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POLITICAL RISK AND THE ISSUE COSTS OF FOREIGN IPOS

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Abstract

I compare the issue costs of 463 foreign and 4129 domestic US companies that raise capital in the US between 1990 and 2018. I find evidence that foreign companies bear a greater home country political risk that generates information asymmetries and increases the first-day initial returns. Political risk correlates positively with underpricing, and the result is significant at the 10% level. However, foreign IPOs possess certain characteristics that make raising capital eventually cheaper for them compared to the domestic IPOs: Foreign companies have more assets in place, list more often in NYSE and are already familiar to US investors at the time of listing. In addition to that, foreign companies list after relatively strong US and home market equity performance, and under stable currency conditions. My results support the Selective entry –hypothesis.

Keywords initial public offerings, political risk, underpricing, issue costs, selective entry

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1. Introduction

The research objective of this paper is to find out how the perceived political risk affects the issue costs of foreign US IPOs, and how those costs compare to the costs of domestic US issues. I find that on a univariate basis, foreign firms that have, on average, higher political risk are still less underpriced. On the other hand, when everything else is kept equal, the higher political risk increases underpricing, although the coefficient (1,78) is significant only at the 10% level.

Theoretically, for foreign firms to go to the US, the listing in the US has to be either less costly or more beneficial compared to listing in their home markets. For investors, on the other hand, firms from more risky countries need to be more competent otherwise to be a compelling investment. Existing literature (Bruner et al. 2004 and Parsons and Raviv 1985) suggest that issue costs are related to the country risk -level of the firm and to the information asymmetry between the firm and investors.

My univariate analysis of the issue costs shows that foreign US firms counter on average 7% lower underpricing on the first day of trading than their domestic US counterparts. Median gross spreads are equal to 7% in both groups, which is in line with the "7-percent rule", theorized by Chen and Ritter (2000). Foreign US firms are less underpriced, even though they possess greater political risk, because they have certain characteristics that make them more stable and reduce the uncertainty of their valuation: Foreign firms list more often in NYSE, have more assets in place prior to IPO, are larger in terms of assets and operate more often in non-high-tech industries. In addition to that, more than one-third of the foreign firms making their way to US stock markets come from countries with a similar culture to the US. All these attributes signal quality and compensate for the higher political risk and information asymmetry between a foreign firm and US investors.

My regression analysis reveals that, when the firm, issue and familiarity characteristics, market conditions and fluctuations in demand are controlled, the indirect costs are larger for the companies that come from riskier countries. The coefficient of "Political Risk Index Score" is relatively small (1,78) and significant only at the 10% level. It seems that foreign firms are initially riskier and less familiar to the US investors but also have certain characteristics that offset those issues.

Given a frictionless world without any barriers of entry or information asymmetry, it would be easy to list in a different country. This should result in a diversified group of firms in terms of risk levels, industries and asset sizes. My analysis suggests the opposite; only companies that can

offset the barriers of entry by signaling quality and stability with certain attributes make their initial public offering to the US. This is in line with Bruner et al. (2004), who suggest that "only the best come to America" because of information asymmetry, capital market frictions and large barriers of entry. My results support this Selective entry –hypothesis.

2. Theoretical background and hypotheses setting:

The univariate analysis done by Bruner et al. (2004) shows greater underpricing for domestic US IPOs compared to the foreign ones. My sample has more recent data and therefore it's worth testing if the results of Bruner et al. (2004) still hold. According to Ritter (2018, University of Florida, IPO database) the mean underpricing (first-day initial return) of the IPOs was quite modest during the 1980s (7,2%) but rose almost every year during the 1990s (mean 14,8%). During the dot-com bubble period in 1999-2000, the mean underpricing took a big jump to an all-time high of 64,8% but has ever since reverted back to the pre-bubble levels.

Loughran and Ritter (2004) state that changing risk composition might be one of the factors affecting the changes in underpricing over time. Ljungqvist and Wilhelm (2003) on the other hand argue that especially during the 1999-2000 bubble period managers were "acquiesced in leaving money on the table" because of the changes in CEO ownership and increased ownership fragmentation. Those changes made managers less motivated to set the offer price high enough.

A great variety of factors, including the changed risk compositions, fragmented ownership structures and two major economic crises, may have affected the overall levels of issue costs after the Bruner et al. (2004) study. However, I have no straightforward theory to use to predict, that on a univariate basis, the domestic US IPOs would not have greater underpricing than the foreign firms, also in my study. My first hypothesis derives from the above arguments:

Hypothesis 1.

-On a univariate basis, domestic US IPOs have greater underpricing than foreign US IPOs.

Ritter and Chen (2000) documented in their paper that over 90% of the 1995 to 1998 IPOs raising 20-80 million dollars had a gross spread of exactly seven percent. The seven percent fee for the investment banks advising in the offering seems to be almost perfectly fixed. Although ADRs were

excluded from the sample of Ritter and Chens, there is no evidence against the "7-percent rule". Bruner et al. (2004) also reported medians of 7% for both foreign and domestic groups. Based on the findings of Ritter and Chen (2000) and Bruner et al. (2004), I form my second hypothesis:

Hypothesis 2.

-On a univariate basis, there is no difference in gross spreads between the two groups.

There is a whole section of finance literature trying to explain what factors affect the most to the underpricing of an IPO. Kim and Ritter (1999) state that relying on accounting information and statistical analysis of multiples, does not provide accurate valuations and could result in large underpricing. Key methods of improving the accuracy of the valuation are the fundamental analysis and estimating the market demand for the firm. The risk composition of the firm is obviously an important part of the fundamental analysis and includes various types of risks from operational risks to financial risks but also political and regulatory risks.

According to basic finance theories, higher (or lower) risk should not affect the accuracy of the valuation or price setting if everybody knows about the risk. On the other hand, higher uncertainty and information asymmetry tend to increase the underpricing. (Parson and Raviv, 2004) Political risk often creates uncertainty of the business conditions of a company. Furthermore, the political risk of a foreign country tends to generate information asymmetries, between the US investors and the management of the foreign company as well as all the other stakeholders internationally.

