

Who benefits from market integration? A comparative study of Yankee IPOs from high and low integrated markets

Kuntara Pukthuanthong, Associate Professor, Department of Finance, College of Business Administration, San Diego State University

Abstract

We present comparative analyses of the aftermarket performance of Yankee IPOs from high and low integrated markets over the 1990-2005 period. The analyses indicate that Yankee IPOs from less integrated markets experience greater improvements in operating and stock performances than those from more integrated markets during the first three years after going public. The significant improvement in performance of Yankee IPOs from low integrated markets persists after controlling for country, IPO, and firm characteristics. The findings of our study support the benefits of market integration and suggest that firms from low integrated markets enjoy greater benefits from entering into high integrated markets than those from high integrated markets.

Globalization has become a topic occupying the attention of many officials, academics, and market participants. The evidence can be seen from the foreign exchange market, which is the largest financial market in the world. Based on the most recent Bank of International Settlement (BIS) report in 2007, daily foreign exchange turnover is U.S.\$ 3.2 trillion. This is a thousand times larger than the NYSE trading volume and in the same range as the annual economic output (GDP) of China and Germany in 2007¹. In addition, foreign trading volumes have increased by 71% since 2004. Globalization is a symptom of the integration of national economies, which has contributed to the increase in foreign exchange trading volumes.

A large body of literature demonstrates that market integration increases economic welfare [Bekaert and Harvey (2003)]. Most studies suggest that foreign investors will raise the bid prices of local stocks that provide them with diversification benefits. In doing so, the cost of capital should decrease, resulting in increased investment and economic welfare. Bekaert et al. (2006) demonstrate that market integration also leads to economic growth. Similarly, Rajan and Zingales (2003) find that liberalization or market integration lead to financial development, where liberalization is defined as the degree of openness to trade and capital flows. Since the question of the benefits from market integration has been largely investigated, we shed a light on who captures the greater proportion of benefits from market integration.

To answer this question, we specifically investigate the impact of market integration on firm performance and make comparisons between firms from low integrated markets and those from high integrated markets. In recent years, we have witnessed a considerable acceleration in the number of international firms issuing equity in the U.S. These equity issuing companies include firms simultaneously issuing equity in both home and host markets and those that have issued equities in other markets previously, i.e., those undertaking seasoned equity offerings (SEOs). Given the other factors are constant, most existing studies of such issues generally ignore the fact that the market response to first-time listings is significantly more profound than that for the follow-on listings. As such, it is important that a cross-listing study separates firms going public for the first time from those that have SEOs [Sarkissian and Schill (2008)]. In this study, we investigate who gains more from market integration by studying international firms that go public for the first time in the U.S. (original IPOs) rather than their own domestic markets. Such IPOs are known as Yankee IPOs. Yankee IPOs provide a clean form of experiment since they are the original IPOs. In addition, Yankee IPOs are undertaken by firms going public only in the U.S.; not simultaneous offerings in local and foreign markets, which reduces the complications of controlling institutional factors that are various among countries.

A large number of Yankee IPOs is issued by companies from emerging countries such as China and Mexico. The lack of liquidity in these markets and the ability to raise capital in the U.S. market should improve the post-IPO operating performance, as compared to the pre-IPO period. The marginal gain from receiving capital for Yankee IPOs from less integrated markets should be higher since such capital helps alleviate the problem of domestic capital shortage, which inhibits their existing growth. Since Yankee IPOs go public for the first time in the U.S., they have to disclose the same level of information to the Securities and Exchange Commission (SEC) that a typical U.S. IPO is required to. Given the level of disclosure required, such IPOs have a strong signalling effect in the market. This is particularly true for those from disintegrated markets where the cost of capital is higher. Additionally, low integration between the U.S. and

emerging markets [Pukthuanthong and Roll (2009)] makes Yankee IPOs from less integrated markets attractive for diversification.

We apply the measure of market integration developed by Pukthuanthong and Roll (2009) and compare the stock and operating performances of Yankee IPOs from countries with different degrees of market integration. We compute 3-year post-IPO stock and operating performances of Yankee IPOs and compare them to their domestic market index returns and the control firms. We carefully choose the matching firms, which are companies going public only in the local market around the same time as the IPO, are in the same industry, and have the same size. The evidence shows that Yankee IPOs outperform their matching firms and that those from less integrated markets experience greater improvements in performance. Our paper contributes to both market integration and cross-listing literature. We are one of a few studies investigating firms that go public for the first time in another country, rather than their own domestic markets. We show that firms from less integrated markets experience greater improvements in performance after being integrated with the world market than firms from more integrated market. On average, Yankee IPOs outperform their comparable IPOs that choose to go public in the local markets. Overall, the results suggest that market integration benefits predominantly flow to firms from segmented or low integrated countries.

Literature review and hypothesis development

How does market integration affect expected returns or cost of capital? By its very nature, volatilities of developing market returns are higher than those of the major world markets. As a result, to keep variance and covariance constant, the prices of the market index should increase and expected returns should decrease. As the developing markets become more integrated with the world, the sensitivity of their market returns increases and so does the covariance of their markets with the world. When the increase in covariance is smaller than the increase in local stock variance the prices are typically higher.

Errunza (2001) explains that the cost of capital or expected return of any security in the integrated market is lower because those traded on any segmented market are mostly held by local investors, and their expected returns depend on the local price risk and national covariance risk. When the market becomes more integrated with the world market, the expected return depends on the global price and covariance risk. Both are lower for the global markets. As a result, the expected return of an integrated market is lower. In addition, a decrease in the cost of capital is a result of a decrease in information asymmetry. When markets become integrated or firms issue ADRs/GDRs and/or country funds, foreign investors will demand a larger quantity and better quality of disclosed information through security regulations and financial reports. Hence, information asymmetry decreases and the cost of capital is reduced. Lastly, as the market becomes more integrated, the securities will be priced by global systematic risk, and the local risk premium will be zero.

Empirically, Bekaert and Harvey (2000) investigate the impact of market integration on the cost of capital directly by applying a cross-sectional and time-series model on a sample of 20 emerging markets. They use dividend yield to measure the cost of capital and find a significant decrease in dividend yield from pre- to post-liberalization periods. In a similar vein, their study in 2003 shows that expected returns or costs of capital decrease in the integrated markets, especially when it comes to developing markets. Henry (2000) and Kim and Singal (2000) find consistent evidence of a decrease in average returns after financial liberalization. Henry's result is stronger than the other studies. He estimates the abnormal return during the liberalization period using the discrete price change directly, whereas Bekaert and

¹ <https://www.cia.gov/library/publications/the-world-factbook/index.html>

Harvey (2000) measure cost of capital changes using aggregate dividend yields. Edison and Warnock (2003) also show that the decrease in dividend yield is strong for countries that had a complete liberalization process. Errunza (2001) argues that studying market integration at the country level for a long period of time is difficult since there are many variables, such as political, social, and economic factors, that may affect long-term performance. As a consequent, some studies show the effects of market integration on the cost of capital using firm level data, such as American Deposit Receipts (ADRs), Global Deposit Receipts (GDRs), or Country Funds (CFs), which are forms of country liberalization. Foerster and Karolyi (1999) study foreign firms cross-listed in the U.S. and document a 28% decrease in the local market beta. Errunza and Miller (2000) study 126 ADRs from 32 countries and find a significant decrease in cost of equity capital and a positive market reaction from the first-time ADR offering announcement. They explain that ADRs allow investors to expand their investment sets. Alexander et al (1987, 1988) and Foerster and Karolyi (1992) suggest that the decrease in the cost of capital is a result of the dissipation of the portion of the risk premium that compensates for cross-border investment barriers. Miller (1999) and Foerster and Karolyi (1999) posit that an increase in investor recognition is another potential explanation for a decrease in cost of capital.

A decrease in cost of capital may be attributed to an increase in liquidity from cross-listing. Foerster and Karolyi (1998) show a decrease in bid-ask spreads of Canadian stocks in Canada that are cross-listed in the U.S. Domowitz et al. (1998) suggest that the impact of cross-listing is complicated depending on the degree of transparency in quoting prices in both markets. Lins et al. (2005) corroborate their findings and suggest that the introduction of ADRs increases liquidity and decreases capital constraints, thereby reducing cost of capital².

A large volume of literature focuses on international cross-listing firms. Most studies find that firms that are cross-listed in other countries that have high disclosure requirements have good quality. Fuerst (1998) and Cheung and Lee (1995) develop a theoretical model showing that firms that cross-list in environments with greater disclosure have better quality and more opportunities to grow. Pagano et al. (2002) find most European firms that cross-list in the U.S. have higher growth and expand without relying on debt. Doidge et al. (2004) use data from Worldscope and show that foreign firms cross-listing in the U.S. are able to reduce shareholders' expropriation, thereby allowing them to maximize and capture growth opportunities. Only a few studies investigate firms going public in another country for the first time (original IPO) without going through their domestic financial markets. Firms that go public in the U.S. for the very first time are called Yankee IPOs. We attempt to fill the gap in literature and are particularly interested in the consequences of market integration for firms from disintegrated market. We shed a light on stock and operating performances of firms from countries with different degrees of market integration. Blass and Yafeh (2001) study 56 Israeli Yankee IPOs going public from 1990 to 1996 and show that they are of higher quality than firms listed in the domestic market. Bruner et al. (2004) find that Yankee IPOs have the same issuing costs as matching U.S. IPOs. Yang and Lau (2008) find that Yankee IPOs have better operating performance than comparable U.S. IPOs, even though, they underperform the U.S. market index. Sarkissian and Schill (2008) document a permanent gain on returns for firms listings in markets that have more liquidity, better legal protection, and larger shareholder base. Given that the U.S. has better legal

protection and disclosure regulation, we expect firms from low integrated market to experience greater benefits from going public in the U.S. market than those from high integrated markets. Furthermore, investors may experience greater diversification benefits from investing in firms that have low integration with the U.S. market. Consequently, cost of capital gain should be maximized by investing in IPOs from host markets whose returns have low integration or disintegration with the home market. We propose the following hypotheses.

Hypothesis 1: Yankee IPOs have better post-IPO stock performance than comparable domestic IPOs.

Hypotheses 2: Yankee IPOs from less integrated markets have better post-IPO risk-adjusted stock performance than those from more integrated markets.

Hypothesis 3: Yankee IPOs from less integrated markets experience greater post-IPO operating performance improvements than those from more integrated markets.

