The performance of Yankee issuers' original IPOs

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Abstract

This paper examines firms from 27 countries/districts that bypassed their home stock markets and conducted initial public offerings in the United States. We find that there is significant improvement in operating performance subsequent to their US IPO events, which is consistent with findings from previous studies that such firms are of a select group of high-quality and high-growth firms. These firms significantly underperform US and home market indices, as well as similar US domestic IPO firms matched on size and industry, after one, three, and five years of seasoning. Coupled with findings from previous studies that such firms, on average, experience the same underwriting costs and first-day underpricing as US domestic IPOs, our finding indicates that they face similar issue costs as US domestic IPO firms.

JEL classification: G15; G30

Keywords: Performance; Yankee Issuer; IPO

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A research grant from Faculty of Business of Auckland University of Technology is gratefully acknowledged.

1. Introduction

There has been a large set of literature on international cross-listing, the corporate event of listing on a foreign exchange a stock that is already listed on a domestic stock exchange (Karolyi (1998) provides an excellent survey of early research. Recent important work includes Doidge, Karolyi, and Stulz (2004), Doidge (2004), Lang, Lins, and Miller (2003), Lins, Strickland, and Zenner (2005), Pagano, Roell, and Zechner (2002), Sarkissian and Schill (2004)). However, as pointed out by Blass and Yafeh (2001), little work has been done on foreign listings without a home exchange listing, where firms bypass their home country and choose to conduct their initial public offering (IPO) on a foreign stock exchange. Motivated by this research gap, in this paper we examine a sample of international firms that conduct their IPOs in the US (Yankee issuers) and such IPOs are their first public equity issue in any market (original IPOs). Specifically, we are interested in the operating and stock market performance of these Yankee issuers' original IPOs.

Previous studies document that firms that raise capital in the US are of high quality. Fuerst (1998) and Cheung and Lee (1995) propose theoretical models where firms cross-list in stricter regulatory environment to signal their high quality and prospects of high profitability. Pagano, Roell, and Zechner (2002) examine the aggregate trends in foreign listings. They find that high-growth European firms that expand quickly without significant leveraging tend to cross-list in the US rather than within Europe. Doidge, Karolyi, and Stulz (2004) show that foreign firms with valuable growth opportunities cross-list in the US because a US listing reduces controlling shareholders' expropriation and enables the firm to take better advantage of their growth opportunities. Utilizing a sample of 219 Israeli IPOs from 1990 till 1996, within which 56 are original IPOs in the US, Blass and Yafeh (2001) study how

Israeli firms choose their IPO location. They find that high-quality Israeli firms bear additional costs to use IPOs in the US market as a signal to reveal their high quality, while less promising firms stay in local market. Bruner, Chaplinsky, and Ramchand (2004) is the first paper to examine an international sample of Yankee issuers' original IPOs. They find that the high-quality of foreign firms conducting their IPOs in the US enables them to bear the same issue costs on average as comparable US domestic IPOs. Based on the above research work, we hypothesize that our sample firms will enjoy improvement in operating performance around their IPO date since they are of high quality. Using seven years' accounting data centered on the year of the IPO event, we find evidence consistent with our hypothesis. Sample firms' profitability and real sales improve significantly following the US IPO and such improvement is not obtained through debt expansion, which is evidenced by the fact that there is no significant change in their leverage around the US IPO. Jain and Kini (1994) and Mikkelson, Partch, and Shah (1997) document significant decline in operating performance following IPOs for domestic US firms. The contrast between US domestic issuers and Yankee issuers suggests the high quality of Yankee issuers. In addition, as "only the best comes to the US", we expect that such firms are a rather homogeneous group of high-quality firms in the sense that whether the firm is listed in an early period or at a later date, whether its listing exchange is NYSE or not, whether it is listed via an ADR program or as common/ordinary shares, whether it is from an emerging or developed country, whether it is from a country sharing the same culture, language, or border as the US, or whether it is from a common-law or civil-law country, does not affect its performance. We conduct subsamples analyses and confirm our expectation.

With regards to the long-run stock market performance of the Yankee issuers, consistent with IPO literature indicating that IPOs suffer long-run underperformance (Ritter (1991), Ritter and Welch (2002)), our analysis finds that the Yankee issuers significantly underperform both the home market and the US market in the long term. Our main focus is on how our sample of Yankee issuers perform in the long run compared with similar US domestic IPOs. Bruner et al. (2004) finds that Yankee issuers experience the same issue costs as US domestic IPOs. The issue cost that they examined composed of underwriting costs and the indirect costs of underpricing. However, as Ritter (1991) points out, "the cost of external equity capital for companies going public depends not only upon the transaction costs incurred in going public but also upon the returns that investors receive in the aftermarket. To the degree that low returns are earned in the aftermarket, the cost of external equity capital is lowered for these firms". Hence we examine the sample firms' long-run stock performance using control samples of US domestic IPOs matched on asset size or industry as benchmarks. Since the Yankee issuers are of high quality and given they experience the same direct issue costs and short-run underpricing as domestic US IPOs, we hypothesize that the long-run realized returns of the Yankee issuers will not be significantly higher than comparable US domestic IPOs. Our analysis finds that Yankee issuers' buy-and-hold abnormal returns (BHAR) using either size or industry control sample of US domestic IPOs as benchmark are significantly negative over one, three, and five years subsequent to the IPO date. Such evidence supports our hypothesis that Yankee issuers' issue costs are not higher than comparable US domestic issuers.

Our paper contributes to both foreign listing and IPO literature. It is one of the few papers examining firms that bypass the home market to conduct IPOs in the US. It is

the first paper examining operating performance patterns around Yankee issuers' IPOs and the first paper comparing their long-run stock returns with US control firms.

Our paper is structured as follows: Section 2 introduces our sample of Yankee issuers. Section 3 examines their operating performance around the IPO. Section 4 studies their long-run stock market performance following IPO date. Concluding remarks are given in Section 5.

2. Sample

2.1. Sample formation

Our sample is very similar to the one used in Bruner et al. (2004). We extract from SDC Platinum's Global New Issues database international (non-US) firms that conduct initial public offerings of their equity in the US and list on a US exchange. This means that no firms with equities already traded in another market prior to this US IPO are included in our sample. Our sample period is from the beginning of 1990 till the end of 1999. We choose this sample period because we need three years' accounting data before IPO event year and it is very difficult to obtain such data for the early 1980s. We also need three years' accounting data following IPO. Hence our sample period ends in 1999. Following Loughran and Ritter (1997) and Bruner et al. (2004), from these firms we eliminate firms from the financial and utilities industries. Simultaneous international offering that includes both IPOs in the US and in other markets are deleted as we want to focus on the US IPOs. We then delete Canadian firms from our sample because prior studies such as Alexander, Eun, and Janakiramanan (1988) have found significant differences between Canadian and non-Canadian firms' US cross-listing and suggests that Canada and US markets are fundamentally integrated. The Multi-Jurisdictional Disclosure System also facilitates the listing of Canadian firms in the US. To be included in our final sample, we require

firms to have accounting data in Compustat or corporate filings such as IPO prospectus from at least two years before till two years after IPO. Hence we end up with a sample of 101 Yankee issuers.

2.2. Sample characteristics

We present sample characteristics in Table 1. Panel A shows the distribution of Yankee issuers original IPOs over the sample period of 1990 till 1999 and across the three US stock exchanges. The 101 IPOs are distributed evenly across the ten years with about 10 issues in each year, except the early period of 1990 and 1991, when only one and two firms conducted IPOs respectively, and except the years of 1996 and 1997, which see the largest number of 22 IPOs in each year. With respect to the listing location, NASDAQ and NYSE capture most of the sample IPOs. We also present the number of issues that list either via American Depositary Receipts/Shares or directly as common/ordinary shares. About 25.74% of the issuers list as ADRs while a majority of 74.26% list as common shares in the US. The average total assets at the last fiscal year-end before the IPO year is 197.030 million US dollars and our sample firms raise 51.523 million on average. While a median sample firm has a total asset of 19.372 million and raises 32.400 million US dollars in its IPO.