According to Ahearne et al. (2004) asymmetries can arise from differences in business standards and regulatory environments across the countries. Parsons and Raviv (1985) argue that the discount in the offer price is a result of asymmetric information among different stakeholders, future investors and current firm owners, and can therefore explain why such offerings are underpriced on average. All else equal, I expect the firms with higher political risk to suffer from greater information asymmetries at the time of listing. This should lead to greater underpricing of the foreign US issues.

Marr et al. (1991) found evidence that firms raising capital outside their home country markets are usually a group that possesses specific characteristics. They observed "self-selection bias" in their sample and concluded that international capital markets are not fully integrated. This implies that some barriers of entry do exist and only the firms who can offset those barriers with other attributes are going to be viable entrants. Bruner et al. (2004) examined the characteristics of foreign US IPOs and found that the entrants are typically large, non-high-tech firms, "that

originate from countries sharing a common border and language with the US". They also state that international listings are done more frequently to NYSE than domestic listings. The foreign issues are also typically done under stable currency conditions. All these attributes help to offset their home country political risk and should lower the underpricing. Some other studies report similar findings of the selective characteristics of international firms, which supports the existence of "selective entry –bias". (Bruner et al. 2004, Yang and Lau 2010) This leads us to my final two hypotheses:

Hypothesis 3.

-Conditionally to the characteristics of the IPOs, foreign US IPOs should have higher or equal underpricing compared to the domestic US IPOs. The coefficient of "Political Risk Index Score" is positive.

Hypothesis 4.

-Foreign firms compensate for their higher political risk by being more competent (less risky and/or more stable) otherwise.

3. Initial data

3.1. Sample of IPOs

I use *SDC New Issues database* to identify all domestic and foreign companies that made their first initial public offering to a US stock market between 1990 and 2018. I exclude all but level three ADRs and direct placements that have filed the SEC file S1 or F1 and therefore meet all the strictest requirements of SEC and the stock market they are listing to. Lower level ADRs have less strict requirements for listing and do not always include capital raising, which might cause bias to my analysis. My sample has only original IPOs with no prior trading history in any market. I exclude financials and utilities companies based on SDC industry codes. I also exclude some firms to whom I do not manage to get stock prices, political risk index score or gross spread. This group of excluded firms makes a total of 1231 listings. Therefore my final dataset consists of 463 foreign and 4129 domestic IPOs. All the eliminations and restrictions are made to ensure the most uniform conditions possible between international and domestic listings. In Table 1 I report the number of IPOs per year and the total volume per year. Table 2 shows IPO statistics per country.

3.2. Political risk index

My primary goal is to find a link between the underpricing of IPOs and the home country political risk level. Existing papers use different indexes and scores to measure either the objective or perceived risk levels. I use the *Freedom in the World* index published annually by *Freedom House*. This index focuses specifically on political risk, unlike other indexes that measure more broadly the country risk. The index scores illustrate the perceived level of political risk in a given country. Perceived risk index suits better for this type of academic research since the investors are the ones who decide how much to pay for a stock given the risk levels they observe. The underlying "objective risk level" is not the driving force of the investment decisions made by investors.

Freedom in the World index provides ratings for both Political Rights and Civil Liberties for 195 countries and I use the average of these two to form a Political Risk Index Score for each IPO based on the year of listing and the home country of the company. The average risk score for foreign issues is 3,03 and for domestic issues 1,01, on a 1 to 7 scale. According to the best of my knowledge, none existing study has used this index to measure the perceived political risk related to an IPO.

4. Methodology

I use three different methods to examine the relationship between political risk and issue costs and the factors driving the costs. First of all, I use univariate analysis to judge the levels of the first day and the first month underpricing and gross spread. "Day 1 IR" is measured as the first-day initial return, on other words the percentage difference between the offer price and the first trading day closing price. "Day 30 IR" is the equivalent, but for the underpricing of the first month. "Gross Spread" is the total manager's fee, expressed as a percentage of the principal amount offered. The univariate analysis gives me benchmarks to compare to after the final regressions. I report the results of the univariate analysis in Table 3.

The comparison of the characteristics of IPOs is the second method. This is ought to give insight on how the foreign and domestic groups differ from each other on average and median basis. I'm also contrasting my findings to the theory and to the existing literature. I grouped the characteristics into four categories: firm and offer related, familiarity related, market conditions and demand related. The numeric values for the comparison are reported in Tables 4 to 8.

The multivariate regression is meant to provide the final results of this paper. In the final regression, my dependent variable is the "Day 1 IR". With the independent variable "Political Risk Index Score", I intend to capture the effect of the home country political risk level to the underpricing. The coefficient of "Political Risk Index Score" explains how much an increase or decrease of one unit in the political risk index increases the first day underpricing of the stock in percentage points. The other independent variables come from all four categories of characteristics and some of them are dichotomous (dummy) variables. I wanted to include variables from all categories in order to cover as large spectrum of characteristics as possible. The variables I choose are easy to measure, can be supported with strong economic arguments and should not cause major biases to the results. I also control for the time fixed effects by adding a dummy variable for each year in the sample. This is done in order to better unveil the effects of the variables that I'm interested in. I report the regression model, coefficients of the variables and t-statistics in Table 9.

5. Characteristics of the IPOs

5.1. Firm and offer related

I compare different characteristics between the two samples, foreign and domestic IPOs, to gain insight on how the samples differ from each other on average. I grouped the characteristics to firm and offer and familiarity related in order to simplify the output. I also performed two-sample T-tests for the means to assess how significant the observed differences are. You can find all firm and offer related characteristics from Table 4.

Foreign US IPOs have more assets in place pre-offer (median 95,8 $M) compared to the domestic US IPOs (43,6 $M). The foreign issues are also larger in terms of issue size; 75,2 $M median compared to 47,0 $M, a significant difference at 1% level. Contrary to my expectations based on prior studies (Bruner et al. 2004 and 2006) the median ages of the two samples are exactly the same and the foreign firms operate more frequently in high-tech industries (61% of offers) than domestic US firms (58%). Bruner et al. (2004) find that foreign firms are more mature and less frequently from high-tech industries than domestic US firms.

