropriate benchmarks are used, three-year BHARs become insignificant even though they remain positive. Moreover, value-weighting decreases the significance level further down.

None of the excess return measures are significant for a five-year horizon, although all remain positive. The equally-weighted average five-year BHAR is insignificant 25 percent while the value-weighted average five-year BHAR is only 7 percent. In contrast, Dewenter and Malatesta (2001) report significantly positive 88 percent of five-year BHARs for their sample of 78 privatization IPOs and Choi (2002) documents significant 69 percent of five-year BHAR for 134 privatization IPOs. Similarly, MNNS (2000) also report statistically significantly positive equally-weighted average five-year BHAR of 91 percent. The primary reason for different results in our study compared to previous studies is likely to be our larger sample size. Our sample includes privatization IPOs during 1997 and 1999 and covers more IPOs during 1981-96, the same period used by MNNS (2000). The inclusion of more IPOs seems to reduce the significance of 5-year BHARs.

In sum, the results in Table 4 show that privatization firms outperform their various domestic

benchmarks over one-year horizon after IPOs, but not generally over longer horizons.⁵ Given previous results that privatization IPO firms improve their operating performance over three years after IPOs (e.g., Boubakri and Cosset (1998)), the market seems to be slow in correctly evaluating the efficiency and/or profitability improvements from privatization during the first year after IPOs but it seems to catch up by the end of the first year. In addition, there is no evidence of underperformance of privatization IPOs. This suggests that privatization IPOs are not offered to take advantage of investor overoptimism, in contrast to private IPOs. This is likely to be true since the timing is determined by government policies not by management. This is also supported by the fact that the number of privatization IPOs has gone down during the internet bubble period when investor overoptimism was prevalent.

In Table 5, we report equally-weighted average BHARs based on domestic market indices and size matched firms for 108 IPOs with available size-and-BM matching firms. This is to check whether the insignificant three-year BHAR based on size-and-BM matching firms is caused by the use of different sample or by the use of a different matching technique. It turns out that when only the 108 IPOs with available size and BM matches are used to measure BHARs based on domestic market indices and size-adjusted matching firms, the equally-weighted BHARs are significantly positive for all three horizons. This shows that one of the reasons why equally-weighted average three-year BHARs based on market indices and size matching firms are not significant in Table 4 is due to different sample characteristics. However, even when the same 108 IPOs are used, equally weighted average three- and five-year BHARs become insignificant if size-and-BM adjusted matching firms are used to calculate BHARs as shown in Table 4. This confirms the importance of benchmarks in a long-run stock performance study.

****** Insert Table 5 about here ******

To check the robustness of the results, we report CARs in Table 6. When domestic market indices are used as benchmark, CARs are significantly positive for one-, three- and five-year horizons for both equally-weighted and value-weighted averages. CARs increase when value-weighting is used even though the statistical significance decreases. For example, the equally-weighted average five-year CAR is 28 percent while the value-weighted average five-year CAR is 35 percent. The significant three- and five-year CARs for both equally-weighted and value-weighted methods again indicate that the results of long-run stock performance of privatization IPOs are not robust to the measurement methods used to calculate abnormal returns even when the same benchmarks are used.

****** Insert Table 6 about here ******

As we use firm characteristics-controlled benchmarks, the results again change. For both

⁵ Even for one-year horizon, BHARs may not be significant if alternative test statistics are used. We are planning to use a bootstrapping method as in Lee (1997) to examine the significance of BHARs in the near future.

equally-weighted and value-weighted averages, one-year CARs remain significantly positive. Even three-year CARs are significantly positive, although the significance level drops. For five-year horizons, all CARs are not statistically significantly different from zero. Therefore, when CARs are used instead of BHARs, we still find some marginally significant over-performance of privatization IPOs over three-year horizons after IPOs for both equally-weighted and value-weighted averages.

Intriguingly, value-weighted average CARs are significantly greater than equally-weighted CARs. For example, the equally-weighted average one-year (three-year) CAR based on size-and-BM matched firms is 14.36 percent (13.96 percent) while the corresponding value-weighted average CAR is 58.75 percent (40.98 percent). Similar patterns exist for BHARs in Table 4. This indicates that large privatization IPOs did well, especially for the first year after IPOs, relative to smaller privatization IPOs. Among privatized companies, telecommunications and utilities companies tend to be larger and they experience significant performance improvements after IPOs (Megginson, Nash and van Randenborgh (1994)).

