A Systematic Analysis of Equity Issuance: Evidence from Around the World

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Abstract

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This study conducts a systematic analysis of seasoned equity offerings across a sample of twelve countries with differing legal systems at the micro level from 2009 to 2019. Civil law countries have been shown to exhibit reduced shareholder protection rights, causing the cost of equity for firms in those countries to be higher and thus making equity issues less attractive. In this paper, we start by using a series of logistic regressions to examine if firms in civil law countries are less likely to pursue financing through seasoned equity offers. More importantly, we employ a range of interaction variables to examine whether the SEO decision policies and likelihood to issue SEOs differ across legal systems based on firm-specific characteristics. Our results indicate significant differences in SEO decision relevance for some firm-specific variables. The results were mainly robust across our subsamples and alternate models, with a few exceptions specifically for our size subsamples.

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1. Introduction

Since the paper "Legal determinants of external finance" (La Porta et al., 1997), numerous researchers have examined the differences in financing decisions and capital structure between law jurisdictions. For instance, La Porta et al. (1997) find that there are fewer shareholder rights in civil law countries when compared to common law countries. La Porta et al. (1998, 2000) extend their earlier findings further by showing differences in corporate behavior across law jurisdictions. Lopez Iturriaga (2005) supports the idea that a country's legal system affects corporations. He finds that several legal-institutional factors, such as creditor protection, firm disclosure requirements, and law enforcement, impact the source of firms' debt. Cotei et al. (2011) find that firms in civil law countries rely more on internal funds and use more short-term debt to address their financing deficits relative to firms in common law countries. Our aim in this research is to explicitly examine the differences in equity issues across the two jurisdictions. We will look at a large international sample that is recent to see if SEOs are more likely to happen in civil law or common law jurisdictions. We also examine whether the differences in likelihood, if any, change with specific firm characteristics?

Our motivation for this research is as follows. La Porta et al. (1997) examine legal environments and equity capital markets on a macro level or top-down approach. Their results indicate that countries with poorer investor protections have narrower capital markets. However, they restrict themselves to country level data and do not extend their analysis to firm level data. Bancel and Mittoo (2004) conclude that "although a country's legal environment is an important determinant of debt policy, it plays a minimal role in common stock policy." This finding shows that the literature does not agree on this subject and warrants a study on the differences in SEO behavior and their determinants between law jurisdictions on more recent data. However, their study was done by surveying managers in 16 European countries and does not address the actual performance of firms. We want to address these two issues by examining firm level behaviour and doing so using firm performance data. In this aspect our work is similar to that of Bessler et al. (2011) who test the core assumption of the pecking order model that information asymmetry is an important determinant of capital structure decisions. However, their motivation was not to compare law jurisdictions. They do use subsamples based on the law jurisdictions, but there is no

cross-examination of the two. If coefficients from the two different law samples have the same direction or sign, we can not compare their differences unless they are in the same sample. They also cannot measure the statistical significance of the differences by using two different sub-samples. Therefore, there is no cross-examination or systematic comparison of the two jurisdictions.

To examine the differences, we use a large international sample of firms from 12 developed countries (or jurisdiction in the case of Hong Kong). Due to the availability of more recent data, our sample is more extensive than extant studies that use international data. First, we employ a logistic regression with the dependent variable being a dummy variable for SEO. The primary predictor variable is a dummy variable LAW to differentiate between law jurisdictions. Next, we expand our list of predictor variables to include a variety of variables that prior literature has indicated as predictive of a firm's probability of issuing an SEO. Crucially, we investigate if the manner in which these variables impact the probability differs across legal jurisdictions by using interaction variables between our LAW dummy variable and all the control variables in the regression. After running the logit regressions, we recalculate the coefficients and z-statistics of the interaction terms to interpret them correctly, as Ai and Norton (2003) and Ai et al. (2004) demonstrated. Finally, based on Psillaki and Daskalakis (2009), we check for the robustness of our results by splitting our sample into two subsamples according to firm size. We do this to ensure that our results are not dominated by small firms, which make up over half of our sample. We also test for the robustness of our results based on using alternate proxies for size, growth, and tangibility for robustness.

Our results clearly show that firms in civil law jurisdictions are much less likely to issue equity than firms in common law jurisdictions. The coefficient is large enough that the probability for a firm in a civil law jurisdiction to issue an SEO will always be lower for any value of any independent variable we use in our regressions compared to a firm in a common law jurisdiction. Our results also show that most of the factors or variables considered for SEO decisions have the same direction or effect across legal jurisdictions. However, many of the variables have significant differences in the change of likelihood as the variable increases by 1. This indicates that variables have significantly different importance in SEO decision-making between the two legal jurisdictions.

