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Journal of Banking & Finance 28 (2004) 2461–2492
Journal of BANKING & FINANCE
www.elsevier.com/locate/econbase

Do government-linked companies underperform?

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Received 20 November 2002; accepted 8 October 2003
Available online 9 January 2004

Abstract

Our comprehensive study of 30 Singapore government-linked companies (GLCs) covering the period 1964 to1998 shows that share issue privatization has some positive impacts on their performance. However, there was no evidence that the GLCs were less profitable than a selected group of non-GLCs that match by size and industry. Taking a buy-and-hold strategy, we found that GLC stocks provide statistically equivalent returns relative to market or other control sample returns over various investment horizons of up to four years. Given that GLCs also perform as well as averages for the market and industry up to five years before their listing, we argue that Singapore's government-owned enterprises are comparable to privately run enterprises in efficiency.
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JEL classification: G30
Keywords: Government-linked companies; Privatization; Singapore; Performance; Profitability

1. Introduction

Market economists argue that firms in private hands are superior to firms in the hands of a government (see, for example, Boycko et al., 1996; Shleifer, 1998;

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doi:10.1016/j.jbankfin.2003.10.012

Dewenter and Malatesta, 2001). The privatization program initiated by the Thatcher government of the United Kingdom in the late 1970s was based on such a belief. Shleifer and Vishny (1994) provided a model to explain why privatization might work. Boardman and Vining (1989), Megginson et al. (1994), D'Souza and Megginson (1999), and others, have provided empirical evidence that government ownership is less efficient than private ownership. Yet studies such as those of Caves and Christensen (1980), Kay and Thompson (1986), Wortzel and Wortzel (1989), Martin and Parker (1995) and Kole and Mulherin (1997) suggest that government ownership is not necessarily less efficient than private ownership. In fact, when a government privatizes, it seldom sells all of its stakes or even controlling shares to private hands. This may be for political reasons, as suggested by Biais and Perotti (2002), or due to the legal structure of the country, as found by Bortolotti et al. (2002). But even for economic reasons, retaining partial government ownership can have a positive effect. Perotti (1995) has a model showing that governments tend to privatize a smaller proportion of such firms at the beginning. Being the largest stakeholder of the partially privatized state-owned enterprise (SOE), the government sends a credible signal to the market that it is not expropriating shareholders' wealth. Boardman and Laurin (2000) found a positive relationship between government ownership and the stock returns of companies going through share-issued privatizations.

In this paper, we examine a group of government-controlled enterprises of an unusual country, Singapore. Singapore is an interesting and enlightening case for study because even though the Singapore economy has been ranked one of the freest in the world, [3] its success owes much to the highly visible hand of its government. Unlike in western industrial countries, the Singapore government never shies away from playing an active role in the country's economy. Contrasting sharply with another "Asian small dragon", Hong Kong, which Milton Friedman once crowned as the only place in the world that is genuinely *laissez faire*, Singapore's government plans, paves, and directs the country's path of development. More than that, immediately after the country gained its independence, the Singapore government set up a group of government-linked companies (GLCs) in key industries that propelled the country's economy forwards. [4] Thus, GLCs have played a strategic and important role in Singapore's economic development from the beginning. Since the mid-1990s, GLCs have again been playing a key role in leading the country to develop business beyond its geographical territory. [5]

[3] According to Gwartney and Lawson (2002), Singapore ranks as the second-freest economy in the world, second only to Hong Kong.

[4] "Government-linked corporation" is the term used in Singapore for state-owned enterprise. They are synonymous as far as this study is concerned.

[5] To cite a few incidences, Neptune Orient Lines (NOL) bought the former American President Lines in 1998 for $825 million. Singapore Airlines purchased 49% in Virgin Atlantic Airways in late 1999 for $941 million and, in 2001, purchased a 25% stake in Air New Zealand, which owns all of Australia's troubled Ansett Airlines, for about $211 million. In March 2002, SingTel snatched Australia's Cable and Wireless Optus worth about $9 billion. And, a few weeks later, the Development Bank of Singapore (DBS) bought Hong Kong's Dao Heng Bank for $5.7 billion.

Yet Singapore should not be confused with centrally planned socialist countries such as the former Eastern Bloc or China. Singapore has a well-developed economy with a smoothly functioning labor market, product market, and capital market. The mode of business and company operations is quite similar to that in western, industrialized countries. This is why Singapore is consistently ranked favorably by various country-rating agencies in dimensions such as competitiveness, openness, degree of corruption, and so forth. For instance, according to the World Competitiveness Yearbook, from 1992 to 2000 Singapore government ranked number one in all categories of competitiveness.

Arguably, Singapore's GLCs may well be the most efficiently operated government-owned enterprises in the world. In fact, a recent issue of *Singapore Country Commercial Guide FY2001* published by the US Embassy in Singapore states that, "Singapore GLCs, unlike typical parastatals, are generally well-run, efficient and profitable". [6] On the other hand, a study conducted by KPMG Consulting in 1999 on listed manufacturing firms in Singapore included three GLCs among the top five "destroyers of shareholder value", but no GLCs among the top five "creators of shareholder value". In recent years, there have been several instances in which the Singapore government appointed foreigners to push through radical restructuring in order to turn around an underperforming GLC (examples include Neptune Oriental Line and DBS Bank). [7] Some analysts have even suggested that it is time for the Singapore government to give up control of the GLCs to allow more competition in the market, which would improve the performance of these companies. [8] But given the fact that Singapore is a small open economy, the GLCs may have been competing with foreign companies all along. Such competition may well have compelled them to become more efficient than "typical" government enterprises. But as Shleifer and Vishny (1997) have argued, competition alone cannot replace the important role of corporate governance in the economic efficiency of a firm. In any case, Singapore's GLCs provide an interesting case in addressing the simple but fundamental question: are government-owned companies necessarily inefficient? [9]

In view of such mixed views and arguments, we believe a serious study can shed light on the issue and adds value to the privatization literature. We make two major comparisons. We fist compare the performance of GLCs before and after their

[6] Singaporeans themselves also have a good impression of GLCs. The major GLCs – examples include Singapore Airlines, Neptune Orient Lines, Keppel and Sembawang – are publicly listed and among the best known corporate names, locally and regionally. Of the top 10 local companies in Singapore ranked by either net profits or sales at the end of 2000, six were GLCs (http://www.usembassysingapore.org.sg). In the annual survey by ACNeilson International Research (Hong Kong) of the Far Eastern Economic Review readership's perception of company leaders in their own countries, Singapore readers included five GLCs in their ranking of the top 10 companies, namely, Singapore Airlines, DBS Bank, SingTel, Singapore MRT, and Singapore Technologies Group.

[7] Source: http://www.usembassysingapore.org.sg.

[8] Source: *Financial Times*, London, 2 April 2002.

[9] We use the term "efficiency" throughout the paper in a loose sense, which refers to the firm level, *technological/cost efficiency*. There is also *allocative efficiency* at the societal level. For a more formal treatment of the difference and trade-off between the two, see Jones et al. (1990).

privatization to see if there is any systematic performance difference between the two periods. Second, we compare GLCs with a few matched samples of non-GLCs both based on their pre- and post-privatization performance to see if there are significant differences. Our results show that there was slight improvement of GLCs following a share issue privatization (SIP) in terms of net income and efficiency increase although no significant increase in return on sales (ROS). However, when comparing both the pre- and post-listing accounting measures of performance against various benchmarks of non-GLC firms, there is no evidence that GLCs perform worse than non-GLCs except for the ROS measure. Using market data, we did not find that the returns of non-GLC stocks outperformed the returns of GLC stocks. This indicated that there was no "discrimination" against GLC stocks by market investors. We hence conclude that the performance of GLCs is comparable to that of non-GLCs. This may be due to the openness of Singapore economy to intense foreign competition and its well-functioning labor, product, and capital markets. Notwithstanding all these, privatization brings some improvements in GLCs' profit, efficiency, and output level.

The remainder of the paper is structured as follows. Section 2 provides a brief background of the GLCs. Section 3 develops the hypotheses that will be tested in the empirical analysis, the data used in the study, and the methodology employed to test the hypotheses. Section 4 consists of the presentation and interpretation of the results. Finally, the conclusions drawn from the research are outlined in Section 5.

2. Background of the GLCs

After independence in 1965, Singapore established GLCs in key industries, but simultaneously offered incentives for foreign multinational companies (MNCs) to set up operations and regional headquarters in Singapore. The government saw both GLCs and MNCs as essential to providing the lift for Singapore's economic take-off.

By definition, GLCs are companies in which some shares are owned by the government. [10] Like all commercial entities, GLCs also produce and sell goods and services in a competitive market environment. Most of these companies were established in the 1960s and 1970s, primarily to facilitate Singapore's economic development in specific sectors. In the 1980s and 1990s, GLCs were formed mainly from the corporatization of former government departments and statutory boards.

The GLCs' reach is broad, and includes Singapore's national airline (Singapore Airlines); two leading telecommunications operators (SingTel and ST Telemedia); south-east Asia's biggest banking group (DBS); the main shipyards (Keppel and SembCorp); the port operator (PSA); a shipping company (Neptune Orient Lines), and a number of other businesses. GLCs account for nearly half of the 20 largest listed companies and 41% of the local Straits Times index, although some big state companies remain unlisted. [11] There have been various attempts to measure the role

[10] See Appendix A for the definition of GLCs.

[11] Source: *Financial Times*, London, April 2, 2002.

of GLCs in Singapore's economy. In May 1993, the Ministry of Finance (MOF), in its *Interim Report of the Committee to Promote Enterprise Overseas*, estimated that "the public sector and GLCs are a major component of the Singapore economy, accounting for about 60% of our Gross Domestic Product (GDP)". [12] In a report on March 2001, [13] the Singapore Department of Statistics estimated the contribution of GLCs to GDP at 12.9% in 1998, [14] while non-GLC public sectors (including statutory boards) accounted for another 8.9%, for a total public sector/GLC share of 21.8%. However, this more recent estimate is limited to GLCs in which the government's effective ownership of voting shares is 20% or more. It does not encompass GLCs where the government's effective ownership level is under 20%.