IV. Summary and Conclusion

Many studies document that the operating performance of privatized companies significantly improves after IPOs (e.g., Boubakri and Cosset (1998) and Megginson and Netter (2001)). Consistent with these findings, earlier studies document significantly positive long-run abnormal stock returns and they conclude that long-run stock performance evidence is consistent with efficiency and/or profitability gains from privatization (e.g., Dewenter and Maletesta (2001)). However, long-term stock performance studies are subject to difficult methodological problems related to the choice of benchmarks and the method of calculating abnormal returns. In addition, statistical tests are not easy to conduct due to a highly skewed distribution of long-term stock returns and clustered sample observations. This study tries to check the robustness of previous results on long-term stock performance of privatization IPOs to have better understanding of the role of privatizations.

To compare the performance of privatization IPOs with better benchmarks, we use size and size-and-BM matched firms from domestic markets for the calculation of abnormal returns. In our knowledge, this is the first attempt to do this in the literature on privatization. We also calculate both BHARs and CARs to check the sensitivity of the results to the way we calculate abnormal returns. In addition, we compare equally-weighted averages with value-weighted averages to see whether large privatization IPOs perform differently compared to smaller privatization IPOs.

Our analyses show that long-run stock performance results are very sensitive to benchmarks, abnormal return calculation methods and weighting methods. We observe statistically significant

abnormal performance when domestic market indices are used as benchmarks. However, the significance level significantly drops when alternative benchmarks, especially size-and-BM-adjusted benchmarks, are used. In addition, we find that statistical significances of BHARs and CARs are quite different, especially for longer horizons. Finally, long-term stock performance of different size groups seem to be quite different since value-weighted averages tend to be much greater than equally-weighted averages. In sum, the results in the paper show that previously documented long-term outperformance of privatization IPOs is not a robust result.

These results raise questions regarding whether privatization indeed improves efficiency and profitability. Dewenter and Maletesta (2001) show that most efficiency and profitability gains occur three years before privatization, and they do not find any efficiency gains after privatization even though they report significant long-term abnormal stock returns. The findings in this paper, particularly the insignificant long-term stock performance relative to similarly sized domestic firms with similar BM, are more consistent with the findings on operating performance of privatized firms in Dewenter and Maletesta (2001).

Alternatively, it is possible that we do not find significant long-term stock returns for privatization IPOs because there is less information asymmetry for privatization IPOs compared to private IPOs. As pointed out by Perotti (1995), in case of privatization IPOs, there is additional risk related to policy uncertainty, which seems to cause significantly positive abnormal stock returns during the first year after privatization IPOs. However, once policy uncertainties are resolved, the market seems to be more accurately valuing privatization IPOs due to the fact that privatization IPO firms are bigger than typical IPOs, with longer operating histories, and are in mature industries with less uncertainty. In short, the findings in this paper suggest that it is important to examine the link between long-term stock performance and operating performance as a next step. This is crucial in better understanding the consequences of privatization. This will be an interesting question to answer in future research.

Things to be added in the near future

- 1. Statistical tests using a simulation method as in Lee (1997)**
- 2. A calendar-time regression approach as in Fama and French (1993).**
- 3. Regression analysis of long-term abnormal returns to identify factors that significantly affect stock performance of privatization IPOs.**

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Table 1 Sample Description

Privatization IPOs during 1981 and 1999 are from the July 1997 edition of *Privatization International*, Jones, Megginson, Nash and Netter (1999) and the World Bank's privatization database. All those without available returns for one-year after the IPO at the *Datastream* are excluded. In addition those IPOs the prices of which are available three months after the IPO are also excluded. Proceeds converted into million 2000 U.S. dollars based on the U.S. consumer price index and exchange rates on the issuing date.