Moreover, some variables can be significant factors for one jurisdiction but not for another. For example, PROFIT is not a statistically significant factor for firms in a common law jurisdiction but is a significant factor for firms in civil law jurisdictions. The results show that in some cases looking at the full sample results does not give us a clear picture of what the SEO determinants are. There are differences in which variables are considered for SEO decision-making between small and large firms. There are some variables in which the direction in the coefficients is different. This indicates that while some variables, such as the dividend dummy, increase the likelihood of issuing SEOs for large firms, they decrease the likelihood of issuing SEOs for smaller firms. As a last robustness test, we redid all our regressions on a sample that excludes the North American observations and the results were largely the same.

This study will add to the toolbox used by managers worldwide to help them with their decisions to issue equity. We see that such a guide is especially relevant based on the legal jurisdiction of the firm's location and size. The study also contributes to investment finance managers because it will help them evaluate the likelihood of a firm to issue equity based on a firm's characteristics. The reason why this would be important for investment managers is that it has been documented that SEO announcements create abnormal negative returns (Asquith & Mullins, 1986; Masulis & Korwar, 1986; Mikkelson & Partch, 1986; Mola & Loughran, 2004).

The remainder of this paper is organized as follows: Section II discusses the related literature. Section III describes our data. Section IV presents our methodology and results. Finally, section V has some concluding remarks.

2. Literature review

There have been many studies around differing corporate finance behavior under different countries and law jurisdictions. An early study by Rajan and Zingales (1995) investigates the capital structure determinants on an international sample consisting of the G-7 countries. They examine the institution differences such as tax and bankruptcy code, the extent of corporate

control, and bank vs. market economies. They conclude that firm leverage across the G-7 countries was closer together at an aggregate level than previously thought. They did not find any systematic differences between bank-oriented and market-oriented countries. Finally, they conclude with the following remark "a deeper examination of the United States and foreign evidence suggests that the theoretical underpinnings of the observed correlations are still largely unresolved" and suggest that a deeper understanding of the effects of institutional differences was necessary. The paper by La Porta et al. (1997) follows up on a conjecture they made in an article a year earlier that investor protections, as reflected by legal rules and their enforcement, can explain the differences of financial systems around the world (La Porta et al., 1996).

Civil law is founded on a pre ascribed book of laws while common law is based on jurisprudence and judges' decisions in comparable prior cases that are then made into legislation. These distinctions in legal systems result in different levels of protection to shareholders which can lead to a difference in corporate behaviour. They find that capital markets are narrower in countries with less shareholder protection. By using several OLS regressions with the dependent variables being the ratio of the number of IPOs divided by population, external capital, and domestic firms/population with several macroeconomic variables as the independent variables, they show that civil law countries issue less equity than common law countries and have narrower debt and equity markets. La Porta et al. (1998) follow up on their previous two studies and again examine 49 countries worldwide at the macro level and come up with three conclusions. First, common law countries tend to protect investors more than civil law countries. Second, law enforcement is more vigorous in common laws. Third, countries develop substitute mechanisms for inadequate investor protection, such as mandatory dividends or legal reserve requirements. La Porta et al. (2000) test two dividend agency models, the "outcome model," which predicts that countries with more substantial minority shareholder rights pay higher dividends payouts, and the "substitute model," which predicts the opposite. They examine dividend policies for 4,103 firms in 33 countries worldwide, and their results support the "outcome model." What was interesting in their results is that it was different for firms experiencing sales growth. They found that firms experiencing higher sales growth in common law countries were paying fewer dividends. There have been many more studies examining the differences in equity markets, capital structure, and other financial market characteristics between legal systems (Booth et al., 2001; Cotei et al., 2011; Demirguc-Kunt Maksimovic, 1999; Jin & Myers, 2006; Morck et al., 2000).

The literature has not always agreed about different legal systems and financing. Some relatively more recent studies have disputed the findings of previous research. For instance, as mentioned earlier in this paper, Bancel and Mittoo (2004) find that while a country's legal system is significant in determining a firm's debt policy, they did not find a relationship between the legal system and common stock policy. Turk Ariss (2016) finds that the common versus civil law distinction does matter for firm financing in developing countries, but in the opposite direction documented for developed countries. Stronger laws are associated with more debt financing in developing countries, as firms are less able to resort to equity issuance compared to developed countries due to less efficient capital markets. Another recent study by Howe and Zhang (2010) examines SEO cycles at the macro level and compares them to IPO cycles. Among several other results explaining SEO cycles, they find that information asymmetry, which is more associated with civil law countries, is not an important factor in explaining SEO volume. This study's results are contrary to the findings of Bessler et al. (2011). These contradictory results indicate that financing characteristics are evolving with time, and a study on more recent data is warranted. A significant advantage in using more recent data for international samples is that they are much larger.