The government invests in corporations through three vehicles: MND Holdings, Singapore Technology Holdings, and Temasek Holdings. As of 1998, up to 70% of some GLCs are directly and indirectly controlled by the government through these three companies, while a smaller percentage of major non-GLCs in the banking, shipping, and technology sectors are controlled indirectly through inter-corporate equity shares between GLCs and non-GLCs. At the end of the 1980s, GLCs comprised 69% of the total assets and 75% of the profits of all domestically-controlled companies in Singapore. [15] However, in the 1990s, those numbers have been reduced through a privatization program that began in March 1985, which was influenced by the wave of privatizations initiated by the Thatcher government in Britain. A committee known as the Public Sector Divestment Committee (PSDC) was set up to identify the GLCs for divestment and also the major forms of privatization. [16] Although the equity of these companies is partly dispersed, the government continues to hold significant ownership through its holding companies.

It should be noted that, in most countries, improving resource allocation and efficiency are the usual objectives of privatization. Different reasons have been put forward by the PSDC for privatization in Singapore. First, the government wants to withdraw from commercial activities that no longer need to be undertaken by the public sector. Second, the government aims to add breadth and depth to Singapore's stock market through the flotation of GLCs and introduction of statutory boards and by the secondary distribution of Government-owned shares. Finally, the government wishes to avoid or reduce competition with the private sector. [17]

[12] Ministry of Finance, 1993, "Interim Report of the Committee to Promote Enterprise Overseas", p. 39.

[13] Singapore Department of Statistics, March 2001, "Occasional Paper Series – Contribution of Government-Linked Companies to Gross Domestic Product".

[14] The contribution of GLCs to GDP increased from 10.6% in 1996 to 12.9% in 1998.

[15] See Mak and Phillip (1999).

[16] There are four major methods of privatization in Singapore. One is privatization of ownership through the sale of assets or shares. The other is the privatization of production, in which the government buys goods and services rather than makes them. The third type is the privatization of financing, wherein the government relies on consumer charges rather than tax revenues to finance operations. The last type is liberalization or deregulation, whereby competition by and in the private sector is encouraged through relaxation or removal of the government regulations.

[17] PSDC Report, p. 1.

3. Data and methodology

We focus only on listed companies due to their reliable and publicly available financial and accounting data. The criteria for selecting the GLCs are mainly based on the Directory of Government-Link Companies, issued in 1985, 1988, 1991 and 1994. However, we are unable to find an issue of the Directory of Government-Linked Companies more recent than 1994. We have excluded financial firms and banks. Moreover, the following five companies are discarded from our sample.

We are unable to find the pre-listing accounting information of Delgro Corporation and United International Securities. Singapore Technologies Engineering is a newly listed company, formed from the merger of four companies: Singapore Technologies Aerospace, Singapore Technologies Automotive, Singapore Technologies Shipbuilding & Energy and ST Electronic & Engineering. SembCorp Industries is also a newly listed company, formed by merging Sembawang Cooperation and Singapore Technologies Industrial. As for SMRT Corporation, which listed in the Stock Exchange of Singapore (SES) in July 2000, full accounting information is not available three years after listing.

Hence, our sample includes 30 GLCs and 26 non-GLCs, as listed in Appendix B. There are four GLCs (Singapore Airlines Ltd, Singapore Telecommunications Ltd, Keppel Corporation Ltd and Singapore Technologies Industrial Ltd) for which we are unable to find corresponding non-GLCs in terms of similar firm size in the same industry. As such, we will work on both the full-size sample and matched sample for all tests that involve the comparison of GLCs and non-GLCs (i.e., excluding the four GLCs for which we are unable to find matched non-GLC counterparts). The sample period runs from 1975 to 1998.

The pre-listing accounting data of the sample firms come from their historical prospectuses, which are available in the Information Resource Centre of the Singapore Exchange. The post-listing accounting and market data are mainly retrieved from the following databases: PACAP (Pacific-Basin Capital Markets); Global Researcher – Worldscope Database (November 1999); Osiris (2001); Financial Database – Nanyang Technological University. Some accounting data, unavailable in the aforementioned databases, are supplemented from the Companies Handbook (1972–1999) or from specific company annual reports. The annual economic data on gross domestic product (GDP) growth and on the consumer price index (CPI) is obtained from the website of Singapore Department of Statistics. [18] The employee figures are difficult to get. We are only able to find the employee data for the year before listing from the IPO prospectuses and at least one year of data for 18 GLC firms within three years after their listing through various sources.

If GLCs are generally well-run, efficient and profitable, the performance of the GLCs, no matter how it is measured, should be comparable to the performance of non-government, private companies. Furthermore, if the privatization objectives of GLCs are unrelated to resource allocation, greater efficiency, or reduction of

[18] http://www.singstat.gov.sg.

the fiscal burden, their performance would not greatly improve after privatization. This assumption is on the basis of our comparison tests. Essentially, we contrast the performance of GLCs before and after share issue privatization and the performance between GLCs and non-GLCs both before and after listing. [19]

To examine the changes in performance before and after SIP, we followed similar testing proxies and methodology as in Megginson et al. (1994), Boubakri and Cosset (1998), D'Souza and Megginson (1999), Dewenter and Malatesta (2001). Specifically, we looked at profitability, efficiency, output and leverage. [20] Profitability is measured by three accounting return measures; i.e., return on sales (ROS), which is net income to total sales; return on assets (ROA), which is net income to total assets; and return on equity (ROE), which is net income to total equity. Output is proxied by real sales (RS), which is nominal total sales adjusted for inflation. Efficiency is proxied by three measures: total asset turnover (TS/TA), which is total sales to total assets; earnings per employee (NI/Emply), which is the net income divided by the number of employees of the company; and output per employee (RS/Emply), which is the real sales divided by the number of employees. Leverage is measured by two ratios; namely, total debt ratio (TL/TA), which is total liability to total assets and long-term debt to equity (LTDE).

Notice a complication in our current study. Many Asian SIPs like those in China and Malaysia involve primary, capital-raising share offerings (Sun and Tong, 2002, 2003) and Singapore is no exception. [21] Some of the proxy variables mentioned above will then be affected mechanically by this one-time increase in capital during privatization which makes the comparison of the pre- and post-privatization performance of GLCs not sensible. Hence, for this particular set of tests, we use the real net income (NI) and return on sales (ROS), not ROE and ROA for the profitability comparison. Similarly, we use times interest earned (TIE), which is essentially the earnings before tax divided by interest expense, and operating cash flow on total debt (OCF/TD), not TL/TA and LTDE for the leverage comparison. [22] We also drop out TS/TA for the efficiency comparison and use only the other two proxies.

We first compute empirical proxies for every sample company for a seven-year period: three years before and three years after listing. We then calculate the mean of each variable for each company over the pre- and post-listing windows (pre-listing: years −3 to −1 and post-listing: years +1 to +3). Since the year of listing (year 0) includes both the public and private ownership phases for all companies, it is excluded from the analyses.

[19] All 30 GLCs in our sample have undergone partial privatization through share issuance. Panel A of Appendix B provides the SIP dates and the average portion of government ownership after listing. As such, we use pre-/post-privatization and pre-/post-listings interchangeably throughout the paper.

[20] We do not examine dividend payouts due to constraints in the data.

[21] See Panel A of Appendix B for the list of firms that have gone through primary issues in privatization.

[22] Sun and Tong (2003) also use these two measures for their leverage comparisons of China privatized SOEs.

We employ the *t*-test and the Wilcoxon signed-rank test to test for any significant mean and median changes in the proxies before and after the SIP, respectively. It might be argued that the impact of getting listed could only be observed a few years after listing. We hence widen the study window to 11 years (five years before to five years after listing) to check the robustness of the results. Due to the constraints of the pre-listing data, we only include those companies that have complete data through the 11-year study period. Opposite to the typical hypothesis in privatization studies, we hypothesize that these characteristics of the firm will not change after the GLCs have been privatized. If the hypothesis cannot be rejected, we have some preliminary evidence that the GLCs were already quite efficient before privatization, although the ineffectiveness of privatization in improving the efficiency of GLCs could also be a factor.

Dewenter and Malatesta (2001) point out that a potential problem with the univariate test is that it ignores the possible impact of changes in the economic environment on the performance of firms. The changes in firm performance that have been observed may be due to the economy rather than to privatization per se. To address this possibility, we run the following simple OLS regression:

$$\Delta \mathrm{PP}_i = \alpha + \beta_1 \Delta \mathrm{GDPGR}_i + \beta_2 \mathrm{GOV}_i + \varepsilon_i. \tag{1}$$

This can be viewed as an alternative approach to the univariate test. Instead of comparing the mean and median differences of the performance proxies, PP, before and after privatization, we use the differences as the dependent variables, denoted by ΔPP. Specifically, the difference is the three-year, post-listing average minus the three-year, pre-listing average of the variable in question. The regression intercept α captures the mean difference of the performance proxy before and after privatization. More than that, the change in GDP growth ΔGDPGR is put into the setting to control for the influence of the economy on performance change. GOV is the government ownership upon share issue privatization, to determine if the fraction of government ownership that remains affects the change in performance around listing. [23] Again, the null hypothesis is that there are no significant changes in firm performance after privatization, which implies that both the regression intercept, α, and the coefficient of the remaining government ownership should be insignificantly different from zero.

If the fact that no significant changes in firm performance occurred after privatization is attributable to the efficiency of GLCs and not to the ineffectiveness of Singapore's privatization program, GLCs should be found to be efficient even *before* privatization. To examine such a possibility, we make two further comparisons, one against the market average and the other against the industry average. Specifically, for the market average, we compute the average of each performance variable over all firms in the years corresponding to the prelisting years for each and every GLC. For the industry average, we select the five largest non-GLC companies in the matching industry and compute their average performance variables in the rele-

[23] We thank the referee for suggesting this to us.

vant years. We compare the computed market and industry averages with the prelisting averages of the GLC performance variables. If the GLCs are already efficient before privatization, the performances in the GLC and market/industry averages should be similar.