Country	Number of Offerings	Average Proceeds	Country	Number of Offerings	Average Proceeds
Argentina	6	1,095	Korea, R.	4	2,128
Australia	8	2,196	Malaysia	12	432
Austria	10	220	Mexico	2	1,939
Brazil	4	736	Morocco	5	75
Canada	9	572	Netherlands	2	2,753
Chile	2	119	New Zealand	4	685
China	24	166	Norway	3	237
Croatia	2	94	Pakistan	1	1,191
Czech	1	146	Peru	1	1,242
Denmark	1	3,458	Philippines	3	238
Egypt	5	29	Poland	14	150
Finland	4	675	Portugal	11	608
France	12	3,653	Singapore	8	437
Germany	6	2,958	South Africa	1	1,857
Greece	3	275	Spain	7	813
Hungary	9	218	Sweden	4	729
India	5	311	Switzerland	1	6,084
Indonesia	4	957	Taiwan	5	107
Ireland	1	177	Thailand	7	156
Israel	3	173	Turkey	2	19
Italy	9	4,117	U.K.	27	2,071
Japan	5	12,476	U.S.	1	2,357
Kenya	2	32	Venezuela	1	1,141
Full Sample				261	1,288

Table 2 Industry classification and issue characteristics of privatization IPOs by Cohort Year, 1981 to 1999

Privatization IPOs during 1981 and 1999 are from the July 1997 edition of the Privatization International, Jones, Megginson, Nash and Netter (1999) and the World Bank's privatization database. All those without available returns for one-year after the IPO at the *Datastream* are excluded. In addition those IPOs the prices of which are available three months after the IPO are also excluded. Samples are classified as f (financial), m (manufacturing), n (natural resources), s (services), and u (utilities) based on two-digit U.S. standard industry classification code. Average first day return is measured from the offer price to the closing price of the first trading day available at the *Datastream*. Stake sold are the percentage of shares sold at the IPO. Proceeds are converted into 2000 U.S. dollars based on the U.S. consumer price index and exchange rates on the issuing date. Market value is the market capitalization of the IPO firm at the end of the first available month at the *Datastream* after the IPO. Market values are also converted into 2000 US dollars using US CPI. Averages in this table are equally-weighted averages.

Year	Number of privatization IPOs by industry						Average First Day Return (%)	Average Stake Sold (%)	Average Proceeds (\$million)	Average Market Value (\$millions)
	f	m	n	s	u	sum				
1981	-	1	-	-	1	2	15.7	50.3	765	1,740
1983	-	-	-	1	-	1	23.2	51.5	59	150
1984	-	-	1	-	1	2	20.6	71.5	4,506	10,980
1985	-	-	-	3	-	3	6.5	22.0	316	1,253
1986	-	2	1	-	1	4	21.1	56.4	7,028	111,331
1987	3	2	2	1	1	9	39.9	81.3	2,383	2,650
1988	1	3	-	2	3	9	33.1	46.9	1,514	2,162,
1989	3	4	2	1	8	18	23.5	62.8	1,048	3,319

1990	1	2	1	2	8	14	35.1	64.3	676	1,413
1991	2	5	2	-	9	18	15.3	41.1	1,143	3,042
1992	5	4	2	6	3	20	23.2	40.7	460	2,174
1993	7	10	3	1	3	24	28.7	31.0	1,022	4,434
1994	9	22	3	3	7	44	32.8	35.7	754	2,423

1995	6	13	5	2	5	31	8.5	36.8	798	2,213
1996	4	11	2	2	9	28	29.3	46.0	1,192	3,057
1997	2	5	1	2	6	16	15.5	46.9	1,651	6,041
1998	1	1	2	-	7	11	33.5	29.9	2,580	13,685
1999	1	1	-	1	4	7	11.2	38.1	4,555	10,690

1981-1989	7	12	6	8	15	48	26.5	60.0	1,962	12,221
1990-1994	24	43	11	12	30	120	28.1	40.0	805	2,773
1995-1999	14	31	10	7	31	93	18.4	40.2	1,390	5,111
1981-1999	45	86	27	27	76	261	24.5	44.0	1,203	5,338

Table 3 Comparisons of firm characteristics of total, size matched and size-and-BM matched samples.

Privatization IPOs during 1981 and 1999 are collected from the July 1997 edition of the Privatization International, Jones, Megginson, Nash and Netter (1999) and the World Bank's privatization database. All those without available returns for one-year after the IPO in *Datastream* are excluded. In addition those IPOs the prices of which are available three months after the IPO are also excluded. First day return is measured based on the offer price and the closing price of the first trading day available at the *Datastream*. Sample IPOs are compared with the domestic firms with similar size or size and book-to-market equity ratio (BM). Due to the data availability, only 185 (108) sample firms are matched with at least one matching firm the size (size and BM) of which is between 70 and 130 percent of that of the IPO firm. Stake sold is the percentage of total number of shares outstanding sold at the IPO. Market capitalization is calculated on the last date of calendar month of IPO dates. Proceeds and market capitalization are converted into million 2000 U.S. dollars based on the U.S. consumer price index and exchange rates on the issuing date.