Sample selection

We collect the sample from SDC Platinum's Global New Issues database that conducts original IPOs in the U.S. We exclude firms trading their equities in other markets before going public in the U.S. and firms having simultaneous offerings. Our sample consists of firms conducting original IPOs in the U.S. from 1990 to 2005, which leaves three years for us to compute post-IPO performance. We start the sample in 1990 because it is difficult to collect accounting information before that time. Following the extant IPO literature, we exclude financial firms, private placements, IPOs that result from spinoffs, and issues with SDC share types other than class A shares, common shares, ordinary shares, ordinary/common shares, equity shares, or ADRs. We also exclude countries that provide no role other than that of corporate tax havens, such as Bermuda, British Virgin Islands, the Cayman Islands, Guernsey, Jersey, Netherlands Antilles, Panama, and Puerto Rico. Our close examination of the SDC database reveals several data problems. We find errors in IPO issue dates for the majority of our sample countries. For example, the SDC often mistakenly provides announcement or subscription dates as issue dates³. To overcome this data problem, we manually cross-reference each of our sample IPOs with Bloomberg to identify and correct the erroneous issue dates. Another major data problem is that many offer prices in the SDC database are incorrect or missing.

We collect accounting information, such as book value, total assets, EBITDA, sales, and cost of sales mainly from Compustat for one year before to three years after the IPOs. Further data not available on Compustat is hand-collected from the IPO prospectuses, registration statements filed with the SEC, and the financial reports on EDGAR. The accounting data reported under different GAAP can be different. To ensure compatibility, we make sure that the financial reports we collect are under the same GAAP as the data we compile from Compustat. Some SDC accounting data (the book values of assets and equity, sales, and EBITDA) are used purely for illustrative purposes or to check for outliers. The ratio of accruals to total assets reported in the first annual statement after the firm goes public is considered as a measure of earnings quality. Using the cash flow statement, we construct accruals as income before extraordinary items

³ The announcement date generally refers to the date when the issuer files a prospectus with the relevant regulatory body. Since the length of the subscription period varies from multiple days to several weeks, it is tricky to pick a day as the subscription date. Our cross-examination of the SDC data against Bloomberg reveals that there is no consistency in SDC's determination of the subscription date, which varies between the beginning and closing of the subscription. Fortunately, Bloomberg provides IPO issue dates directly. Note that the accuracy of issue dates is very crucial for us because we rely on them as a reference time point for calculating IPO returns.

² For those interested in this subject, Chari and Henry (2001) and Patro and Wald (2005) document integration effects using firm-specific data. Karolyi (1998) provides a comprehensive survey of this research area and Stulz (1999) provides an excellent survey of the globalization effect on corporate governance and cost of capital.

(Compustat item 123) minus cash flow from operations (item 308 minus item 124). Forecast earnings data are obtained from the I/B/E/S database. Underwriter quality is based on modifications of the Carter and Manaster (1990) and Carter et al. (1998) rankings as developed by Loughran and Ritter (2004); the rankings are between 0 (low) and 9 (high)⁴.

Finally, we hand-fill gaps in the SDC's coverage of company founding dates and manually check all firms that were according to SDC zero to three years old at the time of the IPO; this is motivated by Loughran and Ritter (2004), who note that the SDC frequently reports the most recent incorporation date rather than the founding date. As in Loughran and Ritter, the founding date is defined here as the date when operations commenced. In IPOs that had been divisions of public corporations, we attempt to determine the date when the division commenced operations. This date normally precedes the date of the division's incorporation. In roll-ups and similar acquisition-based IPOs, the founding date of the IPO is taken as the earliest founding date of any of its constituent firms.

Market integration is developed by Pukthuanthong and Roll (2009). They use 82 countries having index data availability from DataStream. When a country has at least 50 usable daily returns in a given calendar year, its dollar-denominated index returns for that year are regressed on ten global factors, which have been estimated by out-of-sample principal components based on the covariance matrix in the previous calendar year computed with the returns from 17 major countries, the 'pre-1974 cohort' present in the DataStream in 1973, and remaining present every year until February 8, 2008, the end of their database. The resulting R-squares indicate the degree of market integration. Table A1 in the Appendix shows the mean adjusted R-squares of all countries in the sample during 1974 to 2007 and 1990 to 2007. Some countries have same market integration in both periods because they do not have data available in the DataStream until later. We also show t-stats from a regression of R-square fitting into a simple linear time trend for all available years.

There are four legal origins for each country: English common law, French commercial code, German commercial code, and Scandinavian civil law. We collect this information from Reynolds and Flores (1989), and La Porta et al. (1998). The class action dummy is set to 1 if class action lawsuits are available in a prospectus liability case in a given country, and 0 otherwise. We collect this variable from La Porta et al. (2006). Lastly, we collect burden of proof, which is a liability standard measuring the extent of private enforcement of securities laws when investors seek to recover damages from firms and related intermediaries that are responsible for failing to disclose material information in the prospectus. La Porta et al. (2006) use this variable along with disclosure regulation to measure securities laws and regulations around the world and find that such measure is correlated with stock market development. Orens and Lybaert (2007) explain burden of proof (liability standard) as, "The extent to which an investor is able to recover losses from the issuer, the directors, the distributors and the accountant when misleading information is included in the prospectus." We collect this variable from La Porta et al. (2006) computing burden of proof as the arithmetic mean of the burden director index, burden distributor index, and burden accountant index, with higher ratings for less procedural

difficulty in recovering losses. The burden director/distributor index proxies for "the procedural difficulty in recovering losses from the issuer's directors/the distributor in a civil liability case" caused by misleading statements in the prospectus. The burden accountant index measures "the procedural difficulty in recovering losses from the accountant in a civil liability case for losses due to misleading statements in the audited financial information accompanying the prospectus." Our final sample consists of 291 Yankee IPO firms from 34 countries going public between 1990 to 2005.

Methods and empirical results

Table A1 shows the sample of Yankee IPOs across 34 countries. 15% of Yankee IPOs are from Canada, 14% are from the U.K., 10% are from China, 7% from Israel, and about 6% are from Mexico and Hong Kong each. The extant literature documents that firms listed on the NYSE have better quality than those quoted on NASDAQ because the listing requirements of the former are more stringent. 61% of Yankee IPOs are listed on NASDAQ, 29% on the NYSE, 5% on the small cap market, and only 3% on the AMEX and the OTC each. Firms listed in the small cap market have to follow disclosure and trading rules similar to those followed by the NASDAQ National Market [Aggarwal and Wu (2006)]. Most Yankee IPOs for each country in the sample are listed on NASDAQ except for Mexico, Chile, Italy, and South Korea where most Yankee IPOs are listed in the NYSE. Firms going public may issue stocks in the form of common shares or American Depositary Receipts (ADRs). One may argue that ADRs are not fungible while common shares are. 54% of Yankee IPOs in the sample are in the form of ADRs and the rest are common shares. All of Canadian, Dutch, Hong Kong, Greece, and Singapore Yankee IPOs are common shares. 95% of Israel Yankee IPOs are also in common shares. On the other hand, most of the British, Chinese, French, Chilean, Swedish, German, Argentinean, and Norwegian Yankee IPOs are ADRs and all of the Mexican, Italian, South Korean, Irish, New Zealand, and Russian Yankee IPOs are ADRs.

The market integration is indicated by R-squares explained below. We will focus on the average R-squares from 1990 to 2007 since most countries in the sample have data available in DataStream during this period. In addition, it may be appropriate for our study since the sample starts in 1990. Netherlands, France, and Germany are the top three countries with the highest average R-squares, above 70% from 1990-2007; UK and Belgium have R-squares of above 60%; Sweden and Italy have R-squares of 55%. The other Asian countries that have R-squares above the average of 32% are Hong Kong and Singapore. Canada and Australia are the other two countries outside the European Community that have R-squares that are above average. We also show t-statistics from fitting R-square into time trend over 34 years. R-square is from regressing daily returns of a country in a given calendar year, its dollar-denominated index returns for that year on ten global factors. These factors have been estimated by out-of-sample principal components based on the covariance matrix in the previous calendar year computed with the returns from 17 major countries, the 'pre-1974 cohort' described in Pukthuanthong and Roll (2009). T-statistics imply a change in R-squares from 1974 to 2007. The average t-statistic of countries in the sample is 4.36, which is much higher than the mean of 2.53 reported in Pukthuanthong and Roll (2009) using all countries available in DataStream (82 countries.) As expected, countries that have an increasing level of market integration over 34 years with t-statistics of in excess of 8 are France, Italy, Germany, and the Netherlands. Some other notable increases in measured integration include the U.K., Sweden, Belgium, Brazil, Australia, and Switzerland. Three countries from Asia having increasing degree of market integration are South Korea, Hong Kong, and Taiwan. However, there is a glaring exception to the general trend of enhanced integration. Jordan exhibits significantly negative

⁴ Underwriter ranking is based on the SDC's top 500 book runners during our sample period. We assign underwriter ranks on a scale from 0 to 9 based on the global proceeds (measured in U.S.\$) of the IPOs they underwrote during our sample period: it is equal 9 if global proceeds exceed U.S.\$20 billion; 8 if global proceeds are greater than U.S.\$10 billion; 7 if global proceeds are greater than U.S.\$5 billion; 6 if global proceeds are greater than U.S.\$2 billion; 5 if global proceeds exceed U.S.\$1 billion; 4 if global proceeds are greater than U.S.\$0.5 billion; 3 if global proceeds exceed U.S.\$0.2 billion; 2 if global proceeds are greater than U.S.\$0.1 billion; 1 if global proceeds are less than U.S.\$0.1 billion; and 0 if the lead underwriter is not in the SDC's top 500 ranking.

Table 1 - Summary statistics across years

Year	N	NYSE	AMEX	NASDAQ	OTC	Small cap market	Common stocks	ADRs
1990	3	1		1	1		2	1
1991	5	2		3			4	1
1992	12	4	1	7			6	6
1993	21	10	1	8	1	1	7	14
1994	24	16		7		1	4	20
1995	21	5		15		1	13	8
1996	52	16	1	31		4	18	34
1997	48	11	3	31	1	2	25	23
1998	16	3	1	9	1	2	11	5
1999	20	1	1	15		3	13	7
2000	17	2		15			10	7
2001	4	2		1	1		3	1
2002	2	1			1		1	1
2003	2			2			1	1
2004	21	6		14	1		6	15
2005	23	3	1	17	2		10	13
	291	83	9	176	9	14	134	157

time trends in R-squared, which seems anomalous. Pukthuanthong and Roll (2009) believe that this might be due to the small number of observations in their sample. Countries that have low integration with t-stats of about 1 are Argentina, China, with t-stats of about 1.8 are Russia and Canada, and with t-stat of 2 is New Zealand. We also show legal origins, burden of proof, and class action dummy for each country.