Another set of tests aims at comparing the *post-listing* performance of GLCs and a control sample of non-GLCs that match GLCs one by one in industry and size. Specifically, for a GLC, we look for non-GLCs in the same industry as the GLC's and then pick the one closest in size to the GLC in terms of the TA. If the closest TA value of the non-GLC is off the TA of the GLC by more than 20%, that GLC is regarded as having no match. We have four unmatched GLCs, leaving 26 matched pairs. We want to compare directly, although a bit roughly, government-controlled firms with private-controlled firms. We first do the performance comparison by running the following pooled regression:

$$\mathrm{PP}_{i,t} = \alpha_i + \beta_1 \mathrm{DUM}_i + \beta_2 \mathrm{GDPGR}_t + \sum_{j=3}^{6} \beta_j \mathrm{IND}_i + \varepsilon_{i,t}, \tag{2}$$

where $\mathrm{PP}_{i,t}$ is the performance proxy for firm i in year t, which starts from one year after the listing of the firm to 1998, the end of our sample period. Since the regression works on the post-listing period, we include one more performance proxy variable, market-to-book ratio to equity (MBR). This is the market value of equity divided by the book value of equity, which is a proxy for Tobin's q. [24]

Notice that the sample now includes both GLCs and non-GLCs. As such, the test goes beyond the previous tests and contrasts the after-listing performance of GLCs and non-GLCs. This is done by setting the dummy variable DUM, which takes the value of one if the firm is a GLC and zero otherwise. Notice also the interpretation of the coefficient β_1. If it is significantly positive, the after-listing performance proxy of GLCs is better (or worse) than that of non-GLCs. Other variables are control variables. GDPGR_t is the GDP growth for year t, which, again, is used for the purpose of controlling for general economic conditions. IND is another dummy variable, taking the value of one if a firm falls into a particular industry and zero otherwise. [25]

Next, we focus on stock return as a performance measure. Dewenter and Malatesta (1997) and Jones et al. (1999) showed the underpricing of initial offer shares in privatizations of SOEs, similar to the underpricing of private company IPOs. Megginson et al. (2000) and Boardman and Laurin (2000) examined the long-run performance of the share prices of privatized firms across various countries. They found statistically significant positive net returns for these firms. In the same spirit, we examine the market-adjusted and other control sample-adjusted

[24] Tobin's q is a popular proxy for firm performance (Morck et al., 1988; McConnell and Servaes, 1990, 1995, and others). Our proxy is similar to that used in Chung and Pruitt (1994), Perfect and Wiles (1994), Agrawal and Knoeber (1996), Kang and Stulz (1996), Clarkson et al. (1997) and others.

[25] The industrial categories are services, transport/storage/communications, properties, and multi-industry. The manufacturing industry is omitted in the regressions.

annual stock returns of the sample firms up to five years after their listing. The annual raw return is the average of the simple monthly compound returns of the sample GLC firms. The market-adjusted buy and hold returns are calculated as follows:

$$\mathrm{CR}_{i(a-b)} = \prod_{t=a}^{b}(1 + R_{i,t}) - \prod_{t=a}^{b}(1 + \mathrm{MR}_t), \quad i = \text{GLC stocks}, \tag{3}$$

where CR is the market-adjusted cumulative return; R is the firm's monthly stock price return with the cash dividend reinvested; MR is the relevant monthly market return; and ($t = a$ to b) is the time frame of one to five years. The market benchmark used is the equally weighted market return with cash dividend reinvested (EWMR). [26] This is essentially a buy-and-hold strategy for different investment horizons. We want to see if the strategy can beat the market.

Barber and Lyon (1997) suggested that the best way to examine cumulative abnormal returns or buy-and-hold returns is to contrast them with a control sample even if the control is rough. Our control sample is naturally the non-GLC stocks. Hence, we also compare returns of GLC and non-GLC stocks. Such a comparison reveals the market's perception on the future potential of these two groups of firms. If the market indeed views them as comparable to each other, we would expect to see similar returns for these stocks. The comparison is done in two ways. The ''non-GLC adjusted'' comparison contrasts the mean returns of the sample GLC stocks with the mean returns of the sample non-GLC stocks over the same time period. Since the non-GLC sample is matched for size and industry but not for listing year, we further compare it with an IPO control sample (the ''IPO adjusted'' comparison), which is a group of non-GLC firms matched to the GLCs by listing years. Specifically, for each GLC firm, we find the non-GLC firm that has the closest IPO date with that of the GLC firm. [27] Notice that there are four GLCs listed before 1975. However, our databases do not have stock market data before that year; hence, we can only work on 26 firms in this particular set of tests.

To go a step further, we directly contrast the returns of GLC stocks and non-GLC stocks using pooled regression:

$$\mathrm{ER}_{i,t} = \alpha_i + \beta_1 \mathrm{DUM}_i + \beta_2 \mathrm{SIZE}_{i,t} + \beta_3 \mathrm{LEVERAGE}_{t,t} + \varepsilon_{i,t}. \tag{4}$$

$\mathrm{ER}_{i,t}$ is the annual market-adjusted excess return of firm i in year t. Again, EWMR will be the market benchmark return used in the adjustment. DUM, the GLC dummy variable as defined above, captures the possible difference in returns between the GLC and non-GLC stocks. If investors indeed view the GLCs as efficient as non-GLCs, their returns should not be significantly different from each other. SIZE, the firm size measured as the natural log of the annual total assets of the firm, is used to control for the possible size effect documented by Banz (1981), Jacobs and Levy

[26] According to Barber and Lyon (1997), as the sample portfolio return in question is usually equally weighted, comparing with equal-weighted market return is better than with value-weighted market return.

[27] We thank the referee for suggesting such a comparison to us.

(1988), Fama and French (1992) and Jegadeesh (1992), among others. Bhandari (1988) and Barbee et al. (1996) show that the debt–equity ratio has explanatory power for stock returns. LEVERAGE, the debt–equity ratio of the firm, is hence also introduced to control for such an effect.

The above return comparisons between GLC stocks and non-GLC stocks may not be fair as the comparisons ignore the possibility that the two portfolios of stocks bear different market risks. This is quite possible in view of the fact that GLCs are backed by the Singaporean government. It is conceivable that holding the GLC stock portfolio is safer than holding the non-GLC stock portfolio. As a result, the required return for GLC stocks should indeed be lower than that for non-GLC stocks. Hence, as a final test, we run the following pooled regression:

$$(R_p - R_f)_t = \alpha_p + \beta_1 \mathrm{DUM}_{p,t} + \beta_2 (R_m - R_f)_t + \beta_3 \mathrm{DUM}_{p,t} * (R_m - R_f)_t + \varepsilon_{p,t}. \tag{5}$$

$R_{p,t}$ is the return in month t of portfolio p, which comes from the average of the monthly returns of individual stocks within the same portfolio in that month. One portfolio is the GLC stock and the other is the non-GLC stock. $R_{f,t}$ is the risk-free rate in month t, and we use three-month Singaporean Treasury Bills as its proxy. $R_{m,t}$ is the monthly market return proxied by EWMR. $\mathrm{DUM}_{p,t}$ is defined similarly as before, except that it is now a portfolio dummy, which takes a value of one for the GLC portfolio and a value of zero for the non-GLC portfolio. We put in the interactive dummy to allow for the possibility that the two portfolios have different beta risks. Again, taking portfolio risk into consideration, we hypothesize that the risk-adjusted return of the GLC portfolio is insignificantly different from that of the non-GLC portfolio; i.e., β_1 is equal to zero.

4. Empirical results

In Table 1, we present some simple descriptive statistics of the variables we use in our tests.

The mean and standard deviations of the variables are broken down by ownership type. The column with the heading "GLCs (30 firms)" lists statistics on the full-size sample of 30 GLCs. The column with the heading "GLCs (26 firms)" lists the statistics of the 26 GLCs that have corresponding matched non-GLCs, the statistics of which are listed under the "non-GLCs" column. On average, the firm characteristics are comparable between the three groups but the 26 GLCs do indeed have firm characteristics that are more similar to their non-GLC counterparts than do the 30 GLCs. Essentially, the four GLCs without suitable non-GLC matches have much larger asset size with much higher net income and output level. These are reflected in the big differences in the mean values and standard deviations of NI, Real Sales, and Total Assets between 30 and 26 GLCs but much more comparable figures in their median values.

Table 1
Variable means, medians and standard deviations

Variable(s)	GLCs (30 firms) Mean Median (Std. dev.)	Obs.	GLCs (Matched 26 firms) Mean Median (Std. dev.)	Obs.	Non-GLCs (26 firms) Mean Median (Std. dev.)	Obs.
ROA	0.0425 0.0388 (0.0531)	322	0.0404 0.0382 (0.0511)	280	0.0410 0.0483 (0.1165)	272
ROE	0.06979 0.0736 (0.1445)	322	0.0658 0.0713 (0.1495)	278	0.0667 0.0801 (0.3069)	272
ROS	0.0904 0.0669 (0.1621)	310	0.0862 0.0622 (0.1658)	268	0.0891 0.0722 (0.3767)	250
NI	92.75 20.27 (16.883)	310	21.19 16.92 (3.483)	269	30.02 20.91 (2.859)	250
MBR	1.6264 1.2680 (1.2418)	292	1.5771 1.2923 (0.9569)	253	1.4061 1.3122 (2.6951)	231
Efficiency	0.8120 0.6883 (0.7319)	311	0.8582 0.5460 (0.7643)	268	0.7798 0.5989 (0.7348)	250
Real sales	892.7 322.9 (1447.8)	312	524.8 275.4 (660.1)	269	364.0 200.8 (401.6)	250
LA	0.4522 0.4468 (0.1648)	321	0.4516 0.4480 (0.1685)	277	0.3724 0.3643 (0.1718)	272
LTDE	0.3933 0.1378 (0.9529)	246	0.4254 0.1431 (1.0237)	209	0.2980 0.2010 (0.3154)	177
Total assets	2050.5 516.4 (2826.2)	312	1024.2 450.7 (1463.3)	270	991.2 403.1 (1164.1)	272

This table reports the mean, median, and standard deviation for various variables of interests over the sample period (1975–1998). The second column presents these statistics for all 30 GLCs with available data. The fourth and sixth columns present the mean, median and standard deviation, respectively, for 26 GLCs and 26 Non-GLCs matched by industry and firm size. ROA, ROE, ROS and MBR are return on assets, return on equity, return on sales, and market to book equity ratio, respectively. Efficiency is measured in terms of total asset turnover; i.e., total sales over total assets. Real sales, net income (NI) and total assets are in millions of 1997 constant Singapore dollars. The leverage proxies, LA and LTDE, are total liabilities over total assets and long-term debt over total equity, respectively.