On the other hand, foreign firms list more than twice as frequently (36% of the issues) to NYSE as domestic firms (17%), a highly significant difference in means. This is interesting especially when foreign firms are more frequently from high-tech industries. However, NYSE has been actively increasing its portfolio of high-tech stocks, which might explain the differences in my

sample versus the sample of Bruner et al. (2004). The stock market where the stock is listed is meaningful since listing NYSE is known to signal quality (Baker et al. 1999) but also increase the post-IPO analyst and media coverage (Baker et al. 2002 and 1999). I also examined how large percentage of the firms list with a highly ranked bookrunner as their main bookrunner. I judge the quality of the bookrunner with the ranking made by Loughran and Ritter (2004). One-third (66%) of the foreign firms have a highly ranked bookrunner, which is a significantly larger portion than in the domestic group (60%). Highly ranked bookrunner should signal the quality of the issue. For example, Francis et al. (2010) used the same ranking and found that "prestigious underwriter significantly reduces the level of underpricing about 1%".

5.2. Familiarity related

The characteristics of familiarity are key variables in closing on the information asymmetry gap between investors and the listing firm. I report all familiarity related characteristics in Table 5. 10% of the foreign US offers come from countries with common border to the US and 17% from countries with a common language to the US. 35% of the foreign firms come from countries with cultural similarities to the US. The percentages are somewhat small compared to the findings of Bruner et al. (2004); an increasing portion of the offers come from countries with no ties to the US whatsoever. All those attributes, common language, border and culture, tend to increase the familiarity of the company, lead to greater investor sophistication and more broadly to smaller information asymmetries between a foreign company and US investors (Grinblatt and Keloharju, 2001).

Domestic US IPOs have also more analyst coverage after the issue. I find that 62% of the domestic IPOs had gained at least some analyst coverage in two months after the issue (91% in six months) whereas only 41% of the foreign IPOs had coverage in two months (67% in six months). The means are significantly different at the 1% level in both time spans. Domestic firms are more widely covered during the first months after the IPO.

There is also a significant difference in the average number of analysts following, reported right after listing. Domestic stocks gained on average 2,35 analysts as foreign stocks only 1,92. My findings are in line with Bruner et al. (2004). A caveat here is that I could not find analyst data for 228 firms from IBES and therefore assume them to have no analyst following. I also examined the difference after excluding companies with no reported numbers from the sample. In this reduced sample, the foreign stocks have more analyst coverage right after the IPO, but this difference is driven by an outlier. Excluding the outlier, results in similar analyst coverage for both groups in the reduced sample and creates an even bigger difference in the full sample in the advantage of domestic stocks.

6. Market conditions and demand for IPOs

Both foreign and domestic US initial public offerings occur, on average, after a relatively strong period of US market returns. As Table 6 shows, the median equity index returns for a two month period prior to the IPO are 2,48% for foreign and 2,29% for domestic IPOs. The difference in means is small and not significant at all. On the other hand, when those returns are compared to the average US market returns over the 28-year sample period, the pre-IPO growth numbers for both groups are approximately double the average. The home market returns (2,87%) for the foreign firms have in general been higher than US market returns. This can be explained with portfolio diversification arguments, predicting investor demand for foreign stocks after periods of relatively strong foreign market returns compared to the US returns. However, the time span of only two months might not be enough to make a firm case.

The currency conditions are in line with the findings of Bruner et al. (2004). Even though a dramatic weakening of foreign currency would make the issue cheaper for US investors, the currency conditions have rather been stable. On average, the US Dollar has marginally weakened prior to the IPO. All market returns and exchange rates are collected from *Thomson Reuters Datastream*.

As in every field of business, supply and demand factors are also important in initial public offerings in the price setting and mispricing. Prior literature has a strong consensus that underpricing depends on the demand for new issues. Brailsford et al. (2004) present evidence of a strong autocorrelation between past volume and future volume. Past conditions of the stock market and prior levels of underpricing can be used to predict the future volume. Due to the institutional barriers and listing bureaucracy, they find that the largest impact is after a delay of 5 months. Among others, Ibbotson et al. (1994) demonstrate a positive and significant correlation (0,49) between current underpricing and next year's volume.

In general, current large underpricing should lure other firms to make IPOs in the future, which in turn should satisfy the investor demand over time and lower the future initial returns. Contrary to my predictions and findings of existing literature, I report in Table 7 that initial returns are on average higher during the high volume periods. High volume period is a month that has an above-median dollar volume of issued capital over the 28-year period. The "Day 1 IR" for domestic US IPOs is 26% during high volume and 14% during low volume months, an economically large difference that is significant at 1% level. In the case of foreign US IPOs, the difference is smaller and insignificant but still suggests that higher underpricing occurs during the high volume months.

In both groups, approximately three-quarters of initial public offerings are made during the above median volume months. My results are somewhat similar to Bruner et al. (2004), although in my sample the difference in average underpricing between high and low volume periods is significant when it comes to domestic stocks. Overall, the results suggest that the foreign US IPOs are less sensitive to the fluctuations in issue volume and that underpricing and volume have a positive correlation.

Another way of measuring the investor demand for issues is to examine the differences in initial returns when offers are upwardly or downwardly revised with respect to the original middle of file price range. Hanley (1993) suggests that "the final offer price only partially adjust to new information" and upwardly revised (above the middle of the file range) offers tend to experience significantly larger initial returns and vice versa. Ritter (2018, University of Florida, IPO database) shows that offers with final offer price above the file range have experienced severe underpricing since 1980 but especially during the dot-com bubble years. As I show in Table 8, a somewhat larger percentage of offers were downwardly revised than upwardly, but upwardly revised offers experienced on average over 25% first-day initial returns compared to 6-9% when downwardly revised. The difference is economically large, but not significant, perhaps because of the fact that I was not able to get the file range data for 45% of the offers from *SDC New Issues Database*. There is no significant difference between the underpricing of foreign and domestic US IPOs in either above or below original mid-price category. Nonetheless, the results again signal that the demand for IPOs affects underpricing.