Characteristics	Total	Size Matching	Size and BM Matching
Sample	261	185	108
Mean first-day Return	24.42%	22.32%	20.89%
Mean stake sold	44.01%	45.93%	52.87%
Mean proceeds (in millions of 2000 US dollar)	1,288	1,468	1,911
Mean market capitalization (in millions of 2000 US dollar)	5,338	6,143	8,118

Table 4 BHAR of Privatization IPOs Using Domestic Benchmarks

Returns of sample IPOs are compared with domestic market index returns and returns of domestic firms with similar size or size and book-to-market equity ratio (BM). Due to the data availability, only 185 (108) sample firms are matched with at least one matching firm the size (size and BM) of which is between 70 and 130 percent of that of the IPO firm. For each IPO firm, annual buy-and-hold return (BHR) is calculated using the total return index available in *Datastream*. If an IPO firm is delisted before the end of time horizon, the return calculation will stop on the date of delisting. Using the same time horizon used for the calculation of sample firm's BHR, the BHRs of five (or less) matching firms are calculated. If a matching firm is delisted before the end of time horizon, market index returns are spliced until the end of the horizon. BHRs of delisted matching firms are used for the calculation of average annual BHR of matching firms only up to the year of delisting. Average annual matching firm BHRs are calculated using the BHRs of the rest of the matching firms starting from the year after the delisting. Average three- and five-year BHRs are calculated by compounding average annual BHRs over three and five years. This is equivalent to assuming annual rebalancing. Buy-and-hold abnormal returns (BHARs) are then calculated by subtracting the average BHRs of matching firms from the average BHRs of IPO firms. In Panel A, equally-weighted averages are reported and in Panel B, value-weighted averages are reported. For value-weighting, weights are based on the market capitalization of IPO firms at the end of IPO month converted into 2000 US dollars using US CPI and exchange rates. N represents the number of IPOs. For BHAR column, average BHARs are reported on top and t-statistics are reported in parenthesis. *, **, and *** indicate significant results at 10, 5 and 1 percent level, respectively.

Benchmark	Market				Size				Size-BM			
	N	BHR		BHAR	N	BHR		BHAR	N	BHR		BHAR
		IPO	Matching			IPO	Matching			IPO	Matching	
A. Equally-weighted												
One-year	261	30.02%	13.55%	16.45% (4.678 ^{***})	185	28.01%	17.73%	10.31% (2.248 ^{**})	108	24.22%	10.32%	13.85% (2.994 ^{***})
Three-year	261	84.52%	50.47%	34.02% (2.913 ^{***})	183	77.60%	57.54%	20.01% (1.642)	108	76.55%	62.88%	14.59% (1.270)
Five-year	259	125.08%	89.12%	35.93% (1.634)	183	123.02%	107.10%	15.88% (0.928)	107	130.00%	106.01%	25.09% (1.318)
B. Value-weighted												
One-year	258	58.65%	19.82%	38.84% (2.307 ^{**})	185	67.36%	18.93%	48.43% (2.192 ^{**})	108	58.66%	10.73%	47.94% (2.192 ^{**})
Three-year	258	92.73%	47.73%	45.00% (0.872)	183	94.58%	52.59%	42.00% (0.801)	108	88.04%	61.03%	27.02% (0.640)
Five-year	256	100.03%	60.55%	39.49% (0.603)	183	94.17%	76.78%	17.39% (0.342)	107	85.24%	78.59%	6.65% (0.133)

Table 5. Market and Size-adjusted equally-weighted average BHARs of 108 privatization IPOs with available Domestic Size-and-BM matched firms.