Some recent papers examine the equity aspect of capital structure in more detail. Gaud et al. (2007) analyze the debt-equity choices of firms from 13 European countries from 1988 to 2000. They look at possible adjustment towards a target debt ratio to test two common theories in capital structure determinants. They find that neither the pecking order nor the trade-off theory describes the capital structure policies in Europe. Furthermore, they find that the national environment does matter. Their regressions examine a scenario between Equity issues vs. no transactions using a logit estimator for financing choice regressions. Their results indicate that firms time the market and issue less equity when they are highly profitable or have much cash. These regressions had country dummies that were significant, but they argue that "homogeneity in the whole sample is sufficient for a dummy variable control." They do not consider the countries' legal environment by not including any variables for it. They also do not cross-examine any countries to see if their results would vary with specific firm characteristics. Finally, their regressions are only done in scenarios to compare financing choices, i.e., debt issues vs. equity issues, equity issues vs. no transactions, and other financing scenarios. We intend to focus on when equity is issued vs. everything else that does not include an equity issue;

therefore, it is a broader scenario that they do not examine. A more recent paper by Bessler et al.(2011) tests the core assumptions of the pecking order on an international sample from 1995 to 2005. Their findings go against the static pecking order by showing a high correlation between equity issuances and financing deficits. Their paper runs a logistic regression with SEO as their dependent variable and several firm-specific characteristics as their independent variables. They also divide their sample into subsamples of US, non-US, civil law, and common law. They find that equity issuance increases with less pronounced firm-level information asymmetry, but this was not significant on their civil law subsample. They also show that what the firms do with the proceeds of their equity issuances is different across jurisdictions. Again, just as in the Gaudet al. (2007) paper, the authors do not systematically compare the two jurisdictions. Their goal was not to compare results across jurisdictions but to examine some core assumptions of the pecking order theory. As we can see from the literature, there has been extensive research on the differences in capital structure decisions across law jurisdictions. However, there is no study performing a systematic cross-examination of financing through SEOs across legal systems. Our paper aims to fill this gap in the literature by providing answers to how much more or less firms are likely to issue equity across legal systems and examine if the results change based on firm-specific characteristics.

3. Data

For this study, we created a COMPUSTAT universe, which consists of both COMPUSTAT North America and COMPUSTAT Global, of publicly traded firms from 12 developed countries between January 1, 2009, and December 31, 2018. While Hong Kong is not a country, it is considered a developed market and is big enough to be included in this study. Therefore, we treat it as a distinct legal jurisdiction. We excluded financial and utility firms from the sample. To get the observations of firms that issued SEOs, we used SDC platinum. The 12 countries which we categorize into common law jurisdictions and civil law jurisdictions are as follows. The civil law jurisdictions are Germany, France, Italy, Spain, Japan, and South Korea. The Common law jurisdictions are Australia, Great Britain, Singapore, Hong Kong, Canada, and the United States. Firm characteristics used in our analysis are based on the fiscal year-end results before the SEO issue. We use annual rather than quarterly data as the availability of data is significantly better

for annual data in the COMPUSTAT global database. Since COMPUSTAT has a separate database for Global equity and North American equity, measures must be taken to keep the data consistent between the two databases. SDC North American and Global data samples were merged differently with their respective COMPUSTAT data because of the difference in the identifiers they use. In order to address potential issues in data consistency as well as potential dominance of our sample by observations from the US, we redid all our analysis after dropping the North American data from our sample. Our results remain largely unchanged. We matched the North American data on CUSIPS and the global data on SEDOLS. COMPUSTAT Global annual data, unlike COMPUSTAT North America, did not include a variable for the Market Value. As a result, data from COMPUSTAT Global Securities daily database was downloaded and matched with the GLOBAL firms in the sample. This database has the daily share prices and the number of common stocks outstanding, which we used to calculate the market value of the global observations. We used the share price of the last day the market was open if the observation date is a holiday or the weekend. Since we calculated the Global data's market value, we did the same with the North American data to keep the consistency. The observations are in their local currency and were converted to a common currency before the variables can be calculated. The common currency chosen for the data was the US dollar. We used foreign exchange data from the Federal Reserve Bank Reports for all the countries/regions used in the sample. The observations in this database for Foreign Exchange rates ended on December 31, 2018, which is why we ended our sample period there instead of December 31, 2019. We only kept the observations that had all the financial statement variables we are using. After the data cleaning process, we were left with 108,756 firm-year observations and 17272 firms.