7. Variable construction

7.1. Dependent variable

My dependent variable in the final regression is "Day 1 IR". The first-day initial return calculated as the closing price on the first trading day divided by offer price minus one. This variable is measured as percentages and is widely used in the existing literature to measure underpricing. (Rock 1986, Loughran and Ritter 2004 and Bruner et al. 2004)

7.2. Independent variables

In my final regression, I have nine independent variables plus all the dummy variables that control for the time fixed effects. For example, "2000 Dummy" equals 1 if the initial public offering was

made in 2000 and 0 if not. For the sake of clarity, I'm going to go through the other independent variables category by category.

I have four variables that control for the firm and offer related characteristics: "Political Risk Index Score" is the average of two political risk variables at the time of the issue in the home country of the listing firm. This variable is ought to capture the relative difference in underpricing between foreign and domestic US IPOs. "Issue Size (LN)" is the natural logarithm of the principal amount in millions. "Simultaneous Offer Dummy" is a dichotomous variable with a value 1 if the IPO includes two or more simultaneous offers and 0 otherwise. "High-Tech Dummy" is another zero to one variable and equals 1 if the firm's major industry is categorized as a high-tech by the *SDC* industry codes.

The three variables controlling for the familiarity of the issue are all on a dichotomous zero-one scale. "NYSE Dummy" equals 1 if the firms' stock is listed in NYSE and 0 otherwise. "Common Language Dummy" gets the value of 1 if the main business language in the home country of the issuer is English and 0 if some other language. "Highly Ranked Bookrunner Dummy" equals 1 if the main bookrunner of the IPO has a score of 8,5 out of 9 or better in the Jay Ritter ranking of bookrunners, otherwise the dummy variable equals 0.

"HMKT (-60,-2)" is the cumulative return of the home market index in percentages in a given country during the timespan of 60 days to 2 days prior to the IPO (trading day 0). This variable controls the home market conditions two months before the initial public offering. "High-Volume Dummy" controls for the fluctuations in IPO demand. This variable is equal to 1 the IPO occurred during an above median volume month across the 1990-2018 period and 0 otherwise.

Appendix 1 has the full list of variables used in this paper along with the definitions and data sources.

8. Regression results

In general, the results are in line with my hypotheses. In Table 9, I report all the regression results.

The coefficient of "Political Risk Index Score" is positive, although small (1,78) and significant only at the 10% level. This implies that a higher risk index score predicts higher underpricing, all else equal, which is in line with my Hypothesis 3. Foreign firms, that in general are prone to higher risk levels, face larger issue costs all else equal, although the result is not very significant. Bruner et al. (2004) find the coefficient of Foreign Dummy to be negative. That implies that foreign firms,

with higher country risk levels, are in general less underpriced. My results suggest the opposite, although ones again, the results are significant only at a 10% level. Also, "Foreign Dummy" tests whether foreign firms, as a group, are more heavily underpriced than domestic firms when "Political Risk Index Score" only tests the relationship between risk level and underpricing. I'm going test the coefficient of foreign dummy later on as a robustness check.

The coefficients of "High-Tech Dummy" (7,26) and "NYSE Dummy" (-12,54) are both significant at the 1% level. Firms operating in high-tech industries face significantly larger underpricing during the first day of trading as assumed. High-tech firms generally possess higher levels of intangible assets that are hard to value and price correctly, which is ought to generate additional information asymmetries. Issuing in NYSE seems to lower the underpricing significantly. NYSE-listing is theorized to signal the superior quality of the company and my results support that.

Contrary to my predictions, the coefficients of "Simultaneous Offer Dummy" (6,82), "Highly-Ranked Bookrunner Dummy" (5,48) and "Common Language Dummy" (8,02) are all positive and economically large, although the latter two are not significant. Based on different theories I predicted that simultaneous offering would generate additional information of the company and ease the pricing, a highly ranked bookrunner would signal quality (Loughran and Ritter, 2004) and common language decrease the information asymmetries between the management of the company and investors (Grinblatt and Keloharju, 2001).

The coefficient of "High Volume Dummy" is small (0.44) and not significant at all. The coefficient of "HMKT (-60, -2)" is also small but highly significant (4,12 t-stat). In general, my results suggest that most listings follow stable currency and market conditions. "High Volume Dummy" seems to be economically unimportant and does not predict underpricing well. This is exactly what my univariate analysis suggested: although higher underpricing seems to occur during the high volume months (contrary to the theories of fluctuations in demand) the results are partially insignificant. This is particularly interesting because in the study of Bruner et al. (2004) the coefficient of the exact same variable was negative and significant. As said, there is strong micro-economic reasoning behind suggesting negative coefficient: large initial returns signal strong investor demand and should lure other firms to make their IPOs too. Increased volume should satisfy the investor demand and lower the underpricing. I'm going to further examine the effect of volume on the underpricing in the second robustness test.

The coefficient of "Issue Size (LN)" is positive (3,85) and significant at the 1% level. The sign of the coefficient is the opposite of what I predicted. For example, Dunbar (2000) reported a U-shaped relationship between the Issue Size and first-day initial returns. Especially the smallest category issues were highly underpriced. However, Bruner et al. (2004) found similar evidence of positive and significant coefficient of "Issue Size (LN)" in their full sample regression, and Francis et al. (2010) reported a positive relationship between issue size and underpricing.

9. Discussion

My results support the selective entry -hypothesis (Yang and Lau 2010, Bruner et al. 2004). Only foreign firms of superior quality have the opportunity to make their initial public offering in the US. Certain characteristics, such as larger size and being established and stable businesses, offset their high risks arising from the home country political risk and information asymmetry. (Bruner et al. 2004) Those characteristics enable them to make successful listings to the US with equal or even lower issue costs than domestic firms do. Everything seems to support the Selective entry –hypothesis. This is in line with my fourth hypothesis.