Table 1 shows the sample of Yankee IPOs across years. There is a cluster in 1996 and 1997 and the number has gone down thereafter until the bubble burst in 2001 when the number of Yankee IPOs greatly diminished. The number of Yankee IPOs has picked up again in 2004 and 2005. In 1993, 1994, 1996, and 2004, about 50% of Yankee IPOs were in the form of ADRs, while during the dot-com bubble most were in the form of common shares. Since 2004, most Yankee IPOs have been offered in the form of ADRs.

Our objective is to find use the following data to answers the following questions: how does the long-term performance of Yankee IPOs compare with comparable firms choosing not to go public in the U.S.? How does the long-term performance of Yankee IPOs from high integrated markets compare to those from low integrated markets? To answer these questions, we examine the returns of Yankee IPOs following the offer date from countries that have high and low market integration. The measure of market integration is developed by Pukthuanthong and Roll (2009) using stock market index data from 1974 to 2007. For robustness, we estimate long-term returns using three different approaches, a buy-and-hold abnormal returns method, a Fama-French three-factor regression, and a cross-sectional regression method.

Calculating buy-and-hold abnormal returns

Long-run buy-and-hold abnormal returns (BHAR) are measured as follows:

$$R_{nT} = \prod_{t=offerdate+2}^{\min[T,DL]} (1 + R_{nt}) - 1 \tag{1}$$

$$R_{bT} = \prod_{t=offerdate+2}^{\min[T,DL]} (1 + R_{bt}) - 1 \tag{2}$$

where R_{nt} and R_{bt} are the daily returns of an IPO firm n and benchmark b on date t , respectively. R_{nT} and R_{bT} are the long-run returns of issue n and benchmark b , respectively, which we compute beginning on day +2 to avoid any endogeneity problems.

T is the ending date while DL is a delisting date, if it happens prior to T . We now define a firm's BHAR as follows:

$$BHAR_{nT} = R_{nT} - R_{bT} \tag{3}$$

An issuing firm's BHAR is the difference between its buy-and-hold return and the benchmark return. Under the assumption of independence of returns, the mean BHAR and t-statistic are computed as follows:

$$\overline{BHAR}_T = \left(\frac{1}{I}\right) * \left(\sum_{n=1}^I BHAR_{nT}\right) \tag{4}$$

$$t(BHAR_T) = (\sqrt{I}) * \left(\frac{\overline{BHAR}_T}{\sigma(BHAR_T)}\right) \tag{5}$$

The symbol " I " denotes the total number of IPOs in the sample; $\sigma(BHAR_T)$ is the sample standard deviation of the BHAR of IPO firms at the end date T .

Based on Barber and Lyon (1997), BHARs are superior to the cumulative abnormal return (CAR) approach. First, BHARs represent returns earned over the long-term by the mean or median of the sample. For our purposes, BHARs represent an appropriate measure of long-term IPO performance because most IPOs perform better in earlier years of their publicly traded life than in later years. CARs treat a 50 percent gain the same way as a 50 percent loss, thus the result will be biased against long-run underperformance⁵. Second, the CAR gives positively biased results. If a firm is delisted during the period, the mean return reflects fewer firms in subsequent periods. An analysis of the delisted firms shows that their returns at the time of delisting are not significant outliers and thus do not bias our results⁶.

Although BHARs may be superior to CARs as a performance metric, Purnanandam and Swaminathan (2004) caution that there is significant misspecification in the small sample distribution of long-run returns in event studies (especially using BHARs over 3-5 years). To address this concern, we compute t-stats from randomization, which are the percentiles for an upper tail test computed from a bootstrap procedure. The one-to-one correspondence between market integration measures and BHARs is randomly shuffled within each annual IPO cohort by using a randomization procedure (sampling without replacement). This generates sample pseudo market integration and returns. High, medium, and low market integrations are formed from this pseudo sample and the corresponding t-statistic under the independence assumptions are computed. We repeat this procedure 4,000 times and generate the empirical t-distribution. The 90th, 95th, and 99th percentiles from this distribution for an upper tail test are used in our statistical inferences that involve the use of BHARs. The advantage of this procedure is that it limits clustering of the original sample.

Choosing matching firms

To compute risk-adjusted long-term abnormal returns for IPOs, besides using domestic market returns as a benchmark, we use

5 Previous studies, such as Loughran and Ritter (1995), Brav and Gompers (1997), Krigman et al. (1999), Michaely and Womack (1999), and Purnanandam and Swaminathan (2004) also use BHARs to compute long-run returns. However, see Gompers and Lerner (2003) for a comparison of differences in long-term IPO performance, when the latter is measured with BHARs versus CARs.

6 We also adjust for survivorship bias as follows. Assume that we want to calculate two-year buy-and-hold returns and r_{11} is the return of IPO firm 1 for the first year. Also, assume that IPO firm 1 is delisted one year after the issue. We invest its first-year return into a Treasury bill. Hence, the two-year return of IPO firm 1 is $(1+r_{11})(1+r_t)$ where r_t is the return on Treasury bills and our results are unchanged. Krigman et al. (1999), and Purnanandam and Swaminathan (2004) also use the delisting date as the cutoff time when they compute BHAR as we do in this study.

the long-run returns of matching firms by subtracting them from long-run returns of the IPOs. For each Yankee IPO firm in the sample we select a matching firm that is from the same country, listed in the local market, has gone public within a month of the IPO, is in the same industry as the IPO firm, and is closest in terms of sales in the most recent fiscal year. Firms in the same industry are more likely to have similar operating risks, profitability, and growth prospects. In general, matching firms by industry should control for growth since firms in the same industry should have similar growth opportunities. Sales is a proxy for size. We do not match firms based on the other accounting variables because of limited data availability for international firms. Sometimes the matching firms are repeated in subsequent years. Dropping these cases does not appreciably affect our finding.

Our matching method is similar to that of Kim and Ritter (1999) and is a balance between matching only on industry and sales and trying to match on too many financial variables. To choose an appropriate matching firm, we first consider all international IPOs in the SDCs that are from the same country as the Yankee IPOs and are active for the fiscal year before the IPO year. From these firms, we select firms that went public within one month of the IPO date. Then, we delete REITs, closed-end funds, and firms with share prices less than five dollars.

To obtain a matching firm, we first classify all remaining firms into industries based on their SIC codes obtained from SDC as of the end of the prior calendar year. SIC codes are obtained from the SDC for both IPOs and matching firms⁷. We group these firms into 48 industries using the updated industry specifications from Kenneth French's web site, which are groupings of various 4-digit SIC codes, and then assign the IPO firm to its industry group⁸. Potential matching firms in the same industry group as the IPO firm are expunged unless their revenue is close to the IPO firm. If there is more than one firm in this group, we select a match that has accounting ratios available from Worldscope or SDC that are closest to that of the IPO firm⁹. If we have no firms left, we widen the bands at each step. In contrast to many other studies, we do not exclude IPOs that have negative earnings, book values, or EBITDA during the last reporting year prior the issue. They actually represent a large part of the sample. Most such companies are high-growth, high value, and technology firms that dominated the 1997-1999 IPO market. We collect stock prices of matching firms from DataStream and sales from the SDC and Worldscope.

Market integration and IPO returns

Table A2 in the Appendix shows the median and mean of long-run buy-and-hold abnormal returns (BHAR) based on two benchmarks for each market integration level. The two benchmarks include the respective home market index return (DataStream total market index) and the equally weighted control portfolio of firms matched by country, age, industry, and sales. These returns are computed for four windows: the first twenty days after the issue or up to the stabilization period expiration, from the twenty-first day after the issue or the date right after the expiration of the stabilization period until the IPO lockup expiration

date¹⁰, from the date right after the lockup expiration date until two years after the issue, and during the third year after the issue. Most IPOs have a 180-day lockup period, however, there are some with 90, 270, and 360-day lockups. Assuming that all IPOs use 180 days may add noise to the results. Hence, we use the actual lockup date and stabilization window for each firm in our return estimation.

The justification for commencing the buy-and-hold return calculations 20 days after the IPO relies on the evidence provided in the IPO stabilization literature. Numerous studies document underwriter price stabilization within the first 20 trading days after the offering [Hanley et al. (1993), Schultz and Zaman (1994), Asquith et al. (1998), Aggarwal (2000)]. Consequently, calculating from 20 days onward avoids potential biases in our return estimation caused by the post-offering price stabilization activities of the underwriting syndicate.

Our hypothesis 1 is that BHARs for Yankee IPOs are higher than those of matching firms and our hypothesis 2 is that an increase in BHARs of Yankee IPOs from low integrated markets is higher than those from high integrated markets. To construct the test, we assume that the observations are independent; this allows the computation of t-statistics for both the mean and median BHARs. If a matching firm is delisted before the IPO delisting date or the end date it is replaced with another firm having similar characteristics. If this firm is also delisted, a third firm is substituted, and so on.

The results support hypothesis 1 during stabilization period for low and medium market integration groups and before the lockup expiration for mean value measured against domestic markets. Interestingly, Yankee IPOs from low integrated markets outperform both benchmarks in both mean and median except for the median value measured against domestic markets. In contrast, Yankee IPOs from high integrated markets have lower returns than both benchmarks. During the period before lockup expiration we hesitate to draw any conclusions because insiders cannot sell and buy their IPO shares. After a lockup period, the median value for all integration groups measured against their matching firms supports hypothesis 1, although, only the results between the expiration of the post-lockup period and two years are significant. Overall, most Yankee IPOs in our sample have higher returns than their peers but the results do not hold for the mean. The results conform to the findings of the extant literature that foreign firms conducting IPOs in the U.S. have better quality than those peers that go public in their local markets.

How different are the risk-adjusted returns of Yankee IPOs from high integrated markets from those from segmented markets? Interestingly, the results strongly support hypothesis 2. The outperformance of Yankee IPOs from low integrated markets is greater than that of Yankee IPOs from high integrated markets. Although the returns of Yankee IPOs from high integrated markets are higher than those from low integrated markets, the latter outperforms both benchmarks by a greater degree. The pattern of outperformance of Yankee IPOs from low integrated markets persists only until 2 years after the IPO. During the third year post-IPO, the pattern reverts. That is, Yankee IPOs from

7 The source of SIC codes is crucial since the SIC codes reported by SDC, CRSP, and Compustat for the same firm have surprisingly little correlation. We do not use SIC codes from CRSP because CRSP reports SIC codes as of today, not historical SIC codes from the time a firm went public.