Given that we only used 12 developed countries and a period spanning ten years, this sample is relatively the largest of all the capital structure studies we have encountered using an international sample. Table 1 presents our sample description. The data was winsorized at 2 and 98 percent because there were some extreme outliers, with some variables having observations as far as 50 standard deviations from the mean. Considering that the error terms in logit regressions are neither assumed to be normal nor homoscedastic, we believe that winsorizing at 2 and 98 is sufficient. Table 2 provides a descriptive statistic of our variables. We present a variable description table in the Appendix.

4. Methods and results

4.1 Methodology and variable selection

The first step of our analysis will be to run a logit regression based on the following model:

$$\text{Prob (SEO = 1)} = \beta_0 + \beta_1 \text{ law} + \beta_2 \text{ VAR1} + \ldots + \beta_n \text{ VAR n-1} + \beta_m \text{ law} * \text{VAR1} + \ldots + \beta_{m+n-2} \text{ law} * \text{VARn-1} + \varepsilon_i$$

Where SEO takes a value of 1 if a firm issued equity, and 0 otherwise. The variable law is a dummy variable with a value of 1 if the firm is in a civil law jurisdiction and 0 if it is in a common-law jurisdiction. VAR1 to VAR n-1 are our capital structure and SEO determinant variables. Variables law*VAR1 to law*VARn-1 are our interaction variables, allowing us to examine the difference between the two jurisdictions for each explanatory variable in our model. This model builds on the model used by (Bessler et al., 2011), in which their dependent variable was also an SEO dummy, however we add a host of explanatory variables which we justify their inclusion below and we also include a dummy variable for law as well as the interaction of this variable with all other predictor variables. The explanatory variables we have chosen are a mix of traditional capital structure variables, variables that have been linked to SEOs, and some new variables that have not been used before on an SEO regression. We use so many variables because it appears that most studies chose the traditional capital structure variables as their explanatory variables for equity issues in the literature on this subject. We believe there should be more to it, and the traditional capital structure variables are worth examining. However, we should keep in mind that they were originally used as explanatory variables for leverage and not SEOs. Our explanatory variables are LAW, a dummy variable with a value of 1 if the firm is in a civil law jurisdiction. MKTBV is our variable for the market to book equity ratio; while many studies such as Gaud et al. (2007) and Bessler et al. (2011) use market to book value of assets as their market to book ratio, we opted to use the same measure as Myers (1984), and Dong et al. (2012) in which the latter was a study on security issuance decisions and not leverage. We believe this market-to-book ratio will be a good measure for overvaluation, which Baker and Wurgler (2002) find that it increases the likelihood of a firm to issue equity. OANCF is our

variable for net operating cash flows, and we scale it by total assets. As far as we have seen from the previous literature, we have not seen a previous study use this variable. It is an important part of the financing deficit variable used by Shyam-Sunder and Myers (1999), and Frank and Goyal (2003). Their variable, however, is more suited for their study, which was to test the pecking order theory. We do not believe that including CF from financing activity should be part of our study as it already incorporates financing from equity or debt. We also do not believe that the pecking order is the sole theory explaining capital structure decisions (Flannery & Rangan, 2006; Frank & Goyal, 2003; Gaud et al., 2007). RE is our variable for retained earnings, used by Bessler et al. (2013) in their zero-leverage phenomenon study. LEV is our variable for leverage; four values are commonly used for leverage in research (Frank & Goyal, 2009). Out of these four, we have chosen total debt over the book value assets, just as Bessler et al. (2011) did. Size1 is our first measure of size, and it is the natural log of the market value, just as Lev and Thiagarajan (1993) used. We also wanted to use another measure of size since past literature has also used natural log of total sales and natural log of total assets (Bessler et al., 2011; Frank & Goyal, 2009). We believe the different size measures could yield different results. Therefore, we added size2 as our second measure of size, which is the natural log of sales. RUNUP is our variable measuring the stock return over the past 12 months. Lucas and McDonald (1990) found that firms are more likely to issue equity following a strong run in returns. Although suggested by several authors, including Bessler et al. (2011) the RUNUP variable is potentially problematic. The reason is that the literature has shown that firms are more likely to issue equity when they are irrationally overvalued (Baker & Wurgler, 2002; Dong et al., 2012). A strong stock return runup does not necessarily mean the market was irrational. RUNUP was also found not to be one of the core factors in determining capital structure decisions (Frank & Goyal, 2009). For our measure of firm growth, we have again decided to use two variables. The first variable we use is SALEG, our variable for sales growth as used by La Porta et al.(2000). This measure is also consistent with one of the two measures for a firm's size used in this paper. The second variable we use to measure growth ASSG is our variable for asset growth as used by Bessler et al. (2013), and Frank and Goyal (2009). TANG is our variable for tangibility, and we scale it by total assets. This variable has been used by many capital structure studies, as pointed out by Frank and Goyal (2009); therefore, it seemed to be a natural choice in our selection. INTANG is our variable for intangibility. Although this variable has not been used in previous