4.1. Performance changes before and after privatization

Our first major test is to compare the performance of GLCs before and after their privatization. If the purpose of the privatization program in Singapore is unrelated to the effectiveness of the GLCs, we do not expect to see much improvement in firm performance after privatization.

Table 2 [28] shows a comparison of the profitability of the full sample, 30 GLCs before and after listing. The first major row presents the results under a shorter window of seven years. If only look at the profit level, NI, the mean (median) NI increases from 0.64 (0.61) at the pre-privatization period to 1.49 (1.21) at the post-privatization period. The mean NI increase is hence equal to 84.82% with a t-value of 1.78 that is statistically significant at the 10% level. The median increase is 60.09% but the Wilcoxon test statistics of 4.09 is significant at the 5% level. Indeed, the last column that shows the ratio of firms experiencing positive changes in profitability relative to those experiencing negative changes after listing shows a ratio of "21/4" for NI. That means 21 firms experiencing an increase in NI and only 4 firms experiencing a decrease after privatization. The proportion test also indicates the difference being statistically significant at the 5% level. Hence, there is some evidence that the profit level is improved after privatization.

However, if profitability is measured in terms of ROS, the mean (median) increase is a mild 0.98% (1.53%). In fact, both the t and the Wilcoxon test statistics do not bear statistical significance for these changes. The increase/decrease ratio of "14/10" also indicates that 14 firms have an ROS increase whereas 10 firms have an ROS decrease after privatization. In this case, there is no clear evidence that privatization helps boosting GLCs' ROS much.

The second major row of Table 2 presents the results of the comparison of operational efficiency. The two proxies using employment information tend to increase. Specifically, the mean (median) increase of NI/Employee and RS/Employee are 3.57 (3.26) and 1.63 (1.56), respectively. However, the test statistics are not significant for these changes. Hence, there is no evidence of an improvement in efficiency in GLCs although it is true that 16 firms experience an increase in RS/Employee and only 2 firms experience a decrease after SIP.

The third major row of Table 2 reports the changes in output level. The proxy is annual real sales, which shows a substantial increases in output in mean as well as in median following listing. Both the t-value of 4.45 and the Wilcoxon test statistics of 4.54 are highly significant. Also, most of the GLCs (22 out of 24) have output increase after privatization. This is the strongest evidence so far of a significant improvement in performance after the privatization of GLCs.

The fourth major row shows that leverage of GLCs tends to drop after privatization. Notice the interpretations of TIE and OCF/TD. An improvement in leverage

[28] Since NI is in dollar amount, it can be very different across firms of different sizes. In order to make NI comparable across firms when computing Wilcoxon and t-tests in Table 2, we follow previous authors to normalize NI to 1 in year zero for each firm. We do similar normalization for RS.

Table 2
Comparison of GLCs companies before and after listing

Performance variable	Sample period	No. of obs.	Mean (median) before	Mean (median) after	Mean (median) change	*t*-test (Wilcoxon)	+ve/−ve ratio
NI	(−3 to +3)	25	0.6428 (0.6125)	1.4911 (1.2134)	0.8482 (0.6009)	1.7803* (4.094**)	21/4[a]
ROS		24	0.0845 (0.0497)	0.0943 (0.0650)	0.0098 (0.0153)	0.3947 (0.7319)	14/10
NI/Employee		16	18.812 (12.321)	22.387 (15.585)	3.575 (3.263)	0.920 (1.0802)	9/7
RS/Employee		18	168.53 (147.22)	246.84 (220.92)	78.311 (73.709)	1.6368 (1.5661)	16/2[a]
Output		24	0.8161 (0.8084)	1.4299 (1.4017)	0.6138 (0.5933)	4.4542** (4.546**)	22/2[a]
TIE		20	213.6540 (11.6997)	76.2868 (20.6998)	−137.3672 (9.0001)	0.8329 (0.5004)	10/10
OCF/TD		24	0.3542 (0.2801)	0.2712 (0.2107)	−0.0830 (−0.0694)	−1.2114 (1.0001)	7/17[a]
NI	(−5 to +5)	16	0.5036 (0.4837)	1.5660 (1.2738)	1.0625 (0.7900)	3.4817** (3.825**)	14/2[a]
ROS		16	0.0898 (0.0592)	0.0973 (0.0591)	0.0075 (−0.0001)	0.2241 (−0.3580)	9/7
Output		16	0.7503 (0.7549)	1.5609 (1.4569)	0.8106 (0.7019)	4.7077** (4.089**)	15/1[a]
TIE		18	234.3402 (11.6997)	409.8138 (18.3193)	175.4737 (6.6196)	0.4331 (0.3638)	7/11
OCF/TD		21	0.3506 (0.2842)	0.2530 (0.1800)	−0.0976 (−0.1042)	−1.4124 (1.3333)	8/13

The table presents, for each empirical proxy in various samples, the number of observations, the mean and median values of the profitability proxies for an average of three years before and after the listing periods, the mean and median change in the profitability proxies (after–before), and the tests of significance of the mean and the median change. The *t*- and Wilcoxon *Z*-test are employed to test for any significant difference in the mean and median values (paired observation). The last column shows the number of positive versus negative changes and the corresponding proportion test significance.

** (*) denotes significance at the 5% (10%) level (two tails).

[a] Denotes significantly different from 50% at the 5% level.

condition, i.e. less leverage burden after privatization, would reflect in a *positive* change in TIE but a *negative* change in OCF/TD, which is indeed the case we observe here. But since the changes are without statistical significance, we cannot say much. In terms of number of firms having leverage increase versus leverage decrease, same number of GLCs experiences TIE increase as TIE decrease but only seven GLCs experience OCF/TD increase while 17 GLCs experience a decrease after privatization.

Using a longer window of 11 years, the sample size becomes much smaller but the picture is essentially the same. For instance, the NI increase is significant but not for

the ROS increase. The output increase is significant but not for the leverage change. All in all, the privatization impacts on the GLCs are mild in general except for the output level.

To go beyond mean and median comparisons, we run the cross-sectional regression equation (1) to filter out the possible impact from changes in general economic conditions.

The results shown in Table 3 tend to be more significant than those based on the Wilcoxon tests and in favor of supporting the null hypothesis. For profitability results, the regression intercepts, which capture the average changes in profitability, are uniformly negative but without statistical significance. Notice that the change in GDP growth shows up positively in the regressions and bears statistical significance. [29] Specifically, for one percent increase in GDP growth, the NI increase is 9% and the ROS increase is 0.7%. Such a large and significant impact may be due to our long sample period, which covers large changes in GDP in Singapore. GDP grew rapidly in the early 90's and then also contracted rapidly after the Asian financial crisis. [30] Hence, the mild increases in NI and ROS found previously seem to be driven by the GDP growth during the period.

Similar situation is seen in the output regression. In Table 2, the output level is found to increase significantly after privatization. Now, after controlling for the change in GDP growth, which enters significantly into the regression at the 10% level (t-value of 1.81), the change in output level becomes insignificant, as the regression constant has a t-value of only −0.13.

For the two efficiency measures, the changes remain statistically insignificant. However, the leverage regression results are different. The mean TIE increase is 1.31 with a t-value of 1.96, which is almost significant at the 5% level. On the other hand, the mean change of OCF/TD is −0.41 with a t-value of −2.51, which is statistically significant at the 5% level. Notice that not only the change in GDP growth enters significantly into the ΔOCF/TD regression; the government ownership variable also enters significantly in the two leverage change regressions. Specifically, the ownership coefficient is −0.02 (t-value of −2.23) in the ΔTIE regression and 0.005 (t-value of 1.99) in the ΔOCF/TD regression; both are statistically significant at the 5% level. That is to say, when government ownership *drops* by 1%, TIE will *increase* by 2% and OCF/TD will *decrease* by 0.5%. This indicates that if government sells more shares to private hands, the GLC will tend to lower the leverage burden. [31]

[29] Since the number of observations is relatively small, we do not include industry dummies in the regression. However, the results (not reported but available upon request) do not change if industry dummies are included.

[30] We thank the referee for suggesting the possible explanation.

[31] We also tried average government ownership three year after listing. The results are qualitatively the same. We have also thought of using average *changes* in government ownership instead of just government ownership in the regressions. Unfortunately, our inability in getting the pre-listing government ownership data stops us from doing so. On the other hand, we may interpret the current regression formulation as implicitly assuming 100% government holding before privatization. Such assumption may not be far from truth for most of the GLCs, especially the large ones.

Table 3
Cross-sectional regressions on the performance changes of GLCs upon privatization

Explanatory variable	Dependent variable						
	Profitability		Efficiency		Output	Leverage	
	ΔNI	ΔROS	ΔNet income/employee	ΔReal sales/employees	ΔRSALE	ΔTIE	ΔOCF/TL
Constant	−0.0720	−0.0533	−9.6578	62.9386	−0.0728	1.3164	−0.4111
	(−0.0710)	(−1.218)	(−0.382)	(0.516)	(−0.132)	(1.9 600)*	(−2.5166)**
ΔGDPGR	0.0917	0.0074	1.6548	−7.1317	0.0743	−0.0322	0.0187
	(1.3427)	(2.554)**	(1.018)	(−0.689)	(1.817)*	(−0.6886)	(1.7059)*
GOV	0.0141	0.0009	0.3146	0.5607	0.0104	−0.0242	0.0054
	(0.8452)	(−1.368)	(0.773)	(0.312)	(1.087)	(−2.2325)**	(1.9950)*
Adj. R^2	−0.0049	0.1443	−0.0015	−0.0564	0.0668	0.1358	0.1096
OBS	25	24	16	16	24	20	24

This table provides the empirical results of the cross-sectional regression result analysis on the 30 privatized GLCs based on the following model:

$$\Delta PP_i = \alpha_i + \beta \Delta GDPGR_i + \gamma GOV_i + \varepsilon_i,$$

where PP is the performance (profitability, efficiency, output and financial leverage) proxy. GDPGR is the gross domestic product growth rate of Singapore. GOV is the government ownership upon share issue privatization. The difference sign "Δ" is the average of the three-year post-privatization data minus the average of the three-year pre-privatization data of the variable in question, which captures the difference in mean growth of the variable before and after privatization/listing.
* and ** denote statistical significance at the 10% and 5% levels, respectively (two tails).