8

http://mba.tuck.dartmouth.edu/pages/faculty/ken_french/Data_Library/changes_ind.html

9 We also choose matching firms based on two other criteria. The first is market capitalization, which is used as a proxy for size. We choose firms whose market capitalization as of the prior June or December is closest to the market capitalization of the Yankee IPO firm at the close of the offering date. The second is based on market capitalizations and book-to-market ratios where book value of equity is for the fiscal years following the IPO date. Our results are not sensitive to the choice of matching criteria.

10 Stock price performance and insider selling around lock-up expiration are shown in Aggarwal et al. (2002) and Brav and Gompers (2003). The lockup period is the period of time that certain stockholders have agreed to waive their right to sell their shares of a public company. Investment banks that underwrite initial public offerings generally insist upon lockups of at least 180 days from large shareholders (1% ownership or more) in order to allow an orderly market to develop in the shares. Shareholders that are subject to lockups usually include the management and directors of the company, strategic partners, and large investors. These shareholders have typically invested prior to the IPO at a significantly lower price than that offered to the public and therefore stand to make substantial profits on sales of their pre-IPO shares. If a shareholder attempts to sell shares that are subject to lockup during the lockup period, the transfer agent will not permit the sales to be completed.

high integrated markets outperform the benchmarks by a greater extent in the third year. In addition, hypothesis 2 is supported more strongly during the period before lockup expiration than the period between the expiration of the lockups and two years after the IPO. Both t-statistics for testing differences in median and mean and t-statistics from randomization show significance at the 1% or 5% level before the lockup expiration. The significance level of BHARs reduces to 5% or 10% from the expiration of the lockups to two years after the IPO.

Cross-sectional regression tests

We further confirm hypothesis 2 by following a standard procedure in the IPO literature using firm performance as the dependent variable and market integration as the independent variable. The following cross-sectional regression model formally measures the relationship between market integration and long-run risk-adjusted returns:

$$\begin{aligned} \text{Long-run risk-adjusted return}_n = & \beta_1 + \beta_2(\text{market integration})_n + \beta_3(\text{legal origin})_n + \beta_4(\text{burden of proof})_n + \beta_5(\text{class})_n + \beta_6(\text{initial} \\ & \text{return})_n + \beta_7(\text{venture capital dummy})_n + \beta_8(\text{book-to-market})_n + \beta_9 \ln(1 + \text{analyst consensus growth})_n + \beta_{10}(\text{accruals/total assets})_n \\ & + \beta_{11} \ln(\text{proceeds})_n + \beta_{12}(\text{underwriting ranking}) + \beta_{13}(\text{sales/gross} \\ & \text{costs})_n + \beta_{14} \ln(\text{high-tech industry dummy})_n + \beta_{15}(\text{firm age}) + \beta_{16}(\text{ADR dummy}) + \beta_{17}(\text{NASDAQ dummy}) + \beta_{18}(\text{year fixed effect})_n \\ & + \beta_{19}(\text{industry fixed effect}) + \mu_n \end{aligned} \quad (6)$$

where n is an index denoting each IPO firm in our sample. Long-run risk-adjusted returns are estimated by subtracting the long-run returns of IPOs listed in the local market and matched by country, age, industry, and sales (and, if available, some accounting variables that are available from the SDC and Worldscope) as explained above, from the long-run returns of Yankee IPOs. Standard errors are adjusted for time clustering by assuming that observations are independent for companies at different points in time, but not necessarily for companies that go public in the same month. They are more conservative than White (1980) standard errors. Returns are reported for four windows: the first twenty days after the issue or up to the stabilization period expiration, from the twenty-first day after the issue or the date right after the expiration of the stabilization period until the IPO lockup expiration date, from the date right after the lockup expiration date until two years after the issue, and during the third year after the issue. Market integration index is developed by Pukthuanthong and Roll (2009) shown in Table A1 and described above.

We apply control variables at country and firm levels. Following the extant international IPO literature, our first proxy relates litigation risk to the legal origin of each country. We adopt the legal regime classification by La Porta et al. (1998). La Porta et al. group countries into four legal origins, i.e., English common law, French commercial code, German commercial code, and Scandinavian civil law. We use these variables to examine the relationship between long-run risk adjusted returns and market integration by legal origin or legal system. La Porta et al. argue that investors are better protected in common law countries than in civil law countries. Countries that follow the English common law system generally have the strongest, while French civil law countries provide the weakest investor protection. German and Scandinavian civil law countries tend to fall in the middle. We argue that the better investor protection in English common law countries results in higher litigation risk against the issuers in those countries. Thus, we expect to observe higher long-run risk-adjusted returns in English common law countries and lower risk-adjusted returns in French, German and Scandinavian civil law countries.

La Porta et al. (2006) calculate a burden of proof proxy as the arithmetic mean of the burden director index, the burden distributor index, and the burden accountant index, with higher

ratings for less procedural difficulty in recovering losses. Specifically, the burden director/distributor index assesses “the procedural difficulty in recovering losses from the issuer’s directors/distributor in a civil liability case for losses due to misleading statements in the prospectus” [La Porta et al. (2006)]; and the burden accountant index assesses “the procedural difficulty in recovering losses from the accountant in a civil liability case for losses due to misleading statements in the audited financial information accompanying the prospectus” [La Porta et al. (2006)]¹¹. As a securities law variable, the burden of proof proxy provides a meaningful measurement of legal liability across countries. We expect to find a positive relationship between risk-adjusted returns and the burden of proof. We further use La Porta et al.’s (2006) class action dummy variable in our study. The variable identifies the availability of class action lawsuits in a prospectus liability case in a given country¹². Under the lawsuit avoidance hypothesis, we expect the availability of class action lawsuits to be positively related to IPO risk-adjusted returns. Relative to litigation brought by individual investors, class actions generally represent all investors who lost money as a result of the firm’s alleged security law violations. By representing all investors at the same time (some of whom may not otherwise have filed a lawsuit) class actions tend to result in substantially larger damage claims against the issuer and/or the underwriter and auditor. In addition, as argued by Alexander (1993), class actions may result in a considerable loss of reputation capital and may make it harder (and costlier) for an issuer to raise capital through secondary equity offerings, thus increasing the firm’s cost of capital¹³. We expect to have a positive relationship between class and long-run risk adjusted returns of IPOs.

Our firm-level controls include the initial return [Krigman et al. (1999)] and a venture-capital backed dummy [Brav and Gompers (1997)]. Book-to-market ratios are related to the cross-section of stock returns even though there is no evidence that they are related to the cross-section of IPO returns. However, it is important to control for book-to-market effects in the rest of long-run returns. We include analyst growth forecasts because Rajan and Servaes (1997) find that IPOs with high analyst growth expectations subsequently underperform IPOs with low growth expectations. We further include an accruals variable (accruals relative to total assets) from the first annual statement after the IPO date as a control since Teoh et al. (1998) find that IPOs with high accruals underperform. We include prior fiscal year IPO proceeds as a proxy of ex-ante size and prior fiscal year sales divided by gross costs as a control for profitability. While Carter et al. (1998) find that long-term IPO performance is affected by underwriter reputation, Logue et al. (2002) find no evidence of a relation between underwriter reputation and investor returns over different holding periods. Moreover, Doukas, and Gonenc (2001) show that underwriter reputation is not linked to post-issue IPO performance when they control for venture capital backing. Since the relation between initial returns and underwriter ranking is still inconclusive, we include underwriter ranking and venture capital backing as control variables. We control for industry effects by assigning firms with high-tech SIC codes a dummy variable of 1 and zero otherwise¹⁴.

11 See Table 12 in La Porta et al. (2006). A distributor is an underwriter. Burden of proof is the same as liability standard in La Porta et al. (2006). A burden distributor index is a liability standard for distributors in their paper.

12 We thank Andrei Shleifer for making the burden of proof and class action lawsuit data available on his website.

13 On a related note, Van der Goot (2003) argues that the availability of class action in the Dutch legal system is one of the reasons that higher quality underwriters are less likely to take riskier companies public in the Netherlands.

14 We follow Loughran and Ritter (2004) and Cliff and Denis (2004) who categorize firms with the following SIC codes as tech firms: 2833, 2834, 2835, 2836, 3571, 3572, 3575, 3577, 3578, 3661, 3663, 3669, 3674, 3812, 3823, 3825, 3826, 3827, 3829, 3841, 3845, 4812, 4813, 4899, 7370, 7371, 7372, 7373, 7374, 7375, 7377, 7378, 7379.

Table 2 - Cross-sectional long-run risk-adjusted return regressions

Independent variables	From the 3rd day after the issue until the end of the stabilization period (20 days)	After the end of the stabilization period (20 days) until lockup expiration	After lockup expiration until two years after the issue	From the day after the first two years to the third year after the issue
Market integration	-0.24 -3.19 ^a	-0.28 -4.00 ^a	-0.15 -2.48 ^b	-0.10 -1.43
Legal origin	0.16 2.01 ^b	0.29 3.13 ^a	0.25 1.58	0.17 1.40
Burden of proof	0.42 2.18 ^b	0.84 1.82 ^c	0.60 1.79 ^c	0.44 1.83 ^c
Class	0.23 3.41 ^a	0.15 2.80 ^a	0.14 2.11 ^b	0.07 1.08
Initial return	-0.32 -1.42	-0.26 -1.15	-0.34 -1.72	-0.41 -1.34
Venture capital dummy	1.50 1.96 ^c	1.83 2.20 ^b	1.75 2.62 ^b	1.55 2.18 ^b
ln(Book-to-market)	-0.24 -1.95 ^c	-0.18 -1.54	-0.17 -1.22	-0.17 -1.27
ln(1+analyst consensus growth)	-0.18 -1.52	-0.27 -1.09	-0.25 -1.90 ^c	-0.29 -2.50 ^a
Accruals/total assets	-0.50 -1.32	-0.33 -1.64	-0.49 -1.42	-0.55 -1.30
ln(Proceeds)	-0.40 -2.37 ^b	-0.98 -1.98 ^c	-0.67 -1.62	-0.89 -1.08
Underwriter ranking	0.10 2.48 ^b	0.15 2.52 ^b	0.11 1.86 ^c	0.15 1.51
Sales/gross costs	0.18 0.36	0.35 0.47	0.18 0.33	0.23 0.34
High-tech industry dummy	0.18 1.98 [*]	0.15 1.75 [*]	0.31 1.45	0.32 1.54
Firm age	0.23 1.19	0.33 1.52	0.42 1.47	0.35 1.13
ADR dummy	-0.14 -1.22	-0.25 -1.61	-0.17 -1.35	-0.21 -1.70
NASDAQ dummy	-0.35 -1.48	-0.42 -1.51	-0.37 -2.28 ^b	-0.40 -2.22 ^b
Year fixed effect	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included
Adjusted R-squared	34.35%	34.90%	26.12%	23.28%
Number of observations	238	236	229	229

a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively, assuming normality and independence. T-statistics is reported under each coefficient.