Most of my results suggest that firms with high-quality attributes suffer from less severe underpricing. Welch (1989) presents an alternative approach to this: He proposes a signaling model in which high-quality firms underprice their offerings on purpose "to signal quality and separate themselves from lower-quality companies". It is, of course, expensive for the firm to leave great amounts of money on the table, but Welch (1989) finds that those firms then capitalize with the seasoned equity offerings (SEOs) afterwards. This theory might explain why for example large and simultaneous issues seem to be highly underpriced in my sample. Other theories predict them to be less underpriced, but maybe those well-known international companies are willing to underprice their offers as a signal of quality and superiority. Welch's theory might also explain the relatively large coefficient of "Highly Ranked Bookrunner Dummy": high-quality firms are eager to be advised by highly ranked investment banks to enhance their visibility, but then decide to underprice their offers on purpose.

Another reason why offers with highly ranked bookrunner are more underpriced might be the incentives of the bookrunners. They are responsible for the selling of the new shares and do not want the offer to be "cold" or undersubscribed. Cold offers harm the reputation of the bookrunner and lower offer prices are therefore safer. Francis et al. (2010) also argue that listing firms are willing to underprice their offers in exchange for wider analyst coverage from the underwriters in the future.

10. Limitations and possible issues

10.1. SDC and CRSP data

Thomson Reuters is known to have some mistakes in its SDC Platinum database. Jay Ritter has gathered at least some corrections to his own database (University of Florida, IPO data), but it might not contain corrections to all the erroneous data. I manually corrected a few numbers but it is highly likely that my data has more errors. Bollaert and Delanghe (2015) examined how reliable SDC data is in M&A transactions and found that despite some minor limitations and incorrections, that appear 10% of the time at most, SDC is the most accurate and widest in terms of content.

Center of Research in Security Prices (CRSP) data does not contain stock price data for every firm in my sample. The most common reason for this is that CRSP only includes stocks traded on the NYSE, AMEX, Nasdaq (national and small cap markets) and OTC but my original sample included all IPOs made to any of the US stock markets. This explains the omission of roughly 200 companies. However, roughly a thousand companies listed in NYSE, AMEX, Nasdaq or OTC are lacking CRSP price data too. This might be due to survivorship bias or due to some other bias, which would obviously cause major issues and bias to my results. On the other hand, the missing data could be random and therefore only affect the sample size of this study. In total, I was not able to find stock market prices for 1205 companies and had to exclude those firms from the sample.

10.2. Omitted variable bias

Since the adjusted R-squared of my regression is only about 21% it is certain that I'm missing some key variables. This might result in incorrect coefficients because the model attributes the effect of the missing variables to the coefficients of the included variables. Some of the missing variables could very well be the age of a firm prior to the IPO, total assets before the issue or the revisions of the offer price in respect to original file range. I could not find enough data to include those variables in the final regressions.

I find that domestic firms are on average 1,9 years older than the foreign US firms. Bruner et al. (2004) find the opposite. As I report in Table 10, less than 8-year-old firms (below median age) are significantly more underpriced (on average 29%) than at least 8-year-old firms (17%). The maturity of the listing firm seems to be an important factor in underpricing and is likely to cause omitted variable bias to my results.

Foreign firms have significantly more total assets in place than domestic before the issue. Asset size is an often used variable to control for the characteristics of a firm when studying underpricing. It is ought to signal stability and maturity and reduce concerns of political risk. Bruner et al. (2004) include "pre-issue assets"-variable to their regression and find a negative, although an insignificant, correlation between pre-issue assets and underpricing.

Hanley (1993) and Ritter (2018, University of Florida, IPO database) find offer price revisions to affect underpricing. My incomplete dataset also suggests that upwardly revised offers are severely underpriced (27% on average) when downwardly revised offers have only a modest underpricing (7%). However, *Securities Data Company* database does not have original file ranges for 2476 firms in my sample and I'm not able to include this variable to the regressions. Upward revision seems to correlate positively with high underpricing and is likely to cause bias to my results.

10.3. Proxy and contemporaneous variables

In general, private companies do not have established analyst coverage and I'm forced to use post-IPO analyst coverage as a proxy for the familiarity of the firm prior to the IPO. Prior studies, such as Bruner et al. (2004) also use post-issue analyst coverage as a proxy to measure the extent of information available to the investors at the of the IPO. Obviously, the level of success of an IPO might have an effect on the post-IPO analyst coverage. I assume at least the most successful, and perhaps more underpriced, offers to lure analysts to follow those companies in the future. This variable is likely to cause bias and is for those reasons excluded from the regression.

I was not able to find home country stock market indexes for every country in the sample. I replaced the missing indexes with proxy indexes from their related markets. The countries that do not have own indexes (Bahamas, Monaco and Papua New Guinea) are small and mostly operating internationally.

I excluded companies from Bermuda, Cayman Islands, Netherlands Antilles, Isle of Man, Jersey and British Virgin Island from my sample because the Freedom House does not provide political risk index scores for those countries. Another minor assumption, regarding the risk indexes, is that the risk index score for the 2018 listings is the corresponding score from 2017 since that is the latest score available.

My results might also have endogeneity issues because most of my independent variables are measured at the time of the IPO. The primary reason for the timing is that SDC does not provide time-series data but event data for a specific moment of time. For example, the amount of total assets is given as the value right before the IPO (prospectus values). It is possible that for those reasons my results have endogeneity issues but that is the only data available. Another reason

for contemporaneous variables is that it is important to measure some variables at the time of the IPO to gain insight into the behavior of the companies. For example, IPO volumes are measured monthly to find how low volume months (and the corresponding over-demand) affect the next month's IPO volume, investor demand and therefore issue costs of the listings.

10.4. Issues with characteristically different samples

Some prior studies (for example Bruner et al. 2004 and 2006) that examine the issue costs of foreign US IPOs use asset size, issue size, industry, etc. matched samples in regression analysis. This reduced sampling is done in order to make the two groups more comparable with each other. I decided not to modify the sample for the following two reasons: Bruner et al. (2004) reported both results for the matched sample and for the full sample. With the exception of the coefficient of the "Issue Size (LN)" (being smaller and insignificant in the matched sample) the results were unchanged regardless of the samples. Also in a more recent study made by Bruner et al. (2006), the results were not sensitive to the variations in their sample. In addition to that, I wanted to maintain as large sample size as possible to enhance the explanatory power of my statistical analysis.