Overall, controlling for changes in GDP growth gives somewhat different results. Profitability and output improvement that found to be significant in Table 3 become insignificant now. Leverage improvement found insignificant in Table 3 become significant now. Despite the differences, the evidence that privatization gives big push to the performance of the privatized GLCs is mild.

4.2. Comparison of pre-listing performance

As mentioned in the beginning, the literature typically shows that privatization improves the output, efficiency, and profitability of enterprises previously owned by the government. One reason for our findings that privatized GLCs in Singapore do not show dramatic performance improvements may be that they were operating relatively efficiently even before privatization. As the PSDC put it, the government's objectives in privatizing GLCs have nothing to do with improving efficiency. To investigate such a possibility, we contrasted the pre-listing performance of GLCs with the market and industry benchmarks.

Table 4 Panel A presents the comparison of the performance variables of GLCs against the market average during the pre-listing period. For the three-year pre-listing period, the mean (median) of the ROS of the GLCs is 0.10 (0.06), while that of the market average is 0.22 (0.17). Their mean (median) difference is −0.11 (−0.10), with a *t*-value (Wilcoxon statistic) of −2.57 (−2.10), which is statistically significant at a 5% (10%) level. Indeed, based on the ratio figure in the column, only six GLCs have a higher ROS than the market, versus 16 GLCs with lower ROS than the market. All of these indicate that, on average, the ROS of GLCs is lower than the market benchmark three years before privatization.

Besides ROS, other performance indicators show that the GLCs perform better than the market average. For instance, the ROA and ROE of GLCs are much higher than those of the market. [32] The *t*-values (Wilcoxon statistics) of the mean (median) differences of the two groups in ROA and ROE are, respectively, 4.90 (4.48) and 3.60 (4.26), all of which are statistically significant at the 5% level. The ratio figures in the last column indicate that most, if not all, GLCs have a higher ROA and ROE than that of the market. For the efficiency measure, GLCs show higher total sales to total assets than the market average, although the statistical significance rests on only the mean comparison. As for the leverage measure, GLCs have a higher total debt to equity ratio than the market. The mean and median differences are, respectively, 0.14 and 0.10, both of which bear a statistical significance of 5%. [33]

When the window of comparison extends to five years before privatization, the situation is similar. Besides ROS and TL/TA, other performance measures indicate that GLCs are better than the market average. For TL/TA, the mean and median differences between GLCs and the industry average are smaller, and the statistical significance is at the 10% level rather than the 5% level as in the three-year window period.

However, the performance "superiority" of GLCs may not be due to the fact that they are run by the government but, rather, due to their large size, as the market average comes from simple averaging that biases towards small firms. Hence, in Panel B, we contrast GLCs against their respective industry averages, which, recall, come from the five largest non-GLC companies of the respective matching industries. Indeed, the two groups become more comparable in the sense that the mean and median differences of the performance variables between GLCs and industry average do not uniformly show a high statistical significance. Specifically, for the five-year pre-listing window, no mean or median difference of any comparison of performance variable bears any statistical significance, except the mean difference of TL/TA. But even that is only marginally significant at the 10% level (the *t*-value

[32] Since the comparison is the pre-privatization period, we use back the more commonly used profitability measures of ROA and ROE, output measure of TS/TA, and the leverage measure of TL/TA.

[33] As mentioned before, we have only the employee data for the year before privatization for the GLC firms but not for all of the firms in the market portfolio; hence, we cannot compute net income and real sales per employee for GLCs to make the comparison here. Similarly, we are unable to get long-term debt figures in the pre-listing period for all of the firms in the market portfolio, so long-term debt to equity ratio cannot be computed either.

Table 4
Comparison of GLCs with the market/industry average before listing

Performance variable	Sample period	No. of GLC	Mean (median) GLCs	Mean (median) market	Mean (median) difference	*t*-test (Wilcoxon)	+ve/−ve ratio
Panel A. Comparison with the market average							
ROS	(−3 to −1)	22	0.1090	0.2277	−0.1187	−2.570**	6/16[a]
			(0.0635)	(0.1708)	(−0.1073)	(2.101*)	
ROA		23	0.0827	−0.0439	0.1266	4.907**	21/2[a]
			(0.0445)	(−0.0032)	(0.0477)	(4.482**)	
ROE		23	0.1774	0.0388	0.1386	3.609**	23/0[a]
			(0.1190)	(0.0669)	(0.0521)	(4.262**)	
TS/TA		22	1.2010	0.6952	0.5058	2.439**	13/9
			(0.8680)	(0.6759)	(0.1921)	(1.021)	
TL/TA		23	0.5359	0.3901	0.1458	3.4800**	18/5[a]
			(0.5011)	(0.3911)	(0.1099)	(3.055**)	
ROS	(−5 to −1)	15	0.1201	0.1704	−0.0503	−2.057*	4/11[a]
			(0.0827)	(0.1354)	(−0.0527)	(1.742)	
ROA		16	0.0753	−0.0600	0.2353	5.949**	15/1[a]
			(0.0454)	(−0.0473)	(0.0927)	(4.504**)	
ROE		16	0.1401	0.0358	0.1043	3.026**	15/1[a]
			(0.1097)	(0.0302)	(0.0795)	(3.077**)	
TS/TA		15	1.0890	0.7065	0.3825	1.428	8/7
			(0.7849)	(0.7160)	(0.0689)	(0.290)	
TL/TA		16	0.4871	0.3858	0.1012	1.9810*	11/5
			(0.4996)	(0.3864)	(0.1131)	(2.0121*)	
				Mean (median) Ctrl. sample			
Panel B. Comparison with the industry average							
ROS	(−3 to −1)	22	0.1090	0.1357	−0.0267	−1.107	5/17[a]
			(0.0635)	(0.1280)	(−0.0645)	(1.772*)	
ROA		23	0.0827	0.0571	0.0256	1.210	9/14
			(0.0445)	(0.0563)	(−0.0118)	(1.011)	
ROE		23	0.1774	0.0856	0.0918	2.311**	16/7[a]
			(0.1190)	(0.0819)	(0.0371)	(2.395**)	
TS/TA		22	1.2010	0.6283	0.5727	2.760**	15/7[a]
			(0.8680)	(0.6421)	(0.2259)	(1.514)	
TL/TA		23	0.5359	0.3804	0.6066	3.182**	17/6[a]
			(0.5011)	(0.3936)	(0.1075)	(2.790**)	
ROS	(−5 to −1)	15	0.1201	0.1677	−0.0476	−1.241	4/11[a]
			(0.0827)	(0.1614)	(−0.0787)	(1.576)	
ROA		16	0.0753	0.0574	0.0179	0.889	5/11
			(0.0454)	(0.0577)	(−0.0123)	(0.509)	
ROE		16	0.1401	0.0817	0.0584	1.594	9/7
			(0.1097)	(0.0749)	(0.0348)	(1.036)	
TS/TA		15	1.0890	0.6556	0.4334	1.633	9/6
			(0.7849)	(0.6988)	(0.0861)	(0.2489)	
TL/TA		16	0.4871	0.3644	0.1227	1.964*	10/6
			(0.4996)	(0.3778)	(0.1218)	(1.715)	

Notes to Table 4 (*continued*)
The table presents, for each performance proxy, the number of observations in the GLC sample, the mean and median values of various proxies of the GLC sample and the market/industry for an average of three or five years before the listing, respectively. It also presents the mean and median difference in proxies between the GLC sample and market/industry, and the tests of significance of the mean and median differences. The *t*- and Wilcoxon *Z*-test are employed to test for any significant difference in the mean and median values (paired observation). The last column shows the proportion of GLC firms having a higher value in the performance variable than the market/industry average.
** (*) denotes significance at the 5% (10%) level (two tails).
[a] Denotes significantly different from 50% at the 5% level.

being 1.96). All in all, there is no sign that GLCs performed worse than their corresponding industry average before being privatized.

4.3. Comparison of post-listing performance

In this section, we focus on comparing the performance of GLCs and a group of non-GLCs matched by size and industry. If the GLCs are relatively efficient, there should not be much difference between the performances of the two groups of firms. We use the post-listing (starting one year after listing) panel data to run Eq. (2), one controlling and one not controlling for the firm's industry. Like in the pre-listing comparison, we use back the more commonly used ratio measures of profitability and leverage in this part of the comparison, as the temporary impact of the primary issue on GLCs' assets and equities should be negligible given the long time span of the comparison period and the starting of the comparison only after a year of listing. [34] The comparison results are in Table 5.

Panel A contrasts the 30 GLCs and the 26 non-GLCs. The regression results not controlled for industry (Model 1) show that the coefficients for the dummy variable DUM on all accounting profitability measures and for the efficiency measure uniformly lack statistical significance. The results indicate that, on average, there is no difference in performance between the GLCs and the non-GLCs as far as profitability is concerned. [35]

However, we do find that the GLCs have a significantly higher output level than the non-GLCs. The coefficient estimate of real sales, RS is 0.53, which means that the GLC output level is S$0.53 million higher than the non-GLC output level after controlling for GDP growth. This difference is statistically significant at the 1% level as the *t*-value is 6.16.

As for financial leverage, the results are not definite. If leverage is measured as the total debt ratio, the GLCs have a higher financial leverage than the non-GLCs. The

[34] Our sample period runs from 1975 to 1998 for this regression. Although we have most of the data for GLC firms before 1975, we do not have pre-1975 data for matched non-GLC firms from the PACAP database as the data start from 1975.

[35] We do not include government ownership here because there are too many missing data points. The company handbook has changed its reporting format a couple of times during our sample period. For quite some years, there is no information on ownership structure.