Firm age is measured as the natural log of one plus the difference between the date of a firm's IPO and its founding date [Carter et al. (1998)]. The ADRs are the U.S. dollar denominated receipts issued by U.S. depository banks. The receipts are claims to a specific number of the home market shares held in trust by the depository. Common shares are more fungible with the home market security than the ADRs. Although in a different context from cross-listing firms, Karolyi (2002) analyzes Daimler Chrysler Global Registered Shares (GRS) and suggests that the stock performance of cross-listed firms is not explained by how it is cross-listed. Therefore, we add a dummy variable equal to one if a firm issues shares in ADRs and zero for otherwise. About 61% of Yankee IPOs in our sample are listed on the NASDAQ, 28.5% on the NYSE, and the rest are listed on the AMEX, the OTC, and the small cap markets. The IPO literature shows that firms listed on the NASDAQ experience higher IPO underpricing; as a result, we add a dummy equal to one if firms are listed in the NASDAQ and zero for otherwise. Lastly, we control for industry and year fixed effects.

The results in Table 2 show that market integration is significantly negatively related to the risk-adjusted returns only for the first two years after the issue. The results strongly support hypothesis 2 in that Yankee IPOs from low integrated markets outperform their peers from the same country that choose not to go public in the U.S. (or cannot) by a greater degree than those from high

integrated markets. The results are strongly significant at the 1% level before the lock-up expiration and at the 5% level after the lockup until two years after the IPO. Yankee IPOs from countries adopting English common law have higher long-run risk-adjusted returns during the lockup period than those from French, German, and Scandinavian civil law countries. Moreover, IPOs from countries with higher level of burden of proof have higher long-run risk-adjusted returns up until 3 years after going public; although, the significance level is only 10% after the stabilization period. Furthermore, Yankee IPOs from countries adopting class action significantly outperform their benchmarks during two years after the IPO.

In contrast to the negative relationship between long-run risk-adjusted returns and initial returns found by Krigman et al. (1999), we do not find any evidence of such a relationship for either the period before or after the lockup expiration date. Venture capital backing is significantly positively related to returns. Analyst growth forecasts and accruals are both negatively related to long-run returns, but only analyst growth forecasts are statistically significant and that is for the period after lockup period. Small IPOs that are in the high-tech industry have better performance prior to the lockup period. Yankee IPOs that are associated with high ranked underwriters have higher returns than their benchmarks. Firms that have higher book-to-market have lower risk-adjusted returns during stabilization period. There is no profitability, firm age, and ADR effect in our sample. Consistent with the extant literature, firms listed on the NYSE outperform those listed on NASDAQ in the long term. In our study, it is after lock-up period.

These results clearly show that the relationship between market integration and long-run abnormal returns is not driven by the institutional factors such as legal origins, burden of proof, and class action and not by firm characteristics such as analyst consensus growth rates, accruals, offering size, venture capital backing, underwriter reputation, profitability, high-tech, firm age, forms of securities, listing exchange, industry, and time. Yankee IPOs from countries with low degree of market integration outperform their peers by a greater degree than those from high integrated markets during the first two years after the issue. Next, we study the relationship between market integration and long-run returns using a portfolio test.

Long-term performance based on the Fama-French three-factor model

The BHAR metric of long-term performance used in the previous section is based on market-adjusted abnormal returns but does not fully control for systematic risks other than the market index. To address this issue, we use the three-factor Fama and French regression model and compute monthly risk-adjusted abnormal returns (as measured by the intercept term in the Fama-French regression equation) for portfolios of Yankee IPOs, the matching firms, and Yankee IPOs versus matching firms. We allot each firm to one of the three portfolios, which are assumed to be held from the first twenty days after the IPO date until two years after the issue or from the day after the first two years until three years after the issue. After all IPOs are allocated in this fashion, we calculate value- and equally-weighted average returns across all stocks for each calendar month. We repeat the process for Yankee IPOs from low integrated countries. Fama (1998) demonstrates that much of the apparent overreaction and under reaction to information disappears when portfolios are value-weighted and after controlling for common factors such as size and book-to-market effects. Nevertheless, as noted by Loughran and Ritter (2000), when applied to event studies, value-weighted portfolios are likely to be dominated by a few large firms. An equally weighted portfolio is also likely to be more consistent with the way an investor would implement a trading strategy based on the results presented in this study. We compute both equally-

weighted and value-weighted abnormal portfolio returns for Yankee IPOs. We weight each calendar month equally and each month by the number of IPOs in the monthly rolling portfolios.

Abnormal returns are reported for time-series regressions of monthly Yankee IPO returns, the matching firms, and Yankee IPOs-matching firm portfolios based on the security market factors used by Fama and French (1993). There are a number of reasons why this method is preferable to using the long-run buy-and-hold returns (BHAR) method. First, it diminishes the autocorrelation problems that are present when using overlapping long-run buy-and-hold returns, and controls for the cross-correlation among returns across events. Second, the three-factor regression model has the same qualities as the average abnormal returns (AAR) approach, thus it has fewer misspecification problems than the long-run buy-and-hold abnormal returns (BHAR) method. Third, according to Lyon et al. (1997), by using calendar time portfolios to estimate long-run abnormal performance the Fama-French three-factor model controls for the non-independence of returns over time, size, and book-to-market (B/M) effects, and avoids the problem of drawing inferences on skewed, long-horizon returns. Lastly, it can control for B/M effects better than the comparable firm approach. Book value during the IPO period varies, so its effect may be difficult to capture. Nevertheless, Barber and Lyon (1997), and Loughran and Ritter (2000 and 2004) argue that this approach has a lower power to reject the null hypothesis of no abnormal returns when they are in fact present, especially when the samples consist of small stocks, as is typical for IPOs. We estimate the following Fama-French three-factor model:

$$R_{pt} - R_{ft} = C_p + B_p(R_{mt} - R_{ft}) + S_p(\text{SMB}_t) + H_p(\text{HML}_t) + \varepsilon_t \quad (7)$$

where R_{pt} is the monthly return on a portfolio of IPOs; R_{ft} is the monthly return on the one-month T-bill; $R_{mt} - R_{ft}$ is the excess return on the NYSE/AMEX/NASDAQ value (equally)-weighted index; SMB is the difference in the returns of a value (equally)-weighted portfolio of small stocks and big stocks; HML is the difference in the returns of a value (equally)-weighted portfolio of high book-to-market stocks and low book-to-market stocks; and C_p is the monthly risk-adjusted abnormal return in percent. The results of Yankee IPOs from the value (equally)-weighted portfolio are presented in Panel A (B) of Table A3 in the Appendix. The estimate of C_p provides a test of the null hypothesis that the mean monthly abnormal return on the calendar portfolio is zero. B_p , S_p , and H_p are factor-loadings returns, which are obtained from Kenneth French's website¹⁵. Since the U.S. market is highly integrated with the world and the data of three factors are unavailable for international countries, we apply factor loading returns of the U.S. markets when we perform regressions for matching firms.

The left side of the table presents results for the period from the twenty-first day after the issue to the first two years after the issue. The right side of the table provides results for the third year after the issue. The key observation is the risk-adjusted abnormal returns differential between IPOs and matching firms portfolios. During the first two years after the issue, Yankee IPOs from high integrated markets earn a negative 2.300% return (0.192% times 12) for the value-weighted portfolio and a negative 4.077% (0.340% times 12) for the equally-weighted portfolio on an annualized basis, whereas the matching firms from domestic markets earn a significant negative 7.410% per annum (0.618% times 12) for the value-weighted portfolio and a negative 8.137% (0.678% times 12) for the equally-weighted portfolio. Thus, firms that are from high integrated markets outperform their matching firms by about 5.109% (0.426% times 12) for the value-weighted

portfolio and 4.057% (0.338% times 12) for the equally-weighted portfolio on an annualized basis.

On the other hand, Yankee IPOs from low integrated markets earn a negative 2.527% (0.211% times 12) for the value-weighted portfolio and a negative 4.273% (0.356% times 12) for the equally-weighted portfolio, whereas the matching IPOs earn negative 9.598% per annum (0.800 times 12) for the value-weighted portfolio and a negative 8.766% per annum (0.731% times 12) for the equally-weighted portfolio. Firms from low integrated markets outperform their matching firms by 7.069% (0.589% times 12) for the value-weighted portfolio and 4.494% per annum (0.375% times 12) for the equally-weighted portfolio.

During the third year after the issue, the unadjusted return of Yankee IPOs from high integrated market is negative 2.005% (0.167% times 12) in the value-weighted portfolio and negative 1.932% (0.161% times 12) in the equally-weighted portfolio; while, firms from low integrated market earn negative 2.258% (0.188% times 12) for the value-weighted portfolio and negative 2.335% (0.195% times 12) for the equally-weighted portfolio. The matching firms for Yankee IPOs from countries with high and low market integrations again earn negative unadjusted returns. Yankee IPOs from high integrated markets outperform the comparable firms over this period about 0.707% for the value-weighted portfolio and about 0.900% for the equally-weighted portfolio, whereas those from low integrated markets outperform their benchmarks by 0.262% for the value-weighted portfolio and only by 0.112% for the equally-weighted portfolio. Although the risk-adjusted abnormal returns of Yankee IPOs from high integrated markets are higher during the third year, the result is not significant for both value- and equally-weighted portfolios. Both groups of Yankee IPOs and the comparable firms load positively on the SMB factor. This might be explained by the fact that most IPOs tend to be smaller and younger firms. In contrast, there is a difference in the coefficients on the HML factor between Yankee IPOs and comparable firms. Yankee IPOs load negatively on HML while the matching firms load positively.