Returns of sample IPOs are compared with domestic market index returns and returns of domestic firms with similar size or size and book-to-market equity ratio (BM). Due to the data availability, only 108 sample firms are matched with at least one matching firm the size and BM of which are between 70 and 130 percent of those of the IPO firm. For each IPO firm, annual buy-and-hold return (BHR) is calculated using the total return index available at the *Datastream*. If an IPO firm is delisted before the end of time horizon, the return calculation will stop on the date of delisting. Using the same time horizon used for the calculation of sample firm's BHR, the BHRs of five (or less) matching firms are calculated. If a matching firm is delisted before the end of time horizon, market index returns are spliced until the end of the horizon. BHRs of delisted matching firms are used for the calculation of average annual BHR of matching firms only up to the year of delisting. Average annual matching firm BHRs are calculated using the BHRs of the rest of the matching firms starting from the year after the delisting. Average three- and five-year BHRs are calculated by compounding average annual BHRs over three and five years. This is equivalent to assuming annual rebalancing. Buy-and-hold abnormal returns (BHARs) are then calculated by subtracting the average BHRs of matching firms from the average BHRs of IPO firms. *, **, and *** indicate significant results at 10, 5 and 1 percent level, respectively.

Benchmark	One-Year BHAR	Three-Year BHAR	Five-Year BHAR
A. Market Index			
Mean Return	19.71%	45.25%	77.94%
(t-statistic)	(5.063 ^{***})	(4.658 ^{**})	(4.714 ^{***})
B. Size			
Mean Return	12.69%	34.81%	45.30%
(t-statistic)	(3.121 ^{***})	(2.264 ^{**})	(2.858 ^{***})

Table 6 CAR of Privatization IPOs Using Domestic Benchmarks

Returns of sample IPOs are compared with domestic market index returns and returns of domestic firms with similar size or size and book-to-market equity ratio (BM). Due to the data availability, only 185 (108) sample firms are matched with at least one matching firm the size (size and BM) of which is between 70 and 130 percent of that of the IPO firm. For each IPO, we calculate daily abnormal returns by subtracting daily returns of matching firms (or market indices) from those of sample firms and then cumulate those daily abnormal returns over relevant number of days to calculate cumulative abnormal returns (CARs) over one-, three- and five-year horizons. Average CARs are calculated using both equally-weighting and value-weighting methods. For value-weighting, weights are based on the market capitalization of IPO firms converted into 2000 US dollars using US CPI and exchange rates. N represents the number of IPOs. For CAR column, average CARs are reported on top and t-statistics are reported in parenthesis. *, **, and *** indicate significant results at 10, 5 and 1 percent level, respectively.

Benchmark	Market-matched		Size-matched		Size-BM matched	
	N	CAR	N	CAR	N	CAR
A. Equally-weighted						
One-year	261	13.36% (5.239 ^{***})	185	8.59% (2.562 ^{**})	108	14.36% (3.670 ^{***})
Three-year	261	19.14% (4.666 ^{***})	183	9.89% (1.748 [*])	108	13.96% (2.069 ^{**})
Five-year	259	28.31% (4.786 ^{***})	183	-26.74% (-0.699)	107	8.94% (1.238)
B. Value-weighted						
One-year	258	39.40% (3.257 ^{***})	185	50.67% (3.140 ^{***})	108	58.75% (3.180 ^{***})
Three-year	258	41.13% (2.270 ^{**})	183	44.89% (1.845 [*])	108	40.98% (1.652 [*])
Five-year	256	34.95% (1.983 ^{**})	183	14.26% (0.126)	107	24.78% (1.304)

Table 7 BHAR of Privatization IPOs Using International Benchmarks

Returns of sample IPOs are compared with two international market index returns and returns of international firms in the Datastream World Index with similar size or size and book-to-market equity ratio (BM). Panel A reports the average returns in local currencies and Panel B reports the average returns in US dollars. Due to the data availability, only 210 (187) sample firms are matched with at least one matching firm the size (size and BM) of which is between 70 and 130 percent of that of the IPO firm. For each IPO firm, annual buy-and-hold return (BHR) is calculated using the total return index available in *Datastream*. If an IPO firm is delisted before the end of time horizon, the return calculation will stop on the date of delisting. Using the same time horizon used for the calculation of sample firm's BHR, the BHRs of five (or less) matching firms are calculated. If a matching firm is delisted before the end of time horizon, Datastream World Index returns are spliced until the end of the horizon. BHRs of delisted matching firms are used for the calculation of average annual BHR of matching firms only up to the year of delisting. Average annual matching firm BHRs are calculated using the BHRs of the rest of the matching firms starting from the year after the delisting. Average three- and five-year BHRs are calculated by compounding average annual BHRs over three and five years. This is equivalent to assuming annual rebalancing. Buy-and-hold abnormal returns (BHARs) are then calculated by subtracting the average BHRs of matching firms from the average BHRs of IPO firms. N represents the number of IPOs, IPO represents BHRs of IPO firms and Mat represents BHRs of benchmarks. For BHAR column, average BHARs are reported on top and t-statistics are reported in parenthesis. *, **, and *** indicate significant results at 10, 5 and 1 percent level, respectively.