Table 5
Pooled regression results on the firm performance of GLCs and non-GLCs after listing

	Profitability				Efficiency	Output	Leverage	
	ROA	ROE	ROS	MBR	EFFI	RSALES	LA	LTDE
Panel A. 30 GLCs plus 26 non-GLCs								
Model 1								
Constant	0.0064	−0.0112	0.0006	0.9154	0.6307	0.4800	0.4001	0.5125
	(0.441)	(−0.385)	(0.012)	(6.367)**	(8.843)**	(4.301)**	(22.46)**	(4.125)**
DUM	0.0002	0.0001	−0.0038	0.1965	0.0235	0.5355	0.0808	0.1139
	(0.024)	(0.006)	(−0.154)	(1.010)	(0.380)	(6.163)**	(5.808)**	(1.566)
GDPGR	0.4481	1.0083	1.1782	6.4112	1.9849	−1.5447	−0.3647	−2.9742
	(3.463)**	(3.013)**	(3.043)**	(3.575)**	(2.560)**	(−1.076)	(−1.871)*	(−1.774)*
Adj. R^2	0.0307	0.0212	0.0197	0.0101	0.0065	0.0521	0.0559	0.02158
DW	2.1322	2.1765	2.1549	2.1066	1.3128	2.4165	1.6092	2.3942
OBS	594	594	560	523	561	562	593	423
Model 2								
Constant	0.0217	0.0083	−0.0201	1.2002	0.8200	0.3406	0.0766	0.3652
	(−1.577)	(0.266)	(−0.517)	(7.523)**	(10.93)**	(2.849)**	(5.655)**	(3.656)**
DUM	−0.0037	−0.0054	−0.0052	0.0927	0.0204	0.4910	0.3287	0.0928
	(−0.536)	(−0.289)	(−0.229)	(0.522)	(0.360)	(6.237)**	(1.722)*	(1.479)
GDPGR	0.4584	1.0247	1.2176	6.4931	1.8417	−1.2516	−0.0555	−2.9318
	(3.522)**	(3.077)**	(3.066)**	(3.723)**	(2.605)**	(−0.938)	(−0.441)	(−1.840)*
Trans.	−0.0007	−0.0081	0.0523	−0.0032	−0.4725	1.0856	−0.0246	0.6943
	(−0.100)	(−0.403)	(3.312)**	(−0.014)	(−8.119)**	(4.383)**	(−1.001)	(3.625)**
Prop.	−0.0393	−0.0583	0.1612	−0.7782	−0.8635	−0.1908	0.0146	0.2728
	(−7.038)	**(−4.379)**	(4.223)**	(−7.015)**	(−15.46)**	(−2.810)**	(0.986)	(4.563)**
Multi.	−0.0236	−0.0295	−0.0137	−0.4234	−0.0566	0.0151	0.0879	0.0240
	(−2.879)**	(−1.384)	(−0.570)	(−2.491)**	(−0.739)	(0.233)	(2.183)**	(0.716)
Servi.	−0.0001	0.0337	0.0221	0.5160	0.0416	−0.3396	0.0766	−0.0324
	(−0.006)	(1.522)	(0.940)	(1.138)	(0.357)	(−4.256)**	(5.655)**	(−0.651)
Adj. R^2	0.0488	0.0227	0.0466	0.0267	0.1397	0.1800	0.0736	0.1287
DW	2.1418	2.1806	2.1581	2.1449	1.3348	2.6126	1.6711	2.2093
F-stat.	20.1189	10.3444	5.7161	14.4145	137.5431	13.7373	6.7973	8.5548
Prob.	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
OBS	594	594	560	523	561	562	593	423
Panel B. 26 GLCs plus 26 matched non-GLCs								
Model 1								
Constant	0.0060	−0.0131	−0.0028	0.9443	0.6335	0.4513	0.3991	0.5197
	(0.396)	(−0.424)	(−0.059)	(6.737)**	(8.573)**	(6.016)**	(21.64)**	(3.820)**
DUM	−0.0021	−0.0042	−0.0086	0.1511	0.0694	0.1661	0.0788	0.1482
	(−0.286)	(−0.198)	(−0.343)	(0.794)	(1.065)	(3.382)**	(5.401)**	(1.769)*
GDPGR	0.4533	1.0349	1.2233	6.0335	1.9474	−1.1632	−0.3277	−3.0747
	(3.287)**	(2.843)**	(2.934)**	(3.278)**	(2.371)**	(−1.261)	(−1.596)	(−1.668)*
Adj. R^2	0.0299	0.0203	0.0196	0.0087	0.0076	0.00228	0.0509	0.0235
DW	2.1852	2.2165	2.1786	2.1854	1.3477	1.9716	1.6165	2.4979
OBS	552	548	518	484	518	519	547	386

Table 5 (*continued*)

	Profitability				Efficiency	Output	Leverage	
	ROA	ROE	ROS	MBR	EFFI	RSALES	LA	LTDE
Model 2								
Constant	0.0242	0.0115	−0.0182	1.2592	0.8035	0.5492	0.3815	0.3465
	(1.681)*	(0.348)	(−0.443)	(8.044)**	(10.31)**	(6.748)**	(19.15)**	(3.424)**
DUM	−0.0056	−0.0097	−0.0104	0.0573	0.0649	0.1595	0.0746	0.1513
	(−0.816)	(−0.506)	(−0.461)	(0.331)	(1.099)	(3.242)**	(5.302)**	(1.922)*
GDPGR	0.4573	1.0429	1.2589	6.1483	1.7578	−1.1314	−0.2715	−3.0604
	(3.272)**	(2.8865)**	(2.921)**	(3.483)**	(2.354)**	(−1.263)	(−1.379)	(−1.774)*
Trans.	−0.0170	−0.0363	0.0247	−0.3561	−0.4758	0.0051	0.0913	0.9168
	(−2.560)**	(−1.636)	(1.538)	(−2.563)**	(−7.739)**	(0.041)	(3.629)**	(3.793)**
Prop.	−0.0408	−0.0610	0.1587	−0.7930	−0.8628	−0.2429	−0.0259	0.2710
	(−7.228)**	(−4.459)**	(4.164)**	(−7.132)**	(−14.79)**	(−4.060)**	(−1.050)	(4.393)**
Multi.	−0.0240	−0.0305	−0.0160	−0.3998	−0.0094	−0.1251	0.0042	0.0172
	(−2.776)**	(−1.355)	(−0.618)	(−2.220)**	(−0.117)	(−2.242)**	(0.270)	(0.468)
Servi.	−0.0012	0.0320	0.0205	0.5077	0.0351	−0.3399	0.0872	−0.0331
	(−0.131)	(1.420)	(0.858)	(1.119)	(0.292)	(−5.711)**	(2.165)**	(−0.638)
Adj. R^2	0.0449	0.0219	0.0434	0.0234	0.1473	0.0471	0.0875	0.1793
DW	2.1930	2.2192	2.1678	2.2166	1.3847	2.0922	1.7226	2.3340
F-stat	4.0372	2.8409	2.5279	4.0897	19.6781	4.2212	11.7723	18.0710
Prob.	0.0031	0.0237	0.0400	0.0028	0.0000	0.0023	0.0000	0.0000
OBS	552	548	518	484	518	519	547	386

The following is a pooled regression:

$$\mathrm{PP}_i = \alpha_i + \beta_1 \mathrm{DUM}_i + \beta_2 \mathrm{GDPGR} + \sum_{j=3}^{6} \beta_j \mathrm{IndustryDummy}_i + \varepsilon_i,$$

where PP is the performance (profitability, efficiency, output and financial leverage) proxy. The real sales figures RSALES are divided by a million. DUM is a dummy variable taking on the value of 1 if the firm is a GLC, and a value of 0 otherwise. GDPGR is the real gross domestic product growth for the relevant year of an observation. Additionally, Panel B provides the results of the regression, which adds Industry dummy variables. The industry dummy variable takes the value of 1 if a firm falls into that industry, and zero otherwise. Transport/storage/communications, properties, multi-industry and services industry are included. The pooled sample consists of 30 GLCs and 26 non-GLCs over the period 1975–1998. *t*-statistics are reported in parentheses.

Note: The *F*-statistics refer to the test of all the industrial dummies are jointly equal to zero.

* and ** denote statistical significance at the 10% and 5% levels, respectively (two tails).

difference is significant at the 5% level. If we use long-term debt to equity as the leverage measure, the difference is insignificant. The results suggest that GLCs have more short-term debt than non-GLCs. As the Minister of Finance in Singapore noted, the GLCs, being largely cash-rich, usually do not need to resort to raising bonds or bank borrowing. [36] This leads to less long-term debt. Some analysts have said that the GLCs often reflect the Singapore government's operating style – conservative and prone to accumulating stockpiles of cash.

[36] *Business Times*, 23 August 1997.

Notice that as a control variable, GDPGR (GDP growth) that captures the impact of the general economic condition on firm performance does have a significantly positive impact on profitability in all four measures. Conversely, a negative impact occurs on long-term debt to equity. For the equations of efficiency, output, and total debt to total asset, however, the GDPGR coefficients are not significant statistically.

It turns out that controlling for the industry variable has little on the results we found above. The results of Model 2, Panel A, indicate that although some industrial dummies do enter significantly into the regression equations and the F-test on the null hypothesis of all the industrial dummies being jointly equal to zero can be rejected in all the equations, the GLC dummy variable gives most regression coefficients similar to those in Model 1.

In Panel B, the pooled regression is done on 26 matched pairs of GLCs and non-GLCs. Excluding the four big outliers should yield more accurate comparison. Again, Model 1 is for the regression with no industry dummy and Model 2 includes the industry dummy. But in either case, the results are qualitatively the same as the corresponding counterparts in Panel A. Notice that the GLC dummy coefficients for the output regressions are about 0.16 in both Models 1 and 2, much lower than 0.5 reported in Panel A, which is consistent with the fact that four largest GLCs are excluded in the regressions. On the other hand, the GLC dummy now enters significantly in both leverage regressions, which is consistent with some findings that government-backed GLCs have higher debt capacity. [37] This is also consistent with our earlier findings in Table 3 that after listing, the leverage level of the GLCs is significantly reduced. Furthermore, the less shares the government retains after listing, the bigger the leverage reduction is.