Operating performance

We track operating performance for one fiscal year before and four fiscal years after the Yankee IPO. In year 4, we include only IPOs issued during 1990 to 2004. For four different measures of operating performance, Table 3 reports post-IPO yearly medians for Yankee IPOs from low, medium, and high integrated market groups. Due to the skewness of accounting ratios, it is normal to report median values in studies examining operating performance¹⁶. While we report medians, we also find that the same patterns hold in means (unreported) winsorized by eliminating the top and bottom one percent of the observations. The four measures of operating performance are as follows: the first is sales growth, a simple indicator of success. Sales growth may not matter much if profits are poor, so we consider two measures of profitability: sales per gross costs and cash flow return on assets. A more commonly-used profit indicator, EBITDA, is of little use in our study because it is negative for most IPOs; this is not a problem with sales and gross costs, both of which are always positive. Cash flow return on assets is cash flow from operations (CFO) divided by total assets. CFO is directly obtained from the statement of cash flows (Compustat item number 308 minus 124). Lastly, we report Tobin's q (TQ), the ratio of the market value of assets to their replacement costs. Following Himmelberg et al. (1999), firm value is calculated as the market value of common equity plus the liquidation value of preferred equity plus the book value of total liabilities while replacement cost is the book value of total assets. Consequently,

15 http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

16 DeAngelo (1988), Kaplan (1989), Healy and Palepu (1990), DeGeorge and Zeckhauser (1993), Jain and Kini (1994), McLaughlin et al. (1996), Mikkelsen et al. (1997), and Loughran and Ritter (1997), among others, all report median values.

Table 3 - Operating performance of 291 Yankee IPOs that went public between 1990 and 2005 classified by the degree of market integration

Portfolios	Year 0	Year 1	Year 2	Year 3	Year 4
	Sales growth				
Low market integration	26.10%	21.11%	17.31%	12.35%	12.40%
Difference		-4.99%	-3.80%	-4.96%	0.05%
Z-Test		-3.16 ^a	-2.77 ^a	-2.38 ^b	1.12
Medium market integration	38.53%	20.71%	11.83%	5.54%	8.55%
Difference		-17.82%	-8.87%	-6.30%	3.01%
Z-Test		-5.45 ^a	-4.88 ^a	-2.76 ^a	2.05 ^b
High market integration	43.75%	28.61%	21.42%	12.38%	8.22%
Difference		-15.14%	-7.19%	-9.04%	-4.16%
Z-Test		-4.23 ^a	-3.06 ^a	-3.57 ^a	-2.76 ^a
Sales/gross costs					
Low market integration	1.85	1.28	1.00	1.15	1.09
Difference		-0.56	-0.28	0.15	-0.07
Z-Test		-2.45 ^b	-2.13 ^b	2.65 ^b	-1.57
Medium market integration	2.24	1.55	0.63	1.23	1.22
Difference		-0.69	-0.93	0.61	-0.01
Z-Test		-2.79 ^a	-3.28 ^a	3.17 ^a	-1.38
High market integration	3.14	2.28	1.75	1.74	1.27
Difference		-0.85	-0.53	-0.01	-0.48
Z-Test		-3.01 ^a	-2.40 ^b	-1.42	-2.33 ^b
Cash flow return on assets					
Low market integration	6.20%	10.15%	8.56%	8.02%	6.62%
Difference		3.96%	-1.59%	-0.54%	-1.40%
Z-Test		3.57 ^a	-2.36 ^b	-1.98 ^b	-1.82 ^c
Medium market integration	8.95%	8.25%	5.88%	4.83%	5.42%
Difference		-0.70%	-2.37%	-1.06%	0.59%
Z-Test		-1.64	-2.75 ^a	-2.41 ^b	1.75 ^c
High market integration	8.64%	11.10%	7.58%	5.18%	6.83%
Difference		2.46%	-3.51%	-2.40%	1.65%
Z-Test		2.75 ^a	-3.42 ^a	-3.09 ^a	2.96 ^a
Tobin's q					
Low market integration	1.60	1.43	1.44	1.76	0.99
Difference		-0.17	0.01	0.32	-0.77
Z-Test		-2.88 ^a	1.86 ^c	2.04 ^b	-2.06 ^b
Medium market integration	2.64	1.97	1.02	1.00	0.99
Difference		-0.68	-0.95	-0.02	-0.01
Z-Test		-4.12 ^a	-3.49 ^a	-1.47	-1.31
High market integration	2.19	1.91	1.69	1.79	1.59
Difference		-0.29	-0.21	0.10	-0.21
Z-Test		-3.46 ^a	-2.71 ^b	1.62	-1.94 ^c

a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively, assuming normality and independence

our measure of TQ is really the market/book ratio for total assets¹⁷. Tobin's q is presumably higher for firms with high growth opportunities.

For each year, we compute the annual performance measure for each firm and report the median value across firms. Many IPOs are short-lived, so survivorship bias is a potential problem. To mitigate this problem, any IPO firm that did not survive to the end of a calendar year was traced through its last surviving quarter and its performance measures were then grossed up to a full year. For example, if a firm vanished after the first quarter, four times its performance during the first quarter was used as its annual performance number.

Due to the data limitation of non-U.S. matching firms, we report each Yankee IPO's unadjusted operating performance. As expected, sales growth of IPOs is highest in the year of the IPO (year 0) and decreases over time. Although post-IPO sales growth of Yankee IPOs from low integrated markets is lowest compared to the medium and high groups, a decrease in sales growth of the low group from year 0 to year 1, year 1 to year 2, and year 2 to year 3 is lowest. The same pattern persists for sales

divided by gross costs. A decrease in profitability of Yankee IPOs from low integrated market is not as bad as those from the medium and high groups from the IPO year to the 1st year and from the 1st year to the 2nd year. The medium group has the highest increase in profitability from the 2nd to the 3rd and the lowest decrease from the 3rd to the 4th year. The third measure of profitability is cash flow returns on assets. Yankee IPOs from low integrated markets experience the highest improvement from the issuance year to the 1st year and the lowest decrease in this profitability measure from the 1st to the 2nd year and from the 2nd to the 3rd year. On the other hand, those from high integrated markets experience significant improvements in profitability from the 3rd to the 4th year. Perhaps, IPOs from high integrated markets have stronger fundamentals to sustain them for long-term growth. Finally, we compute Tobin-q to capture potential growth opportunities. The same pattern remains. Yankee IPOs from low integrated markets suffer the least from a decrease in Tobin-q from year 0 to year 1. Moreover, their growth opportunities improve from the 1st to the 2nd year and from the 2nd year to the 3rd year. Nonetheless, the medium group has the least decrease in Tobin-q from the 3rd to the 4th year. Our result is consistent with Doidge et al. (2004), who document that foreign firms that cross-list in the U.S. have higher valuation in terms of Tobin's q ratio. Taken together, Yankee IPOs have more improvement or less decrease in operating performance during the first 3 years after going public; although, they have lower operating performance than the other two groups. The results support hypothesis 3. In the long-term, those from the medium and high integrated markets have better improvement in operating performance.

Conclusion

In recent decades, financial markets have become global. Corroborating evidence include lower barriers to capital flows, the emergence of American Depository Receipts (ADRs), and Global Depository Receipts (GDRs), country funds (CFs), exchange traded funds (ETFs), and more widespread dissemination of information allowing foreign firms to raise funding outside of their local financial markets. In this study, we apply the new measure of market integration developed by Pukthuanthong and Roll (2009) and examine how the performance of cross-listing IPOs from countries with various degrees of market integration differs. A large body of literature has studied cross-listing firms; nevertheless, only a few studies have investigated firms choosing to go public in a foreign market ignoring their own domestic markets. Our study attempts to fill in this gap. We provide evidence for post-IPO performance of firms that go public for the first time in the U.S. (original IPO). These firms are known as Yankee IPOs. We find that Yankee IPOs outperform their peers, which are firms that have comparable age and size and are in the same industry and country as the Yankee IPOs, but choose to go public in their local market. We find that Yankee IPOs from low integrated markets outperform their matching firms by a greater degree than those from high integrated markets. The outperformance in stocks persists for two years after the IPO. Lastly, we find that Yankee IPOs from low integrated markets experience a greater degree of improvement in operating performance from a year before going public to three years after. Our operating performance includes sales growth, sales per gross costs, operating cash flow per total assets, and Tobin's q. Taken together, our study shows the benefit of market integration. Specifically, we document that such benefits are enjoyed predominantly by firms from low integrated markets expanding their business into high integrated markets. Future research should expand the sample to include the other host countries in addition to the U.S.

17 Since we do not have the market value of debt, our measure of Tobin's q is more precisely the market value of equity plus the book value of debt divided by the book value of assets.