In Panel B we show the geographical distribution and the legal origins of the US IPOs. Our sample firms are from 27 countries or districts. Israel, Hong Kong, and Netherlands are the top three winners. Israel tops the list with 33 US IPOs. Hong Kong and Netherlands have 10 and 8 US IPOs respectively. This pattern is consistent with the evidence shown in Blass and Yafeh (2001) that a large number of Israeli firms bypass Tel Aviv stock exchange and list their IPOs directly in the US. About 61.46% of the sample firms are from emerging markets while only 38.54% are from developed economies. About half of the sample firms are from countries that share a

common border, or a common language or culture with the US. The legal origin classification is from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). We have legal origin data for 93 firms from 21 countries/districts. Among them 58 firms, about 62%, are from common-law countries while the remaining 35 firms come from civil-law countries.

Table 1 indicates that our sample firms are spread roughly evenly across the sample period, are listed on different US exchanges, are listed either via ADR or directly as common shares, are from emerging or developed economies, are from countries that either share a border, language or culture with the US or not, and have either common-law or civil-law legal origin. Such diversity of the composition of our sample prompts us to conduct subsamples analyses based on these sample characteristics. If different subsamples show the same performance improvement, we can be more confident that our results are solid and robust.

3. Operating performance

3.1. Hypothesis

Prior studies on foreign listing indicate that only the best international firms come to the US market. Using the Worldscope database universe of firms, Doidge, Karolyi, and Stulz (2004) document that the international firms that cross-list in the US are firms with valuable growth opportunities. Listing in the US restricts controlling shareholders' expropriation and increases the firms' ability to take advantage of growth opportunities and hence investors valuate such firms more highly than those firms that stay at home. Pagano, Roell, and Zechner (2002) show that European companies with high growth potential tend to cross-list in the US rather than within Europe and they tend to expand via equity-funding rather than debt expansion. Fuerst (1998) and Cheung and Lee (1995) present theoretical models where strict regulatory

environment enables managers of highly profitable foreign firms to credibly signal private information about their firms' future prospects to investors. Since the US has the strictest regulation of stock market, international firms that list in the US tend to be high-quality profitable firms. Consistent with the signaling model, Blass and Yafeh (2001) present empirical evidence that Israeli firms list in the US are high-quality innovative firms willing to incur additional costs from the US listing to reveal their value and distinguish themselves from those staying at home. Bruner et al. (2004) examine a large sample of Yankee issuers and document that such firms are of high quality. Based on the above research findings, we hypothesize that the Yankee issuers show significant operating performance improvement around their US IPO events.

3.2. Data and methodology

It is rather difficult to obtain truly comparable pre- and post-IPO accounting data for a large, multi-national, multi-industry sample like the sample of our Yankee issuers. We first extract seven years (centered on the IPO year) accounting data from the Compustat database. However, a lot of data are not available and almost no firm has complete data for the seven years in Compustat. We spend much time in collecting the missing data manually from the IPO prospectuses, registration statements filed with Securities and Exchange Commission, and annual reports. In doing so, we take great care to ensure that the data that we collect are from financial statements that report under the same GAAP as the data we obtained from Compustat. We understand that different reporting GAAP can give very different accounting data for the same firm. The same GAAP ensures the comparability of our dataset.

Our performance measures and methodology follow those used in the privatization literature to detect performance changes around the privatization event by Megginson, Nash, and Randenborgh (1994), Boubakri and Cosset (1998), D'Souza and

Megginson (1999), Sun and Tong (2002, 2003), Wei, Varela, D'Souza, and Hassan (2003), and Dewenter and Malatesta (2001). We use nonparametric Wilcoxon test statistics because Barber and Lyon (1996) find that such tests are uniformly more powerful than parametric t-statistics regardless of the operating performance measures used.

We present the operating performance measures in Table 2. We analyze three categories of performance: profitability, output, and leverage. Traditional profitability measures include conventional accounting ratios such as return on assets, return on equity, and return on sales. We use only return on sales (ROS) because, as Sun and Tong (2003) point out, the initial public offering increases a firm's assets and equity significantly and therefore ROA and ROE will decrease mechanically even if net income stays the same. Hence we only use the accounting ratio ROS. Following Sun and Tong (2003), we also use level profitability measures. We use real net income and real operating cash flow as two additional measures of profitability, as Jain and Kini (1994) point out that operating cash flows are a primary component in net present value calculations used to value a firm and hence are a useful measure of operating performance. For output we analyze real sales. For leverage, conventional measures such as total liability to total assets, total debt to total assets, and long-term debt to equity suffer the same mechanical decline as ROA and ROE around the IPO event. Hence we follow Sun and Tong (2003) to take an income view of debt and use the operating cash flow to total debt, which indicates a firm's ability to cover total debt with yearly cash flow, and operating cash flow to long-term debt to capture the leverage change.

To detect the performance changes around the IPO event, for each sample firm and each performance measure we calculate the mean and median value over three years

before the IPO event and three years after the IPO event. For ratios we calculate directly while for level measures we first normalize each year's observation relative to that of year 0 (the IPO event year) before calculation of the mean and median. We then use Wilcoxon sign-rank test to detect whether there is any significant change in median values of the performance measures between the pre-IPO and post-IPO period. We also conduct a proportion test to detect whether the proportion of firms that experience an increase in the measure is higher than those that experience a decrease.

3.3. Empirical results

3.3.1. Whole sample

The operating performance around the IPO event for our sample firms are shown in Table 3. Median return on sales declines from 0.0316 to 0.0008, though the average ROS increases from -1.1840 to -0.1802 from the three years before the IPO event to three years after the IPO event. This decline is marginally significant at the 10% level. This seems contrary to our hypothesis that the profitability of sample firms should increase. However, ROS depends both on net income and on sales. The marginal decline in ROS may exist even if the net income increases after the IPO when sales increase at a faster rate than net income. Our later analysis of real sales confirms this. The other two measures of profitability support our hypothesis. Real net income increases from a median (mean) of 0.3126 (0.0220) to 0.7371 (1.0668) and Wilcoxon statistics show that this increase is statistically significant. The proportion test finds that there are significantly more firms experiencing an increase in real net income than those firms experiencing a decrease. Real operating cash flow also increases from a median (mean) of 0.3604 (2.3649) to 0.7799 (4.3944) and this increase is significant at the 1% level. Proportion tests show that there are more firms experiencing positive real cash flow change than firms experiencing negative change

and the difference is significant at the 1% level. Given the diversity of our multi-national multi-industry sample, the results from the proportion tests show reinforcing evidence to support our hypothesis that the profitability increases significantly around the US IPO events for our sample.

We then turn to output change. Real sales show substantial growth. It increases from a median of 0.5786 before the US IPO to a median of 1.4028 after the US IPO. Wilcoxon tests show that this increase is statistically significant at 1%. Out of our 101 sample firms, there are 91 firms enjoying sales increases and only 10 suffering sales decreases and proportion tests show this difference is significant at 1%. Hence, the evidence indicates that the real output of our sample firms increases significantly around US IPOs.

Finally, we study the change in leverage. One may ask whether the profitability and sales growth comes at the cost of expanding debt. The operating cash flow to debt ratios show that this is not the case. The ratio of operating cash flow to total debt increases from a median of 0.2784 to a median of 0.1847, though it is not statistically significant. The median increase in ratio of operating cash flow to long term debt is 0.0989. These findings suggest that there is improvement in the sample firms' capability to repay debts though such improvement is not statistically significant. There is no evidence to suggest that the sample firms' capability to repay debts worsens around the US IPO event.

Therefore, the evidence shown in Table 3 supports our hypothesis that the Yankee issuers operating performance improves around their US IPOs: profitability increases, sales grow, while leverage shows no adverse change.