4.4. Comparison of post-listing return

As the final test, we compare the two groups of firms based on market data. Specifically, we contrast their stock returns. Accounting data typically lag behind actual performance, and do not reflect the future prospects of the privatized companies. The stock returns of the sample companies can be taken as another measure of the possible future bearings of privatization on firm performance. Previous studies have reported positive long-run returns on privatization issues, which provide more evidence of the improvement in firm performance. For instance, Megginson et al. (2000) examined 158 SIPs from 33 countries during the period 1981–1997 and found statistically significant positive net returns for these firms for all holding periods and for all benchmarks.

The annual means of raw and market-adjusted buy and hold returns of firms up to five years after their listing are computed and the results are reported in the first two major rows of Table 6A.

[37] See Megginson et al. (1994) and Sun and Tong (2002). We thank the referee for pointing this out to us.

Table 6
Market and control portfolio adjusted returns after privatization

	1 Year	2 Years	3 Years	4 Years	5 Years
Panel A: Raw and market-adjusted returns for GLCs (30 firms)					
Observations	26	25	24	23	22
Raw portfolio returns					
Mean	0.2571	0.4827	0.5527	0.7729	0.3949
t-value	2.785**	2.961**	3.551**	2.882**	1.929**
+ve/−ve ratio	11/15	11/14	9/15	6/17	5/17
EWMR adjusted					
Mean	0.0802	0.0404	−0.1293	−0.1075	−0.4270
t-value	1.1440	0.3085	−0.8913	−0.4513	−2.3417**
+ve/−ve ratio	14/12	14/11	11/13	10/13	6/16
Non-GLC adjusted					
Mean	0.1132	0.0371	−0.1115	−0.2858	−0.3797
t-value	1.2259	0.2275	−0.7162	−1.1843	−1.8533*
+ve/−ve ratio	15/11	10/15	8/16	8/15	6/16
IPO adjusted					
Mean	0.0736	0.3557	0.1067	0.0722	0.0577
t-value	0.5748	1.725*	1.003	1.005	1.000
+ve/−ve ratio	13/13	14/11	17/7	14/9	14/8
Panel B: Raw and market-adjusted returns for GLCs (26 firms)					
Observations	22	21	20	19	18
Raw portfolio returns					
Mean	0.2129	0.4706	0.4659	0.7229	0.4273
t-value	2.145**	2.492**	2.994**	2.428**	1.775*
+ve/−ve ratio	13/9	13/8	16/4	14/5	9/9
EWMR adjusted					
Mean	0.0783	0.0235	−0.2185	−0.1668	−0.4765
t-value	0.9478	0.1535	−1.509	−0.6399	−2.296**
+ve/−ve ratio	8/14	9/12	6/14	6/15	3/15
Non-GLC adjusted					
Mean	0.0690	0.0250	−0.1983	−0.2358	−0.3474
t-value	0.6953	0.1324	−1.2743	−1.3997	−1.4427
+ve/−ve ratio	13/9	8/13	6/14	13/6	5/13
IPO adjusted					
Mean	0.0349	0.3196	0.1258	0.170	−0.0743
t-value	0.2514	1.367	0.5802	0.4155	−0.2015
+ve/−ve ratio	11/11	12/9	13/7	10/9	11/7

This table presents the summary statistics for cumulative market-adjusted or control portfolio adjusted stock returns of privatized companies until five years after the privatization. The adjustment is calculated below:

$$\mathrm{CR}_{i(a-b)} = \prod_{t=a}^{b}(1 + R_{i,t}) - \prod_{t=a}^{b}(1 + \mathrm{MR}_t),$$

(*continued on next page*)

Notes to Table 6 (continued)
where ER is the market-adjusted cumulative return. R_i is firm i's monthly stock price return with the cash dividend reinvested. MR is the relevant monthly market or control portfolio return, and ($t = a$ to b) is the time frame of one to five years. Both the firm and the market monthly returns are cumulated over the time frame and their differences (ER) are calculated. The cross-sectional mean and median of ER are shown below. The three benchmarks utilized for adjustment in the study are the equally weighted market return (EWMR), IPO matched control sample return, and the non-GLC portfolio return with the cash dividend reinvested.
* and ** denote statistical significance at the 10% and 5% levels respectively (two tails).

Although the raw holding returns of the 26 GLCs are significantly positive up to five years, the market-adjusted returns are not. In fact, in holding the GLC stocks for five years, the total return is 42% lower than holding the equally weighted market portfolio. The t-value of −2.34 suggests that it is statistically significant at the 5% level. Also, the market-adjusted returns show a downward tendency as the holding period increases. That is to say, GLC stocks tend to underperform the market in the long run. [38]

The results are similar for the two control sample comparisons, as reported in the last two major rows in Table 6. When compared to the mean returns of the matched non-GLC firms, as shown in the third major row under "Non-GLC Adjusted", the mean returns of GLC firms also tend to be higher in the first two years and subsequently become lower. The difference in mean return is even marginally significant at the 10% level if the holding period is five years. As for the comparison of GLCs and private IPOs that are listed in the same year (shown in the last major row under "IPO Adjusted"), the mean return differences across various holding periods tend to be positive but to lack statistical significance in general, except for the two-year period.

In Panel B, comparisons are done on 26 matched pairs of GLCs and non-GLCs. Again, excluding the four big outliers provides essentially the same picture. All in all, there is very limited evidence that GLC stocks perform worse than non-GLC stocks. To confirm this, we ran the pooled regression equation (4) to perform a direct test. The results are presented in Table 7.

We run the equation with and without the control variables for size and leverage, and the results are presented in Models B and A, respectively. All of the coefficient estimates of the GLC dummy show that the non-GLCs outperform their government-linked counterparts, with statistical significance at the 5% level. This holds true for the full sample as well as for the matched sample. This is the first time we found some stronger evidence that market-adjusted GLC stock returns are lower than market-adjusted non-GLC stock returns.

However, such a comparison ignores the possibility that the two portfolios may have different market risks. Without showing the analysis here, we compared the raw returns and the market-adjusted returns between GLC and the matched non-GLC stocks across various holding periods, as done in Table 6. In general, we find that GLC stocks tend to have more stable raw returns than non-GLC stocks, and

[38] If the GLC return is adjusted by value-weighted market return, the adjusted returns are not statistically significant in any of the five holding horizons considered.

Table 7
Pooled regression results on market-adjusted annual returns of GLCs and non-GLCs

	All firms (30 GLCs plus 26 non-GLCs)		Matched firms (26 GLCs plus 26 non-GLCs)	
	Model A	Model B	Model A	Model B
Constant	0.0857	−0.0980	0.0856	−0.2960
	(2.668)**	(−0.462)	(2.653)**	(−0.119)
DUM	−0.0856	−0.1049	−0.0951	−0.1055
	(−2.668)**	(−2.405)**	(−2.122)**	(−2.380)**
Size		0.0237		0.0148
		(0.649)		(0.344)
Leverage		0.1344		0.0858
		(1.096)		(0.676)
Adj. R^2	0.0055	0.0058	0.0068	0.0054
DW Stat.	2.0307	1.9461	2.0154	1.9195
Obs.	551	551	511	511

$$\mathrm{ER}_{i,t} = \alpha_i + \beta_1 \mathrm{GLC}_i + \beta_2 \mathrm{Size}_i + \beta_3 \mathrm{Leverage}_i + \varepsilon_i,$$

where ER is the annual market-adjusted returns over the period 1976–1998. The market benchmark used is the equally weighted market return (EWMR). GLC is a dummy variable taking on the value of 1 if the firm is a GLC and a value of 0 otherwise. Firm size is measured as the natural logarithms of the annual total assets of the firm, which is adjusted by inflation factor.

* and ** denote statistical significance at the 10% and 5% levels, respectively (two tails).

that the *t*-values of GLC raw returns are consistently much larger than the *t*-values of the non-GLC raw returns, suggesting the raw return variation for the GLC stocks is much less than that for the non-GLC stocks. Also, the mean market-adjusted returns of non-GLC stocks are much higher than that of GLC stocks, but there is a general lack of statistical significance of market-adjusted non-GLC stock returns for all holding periods. This is because the return standard deviations are much higher for non-GLC stocks than for GLC-stocks. All of these hint at the possibility that although non-GLCs match with GLCs in size and industry, their risk profile may not be the same. Notice that GLCs are backed by the Singaporean government, as they are only partially privatized and the Singapore government still owns shares in these companies. As such, it is conceivable that these GLCs face a lower operational and/or financial risk than do their private counterparts. In fact, our previous findings in Tables 3 and 5 are consistent with such conjecture. Hence, we did a risk-adjusted return comparison as in Eq. (5) to cater for such possibility.

Since the risk-free rate is not available until January 1980, the data used spans from 1980 to 1998. The results, presented in Table 8, show that the regression intercepts are not significantly different from zero, as their *t*-values for the non-matched and matched portfolios are −0.91 and −0.88, respectively, which are too small to claim statistical significance. The betas for the matched and non-matched portfolios are 0.97, indicating significant diversification of the combined GLC-non-GLC portfolio. The key testing variable, the GLC dummy, has coefficients insignificantly different from zero in the statistical sense, hence confirming that the two portfolios of GLC and non-GLC stocks provide similar returns. The coefficients of the interactive

Table 8
Pooled regression results on the monthly excess returns of GLCs and non-GLCs

	Non-matched portfolios (56 firms)	Matched portfolios (52 firms)
Constant	−0.0022	−0.0022
	(−0.917)	(−0.886)
R_m	0.9728	0.9728
	(38.31)**	(36.98)**
DUM	0.0018	0.0022
	(0.562)	(0.654)
DUM $* R_m$	−0.0108	−0.0321
	(−0.301)	(−0.865)
Adjusted R^2	0.8670	0.8612
DW Stat.	1.8723	1.8579
No. of Obs.	456	456

The following is a pooled regression:

$$(R_p - R_f)_t = \alpha_p + \beta_1 \mathrm{DUM}_{p,t} + \beta_2 (R_m - R_f)_t + \beta_3 \mathrm{DUM}_{p,t} * (R_m - R_f)_t + \varepsilon_{p,t},$$

where R_p is the monthly portfolio return over the period 1980–1998. R_m is the monthly market return, which is the equally weighted market return (EWMR). DUM is a dummy variable taking on the value of 1 if the firm is a GLC, and a value of 0 otherwise.