References

- Aggarwal, R., 2000, "Stabilization activities by underwriters after IPOs," *Journal of Finance*, 55, 1075-1103
- Aggarwal, R., L. Krigman, and K. Womack, 2002, "Strategic IPO underpricing, information momentum, and lockup expiration selling," *Journal of Financial Economics*, 66, 105-137
- Alexander, G. J., C. S. Eun, and S. Janakiramanan, 1987, "Asset pricing and dual listing on foreign capital markets: A note," *Journal of Finance*, 42, 151-158
- Alexander, G. J., C. S. Eun, and S. Janakiramanan, 1988, "International listings and stock returns: Some empirical evidence," *Journal of Financial and Quantitative Analysis*, 23, 135-151
- Alexander, J., 1993, "The lawsuit avoidance theory of why initial public offerings are underpriced," *UCLA Law Review* 41, 17-73
- Asquith, D., J. Jones, and R. Kieschnick, 1998, "Evidence on price stabilization and underpricing in early IPO returns," *Journal of Finance*, 53, 1759-1773
- Barber, B., and J. Lyon, 1997, "Detecting long-run abnormal stock returns: The empirical power and specification of test-statistics," *Journal of Financial Economics*, 43, 341-372
- Bekaert, G., and C. R. Harvey, 2000, "Foreign speculators and emerging equity markets," *Journal of Finance* 55, 565-614
- Bekaert, G., and C. R. Harvey, 2003, "Emerging market finance," *Journal of Empirical Finance*, 10, 3-55
- Bekaert, G., C. R. Harvey, and C. Lundblad, 2006, "Growth volatility and equity market liberalization?" *Journal of International Money and Finance*, 25, 370-403
- Blass, A., and Y. Yafeh, 2001, "Vagabond shoes longing to stray: Why foreign firms list in the U.S.," *Journal of Banking and Finance*, 25, 555-572
- Brav, A., and P. Gompers, 1997, "Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies," *Journal of Finance*, 52, 1791-1821
- Brav, A., and P. Gompers, 2003, "The role of lockups in initial public offerings," *Review of Financial Studies*, 16, 1-29
- Bruner, R., S. Chaplinsky, and L. Ramchand, 2004, "U.S.-bound IPOs: Issue costs and selective entry," *Financial Management*, 33, 39-60
- Carter, R., F. Dark, and A. Singh, 1998, "Underwriter reputation, initial returns, and the long-run performance of IPO stocks," *Journal of Finance*, 53, 285-311
- Carter, R., and S. Manaster, 1990, "Initial public offerings and underwriter reputation," *Journal of Finance*, 45, 1045-1067
- Chari, A., and P. B. Henry, 2001, "Stock market liberalizations and the repricing of systematic risk," manuscript, Stanford University
- Cheung, C.S., and J. Lee, 1995, "Disclosure environment and listing on foreign stock exchanges," *Journal of Banking and Finance*, 19, 347-362
- Cliff, M., and D. Denis, 2004, "Do IPO firms purchase analyst coverage with underpricing?" *Journal of Finance*, 59, 2871-2901
- DeAngelo, L., 1988, "Managerial compensation, information costs, and corporate governance: The use of accounting performance measures in proxy contests," *Journal of Accounting and Economics*, 10, 9-96
- DeGeorge, F., and R. Zeckhauser, 1993, "The reverse LBO decision and firm performance: Theory and evidence," *Journal of Finance*, 48, 1323-1348
- Doidge, C., G.A. Karolyi, and R.M. Stulz, 2004, "Why are foreign firms listed in the U.S. worth more?" *Journal of Financial Economics*, 71, 205-238
- Domowitz, I., J. Glen, and A. Madhavan, 1998, "International cross-listing and order flow migration: Evidence from an emerging market," *Journal of Finance*, 53, 2001-2027
- Doukas, J., and H. Gonenc, 2001, "Long-term performance of new equity issuers, venture capital, and reputation of investment bankers," *Economic Notes*, 34, 1-34
- Edison, H. J., and F. E. Warnock, 2003, "U.S. investors' emerging market equity portfolios: A security-level analysis," *International Finance Discussion Paper No. 771* (Washington: Board of Governors of the Federal Reserve System)
- Errunza, V., 2001, "Foreign portfolio equity investments, financial liberalization and economic development," *Special issue of Review of International Economics, International Financial Liberalization, Capital Flows and Exchange Rate Regimes: Essays in Honor of Robert A. Mundell*, 9, 703-726
- Errunza, V., and D. Miller, 2000, "Market segmentation and the cost of capital in international equity markets," *Journal of Financial and Quantitative Analysis*, 35, 577-600
- Fama, E., 1998, "Market efficiency, long-term returns, and behavioral finance," *Journal of Financial Economics*, 49, 283-306.
- Fama, E., and K. French, 1993, "Common risk factors in the returns on stocks and bonds," *Journal of Financial Economics*, 33, 3-56
- Foerster, S. R., and A. G. Karolyi, 1993, "International listings of stocks: The case of Canada and the U.S.," *Journal of International Business Studies*, 24, 763-784
- Foerster, S., and G. A. Karolyi, 1998, "Multi-market trading and liquidity: A transaction data analysis of Canada - U.S. interlistings," *Journal of International Financial Markets, Institutions, and Money*, 8, 393-412
- Foerster, S., and G. A. Karolyi, 1999, "The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States," *Journal of Finance*, 54, 981-1013
- Fuerst, O., 1998, "A theoretical analysis of the investor protection regulations argument for global listing of stocks," *Working Paper, Yale University Yale School of Management*
- Hanley, K., A. Kumar, and P. Seguin, 1993, "Price stabilization in the market for new issues," *Journal of Financial Economics*, 34, 177-197
- Healy, P., and K. Palepu, 1990, "Earnings and risk changes surrounding primary stock offers," *Journal of Accounting Research*, 28, 25-48
- Henry, P. B., 2000, "Stock market liberalization, economic reform, and emerging market equity prices," *Journal of Finance*, 55, 529-564
- Himmelberg, C., R. Hubbard, and D. Palia, 1999, "Understanding the determinants of managerial ownership and the link between ownership and performance," *Journal of Financial Economics*, 53, 353-384
- Jain, B., and O. Kini, 1994, "The post-issue operating performance of IPO firms," *Journal of Finance*, 49, 1699-1726
- Kaplan, S., 1989, "The effect of management buyouts on operating performance and value," *Journal of Financial Economics*, 24, 217-254
- Karolyi, A. G., 2002, "DaimlerChrysler AG, the first truly global share," *Journal of Corporate Finance* (special

- issue on market microstructure and corporate finance), 9, 409-430
- Karolyi, G.A., 1998, "Why do companies list their shares abroad? (A Survey of the Evidence and Its Managerial Implications)," Salomon Brothers Monograph Series, vol. 7: New York University, NY
 - Kim, H. E., and V. Singal, 2000, "Stock market openings: Experience of emerging economies," *Journal of Business*, 73, 25-66
 - Kim, M., and J. Ritter, 1999, "Valuing IPOs," *Journal of Financial Economics*, 53, 409-437
 - Krigman, L., W. Shaw, and K. Womack, 1999, "The persistence of IPO misvaluation and the predictive power of block-trading," *Journal of Finance*, 3, 1015-1044
 - La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, 2006, "What works in securities laws?" *Journal of Finance*, 61, 1-32
 - La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1998, "Law and finance," *Journal of Political Economy*, 106, 1113-1155
 - Lins, K. V., D. Strickland, and M. Zenner, 2005, "Do non-U.S. firms issue equity on U.S. exchanges to relax capital constraints?" *Journal of Financial and Quantitative Analysis*, 40, 109-133
 - Logue, D., R. Rogalski, J. Seward, and L. Foster-Johnson, 2002, "What's special about the role of underwriter reputation and market activities in IPOs?" *Journal of Business*, 75, 213-244
 - Loughran, T., and J. Ritter, 1995, "The new issues puzzle," *Journal of Finance*, 50, 23-51
 - Loughran, T., and J. Ritter, 1997, "The operating performance of firms conducting seasoned equity offerings," *Journal of Finance*, 52, 1823-1850
 - Loughran, T., and J. Ritter, 2000, "Uniformly least powerful tests of market efficiency," *Journal of Financial Economics*, 55, 361-390
 - Loughran, T., and J. Ritter, 2004, "Why has IPO underpricing changed over time?" *Financial Management*, 33, 5-37
 - Lyon, J., B. Barber, and C. Tsai, 1997, "Improved methods for tests of long-run abnormal stock returns," *Journal of Finance*, 54, 165-201
 - McLaughlin, R., A. Safieddine, and G. Vasudevan, 1996, "The operating performance of seasoned equity issuers: free cash flow and post-issue performance," *Financial Management*, 25, 41-53
 - Michaely, R., and K. Womack, 1999, "Conflict of interest and the credibility of underwriter analyst recommendations," *Review of Financial Studies*, 12, 573-608
 - Mikkelsen, W., M. Partch, and K. Shah, 1997, "Ownership and operating performance of companies that go public," *Journal of Financial Economics*, 44, 281-307
 - Miller, D., 1999, "The Market reaction to international cross-listings: Evidence from depositary receipts," *Journal of Financial Economics*, 51, 103-123
 - Orens, R., and N. Lybaert, 2007, "Does the financial analysts' usage of non-financial information influence the analysts' forecast accuracy? Some evidence from the Belgian sell-side financial analyst," *The International Journal of Accounting*, 42, 237-271
 - Pagano, M., A. Roell, and J. Zechner, 2002, "The geography of equity listing: Why do companies list abroad," *Journal of Finance*, 57, 2651-2694
 - Patro, D. K., and J. K. Wald, 2005, "Firm characteristics and the impact of emerging market liberalizations," *Journal of Banking and Finance*, 29, 1671-1695
 - Pukthuanthong, K., and R. Roll, 2009, "Global market integration: An alternative measure and its application," *Forthcoming Journal of Financial Economics*
 - Purnanandam, A., and B. Swaminathan, 2004, "Are IPOs really underpriced?" *Review of Financial Studies*, 17, 811-848
 - Rajan, R.G., and H. Servaes, 1997, "Analyst following of initial public offerings," *Journal of Finance*, 52, 507-529
 - Rajan, R. G., and L. Zingales, 2003, "The great reversals: the politics of financial development in the twentieth century," *Journal of Financial Economics*, 69, 5-50
 - Reynolds, T., and A. Flores, 1989, "Foreign law: current sources of codes and basic legislation in jurisdictions of the world," Rothman & Co., Littleton, CO
 - Sarkissian, S., and M.J. Schill, 2008, "Are there permanent valuation gains to overseas listing?" *Review of Financial Studies*, 22, 371-412
 - Schultz, P., and M. Zaman, 1994, "Aftermarket support and underpricing of initial public offerings," *Journal of Financial Economics*, 35, 199-219
 - Stulz, R. M., 1999, "International portfolio flows and security markets," in: Feldstein, M. (ed.), *International Capital Flows*. National Bureau of Economic Research and University of Chicago Press, 257-293
 - Teoh, S., I. Welch, and T. Wong, 1998, "Earnings management and the long-run market performance of initial public offerings," *Journal of Finance*, 53, 1935-1974
 - Van der Goot, T., 2003, "Risk, the quality of intermediaries and legal liability in the Netherlands IPO market," *International Review of Law and Economics*, 23, 121-140
 - White, H., 1980, "A heteroscedasticity consistent covariance matrix estimator and a direct test for heteroscedasticity," *Econometrica*, 48, 817-838
 - Yang, T., and S.T. Lau, 2008, "An empirical investigation of Yankee stock offerings," Auckland University of Technology working paper