Panel B of Table 1 shows that Israeli firms account for about 33% of our sample firms. One may doubt whether the operating performance improvement for our whole

sample shown in Table 3 is mainly driven by performance changes for Israeli firms. To address this concern, we exclude all the 33 Israeli firms from our sample and repeat the nonparametric tests for the remaining sample firms. Results (not shown) remain qualitatively the same, except that the decrease in ROS becomes statistically insignificant.

3.3.2. Panel regression

3.3. 2.1. The effect of the business cycle

Our analysis so far has not taken into consideration the effect of the business cycle, the general level of economic activity. Our sample firms may enjoy operating performance improvement around the US IPOs because the general economic condition in their countries is improving during the same time. Following the methodology used by Dewenter and Malatesta (2001), we conduct the following panel data regression to use it as a robustness test for our previous findings:

$$\Pr oxy_{it} = \beta_1 Before_{it} + \beta_2 After_{it} + \beta_3 RGDPGrowth_{it} + \varepsilon_{it} \quad (1)$$

Where: Proxy are the performance measures as defined in Table 2. Before is a dummy variable that takes the value of 1 if the observation falls within the three years before the IPO event year and equals 0 otherwise. After is a dummy variable that takes the value of 1 if the observation falls within the three years after the IPO event year and equals 0 otherwise. RGDPGrowth is the annual real GDP growth for the sample firms' countries. We obtain GDP and GDP deflator data for 23 countries or districts from the International Financial Statistics database maintained by International Monetary Fund. There are eight firms in our sample domiciled in the Bahamas, Bermuda, Netherland Antilles, and British Virgin Islands. For such firms, the country of incorporation is usually unrelated to their country of operation and as Pulatkonak and Sofianos (1999) point out, such an arrangement is just used as a flag of

convenience. Because we need to find the GDP data for each of the sample firms, we try to classify these eight firms into the "real" country of operation. We read the corporate filings of such firms and classified four of them. However, for the remaining four we cannot be sure of its real domicile nation. Consequently we drop them from our panel analysis. After deleting another three firms without GDP data, we include 94 firms in our panel analysis of seven years around the IPO event (The base of the regression is year 0). We delete the firms from a domicile nation of flag of convenience without doing any reclassification and the results remain qualitatively the same.

The panel regression results are presented in Table 4. After taking into consideration the effect of general economic conditions, our analysis shows generally the same picture as our previous results in Table 3. Our focus is on the difference of After minus Before, which measures the operating performance change around the US IPO event. All the profitability measures and output measures, including ROS, show increases and such increases are all statistically significant at the 1% level. The two leverage proxies show mixed results: operating cash flow to total debt has a significant decrease while operating cash flow to long-term debt shows a significant increase. From the panel regression evidence in Table 4 we conclude that our previous finding of improved operating performance around the US IPO event is robust.

3.3.2.2. The effect of industry growth

Besides the effect of the general business cycle at country levels, another concern is that the strong operating performance for our sample firms may be driven by the possibility that the industries to which they belong are in the boom during the sample periods. To address this concern, we replace RGDPGrowth with RINDGrowth and repeat our panel regression shown in Equation (1):

$$\mathrm{Pr}oxy_{it} = \beta_1 Before_{it} + \beta_2 After_{it} + \beta_3 RINDGrowth_{it} + \varepsilon_{it} \quad (2)$$

$RINDGrowth_{it}$ is the median of two-year real sales growth in year t for all the same-industry firms from the same country as sample firm i. It is used as a proxy for industry growth effect. The two-year real sales growth is calculated as:

$$\mathrm{Re}alSalesGrowth_{it} = \frac{SALES_{it}}{SALES_{i,t-1}} * \frac{GDPDeflator_{i,t-1}}{GDPDeflator_{it}} \quad (3)$$

The same-industry firms are identified by matching SIC codes. The data are obtained from Standard and Poor's Global Vantage database. Due to the difficulty in finding real sales growth data for same-industry firms, our sample firms are cut by half. Six of the 27 countries lose all sample firms and some countries lose part of their sample firms. We end up with 54 firms that have the necessary data to perform the panel regression specified in Equation (2). In addition to Equation (2), we also perform regressions including both RGDPGrowth with RINDGrowth as explanatory variables.

The regression results are presented in Table 5. After taking into consideration the industry growth effect, our analysis remains consistent with previous findings: all measures of profitability show significant increase and so does real output, while the two measures of leverage show mixed results. Controlling both the industry effect and the general business cycle gives the same picture.

3.3.3. Subsamples analysis

The sample statistics shown in Table 1 indicate that our sample firms are different on many dimensions: the IPO year, the listing US exchange, listing program (ADR or common shares), economy development of home country, the degree of how their home countries are related to the US, and the legal origin. Such diversity of the sample firms prompts us to conduct a subsamples analysis as a further robustness check. We classify sample firms into two subsamples based on each of the six

abovementioned dimensions, resulting in 12 subsamples altogether. We perform the same nonparametric test as we did in Table 3 (for the whole sample) for each of the 12 subsamples and also utilize Wilcoxon/Mann-Whitney test to compare whether there is any significant difference in performance change between each two subsamples classified on the same one of the five dimensions. If our subsamples in general show performance increase around the US IPO event, this corroborates our previous findings from the whole sample.

The subsamples are detailed as follows:

1. The Early Subsample vs. the Late Subsample. We use the end of 1995 as the dividing line. The rationale behind the classification is that late IPOs may learn from the experience of early US IPOs and hence may have better performance change.

2. The NYSE Subsample vs. the AMEX-NASDAQ Subsample. We employ such division because one may argue that NYSE-listed firms are of even higher quality.

3. The ADR Subsample vs. the Common Share Subsample. One may argue that there is a significant difference between ADR and common shares. ADRs are not truly fungible while common shares are. Such difference may influence the sample firms' performance change.

4. Emerging Market Subsample vs. Developed Economy Subsample. One may wonder whether firms from developed economies are of better quality and hence achieve better performance improvement. Following Bruner, Chaplinsky, and Ramchand (2004), we use the country risk rating contained in the Panel B of their Table 1, which is from Euromoney data, and the same cutting point of 86 to divide countries with a risk rating lower than 86 as emerging markets. Bruner et al. (2004) do not provide a risk rating for Taiwan. We classify Taiwan as a developed economy according to the classification of the International Monetary Fund.

5. More Related Subsample vs. Less Related Subsample. This classification is also based on Bruner et al. (2004). We classify firms from countries that either share a common border (Mexico), or have a common language (UK, Ireland, and Australia), or have common culture (UK, Ireland, Israel, and Australia) with the US into More-Related Subsample, while the remaining firms are in the Less-Related Subsample. The reason is because one may argue that firms from countries that are more related to the US perform better.

6. Common-law Subsample vs. Civil-law Subsample. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) examine laws governing protection of investors in 49 countries. They find that laws differ significantly among countries. Common-law countries generally give investors considerably better protection than civil-law countries. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) and Doidge, Karolyi, and Stulz (2004) find that better investor protection limits controlling shareholders' expropriation and increases the firms' ability to take better advantage of growth opportunities. Hence we form two common-law and civil-law subsamples based on the classification in La Porta et al. (1998).

The results of the subsamples analyses are shown in Table 6. The findings clearly support our hypothesis that the sample firms' operating performance improves significantly around their US IPOs. Panel A presents the profitability measures. Though sales grow at a faster speed than net income for our sample firms, only four subsamples out of the 12 show significant decline in median ROS. All the remaining eight subsamples' median ROS change is not significantly different from zero. For real net income, six out of the 12 subsamples show significant increase in medians around their US IPOs and the remaining six show positive but not significant change. With regards to real cash flow, nine of the 12 subsamples show significantly positive

median changes and the remaining three experience positive but not significant change. Results in Panel A indicate that the sample firms' profitability increases significantly around their US IPOs. Panel B shows results for real sales. All of the 12 subsamples enjoy substantial sales growth around their US IPOs and such increases are all statistically significant at 1%. Results for leverage in Panel C also echo our earlier findings for the whole sample: no subsample shows any significant change in their leverage.