10.5. Privatizations

Privatizations are known to perform better during the first five years of existence than non-privatizations. (Choi et al. 2010) Unfortunately, I was not able to find this information for a large enough portion of the issues to judge the effect of privatization on the cost of issuance. For the same reason, I did not exclude privatizations from the sample as some prior studies have done (Bruner et al. 2004 and 2006). The fact that my sample includes an unknown amount of privatizations might inflate the average underpricing and cause bias to my final results.

11. Robustness tests

11.1. Foreign Dummy as a proxy for political risk

I address the robustness of the political risk index by repeating the regression with "Foreign Dummy" as a proxy for the political risk. This method assumes that all foreign companies bear the same level of perceived political risk. The coefficient of the dummy variable is ought to

capture the relative difference in underpricing between foreign and domestic US listings. The original results are not robust to this change since the coefficient of “Foreign Dummy” (-3,59) is completely opposite to the coefficient of “Political Risk Index Score” (1,78), although not significant. It seems that “foreignness” in general does not increase the underpricing but more likely reduces it. This implies that the foreign IPOs that come from high-risk countries suffer from severe underpricing, but firms from less risky countries have even lower indirect costs than the domestic issuers. The coefficients of other variables, except “Common language Dummy”, remain mostly unchanged. This test is particularly interesting because “Foreign Dummy” was the main independent variable in the paper of Bruner et al. (2004) and the results are quite similar. I report the regression results of this robustness test in Table 11.

11.2. Further investigation of high-tech and high volume attributes

I also further test the effects of “High-Tech Dummy” and “High Volume Dummy” on the underpricing by creating two new independent variables. “High-Tech x Foreign Dummy” is the multiple of those two variables and the same formula applies for “High Volume x Foreign Dummy”. Interestingly the coefficient of “High-Tech x Foreign Dummy” (-5,32) is large and negative when the coefficient of “High-Tech Dummy” (5,45) is large and positive. This result suggests that the high-tech “attribute” decreases underpricing for foreign companies but increases it for domestic companies. This is in line with the findings of Bruner et al. (2004 and 2006).

The coefficient of “High Volume x Foreign Dummy” is -1,23 and the coefficient of “High Volume” 0,51. Neither of the coefficients is significant, nor economically very large. The interesting finding though is that the coefficients are of opposite sign. However, I do not want to derive any grand conclusions since the results are not significant and both signs can be supported with solid theories. I report the results of the second robustness test in Table 12.

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Tables

I report all the tables in this section. In tables 3-8 I test the differences in means with two-sample T-tests assuming unequal variances. The superscripts in t-stat values indicate the statistical significance of the result:

A = Significant at 1% level

B = Significant at 5% level

C = Significant at 10% level

The full list of variable definitions and data sources is reported in Appendix 1 after the tables.

Table 1. Foreign IPO statistics by year

Year	Number of IPOs	Volume ($mil)	Average issue size ($mil)
1990	1	68,40	68,40
1991	2	44,85	22,43
1992	15	615,86	41,06
1993	31	2791,23	90,04
1994	22	1457,44	66,25
1995	24	2506,25	104,43
1996	50	3929,48	78,59
1997	37	2572,98	69,54
1998	14	970,77	69,34
1999	13	712,17	54,78
2000	13	800,20	61,55
2001	4	227,70	56,93
2002	1	68,34	68,34
2003	1	75,60	75,60
2004	12	1348,50	112,38
2005	19	2812,20	148,01
2006	19	5936,90	312,47
2007	28	6206,92	221,68
2008	3	297,55	99,18
2009	0	0,00	0,00
2010	30	3207,31	106,91
2011	14	4701,79	335,84
2012	11	1512,34	137,49
2013	17	2468,98	145,23
2014	37	28149,54	760,80
2015	11	927,71	84,34
2016	4	359,10	89,78
2017	10	3249,24	324,92
2018	20	6747,81	337,39
Total	**463**	**84767,15**	**183,08**

Table 2. Foreign IPO statistics by country

Nation	Number of IPOs	Year of the first IPO	Month of the first IPO
Argentina	6	1993	3
Australia	2	1996	5
Austria	1	2015	9
Bahamas	2	1995	7
Belgium	3	1996	3
Brazil	1	2018	1
Canada	30	1992	1
Chile	8	1993	1
China	120	1994	1
Cyprus	2	1998	5
Denmark	3	1992	1
France	16	1993	2
Germany	8	1996	6
Greece	15	1998	2
Hong Kong	19	1992	3
India	2	2006	7
Indonesia	1	1997	9
Ireland-Rep	11	1992	2
Israel	82	1991	1
Italy	7	1990	1
Jordan	1	1997	1
Luxembourg	9	1993	1
Malaysia	1	2014	10
Mexico	16	1992	2
Monaco	3	2012	3
Netherlands	22	1993	2
New Zealand	4	1996	6
Norway	3	1995	6
Papua N Guinea	1	1995	10
Peru	1	1996	5
Philippines	2	2000	3
Russian Fed	4	1996	2
Singapore	5	1992	3
South Korea	4	2005	2
Spain	1	2004	10
Sweden	4	1996	2
Switzerland	6	1996	6
Taiwan	3	1996	3
United Kingdom	33	1992	1
Utd Arab Em	1	2012	10
Total	**463**		

Table 3. Univariate analysis

Variable	Foreign US IPOs	Domestic US IPOs	t-stat
Day 1 IR (%)	**15,79**	**22,74**	-4,07[A]
(median)	5,21	9,09	
(variance)	0,11	0,22	
Day 30 IR (%)	**17,98**	**29,14**	-4,43[A]
(median)	5,15	13,43	
(variance)	0,24	0,44	
Gross Spread (%)	**6,74**	**7,00**	-2,85[A]
(median)	7,00	7,00	
(variance)	3,66	0,79	
N	463	4129	