Benchmarks	Market								Size				Size & BM			
	FTSE All World				Datastream World				N	IPO	Mat	BHAR	N	IPO	Mat	BHAR
	N	IPO	Mat	BHAR	N	IPO	Mat	BHAR								
Panel A. Return in Local Currency																
One-year	121	28.99%	11.65%	17.34% (3.022 ^{***})	210	27.97%	10.05%	17.92% (4.252 ^{***})	210	28.42%	16.69%	11.73% (1.940 [*])	187	29.88%	1569%	14.19% (2.629 ^{***})
Three-year	120	66.81%	44.21%	22.60% (1.878 [*])	209	61.82%	37.42%	24.40% (3.050 ^{***})	211	62.21%	47.27%	14.94% (1.079)	186	82.55%	8633%	-3.78% (-0.178)
Five-year	107	91.37%	37.59%	20.21% (1.087)	196	90.87%	63.81%	27.06% (2.460 ^{**})	196	9196%	113.88%	-21.92% (-0.631)	173	13296%	13419%	-7.19% (-0.303)
Panel B. US Dollar Return																
One-year	121	26.18%	1043%	1575% (3.022 ^{***})	210	27.97%	10.05%	17.92% (4.252 ^{***})	210	28.37%	16.64%	11.73% (1.940 [*])	187	2874%	16.35%	12.39% (2.147 ^{**})
Three-year	120	44.24%	41.33%	2.91% (0.655)	209	61.82%	37.42%	24.40% (3.050 ^{***})	211	62.92%	47.98%	14.94% (1.079)	186	66.19%	76.63%	-10.44% (-0.520)
Five-year	107	49.70%	58.34%	-8.64% (-0.737)	196	90.87%	63.81%	27.06% (2.460 ^{**})	196	91.28%	113.20%	-21.92% (-0.631)	173	9974%	110.49%	-1075% (-0.594)

Table 8 CAR of Privatization IPOs Using International Benchmarks

Returns of sample IPOs are compared with two international market index returns and returns of international firms in the Datastream World Index with similar size or size and book-to-market equity ratio (BM). Panel A reports the average returns in local currencies and Panel B reports the average returns in US dollars. Due to the data availability, only 210 (187) sample firms are matched with at least one matching firm the size (size and BM) of which is between 70 and 130 percent of that of the IPO firm. For each IPO, we calculate daily abnormal returns by subtracting daily returns of matching firms (or market indices) from those of sample firms and then cumulate those daily abnormal returns over relevant number of days to calculate cumulative abnormal returns (CARs) over one-, three- and five-year horizons. Average CARs are calculated using both equally-weighting and value-weighting methods. For value-weighting, weights are based on the market capitalization of IPO firms converted into 2000 US dollars using US CPI and exchange rates. N represents the number of IPOs. For CAR column, average CARs are reported on top and t-statistics are reported in parenthesis. *, **, and *** indicate significant results at 10, 5 and 1 percent level, respectively.

Benchmark	Market				Size		Size & BM	
	FTSE All World		Datastream World		N	CAR	N	CAR
	N	CAR	N	CAR				
Panel A. Return in Local Currency								
One-year	121	12.25% (3.237 ^{***})	210	14.24% (4.827 ^{***})	210	10.36% (2.291 ^{**})	187	109.33% (2.664 ^{***})
Three-year	120	16.19% (2.823 ^{***})	209	18.19% (4.032 ^{***})	209	10.34% (1.462)	186	2.70% (0.396)
Five-year	107	25.56% (3.727 ^{**})	196	23.79% (4.320 ^{***})	196	-3.65% (-0.420)	173	-6.60% (-0.762)
Panel B. US Dollar Return								
One-year	121	10.76% (2.764 ^{***})	210	14.24% (4.827 ^{***})	210	10.96% (2.353 ^{**})	187	9.55% (2.664 ^{***})
Three-year	120	8.32% (1.472)	209	18.19% (4.032 ^{***})	209	6.48% (0.943)	186	1.02% (0.396)
Five-year	107	11.90% (1.748 [*])	196	23.79% (4.320 ^{***})	196	-14.01% (-1.694 [*])	173	-11.59% (-1.419)