We then examine whether there is any significant difference between each two of the six sets of subsamples. Most subsamples comparison shows no significant difference. The only two exceptions are for real sales: Amex-Nasdaq subsample firms have higher sales growth than firms listed on the NYSE, and the sales of firms listed as common shares also show larger growth than those of firms listed as ADRs. Though such difference exists, the four subsamples uniformly experience significantly positive sales growth. These results from our subsamples comparisons indicate that though our sample firms are different from each other on many dimensions, they share one common characteristic: the significant improvement in operating performance around their US IPOs.

4. Stock market performance

4.1. Hypothesis

Having shown that the international firms that conduct their initial public offerings in the US are high quality firms that experience significant improvement in operating performance, we turn to the issue of their stock market performance: how do they perform in the stock market where they choose as their location of first entry into public stock market? The IPO literature documents that the stocks of IPO firms show significant long-run underperformance compared to various benchmarks. Using a

sample of 1526 IPOs during 1975 to 1984, Ritter (1991) first documents the anomaly that IPOs show significant underperformance relative to both broad stock market indices and firms matched by industry and market capitalization. Ritter and Welch (2002) conduct an extensive review of the theory and evidence on IPO activity and confirm the existence of IPO long-run underperformance. Most of these findings are for IPOs conducted within the firms' own market. The only paper that we are aware of that examines the long-run stock performance for firms' IPOs in a foreign market is Blass and Yafeh (2001). They find that Israeli firms that conduct their IPOs in the US show significant cumulative abnormal returns of -27.64% three years following their IPOs relative to the S&P index and underperform 16.14% relative to the Israeli market. Based on the above-mentioned evidence, we hypothesize that our sample of international Yankee issuers shows significant long-run underperformance subsequent to their US IPOs.

We are also interested in another issue, on which we put more emphasis. How do the international Yankee issuers' IPOs in the US perform in the long-run compared with similar US firms' domestic IPOs? Bruner et al. (2004) examine a similar sample of international Yankee issuers' IPOs in the US and they find such IPOs experience approximately the same issue costs as domestic US IPOs in terms of the direct cost of underwriting fees and the indirect costs of first-day underpricing. However, they did not examine their long-run performance. Ritter (1991) points out that the cost of external capital for IPO firms depends not only on the transaction costs incurred in going public but also on the returns investors receive in the aftermarket. Hence, we argue that to get a complete view of the issue costs, one needs to also compare the long-run stock market performance. We have shown that our international Yankee issuers show significant profitability improvement and sales growth around their US

IPOs. This contrasts sharply with the findings in Jay and Kini (1994) and Mikkelson, Partch, and Shah (1997) that US domestic IPO firms show significant operating performance decline following their IPO event. Given our finding that the international Yankee issuers are of high quality and the evidence in Bruner et al. (2004) that they experience the same underwriting costs and first-day underpricing, we hypothesize that if the international Yankee issuers face issue costs not higher than comparable US domestic IPO firms, then they should have long-run returns lower than or at most equal to US IPOs.

4.2. Data and methodology

To examine the long-run stock market performance, we collect daily stock return data for our sample firms from the CRSP database. The data spans from the first trading day till five years after IPO. First we benchmark the buy-and-hold returns over one, three, and five years following the IPO date against both the US and the Yankee issuers' home market index returns over the same intervals. For the US market, we use the S&P 500 composite, which is value-weighted, and also CRSP NYSE/AMEX/NASDAQ equally-weighted index. For issuers' home markets we use Datastream's Total Market Index for each country. We then form two control samples, one consisting of US domestic IPOs matched on total assets at the last fiscal year-end before IPO and the other consisting of US domestic IPOs matched on industry. We also benchmark our sample firms' returns against these two control samples. The returns we use are all based on simple returns, because Barber and Lyon (1997) point out that continuously compounded returns yield inherently negatively biased estimates of long-run abnormal returns. Following Dewenter and Malatesta (2001), we calculate buy-and-hold abnormal returns as follows:

$$BHAR_{i(a-b)} = \prod_{t=a}^{b}(1+R_{it}) - \prod_{t=a}^{b}(1+MR_t(orCR_{it})) \quad (4)$$

Where BHAR is the buy-and-hold abnormal return for sample firm i over the period of a to b. We use BHAR because Barber and Lyon (1997) find that long-run abnormal returns should be calculated as the long-run buy-and-hold returns of a sample firm less the long-run return of a benchmark and they recommend the use of BHAR instead of cumulative abnormal returns (CAR). The period of a to b is time intervals of one, three, and five years from the first trading day after the IPO event. R_{it} is the simple daily return for sample firm i for day t. MR_t is a US stock market index return or home market index return. CR_{it} is the daily simple return for the control firm of firm i at day t.

We use both the t-test to test whether the mean buy-and-hold abnormal returns equals to zero over one, three, and five years following IPOs and the non-parametric Wilcoxon signed rank test to test the null that the median BHARs equals to zero.

To find a size or industry matched control for each sample firm we first collect from the SDC global new issues database all US common stock IPOs during the period from the beginning of 1990 till the end of 1999. We then exclude all Yankee issuers' IPOs. From this, IPOs from financial and utilities industries, IPOs not listed on a national stock exchange, and IPOs of units offering are deleted. We end up with 3178 domestic US firms' IPOs from which to find controls for our sample firms. We begin with all IPOs within the same month of the sample firm, from which we choose the one with the closest total assets at the last fiscal year-end before the IPO date to the sample firm to be the control firm matched on size (the total assets data are from Compustat database). To find an industry match, we also begin with all IPOs within the same month of the sample firm, from which we first match on the three-digit SIC code. If there is no firm with the same three-digit SIC code, we match on two-digit. And if there is no firm with the same two-digit code, we turn to the one-digit SIC

code. If there is no one-digit code match, we turn to IPOs from one month before and one month after the sample firm's IPO date, from which we repeat the SIC code match. If multiple matches are found, we choose the one with the closest total assets as the industry control. If one firm has been chosen as a control, it cannot be chosen as a control again. Because we need to calculate five-year returns, we require control firms to have at least five years returns data in the CRSP database except for IPOs in 1999. For IPOs in 1999, we require a control to have returns data for at least 3 years after IPOs because the CRSP data we have ends in December 2003.

4.3. Empirical results

Our sample firms mean buy-and-hold returns over one, three, and five years following IPO date are 10.42%, 2.04%, and 11.05% respectively. A median sample firm has buy-and-hold returns of -5.00%, -42.98%, and -45.91% over one, three, and five years subsequent to the IPO date respectively. Their long-run abnormal performance relative to US and home market benchmarks are presented in Panel A of Table 7. Panel A shows that our sample of international Yankee issuers' US original IPOs severely underperform the US market in the long run, which supports our hypothesis. Except the mean BHAR relative to the S&P 500 over a one-year holding period, all the mean and median BHARs relative to the S&P 500 and the CRSP equally-weighted index are significantly negative. The underperformance ranges from the lowest 8.73% over a one-year holding period to the highest 256.85% over a five-year holding period. The corresponding figures for medians are 21.46% and 249.49%. The abnormal returns are uniformly more severe over all the three holding periods when sample firms' returns are benchmarked against CRSP equally-weighted index than against the S&P 500. The negative abnormal returns appear in the first year,

continue through the third year, and keep worsening till the fifth year. The data do not seem to suggest any sign of performance recovery.

Panel A also shows our sample firms' long-run performance relative to their respective home stock market. In general, our sample firms also underperform their home stock markets in the long term. However, there are two differences between the underperformance benchmarked against the US market and home markets. The first difference is that the underperformance relative to the home markets are uniformly less severe than that relative to the US market, no matter which US market index is used. The underperformance relative to the home market ranges from 8.20% to 40.25% on average. The corresponding figures for medians are 18.99% to 78.65%. The second difference is that the underperformance relative to the home market starts from the first year and reaches the highest underperformance in the third year. However, unlike the underperformance relative to the US market, it shows signs of recovery after the third year, though until the fifth year the underperformance is still larger than that in the first year.