Table 4. Characteristics of the IPOs

Variable		Foreign US IPOs	Domestic US IPOs	t-stat
Pre-issue assets ($M)		**539,3**	**359,5**	1,81[C]
	(median)	95,8	**43,6**	
Issue size ($M)		**183,1**	**100,1**	1,72[A]
	(median)	75,2	47,0	
Firm age prior to IPO		**14,0**	**15,9**	-1,42
	(median)	8,0	8,0	
Offers Listing on NYSE (%)		**35,85**	**17,15**	8,11[A]
Offers with Highly Ranked Bookrunner (%)		66,09	56,94	3,92[A]
Simultaneous offers (%)		24,19	15,26	4,32[A]
Portion of offer sold in US (%)		90,14	97,37	-7,57[A]
Hi-tech offers (%)		61,12	58,17	1,23
Political risk index score		3,03	1,01	
N		463	4129	

There are 463 foreign issues and 4129 domestic issues except for the age (245 foreign and 3827 domestic issues) and for the Pre-issue assets (323 foreign and 3488 domestic issues).

Table 5. Familiarity

Variable	Foreign US IPOs	Domestic US IPOs	t-stat
Number of analysts - average	1,92	2,35	-4,86[A]
Number of analysts - median	2,00	2,00	
IPOs with coverage in <2 months (%)	40,60	61,95	-8,87[A]
IPOs with coverage in <6 months (%)	67,17	90,77	-10,58[A]
N	463	4129	
Characteristics related to familiarity			
Offers with Common Border to US	9,94 %		
Offers with Common Language to US	17,28 %		
Offers with Common Culture to US	34,99 %		
Offers with a Highly Ranked Bookrunner	66,09 %	56,94 %	
N	463	4129	

I couldn't find data from IBES for 228 firms (89 foreign and 139 domestic) and therefore assume them to have no analysts following.

Table 6. Market conditions

Variable	Foreign US IPOs	Domestic US IPOs	t-stat
USMKT (-60, -2)	2,65 %	2,40 %	1,16[A]
(median)	2,48 %	2,29 %	
HMKT (-60, -2)	3,13 %	NMF	
(median)	2,87 %		
CURR (-60, -2)	0,16 %	NMF	
(median)	-0,06 %		
N	463	4129	

NMF = Not meaningful

Table 7. Fluctuations in demand

Variable	Foreign US IPOs	Domestic US IPOs
Above Median Volume Months		
N of IPOs	364	3102
Percent of sample (%)	**78,62**	**75,13**
Below Median Volume Months		
N of IPOs	99	1027
Percent of sample (%)	**21,38**	**24,87**
Day 1 IR		
Above Median Months (%)	**16,36**	**25,67**
Below Median Months (%)	**13,69**	**13,88**
t-stat (above vs below)	0,89	10,50[A]

Table 8. Revisions of the offer price

Variable	Foreign US IPOs	Domestic US IPOs	t-stat
Upward Revisions			
Day 1 IR (%)	28,29	25,83	0,62
(median)	17,51	18,75	
N of IPOs	110	939	
Percent of sample (%)	23,76	22,74	
Downward Revisions			
Day 1 IR (%)	8,88	6,01	1,37
(median)	0,95	1,92	
N of IPOs	142	1287	
Percent of sample (%)	30,67	31,17	
Missing data			
N of IPOs	211	1903	
Percent of sample (%)	45,57	46,09	
N	463	4129	

Original filing prices available for only 252 foreign and 2224 domestic companies.

Table 9. Regression results

N = 4592 Adjusted R^2 = 0,21 F-test = 34,65[A]

Variable	Coefficient	t-statistic
Constant	-9,58	-0,97
Political Risk Index Score	1,78	1,84[C]
Issue Size (LN)	3,85	4,32[A]
HMKT (-60, -2)	0,53	4,12[A]
Simultaneous Offer Dummy	6,82	3,51[A]
High-Tech Dummy	7,26	5,41[A]
High Volume Dummy	0,44	0,27
Highly Ranked Bookrunner Dummy	5,48	3,79[A]
Common Language Dummy	8,02	2,54[B]
NYSE Dummy	-12,54	-6,35[A]
1990 Dummy	-7,40	-0,79
1991 Dummy	-7,33	-0,84
1992 Dummy	-9,84	-1,15
1993 Dummy	-7,94	-0,93
1994 Dummy	-8,91	-1,04
1995 Dummy	-2,53	-0,3
1996 Dummy	-7,25	-0,86
1997 Dummy	-9,04	-0,95
1998 Dummy	0,77	0,09
1999 Dummy	50,60	5,94[A]
2000 Dummy	28,02	3,25[A]
2001 Dummy	-11,49	-1,17
2002 Dummy	-12,23	-1,23
2003 Dummy	-10,46	-0,97
2004 Dummy	-13,29	-1,48
2005 Dummy	-12,80	-1,42
2006 Dummy	-14,46	-1,61
2007 Dummy	-12,70	-1,43
2008 Dummy	-12,56	-0,98
2009 Dummy	-14,16	-1,25
2010 Dummy	-8,05	-0,88
2011 Dummy	-7,90	-0,85
2012 Dummy	-3,94	-0,43
2013 Dummy	-0,55	-0,06
2014 Dummy	-7,59	-0,97
2015 Dummy	-0,65	-0,07
2016 Dummy	-8,99	-0,88
2017 Dummy	0,00	(omitted)
2018 Dummy	-6,09	-0,63

Table 10. Age and underpricing

Variable	Less than 8 years	At least 8 years
N	1783	2211
Percent of sample	44,64	55,36
Day 1 IR %	29,35	16,63

Table 11. Robustness test 1

N = 4592 Adjusted R^2 = 0,21 F-test = 34,55[A]