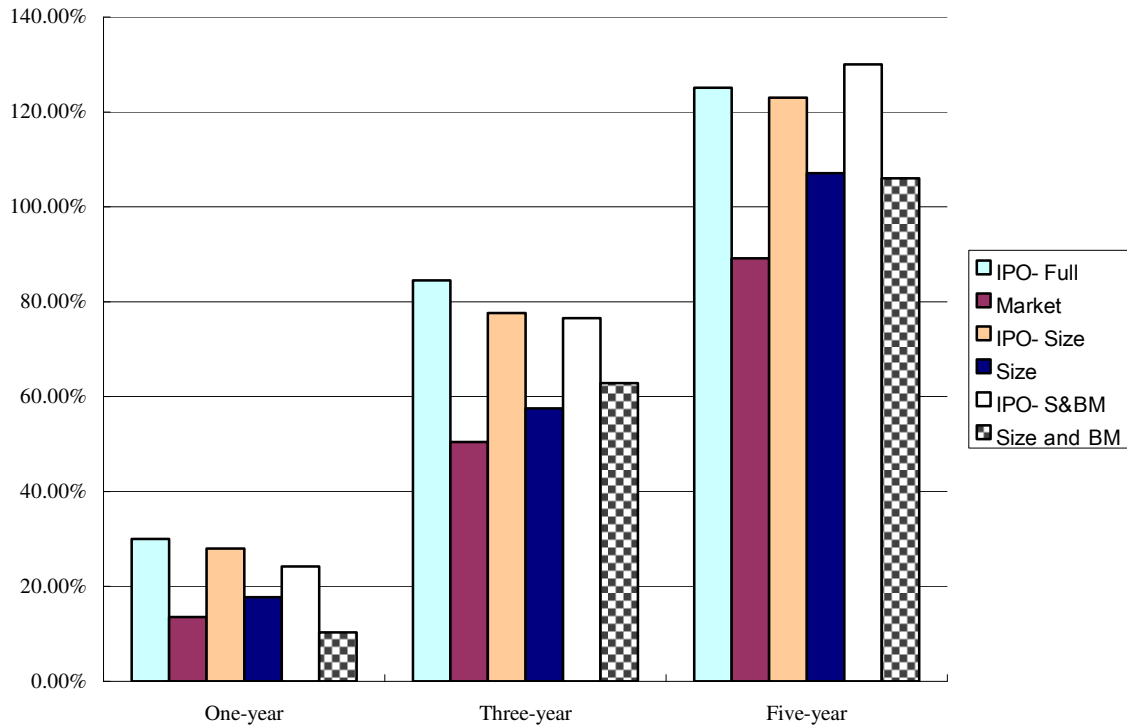


Figure 1 Equally-weighted average buy-and-hold return (BHR) of privatization IPOs and their benchmarks

Returns of sample IPOs are compared with domestic market index returns and returns of domestic firms with similar size or size and book-to-market equity ratio (BM). Due to the data availability, only 185 (108) sample firms are matched with at least one matching firm the size (size and BM) of which is between 70 percent and 130 of that of the IPO firm. For each IPO firm, annual buy-and-hold return (BHR) is calculated using the total return index available in *Datastream*. Average three- and five-year BHRs are calculated by compounding average annual BHRs over three and five years. Buy-and-hold abnormal returns (BHARs) are then calculated by subtracting the average BHRs of matching firms from the average BHRs of IPO firms. IPO-Full, IPO-Size and IPO-S&BM represent equally-weighted average BHRs of IPO firms in total sample (261), size-matched sample (185) and size-and-book-to-market equity ratio-matched sample (108), respectively. Market, Size and Size and BM represent equally-weighted BHRs of domestic market indices, size matched firms and size-and-BM matched firms.