** denotes statistical significance at the 1% level (two tails).

dummy are negative, which is consistent with the hypothesis that GLCs tend to have less risk than non-GLCs. However, the interactive dummy bears no statistical significance. Anyway, once the risk is controlled, GLC stock returns perform no worse than non-GLC stock returns.

5. Conclusion

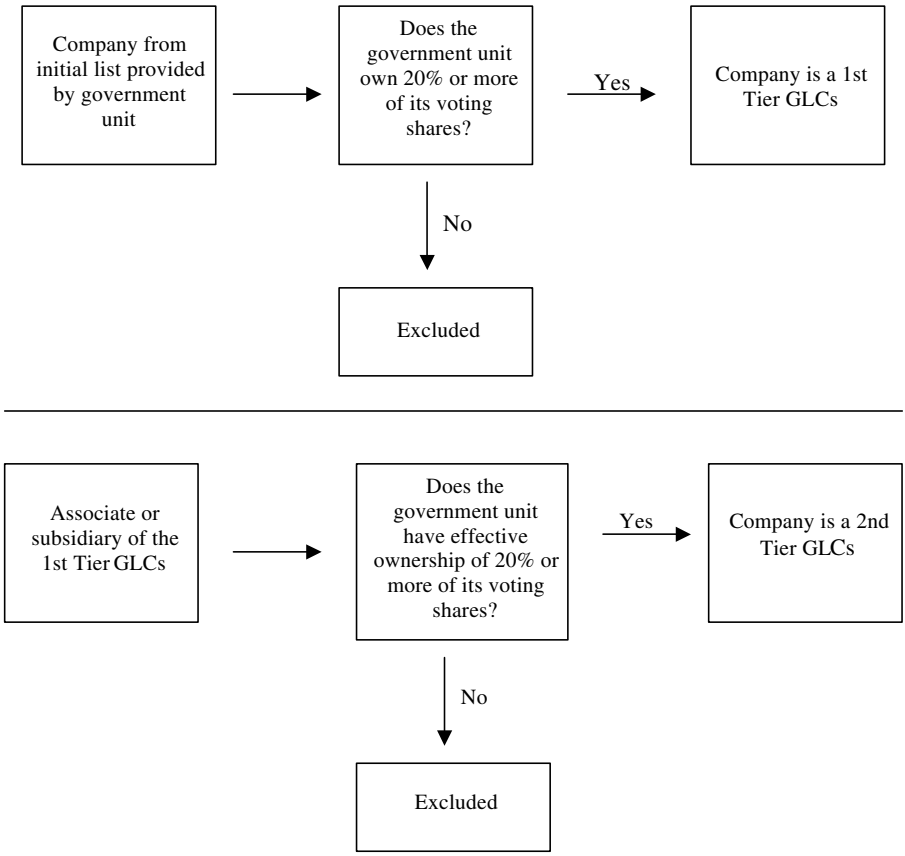
The investigation of Singapore's government-linked corporations is interesting and important. Singapore's GLCs play a significant and active role in Singapore's economy, which has done quite well throughout the years. Moreover, the Singapore government claims that the objectives of privatizing some of the GLCs are not for better resource allocation, higher profitability, greater efficiency and reduction of the fiscal burden. This seems to imply that these GLCs have been operating efficiently all along, which is not utterly inconceivable given the openness of Singapore's economy to foreign competition and well-functioning of its labor, product, and capital markets. Some people even say that Singapore Government runs Singapore as if it is a corporation. Our study hence provides important evidence as to whether government-owned enterprises, under such special setting, can be as efficient as privately owned enterprises.

Our study of 30 Singapore GLCs covering the period from 1964 to 1998 shows increase in real net income and real sales but no significant changes in return on sales, efficiency and leverage measures upon share issue privatization. However, after controlled for GDP growth, no increase in real net income or real sales is observed. Instead, the leverage level of the privatized GLCs is found to reduce. Taking a buy-and-hold strategy, we find no evidence that the GLCs underperform the equal-weighted market

portfolio, the portfolio of non-GLC stocks matched by size, and the portfolio of non-GLC stocks matched by IPO time over various investment horizons of up to four years. If the holding period is five years, there is some mild evidence that GLC stocks perform worse than two of the benchmark portfolios. We also find that the GLCs perform as well as the market and the industry averages even before share issue privatization.

The results are consistent with some findings that government ownership is not necessarily associated with bad performance. The openness of the Singapore economy to intense foreign competition and its well-functioning markets may be the reasons for their GLCs being comparable to the privately run counterparts in efficiency. But even that, privatization is still found to bring some positive impacts to the GLCs. Since our sample size is relatively small, the matching exercise is far from perfect, and some big GLCs like Singapore Technologies, PSA Corporation, Singapore Power, and Singapore Post are not included in the sample, our results should be interpreted with caution.

Appendix A. Definition of GLCs



Appendix B. List of selected companies

Company name	Listing date	Gov. ownership upon listing (%)	Ave. gov. ownership of 3 years after listing (%)	Issuing proceeds (S$ in mil.)	Raise new capital	Industry sector
Panel A: 30 GLCs						
Delifrance Asia Ltd	961021	52	51.78	21.7	Yes	Manufacturing
Jurong Shipyard Ltd	870918	40.07	19.23	5.6	Yes	Manufacturing
Keppel Far East Levingston Shipbuilding Ltd	690327	50	50	9.2	Yes	Manufacturing
Keppel Integrated Engineering Ltd	920820	62.7	62.7	52.1	Yes	Manufacturing
Keppel Marine Industries Ltd	871008	42	41	15.1	Yes	Manufacturing
Sembawang Resources Ltd	870109	40.3	43.8	10.9	Yes	Manufacturing
Singapore Petroleum Company Ltd	901025	44	51	35.9	No	Manufacturing
SNP Corporation Ltd	870218	63.16	51.67	4.75	Yes	Manufacturing
Keppel Hitachi Zosen Ltd	921030	20	20	125	No	Manufacturing
Natsteel Electronics Ltd	971010	76.76	18.47	138.7	Yes	Manufacturing
CWT Distribution Ltd	930412	67.5	54.77	20	Yes	Transport/storage/communications
Neptune Orient Lines Ltd	810519	61.84	65.93	155.7	Yes	Transport/storage/communications
Sembawang Maritime & Logistics Ltd	870618	35.72	34.65	62.6	Yes	Transport/storage/communications
Comfort Group Ltd	940606	41.69	37.88	39.8	Yes	Transport/storage/communications
DBS Land Ltd	871029	49	49.02	300	No	Properties
Keppel Land Ltd	830601	59	59		NA	Properties
Intraco Ltd	721218	83.3	82.63	2.8	Yes	Multi-industry

Natsteel Ltd	640608	NA	NA	12	Yes	Multi-industry
Sembawang Cooperation Ltd	730417	75	74	50	Yes	Multi-industry
Singapore Technologies Aerospace Ltd	900808	66.67	66.67	145	Yes	Multi-industry
Singapore Technologies Automotive Ltd	910930	70	70	23.1	Yes	Multi-industry
Singapore Technologies Shipbuilding & Energy Ltd	900828	60.22	55.18	55.2	No	Multi-industry
ST Electronic & Engineering Ltd	910823	65	65	26.3	Yes	Multi-industry
Keppel Telecommunications and Transportation Ltd	890407	54	53.91	23.1	Yes	Services
Vicom Ltd	951011	75	75	11.2	Yes	Services
ST Computer Systems & Services Ltd	911115	55	55.5	3.65	Yes	Services
Singapore Airlines Ltd	851218	63	59.25	243	Yes	Transport/storage/communications
Singapore Telecommunications Ltd	931101	89	88.45	2165	No	Transport/storage/communications
Keppel Corporation Ltd	801024	75	70	96.6	No	Multi-industry
Singapore Technologies Industrial Ltd	930615	49.86	70.62	42.7	Yes	Manufacturing
		Industry				
Panel B: 26 Non-GLCs						
Asia Pacific Breweries Ltd	660601	Manufacturing				
SM Summit Holdings Ltd	950126	Manufacturing				
Creative Technologies Ltd	940615	Manufacturing				
Times Publishing Ltd	890317	Manufacturing				
GP Batteries International Ltd	910320	Manufacturing				

Appendix B (*continued*)

Company name	Listing date	Industry
Venture Manufacturing(s) Ltd	920427	Manufacturing
Want Want Holdings Ltd	960516	Manufacturing
Berger International Ltd	940420	Manufacturing
Jaya Holdings Ltd	920302	Transport/storage/communications
Osprey Maritime Ltd	940422	Transport/storage/communications
Pacific Carriers Ltd	900710	Transport/storage/communications
Ming wah Universal Bermuda Company Ltd	960624	Transport/storage/communications
Labroy Maritime Ltd	961018	Transport/storage/communications
TIBS Holdings Ltd	870427	Transport/storage/communications
Wing Tai Holdings Ltd	890221	Properties
Singapore Land Ltd	750102	Properties
Sime Singapore Ltd	900227	Multi-industry
Hotel Properties Ltd	820617	Multi-industry
Straits Trading Company Ltd	750102	Multi-industry
Asia Food & Properties Ltd	970718	Multi-industry
Haw Par Corporation Ltd	690718	Multi-industry
Singatronics Ltd	871019	Multi-industry
Acma Ltd	750102	Multi-industry
Alliance Technology and Development Ltd	780711	Multi-industry
CSA Holdings Ltd	910729	Services
Datacraft Asia Ltd	950407	Services

Note: The last four GLCs in Panel A do not have their matched non-GLC counterparts in terms of firm size. Keppel Land was originally a privately listed company and was bought by Keppel Corp. in June 1983. The percentage of government ownership for Keppel Land was the percentage upon and after it was bought by Keppel Corp.

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