Now we turn to the performance relative to US control IPO firms. We present in Table 8 the percentiles of the total assets at the last fiscal year-end before IPOs for our 101 international sample firms and 101 US domestic control IPO firms. The comparison of the percentiles indicates that our size controls are matched quite well with our sample firms, except for a few extremely large sample firms. The median total assets are around 19 million US dollars for both our sample firms and US IPO controls. Our focus is on Panel B of Table 7, which shows our sample IPO firms suffer significant long-run underperformance compared with US domestic IPO firms with the same size or in the same industry. Yankee issuers on average underperform US domestic IPO firms with similar size 20.48%, 118.34%, and 68.84% over the one,

three, and five year holding periods, respectively. A median Yankee issuer underperforms US domestic IPO firms of similar size 13.05%, 45.24%, and 35.41% over the corresponding three holding periods. When compared with US domestic IPO firms from the same industry, our Yankee issuers on average underperform 16.80%, 87.36%, and 85.75% one year, two years, and three years after IPO. A median Yankee issuer underperforms same industry US domestic issuer 17.77% one year after IPO and the underperformance stays around 15% after three or five years' seasoning. The findings in Panel B of Table 7 support our hypothesis that international Yankee issuers underperform comparable US domestic issuers in the long run and hence they face cost of external capital comparable to or lower than similar US domestic issuers.

5. Concluding remarks

In a scenario of accelerating market integration, a firm can choose either the home stock market or a foreign market as the location for its first public offering and exchange of listing. Though there has been a considerable amount of studies on both IPOs and international foreign listings, firms conducting IPOs in a foreign market are to a large extent neglected.

In this paper we examine a sample of international firms that bypass their home markets and conduct their IPOs in the US and list their shares for public trading in the US. Our focus is on the operating performance change around their IPOs and the long-run stock market performance subsequent to IPOs. Using high-quality accounting data, we detect significant improvement in profitability and substantial increase in sales without any deterioration of debt-repaying capability from three years before to three years after IPO. The finding of strong operating performance is consistent with the argument that "only the best comes to the US" and such Yankee issuers are from a select group of high-quality firms.

Bruner et al. (2004) examine the direct issue costs of underwriting fees and indirect costs of first day underpricing for a similar sample to ours. They find international Yankee issuers on average face the same issue costs as comparable US domestic IPO firms. We try to complete the analysis of costs of external capital for such international Yankee issuers by studying the long-run aftermarket performance, as suggested by Ritter (1991). Using various benchmarks, we find that Yankee issuers severely underperform the US market over one, three, and five year holding periods and significantly underperform, but to a lesser degree, their home stock market. We also compare the long-run performance of Yankee issuers with US domestic IPO firms matched on size or industry and still find significant underperformance. These results indicate that the costs of external capital for Yankee issuers in the US market do not surpass those for comparable US domestic issuers. Since the Yankee issuers conduct public offerings and list on a US exchange, when compared with US firms, they have to satisfy the same strict disclosure requirements as US domestic public firms. When compared with firms in their home country, Lang, Raedy, and Yetman (2003) documents that the accounting quality of international firms listing on a US exchange is significantly better than those firms staying in the home market. The finding of lower cost of external capital is consistent with a set of literature proposing that higher accounting disclosure leads to lower cost of capital (Verrecchia, 1999).

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Table 1
Sample characteristics
Panel A.

year	NYSE	AMEX	NASD	ADR	Common	Total	TA(-1)		Issue Size	
							mean	median	mean	median
1990	1	0	0	1	0	1	227.140	227.140	68.400	68.400
1991	0	0	2	0	2	2	7.469	7.469	34.250	34.250
1992	2	0	8	1	9	10	30.400	19.952	34.490	26.400
1993	5	0	6	4	7	11	158.650	79.118	54.373	46.000
1994	2	0	7	2	7	9	59.096	21.826	32.611	35.000
1995	2	0	8	3	7	10	661.270	24.06	48.780	38.400
1996	4	0	17	9	12	21	241.934	17.877	75.719	30.800
1997	3	1	17	6	15	21	235.517	19.372	52.752	22.500
1998	0	3	5	0	8	8	15.482	10.179	16.025	13.550
1999	0	0	8	0	8	8	39.235	10.840	64.563	48.500
							mean for all:	median for all:	mean for all:	median for all:
Total	19	4	78	26	75	101	197.030	19.372	51.523	32.400

Table 1 (*continued*)
Panel B

Country/District	Number	Legal Origin	Country/District	Number	Legal Origin
Australia	2	Common	Israel	33	Common
Bahamas	1	N/A	Italy	3	Civil
Belgium	1	Civil	Jordan	1	Civil
Bermuda	2	N/A	Mexico	1	Civil
Brazil	1	Civil	Netherlands Antilles	1	N/A
Chile	3	Civil	Netherlands	8	Civil
China	6	Civil	Panama	2	N/A
Cyprus	1	N/A	Puerto Rico	1	N/A
Denmark	1	Civil	Singapore	2	Common
France	4	Civil	Sweden	1	Civil
Germany	1	Civil	Switzerland	1	Civil
Hong Kong, China	10	Common	Taiwan, China	2	Civil
Indonesia	1	Civil	United Kingdom	8	Common
Ireland	3	Common	Total	101	

This table presents some characteristics for our sample. Panel A shows by year the number of Yankee issuers' IPOs in the US. NYSE, AMEX, and NASD are the number of such IPOs listed on NYSE, AMEX, and NASDAQ respectively. These IPOs are either listed as ADR or as common shares and ADR and Common show the number of such listings. TA(-1) is the total assets at the last fiscal year end before IPO date in millions of US dollars. Issue Size shows the amount raised in such IPOs. Panel B presents the geographical distribution of our sample firms and their legal origins. Common represents common-law legal origin while Civil denotes civil-law legal origin. The classification of the legal origins is from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).

Table 2
Performance measurement

Category	Measures	Predicted Change
Profitability	Return on Sales =Net Income/Sales	Increase
	Real Net Income=Net Income/US GDP deflator	Increase
	Real Cash Flow=Net Operating Cash Flow/US GDP deflator	Increase
Output	Real Sales=Sales/US GDP deflator	Increase
Leverage	Net Operating Cash Flow/Total Debt	No Deterioration
	Net Operating Cash Flow/Long Term Debt	No Deterioration

This table shows the three categories of operating performance that we examine, the corresponding measures that we employ for each category, and the predicted change around the US IPO dates. The ratios are calculated by using nominal data. The real net income, real cash flow, and real sales are nominal data scaled by the corresponding US GDP deflator. Real net income, real cash flow, and real sales for year 0 (the IPO event year) are defined as having an index value of 1, with other years' data being expressed relative to unity in this year.

Table 3
Whole sample operating performance

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	+/- Ratio	Sign Test for Significance of Proportion Change (P-value)
Profitability							
ROS	99	0.0316 (-1.8140)	0.0008 (-0.1802)	-0.0185 (1.6338)	1.667* (0.096)	38/61	2.211*** (0.027)
RNI	101	0.3126 (0.0220)	0.7371 (1.0668)	0.4154 (1.0448)	1.934* (0.053)	60/41	1.791* (0.073)
RCF	100	0.3604 (2.3649)	0.7799 (4.3944)	0.3169 (2.0295)	2.997*** (0.003)	65/35	2.900*** (0.004)
Output							
Real Sales	101	0.5786 (2.4992)	1.4028 (1.7582)	0.8082 (-0.7410)	7.819*** (0.000)	91/10	7.960*** (0.000)
Leverage							
Operating Cash Flow /Total Debt	78	0.2784 (0.9193)	0.1847 (53.4260)	0.0500 (52.5068)	0.722 (0.470)	42/36	0.566 (0.571)
Operating Cash Flow /Long-term Debt	60	0.6871 (1.4988)	0.5223 (6.1368)	0.0989 (4.6380)	0.077 (0.938)	31/29	0.129 (0.897)

This table shows the results for our whole sample. N is the number of observations. Median (Mean) Before is the median and mean value for average measure values over three years before IPO. Median (Mean) After is the median and mean value for average measure values over three years after IPO. Median (Mean) Change is the median and mean value for differences between After and Before IPO averages (After-Before). Wilcoxon signed rank test is used to detect significant median changes around IPOs. +/- Ratio is the ratio of number of positive measure changes to that of negative measure changes. Sign test is used to decide whether this ratio is significantly different from 0.5.