Table A1 - Summary statistics across countries

Country	N	NYSE	AMEX	NASDAQ	OTC	Small cap market	Common stocks	ADRs	MI_74to07	MI_90to07	Market integration	Legal origin	Burden of proof	Class
Argentina	5	2		3			1	4	0.22	0.22	1.13	2	0.220	0
Australia	5		1	4			2	3	0.32	0.41	6.33	1	0.660	1
Belgium	3			3			2	1	0.50	0.64	6.53	2	0.110	0
Brazil	3	2		1			1	2	0.16	0.22	6.43	2	0.330	1
Canada	43	2	3	29	4	5	43		0.39	0.41	1.86	1	1.000	1
Chile	10	9		1			1	9	0.18	0.18	3.01	2	0.330	0
China	29	7		21		1	6	23	0.02	0.02	1.24	NA	NA	NA
Denmark	1			1			1		0.24	0.31	4.08	4	0.553	0
France	13	3		10			3	10	0.56	0.74	8.78	2	0.220	1
Germany	5	1		2		2	1	4	0.59	0.72	8.5	3	0.000	0
Greece	9	2		7			8	1	0.25	0.27	3.84	2	0.495	0
Hong Kong	17	6	1	8		2	11	6	0.33	0.44	5.2	1	0.660	0
India	1			1				1	0.08	0.09	4.43	1	0.660	1
Indonesia	1	1					1		0.24	0.24	3.59	2	0.660	0
Ireland	6			5		1		6	0.39	0.46	4.09	1	0.440	0
Israel	21	1		16	1	3	20	1	0.15	0.16	2.83	1	0.660	1
Italy	8	5	1	2				8	0.37	0.55	8.53	2	0.220	0
Japan	2			2				2	0.24	0.27	3.45	3	0.660	0
Jordan	1			1			1		0.03	0.03	-3.91	2	0.220	0
Luxembourg	3			3			1	2	0.36	0.36	2.47	NA	NA	NA
Mexico	17	15	1	1				17	0.31	0.33	4.35	2	0.110	0
Netherlands	15	4		11			15		0.67	0.79	8.5	2	0.888	1
New Zealand	5	1		4				5			2.03	1	0.440	1
Norway	4	1		2	1		1	3	0.41	0.46	3.69	4	0.385	0
Peru	2	2						2	0.13	0.13	2.57	2	0.660	0
Portugal	1	1						1	0.44	0.46	3.05	2	0.660	1
Russia	4	4						4	0.22	0.22	1.83	NA	NA	NA
Singapore	2	2					2		0.35	0.43	3.61	1	0.660	0
South Africa	1			1			1		0.25	0.32	3.9	1	0.660	0
South Korea	7	4		3				7	0.12	0.22	7.66	3	0.660	0
Sweden	5	2		3			1	4	0.44	0.55	7.23	4	0.275	0
Switzerland	3	1		2			2	1	0.59	0.66	4.92	3	0.440	0
Taiwan	1			1				1	0.17	0.19	4.81	3	0.660	1
U.K.	38	5	2	28	3		9	29	0.50	0.61	7.82	1	0.660	1
Total	291	83	9	176	9	14	134	157						

Table A2 - Buy-and-hold abnormal returns for Yankee IPOs from a low, medium, and high integrated markets

Market Integration Portfolio	Median										Mean									
	Domestic market index as a benchmark (BM)					Firms matched by country, age, industry, and sales as a benchmark (BM)					Domestic market index as a benchmark (BM)					Firms matched by country, age, industry, and sales as a benchmark (BM)				
	Issuers	BM	BHAR	t-stat	t-stat*	Issuers	BM	BHAR	t-stat	t-stat*	Issuers	BM	BHAR	t-stat	t-stat*	Issuers	BM	BHAR	t-stat	t-stat*
Panel A - Median and mean abnormal returns for the first twenty trading days after the issue																				
High market integration	0.90%	1.23%	-0.33%	-2.76 ^a	-2.51	1.08%	1.20%	-0.12%	-2.73 ^b	-3.22	1.63%	1.83%	-0.20%	-2.63 ^b	-3.12	1.86%	2.04%	-0.18%	-2.04 ^b	-2.20
Medium market integration	0.77%	1.18%	-0.41%	-3.77 ^a	-2.46	0.80%	0.44%	0.36%	2.48 ^b	2.78	1.35%	0.87%	0.48%	2.75 ^a	2.69	1.50%	1.29%	0.21%	2.32 ^b	2.81
Low market integration	0.18%	0.19%	-0.01%	-2.03 ^b	-3.18	0.50%	0.05%	0.45%	3.16 ^a	2.54	1.16%	0.51%	0.65%	2.97 ^a	3.31	1.16%	0.29%	0.87%	3.45 ^a	3.56
All IPOs	0.62%	0.87%	-0.25%			0.79%	0.56%	0.23%			1.38%	1.07%	0.31%			1.51%	1.21%	0.30%		
Panel B - Median and mean abnormal returns from the twenty-first day after the issue to the lockup expiration																				
High market integration	1.50%	3.59%	-2.09%	-2.85 ^a	-3.61	0.59%	1.50%	-0.91%	-3.34 ^a	-2.88	7.50%	5.29%	2.21%	2.32 ^b	2.57	5.70%	6.83%	-1.13%	-3.19 ^a	-2.71
Medium market integration	1.02%	2.76%	-1.74%	-2.60 ^b	-2.94	0.22%	0.41%	-0.19%	-2.76 ^a	-3.02	6.30%	4.16%	2.14%	1.98 ^c	2.09	5.14%	5.74%	-0.60%	-2.29 ^b	-2.08
Low market integration	0.32%	1.70%	-1.38%	-2.41 ^b	-2.47	1.01%	0.75%	0.26%	3.08 ^a	2.56	3.23%	0.95%	2.28%	2.47 ^b	3.11	4.01%	3.66%	0.35%	3.31 ^a	3.46
All IPOs	0.95%	2.68%	-1.74%			0.61%	0.89%	-0.28%			5.68%	3.47%	2.21%			4.95%	5.41%	-0.46%		
Panel C - Median and mean abnormal returns from the lockup expiration to two years after the issue																				
High market integration	2.82%	9.16%	-6.34%	-3.05 ^a	-2.51	5.92%	5.54%	0.38%	1.67	1.83	17.97%	22.49%	-4.52%	-2.52 ^b	-3.10	22.73%	25.36%	-2.63%	-2.17 ^b	-2.59
Medium market integration	9.78%	14.60%	-4.82%	-2.01 ^b	-2.29	4.37%	3.20%	1.17%	1.77 ^c	2.04	25.44%	29.35%	-3.91%	-2.40 ^b	-2.16	16.57%	19.43%	-2.86%	-2.39 ^b	-2.40
Low market integration	6.89%	10.89%	-4.00%	-1.89 ^c	-1.75	2.73%	0.80%	1.93%	2.21 ^b	1.92	18.49%	22.18%	-3.69%	-1.78 ^c	-1.17	17.11%	18.35%	-1.24%	-2.03 ^b	-1.96
All IPOs	14.60%	9.78%	-5.05%			4.34%	3.18%	1.16%			25.77%	21.97%	-3.80%			18.80%	21.05%	-2.24%		
Panel D - Median and mean abnormal returns during the third year after the issue																				
High market integration	3.77%	9.36%	-5.59%	-1.25	-1.77	4.46%	2.09%	2.37%	1.88 ^a	1.43	15.11%	17.04%	-1.93%	-1.25	-1.70	14.80%	12.40%	2.40%	1.36	1.06
Medium market integration	1.16%	9.42%	-8.26%	-1.97 ^c	-1.82	1.41%	0.95%	0.46%	1.47	1.59	11.51%	19.80%	-8.29%	-1.36	-1.51	12.10%	13.75%	-1.65%	-1.07	-1.44
Low market integration	0.73%	8.45%	-7.72%	-1.74	-1.62	0.63%	0.46%	0.17%	1.09	2.02	11.07%	16.51%	-5.44%	-1.68	-1.83	9.40%	11.06%	-1.66%	-0.93	-1.28
All IPOs	1.89%	9.08%	-7.19%			2.17%	1.17%	1.00%			12.56%	17.78%	-5.22%			12.10%	12.40%	-0.30%		

a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively, assuming normality and independence

Table A3 - Fama and French three factor time-series regressions

Independent variables	From the twenty-first trading day through two years after the issue			During the third year after the issue		
	IPOs	Comparable firms	IPOs-Comparable firms	IPOs	Comparable firms	IPOs-Comparable firms
Panel A - Value-weighted index						
Panel A.1 - Yankee IPOs from high market integration						
Intercept	-0.192 -1.038	-0.618 -1.900 ^c	0.426 2.136 ^b	-0.167 -1.024	-0.226 -2.077 ^b	0.059 1.204
R _m -R _f	1.409 12.765 ^a	1.121 12.992 ^a	0.288 0.477	1.053 16.771 ^a	0.932 9.701 ^a	0.121 0.239
SMB	1.203 11.294 ^a	1.097 9.675 ^a	0.106 0.516	1.039 18.157 ^a	0.975 8.731 ^a	0.063 0.075
HML	-0.167 -1.680	0.093 1.380	-0.260 -1.293	-0.193 -1.752 [*]	0.120 0.987	-0.313 -0.868
Adjusted R-squared	55.36%	54.47%	23.97%	61.62%	51.90%	16.38%
Panel A.2 - Yankee IPOs from low market integration						
Intercept	-0.211 -1.111	-0.800 -2.039 ^b	0.589 2.155 ^b	-0.188 -0.989	-0.210 -2.096 ^b	0.022 1.341
R _m -R _f	1.622 12.183 ^a	1.273 12.969 ^a	0.349 0.437	1.168 13.839 ^a	0.918 10.564 ^a	0.250 0.212
SMB	1.021 10.796 ^a	1.033 9.021 ^a	-0.012 -0.549	1.002 17.073 ^a	0.932 7.667 ^a	0.070 0.085
HML	-0.132 -1.405	0.105 1.361	-0.238 -1.275	-0.216 -1.707	0.118 1.178	-0.334 -0.842
Adjusted R-squared	69.88%	58.70%	23.00%	51.38%	59.52%	16.90%
Panel B - Equally-weighted index						
Panel B.1 - Yankee IPOs from high market integration						
Intercept	-0.340 -1.201	-0.678 -1.888 ^c	0.338 1.981 ^c	-0.161 -1.199	-0.236 -1.550	0.075 1.085
R _m -R _f	1.288 18.073 ^a	1.015 11.134 ^a	0.273 0.112	0.998 14.432 ^a	0.853 12.812 ^a	0.145 1.192
SMB	0.910 10.828 ^a	0.847 10.475 ^a	0.063 0.694	0.963 11.880 ^a	0.887 10.765 ^a	0.076 0.570
HML	-0.126 -1.403	0.181 0.995	-0.307 -1.778 ^c	-0.170 -1.372	0.103 1.344	-0.273 -1.041
Adjusted R-squared	73.71%	72.43%	15.93%	62.92%	58.76%	15.56%
Panel B.2 - Yankee IPOs from low market integration						
Intercept	-0.356 -1.025	-0.731 -1.563	0.375 2.331 ^b	-0.195 -1.563	-0.204 -1.645	0.009 1.177
R _m -R _f	1.127 18.081 ^a	0.894 11.757 ^a	0.233 6.324 ^a	1.143 13.242 ^a	0.967 11.663 ^a	0.176 1.071
SMB	0.932 12.127 ^a	0.935 9.147 ^a	-0.003 -0.785	1.118 12.396 ^a	0.730 10.784 ^a	0.388 0.665
HML	-0.140 -1.512	0.160 1.132	-0.300 -1.771 ^c	-0.179 -1.308	0.093 1.215	-0.272 -1.181
Adjusted R-squared	81.95%	70.79%	16.21%	67.23%	64.05%	14.28%

a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively, assuming normality and independence; t-statistics are reported under each coefficient.