Variable	Coefficient	t-statistic
Constant	1,40	0,14
Foreign Dummy	-3,59	-0,77
Issue Size (LN)	3,81	4,27[A]
HMKT (-60, -2)	0,53	4,24[A]
Simultaneous Offer Dummy	6,74	3,47[A]
High-Tech Dummy	7,34	5,47[A]
High Volume Dummy	0,51	0,27
Highly Ranked Bookrunner Dummy	5,58	3,86[A]
Common Language Dummy	0,48	0,09
NYSE Dummy	-12,73	-6,27[A]
1990 Dummy	-9,08	-0,98
1991 Dummy	-8,99	-1,04
1992 Dummy	-11,46	-1,35
1993 Dummy	-9,62	-1,14
1994 Dummy	-10,49	-1,23
1995 Dummy	-4,20	-0,49
1996 Dummy	-9,00	-1,07
1997 Dummy	-9,58	-1,13
1998 Dummy	-0,96	-0,11
1999 Dummy	48,96	5,77[A]
2000 Dummy	26,40	3,07[A]
2001 Dummy	-13,04	-1,33
2002 Dummy	-13,79	-1,39
2003 Dummy	-11,92	-1,11
2004 Dummy	-14,65	-1,64
2005 Dummy	-14,40	-1,61
2006 Dummy	-16,00	-1,79
2007 Dummy	-13,56	-1,53
2008 Dummy	-13,69	-1,07
2009 Dummy	-15,85	-1,40
2010 Dummy	-8,15	-0,89
2011 Dummy	-8,99	-0,97
2012 Dummy	-5,37	-0,59
2013 Dummy	-2,19	-0,25
2014 Dummy	-9,17	-1,05
2015 Dummy	-2,06	-0,22
2016 Dummy	-10,52	-1,03
2017 Dummy	0,00	omitted
2018 Dummy	-5,62	-0,58

Table 12. Robustness test 2

N = 4592 Adjusted R^2 = 0,21 F-test = 32,94[A]

Variable	Coefficient	t-statistic
Constant	-6,10	-0,59
Political Risk Index Score	1,84	1,90[B]
Issue Size (LN)	3,88	4,36[A]
HMKT (-60, -2)	0,53	4,12[A]
Simultaneous Offer Dummy	6,80	3,50[A]
High-Tech Dummy	7,81	5,60[A]
High Volume Dummy	0,51	0,30
Highly Ranked Bookrunner Dummy	5,45	3,77[A]
Common Language Dummy	4,11	0,91
NYSE Dummy	-12,7	-6,42[A]
High-Tech x Foreign Dummy	-5,32	-1,43
High Volume x Foreign Dummy	-1,23	-0,30
1990 Dummy	-7,36	-0,79
1991 Dummy	-7,29	-0,84
1992 Dummy	-9,79	-1,15
1993 Dummy	-7,94	-0,93
1994 Dummy	-8,81	-1,03
1995 Dummy	-2,54	-0,30
1996 Dummy	-7,23	-0,86
1997 Dummy	-7,98	-0,94
1998 Dummy	0,72	0,08
1999 Dummy	50,43	5,92[A]
2000 Dummy	27,85	3,23[A]
2001 Dummy	-11,57	-1,18
2002 Dummy	-12,36	-1,24
2003 Dummy	-10,44	-0,97
2004 Dummy	-13,25	-1,48
2005 Dummy	-12,68	-1,41
2006 Dummy	-14,38	-1,60
2007 Dummy	-12,64	-1,43
2008 Dummy	-12,56	-0,98
2009 Dummy	-14,22	-1,26
2010 Dummy	-8,18	-0,89
2011 Dummy	-7,93	-0,86
2012 Dummy	-3,83	-0,42
2013 Dummy	-0,49	-0,06
2014 Dummy	-7,29	-0,83
2015 Dummy	-0,70	-0,08
2016 Dummy	-8,93	-0,87
2017 Dummy	0,00	omitted
2018 Dummy	-5,96	-0,62

Appendix 1. Variable definitions and data sources

Variable	Definition	Data source
Day 1 IR (%)	Initial return calculated as the closing price on the first trading day divided by offer price minus one	SDC and CRSP
Day 30 IR (%)	Initial return calculated as the closing price on the 30th trading day divided by offer price minus one	SDC and CRSP
Political Risk Index Score	Average of the Political Rights score and Civil Liberties score on a 1 to 7 scale from Freedom in the World - index, higher values imply higher risk level	Freedom House
Issue Size (LN)	Natural logarithm of the gross proceeds in all markets in millions of USD	SDC
HMKT(-60, -2)	Percentage price change in the home market equity index from day -60 to day -2 in regards to issue date	Thomson Reuters Datastream
USMKT (-60, -2)	Percentage price change in the US market equity index from day -60 to day -2 in regards to issue date	Thomson Reuters Datastream
CURR (-60, -2)	Percentage change in the exchange rate (foreign currency per USD) from day -60 to day -2 in regards to issue date	Thomson Reuters Datastream
Simultaneous Offer Dummy	Equals 1 if issue involves two or more simultaneous listings, 0 otherwise	SDC
High-Tech Dummy	Equals 1 if the main industry of the issuer is classified as high-tech industry, 0 otherwise	SDC
High Volume Dummy	Equals 1 if the issue occurs during an above median volume month across the sample period, 0 otherwise	SDC
Highly Ranked Bookrunner Dummy	Equals 1 if the main bookrunner has an underwriter rank score equal or higher than 8,5 in 1 to 9 scale, 0 otherwise	UF Jay Ritter IPO database
NYSE Dummy	Equals 1 if the issue is made in NYSE, 0 otherwise	SDC
High-Tech x Foreign Dummy	High-Tech Dummy multiplied by Foreign Dummy	SDC
High Volume x Foreign Dummy	High Volume Dummy multiplied by Foreign Dummy	SDC
Firm age prior to IPO	Offer year minus founding year	UF Jay Ritter IPO database
Foreign Dummy	Equals 1 if the issuer is from some other country than US, 0 if from US	

Common Border Dummy	Equals 1 if the issuers home country has common border to US, 0 otherwise: Canada and Mexico	
Common Culture Dummy	Equals 1 if the issuers home country has cultural similarities to US, 0 otherwise: Canada, UK, Ireland, Israel, Australia and New Zealand	
Common Language Dummy	Equals 1 if the issuers home country has a common language to US, 0 otherwise: Canada, UK, Ireland, Australia and New Zealand	