Table 4
Panel regression

Proxy	Before (-3, -1)	After (+1, +3)	RGDPGrowth	Adjusted R-squared	N	After-Before (P-value from Chi-square test)
Profitability						
ROS	-0.1407***	-0.1073***	0.7588***	0.0614	638	0.0334*** (0.000)
RNI	-0.5532***	0.1656***	-6.0890***	0.1389	644	0.7188*** (0.000)
RCF	-0.6171***	0.0457**	14.2658***	0.5397	638	0.6629*** (0.000)
Output						
Real Sales	-0.3136***	0.2407***	0.6259***	-0.0083	645	0.5543*** (0.000)
Leverage						
Operating Cash Flow / Total Debt	-0.2376***	-0.3927***	0.8239***	0.1709	527	-0.1552*** (0.000)
Operating Cash Flow /Long-term Debt	1.5944***	4.3162***	-210.2477***	-0.0047	451	2.7217*** (0.000)

This table shows the panel regression results for our whole sample. Proxy is the performance measures, which are the dependent variables. Before is a dummy variable that equals to one when the observation is from the three years before sample firms' US IPO year and equals to zero otherwise. After is a dummy variable that equals to one when the observation is from the three years after sample firms' US IPO year and equals to zero otherwise. RGDPGrowth is the annual real GDP growth for the sample firm's home country. N is the number of observations. Wald test is utilized to test whether there is significant difference between Before and After.

Table 5
Panel results on the effect of industry growth

Proxy	Before (-3, -1)	After (+1, +3)	RGDPGrowth	RINDGrowth	Adjusted R-squared	N	After-Before (P-value)
Profitability							
ROS	-0.2338***	-0.0663***		0.0015	0.0160	356	0.1675*** (0.000)
ROS	-0.2739***	-0.0871***	3.6399***	-0.0262***	0.0131	356	0.1868*** (0.000)
RNI	-0.5320***	0.3898***		-0.2812***	0.1366	359	0.9218*** (0.000)
RNI	-0.5090***	0.3478***	-11.7017***	-0.1049***	0.1454	359	0.8568*** (0.000)
RCF	-0.3859***	$3.68*10^{-5}$		-0.1544***	0.2469	358	0.3859*** (0.000)
RCF	-0.5399***	-0.0634***	12.4048***	-0.4077***	0.2488	358	0.4765*** (0.000)
Output							
Real Sales	-0.3992***	0.4256***		-0.0871***	-0.0186	360	0.8248*** (0.000)
Real Sales	-0.4207***	0.4287***	1.3809***	-0.0961***	-0.0221	360	0.8494*** (0.000)

Table 5 (*continued*)

Proxy	Before (-3, -1)	After (+1, +3)	RGDPGrowth	RINDGrowth	Adjusted R-squared	N	After-Before (P-value)
Leverage							
Operating Cash Flow /Total Debt	0.1695***	-0.3267***		0.4253***	0.1677	297	-0.4961*** (0.000)
Operating Cash Flow /Total Debt	0.2325***	-0.2988***	-5.8227***	0.5697***	0.1643	297	-0.5313*** (0.000)
Operating Cash Flow /Long-term Debt	-2.0797***	3.2222***		-11.8448***	-0.0152	254	5.3019*** (0.000)
Operating Cash Flow /Long-term Debt	-1.6961***	5.6592***	-63.4514***	-15.0587***	-0.0165	254	7.3553*** (0.000)

This table shows the panel regression results for our whole sample. Proxy is the performance measures, which are the dependent variables. Before is a dummy variable that equals to one when the observation is from the three years before sample firms' US IPO year and equals to zero otherwise. After is a dummy variable that equals to one when the observation is from the three years after sample firms' US IPO year and equals to zero otherwise. RINDGrowth is the median two-year real sales growth of firms from the same country matched on SIC codes. RGDPGrowth is the annual real GDP growth for the sample firm's home country. N is the number of observations. Wald test is utilized to test whether there is significant difference between Before and After.

Table 6
Subsample analysis
Panel A. Profitability

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
ROS								
		0.0492	0.0183	-0.0321	2.2029**	1.2254		2.1864**
Early	41	(-1.7956)	(-0.1478)	(1.6478)	(0.0276)	(0.2204)	13/28	(0.0288)
		0.0129	-0.0125	-0.0170	0.2942			0.9191
Late	58	(-1.8271)	(-0.2032)	(1.6239)	(0.7686)		25/33	(0.3580)
		0.0129	-0.0186	-0.0182	1.1295	0.2977		1.6771*
Amex-Nasd	80	(-2.2757)	(-0.2415)	(2.0342)	(0.2587)	(0.7660)	32/48	(0.0935)
		0.0520	0.0550	-0.0321	1.7505*			1.3765
NYSE	19	(0.1297)	(0.0777)	(-0.0520)	(0.0800)		6/13	(0.1687)
		0.0634	0.0635	-0.0180	0.9956	0.0362		1.2000
ADR	25	(-3.2950)	(-0.1119)	(3.1831)	(0.3195)	(0.9711)	9/16	(0.2301)
		0.0173	-0.0104	-0.0191	1.3953			1.7437*
Common	74	(-1.3137)	(-0.2033)	(1.1104)	(0.1629)		29/45	(0.0812)
		0.0312	0.0219	-0.0087	0.1021	1.6072		0.5000
Developed	36	(-4.4713)	(-0.1798)	(4.2914)	(0.9187)	(0.1080)	16/20	(0.6171)
		0.0408	-0.0187	-0.0337	2.3436**			2.6038***
Emerging	59	(-0.3146)	(-0.1983)	(0.1163)	(0.0191)		19/40	(0.0092)
		0.0492	0.0352	-0.0180	1.2931	0.9197		1.4286
Less Related	49	(-1.8261)	(-0.1542)	(1.6719)	(0.1960)	(0.3577)	19/30	(0.1531)
		0.0070	-0.1123	-0.0453	1.5514			1.9167*
More Related	46	(-1.9576)	(-0.2308)	(1.7267)	(0.1208)		16/30	(0.0553)

Table 6 (*continued*)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.0237	-0.0187	-0.0231	1.8115*	0.5549		2.1193**
Common-law	57	(-1.5659)	(-0.1791)	(1.3868)	(0.0701)	(0.5790)	20/37	(0.0341)
		0.0408	0.0352	-0.0208	0.9909			1.0142
Civil-law	35	(-2.5854)	(-0.2332)	(2.3523)	(0.3217)		14/21	(0.3105)
RNI								
		0.2705	0.5000	0.0428	0.4528	1.2122		$2.17*10^{-16}$
Early	43	(-0.0589)	(0.5012)	(0.5601)	(0.6507)	(0.2254)	22/21	(1.0000)
		0.3621	0.9248	0.5519	1.9898**			2.2322**
Late	58	(0.0821)	(1.4862)	(1.4041)	(0.0466)		38/20	(0.0256)
		0.2715	0.8215	0.4407	1.9879**	1.0037		1.8773*
Amex-Nasd	82	(-0.1519)	(1.1616)	(1.3135)	(0.0468)	(0.3155)	50/32	(0.0605)
		0.6172	0.5000	0.0662	0.3018			$-2.55*10^{-16}$
NYSE	19	(0.7727)	(0.6580)	(-0.1146)	(0.7628)		10/9	(1.0000)
		0.6402	1.1450	0.4998	1.9048*	0.8195		1.3728
ADR	26	(0.5733)	(2.3763)	(1.8030)	(0.0568)	(0.4125)	17/9	(0.1698)
		0.2705	0.4749	0.4089	1.1696			1.1547
Common	75	(-0.1691)	(0.6129)	(0.7820)	(0.2421)		43/32	(0.2482)
		0.3446	0.9953	0.4458	1.7198*	0.3463		1.3152
Developed	37	(-0.0792)	(0.7875)	(0.8668)	(0.0855)	(0.7291)	23/14	(0.1884)
		0.2865	0.7277	0.4154	1.3171			1.3019
Emerging	59	(0.0342)	(1.2640)	(1.2298)	(0.1878)		35/24	(0.1930)

Table 6 (*continued*)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.5062	1.0095	0.4778	2.2182**	0.4324		2.0000**
Less Related	49	(0.3147)	(1.8548)	(1.5401)	(0.0265)	(0.6654)	32/17	(0.0455)
		0.1135	0.4403	0.0840	0.8624			0.5835
More Related	47	(-0.3476)	(0.2730)	(0.6205)	(0.3884)		26/21	(0.5596)
		0.2688	0.6925	0.2360	1.1149	0.7335		1.1818
Common-law	58	(-0.2021)	(0.3505)	(0.5526)	(0.2649)	(0.4632)	34/24	(0.2373)
		0.5881	1.0854	0.4778	2.5306**			1.6903*
Civil-law	35	(0.1647)	(2.4269)	(2.2623)	(0.0114)		23/12	(0.0910)
RCF								
		0.2438	0.7053	0.2593	2.0131**	0.2898		1.6973*
Early	42	(3.3425)	(5.4993)	(2.1568)	(0.0441)	(0.7719)	27/15	(0.0896)
		0.4241	0.7799	0.3959	2.1988**			2.2322**
Late	58	(1.6570)	(3.5944)	(1.9373)	(0.0279)		38/20	(0.0256)
		0.3458	0.8078	0.6410	2.8014***	0.6414		2.6667***
Amex-Nasd	81	(1.2927)	(2.9258)	(1.6331)	(0.0051)	(0.5213)	53/28	(0.0077)
		0.5700	0.6613	0.2412	1.2274			0.9177
NYSE	19	(6.9360)	(10.6556)	(3.7195)	(0.2197)		12/7	(0.3588)
		0.5280	1.0878	0.3110	2.0064**	0.5697		2.1573**
ADR	26	(4.5617)	(8.2694)	(3.7078)	(0.0448)	(0.5689)	19/7	(0.0310)
		0.3393	0.7029	0.3521	2.3111**			1.9762**
Common	74	(1.5931)	(3.0330)	(1.4398)	(0.0208)		46/28	(0.0481)
		0.5602	1.0748	0.3186	2.0970**	0.3015		2.3016**
Developed	37	(0.6139)	(1.3268)	(0.7129)	(0.0360)	(0.7631)	26/11	(0.0214)
		0.2410	0.4522	0.2224	1.6878*			1.1818
Emerging	58	(3.6419)	(6.4576)	(2.8157)	(0.0914)		34/24	(0.2373)

Table 6 (*continued*)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.5545	0.9382	0.3068	2.4769**	0.5399		2.0000**
Less Related	49	(4.5089)	(7.9636)	(3.4547)	(0.0133)	(0.5893)	32/17	(0.0455)
		0.2167	0.3728	0.3211	1.2564			1.3270
More Related	46	(0.2827)	(0.7264)	(0.4436)	(0.2090)		28/18	(0.1845)
		0.2071	0.3886	0.2528	1.3030	0.9812		1.0596
Common-law	57	(0.0874)	(0.5585)	(0.4711)	(0.1926)	(0.3265)	33/24	(0.2893)
		0.6168	1.0850	0.3186	2.4651**			2.3664**
Civil-law	35	(6.4808)	(10.1138)	(3.6330)	(0.0137)		25/10	(0.0180)

Table 6 (*continued*)
Panel B. Output

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. In Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
RS								
		0.6086	1.3817	0.6191	5.1500***	1.2878		4.8800***
Early	43	(0.6039)	(1.4942)	(0.8903)	(0.0000)	(0.1978)	38/5	(0.0000)
		0.5676	1.4175	0.9438	5.8842***			6.1714***
Late	58	(3.9044)	(1.9540)	(-1.9504)	(0.0000)		53/5	(0.0000)
		0.5172	1.4337	0.9195	7.1101***	2.9067***		7.6198***
Amex-Nasd	82	(2.9072)	(1.8836)	(-1.0236)	(0.0000)	(0.0037)	76/6	(0.0000)
		0.7777	1.0861	0.3100	3.1188***			2.2942**
NYSE	19	(0.7386)	(1.2173)	(0.4787)	(0.0018)		15/4	(0.0218)
		0.7365	1.1286	0.5289	3.0986***	2.7302***		2.9417***
ADR	26	(8.1862)	(1.4034)	(-6.7828)	(0.0019)	(0.0063)	21/5	(0.0033)
		0.5239	1.4645	0.9515	7.2159***			7.3901***
Common	75	(0.5277)	(1.8812)	(1.3535)	(0.0000)		70/5	(0.0000)
		0.6327	1.4028	0.6959	4.2694***	0.9410		4.2744***
Developed	37	(5.8801)	(1.9903)	(-3.8898)	(0.0000)	(0.3467)	32/5	(0.0000)
		0.5239	1.4062	0.8498	6.3365***			6.5094***
Emerging	59	(0.5368)	(1.6444)	(1.1076)	(0.0000)		55/4	(0.0000)
		0.6086	1.4028	0.8082	5.9883***	0.3958		6.0000***
Less Related	49	(0.5948)	(1.8485)	(1.2537)	(0.0000)	(0.6923)	46/3	(0.0000)
		0.4798	1.4062	0.8234	4.8625***			4.9594***
More Related	47	(4.6828)	(1.7039)	(-2.9789)	(0.0000)		41/6	(0.0000)
		0.5153	1.4175	0.8336	5.7139***	0.6939		5.9088***
Common-law	58	(3.9071)	(1.7056)	(-2.2016)	(0.0000)	(0.4878)	52/6	(0.0000)
		0.5974	1.4019	0.8082	4.9711***			4.7329***
Civil-law	35	(0.5791)	(1.9464)	(1.3672)	(0.0000)		32/3	(0.0000)

Table 6 (*continued*)
Panel C. Leverage

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
Operating Cash Flow /Total Debt								
		0.3612	0.0692	-0.0202	0.0901	0.7736		0.3381
Early	35	(0.9461)	(-0.9894)	(-1.9355)	(0.9282)	(0.4392)	16/19	(0.7353)
		0.1977	0.2550	0.1218	1.0203			1.2200
Late	43	(0.8974)	(97.7177)	(96.8203)	(0.3076)		26/17	(0.2225)
Amex-Nasd	60	0.1546 (0.6692)	0.2095 (68.9301)	0.1446 (68.2609)	0.8429 (0.3993)	0.7412 (0.4586)	34/26	0.9037 (0.3662)
		0.3954	0.1556	-0.0131	0.2613			0.2357
NYSE	18	(1.7526)	(1.7456)	(-0.0070)	(0.7939)		8/10	(0.8137)
		0.4980	0.1428	-0.0308	1.0143	1.5860		1.0206
ADR	24	(1.4551)	(-4.9975)	(-6.4526)	(0.3104)	(0.1127)	9/15	(0.3074)
		0.2135	0.2402	0.1446	1.4465			1.4969
Common	54	(0.6811)	(79.3920)	(78.7109)	(0.1480)		33/21	(0.1344)
		0.3612	0.1018	-0.0017	0.4824	1.0005		0.3482
Developed	33	(0.9798)	(-4.5116)	(-5.4914)	(0.6295)	(0.3171)	15/18	(0.7277)
		0.3266	0.3904	0.0652	0.9978			0.6247
Emerging	41	(0.9432)	(3.3142)	(2.3710)	(0.3184)		23/18	(0.5322)
Less Related	43	0.3840 (0.9361)	0.1565 (1.7025)	0.0602 (0.7665)	1.3947 (0.1631)	1.0408 (0.2980)	24/19	0.6100 (0.5419)
		0.1142	-0.0609	-0.2123	0.5977			0.3592
More Related	31	(0.9920)	(-2.7809)	(-3.7730)	(0.5500)		14/17	(0.7194)

Table 6 (*continued*)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
Common-law	41	0.1142 (1.0455)	0.1936 (-0.6128)	0.0225 (-1.6583)	0.0259 (0.9793)	0.1706 (0.8645)	21/20	$1.39*10^{-16}$ (1.0000)
Civil-law	31	0.3840 (0.8213)	0.1101 (0.1150)	0.0392 (-0.7064)	0.4997 (0.6173)		16/15	$-1.60*10^{-16}$ (1.0000)
Operating Cash Flow /Long-term Debt								
Early	26	0.6871 (1.9072)	0.5778 (1.1783)	0.3114 (-0.7289)	0.5080 (0.6115)	0.5743 (0.5657)	15/11	0.5883 (0.5563)
Late	34	0.5556 (1.1865)	0.5144 (9.9286)	-0.0199 (8.7421)	0.3590 (0.7196)		16/18	0.1715 (0.8638)
Amex-Nasd	45	0.7228 (0.4179)	0.6130 (6.9685)	0.2132 (6.5507)	0.0677 (0.9460)	0.1536 (0.8779)	24/21	0.2981 (0.7656)
NYSE	15	0.6208 (4.7417)	0.3558 (3.6417)	-0.0251 (-1.1000)	0.1988 (0.8424)		7/8	$-5.73*10^{-17}$ (1.0000)
ADR	22	1.5258 (3.0898)	0.7061 (10.1934)	0.4754 (7.1036)	0.8116 (0.4170)	0.8974 (0.3695)	12/10	0.2132 (0.8312)
Common	38	0.3833 (0.5777)	0.4874 (3.7883)	0.0262 (3.2105)	0.4641 (0.6426)		19/19	-0.1622 (0.8711)
Developed	29	0.9753 (1.1490)	0.5493 (5.4864)	-0.0251 (4.3374)	0.1946 (0.8457)	0.2793 (0.7800)	14/15	$-2.27*10^{-16}$ (1.0000)
Emerging	28	0.5923 (0.9194)	0.6367 (7.4236)	0.0993 (6.5042)	0.1936 (0.8465)		14/14	-0.1890 (0.8501)

Table 6 (*continued*)

Variables	N	Median (Mean) Before	Median (Mean) After	Median (Mean) Change	Wilcoxon Stat. for Dif. in Medians (After-Before) (P-value)	Wilcoxon/Mann-Whitney Stat. for Dif. In Median Change Between Subsamples	+/- Ratio	Sign Test for Significant Proportion Change (P-value)
		0.6208	0.7518	0.3178	0.9470	1.0587		0.6963
Less Related	33	(1.5309)	(0.9182)	(-0.6127)	(0.3436)	(0.2898)	19/14	(0.4862)
		3.0968	-0.0178	-1.1992	0.6143			1.0206
More Related	24	(1.6316)	(14.0358)	(12.4042)	(0.5390)		9/15	(0.3074)
		1.0504	0.2105	-0.0344	0.3395	0.5738		0.3482
Common-law	33	(1.1012)	(10.3976)	(9.2964)	(0.7342)	(0.5661)	15/18	(0.7277)
		0.7062	0.6837	0.3061	0.5000			0.2041
Civil-law	24	(0.9469)	(0.9936)	(0.0467)	(0.6171)			(0.8383)

This table shows the operating performance change for six pairs of subsamples. Panels A, B, and C details the results for profitability, output, and leverage, respectively. N is the number of observations. Median (Mean) Before is the median and mean value for average measure values over three years before IPO. Median (Mean) After is the median and mean value for average measure values over three years after IPO. Median (Mean) Change is the median and mean value for differences between After and Before IPO averages (After-Before). Wilcoxon signed rank test is used to detect significant median changes around IPOs. Wilcoxon/Mann-Whiney test is utilized to test whether there is any significant difference between median changes for the two subsamples within each of the six pairs. +/- Ratio is the ratio of number of positive measure changes to that of negative measure changes. Sign test is used to decide whether this ratio is significantly different from 0.5.

Table 7
Long-run stock market performance
Panel A. Long-run underperformance

Abnormal Returns	N	Mean	T-test (P-value)	Median	Wilcoxon Signed Rank Test (P-value)
S&P 500 Composite					
One-year	101	-0.0873	-1.1746 (0.2430)	-0.2146	2.7237*** (0.0065)
Three-year	95	-0.5746	-4.9221*** (0.0000)	-0.8297	4.9943*** (0.0000)
Five-year	70	-0.7598	-4.4027*** (0.0000)	-1.0378	4.1024*** (0.0000)
CRSP Equally-Weighted					
One-year	101	-0.2461	-3.2790*** (0.0014)	-0.3497	4.4717*** (0.0000)
Three-year	95	-1.2792	-10.1900*** (0.0000)	-1.4594	6.8131*** (0.0000)
Five-year	70	-2.5685	-12.2085*** (0.0000)	-2.4949	6.7534*** (0.0000)
DS Total Home Market					
One-year	85	-0.0820	-1.0523 (0.2957)	-0.1899	2.6685*** (0.0076)
Three-year	81	-0.4025	-3.2723*** (0.0016)	-0.7865	3.7572*** (0.0002)
Five-year	57	-0.2586	-1.2430 (0.2190)	-0.5963	2.6616*** (0.0078)

Table 7 (*continued*)
Panel B. Long-run performance relative to US control IPO firms

Abnormal Returns	N	Mean	T-test (P-value)	Median	Wilcoxon Signed Rank Test (P-value)
Controls Matched on Size					
One-year	101	-0.2048	-1.6952* (0.0932)	-0.1305	1.6769* (0.0936)
Three-year	95	-1.1834	-2.4929** (0.0144)	-0.4524	2.9862*** (0.0028)
Five-year	70	-0.6884	-1.9220* (0.0587)	-0.3541	1.9897** (0.0466)
Controls Matched on Industry					
One-year	101	-0.1680	-1.6394 (0.1043)	-0.1777	1.7277* (0.0840)
Three-year	95	-0.8736	-2.0712** (0.0411)	-0.1591	2.6707*** (0.0076)
Five-year	70	-0.8575	-2.0467** (0.0445)	-0.1522	1.7381* (0.0822)

This tables shows the sample firms' stock market performance relative to US market (S&P 500 Composite and CRSP Equally-Weighted index) and to their home market (Datastream total market index for the country) in Panel A and relative to control samples of US domestic IPOs matched on size or industry in Panel B one, three, and five years subsequent to their US IPOs. N is the number of observations. Mean and Median show the mean and median buy-and-hold abnormal returns. T-test and Wilcoxon signed rank test are used to test whether there is significant mean and median abnormal return.

Table 8
Distribution of total assets for sample firms and US control IPOs matched on size

Percentiles	Sample IPO Firms (in Millions of US Dollars)	US Control IPOs Matched on Size (in Millions of US Dollars)
First	0.977	2.281
Tenth	3.934	4.542
Twentieth	7.502	7.781
Thirtieth	10.700	10.628
Fortieth	13.908	13.830
Fiftieth (Median)	19.372	19.878
Sixtieth	26.262	26.428
Seventieth	49.160	48.142
Eightieth	107.704	82.531
Ninetieth	227.140	149.619
One Hundredth	4267.529	2940.900

This table shows the percentiles for the size of our sample firms and the control sample of US domestic IPOs matched on size. Size is measured in total assets at the last fiscal year-end before IPOs.