literature, we decided to include it based on the comment by Frank and Goyal (2009) that "intangibles have become increasingly important in recent periods." PE is our variable for the price-earnings ratio. We could not find any past literature using this variable in capital structure studies. Since our study looks at determinants of SEOs and not leverage, we believe it is reasonable to test the PE ratio. It is a prevalent valuation ratio used in investment finance. APTURN is our variable for Accounts payables turnover. While we have not seen any past literature using this capital structure studies, we believe that AP turnover is an early signal to detect if a firm attempts to control its cash flows. Our choice of this variable was inspired by Lev and Thiagarajan (1993). Although they do not use AP turnover, they do use accounts receivables. However, we believe that Accounts payables would make a better measure because it is more in the control of their firm than external parties. PROFIT is our variable for profit, and we also scale it by total assets, just as Frank and Goyal (2009). EPS is our variable for earnings per share, which Lev and Thiagarajan (1993) used. Issuing new equity should dilute this ratio, and generally, investors are not happy with that. It is also a popular valuation ratio in investment finance, just as the PE ratio. Finally, we add a dividend dummy variable with the value of 1 if the company pays dividends. Frank and Goyal (2009) found it reliable outside of the six core factors. La Porta et al. (1998) show that dividend-paying companies behave differently across jurisdictions, with firms in common law countries having higher payouts than civil law countries. However, when this interacted with sales growth, the results showed the opposite behavior. Table 3 shows us the Pearson correlation coefficient matrix, and there is it shows that there are no signs of multicollinearity between our variables. Table 4 presents the results of our logit regressions. However, before we can begin to interpret them, we must first correct our interaction terms.

The second step of our analysis is to correct the interaction variable coefficients. Ai and Norton (2003) and Ai et al. (2004) demonstrate that the intuition of linear models used to interpret the coefficients of interaction terms and their statistical significance does not extend to nonlinear models. They reviewed 13 economics journals listed on the JSTOR (www.jstor.org) and found 72 articles between 1982 and 2000 that incorrectly interpreted the interaction terms in nonlinear models. They show that to compute the interaction effect in a nonlinear model, the cross-partial derivative of the expected value of the independent variable must be calculated and not just the derivative. This difference has several significant ramifications. First, the statistical significance

of the whole cross-partial derivative must be calculated because a t-test can no longer be used to test for the statistical significance of the coefficients. Furthermore, unlike the linear models, the interaction effect is conditional on the other independent variables. Another implication is that because the cross-partial derivative consists of two additive terms, the interaction effect can have different directions for different values of the covariates. Finally, the interaction effect is not necessarily zero, even if the coefficient is 0. We will use their methodology to recalculate the coefficients and the z-statistics of our interaction variables.

4.2 Results

4.2.1 Main effects

The coefficients discussed in this subsection will be representative of the effects on the common law observations which are presented in table 4. We will discuss the interaction effects in the following subsection.

Our law jurisdiction dummy variable (LAW) coefficient is negative for all samples, which indicates that firms in civil law jurisdictions are less likely to issue SEOs than firms in common law jurisdictions. This result strongly confirms the results of La Porta et al. (1997) and goes against the results of Bancel and Mittoo (2004) and Turk Ariss (2016).

4.2.1.1 Overvaluation

The coefficient for the market to book ratio (MKTBV) is positive. The result confirms the findings of Baker and Wurgler (2002) that firms time the market when they believe irrational investors overvalue them. Frank and Goyal (2009) find that firms have lower leverage as the market to book ratio increases.

4.2.1.2 Financial deficit

As expected, the coefficient for net cash flow from operating activities (OANCF) is negative. This result indicates that as OANCF increases, firms are less likely to issue equity or vice versa.

4.2.1.3 Internal funds

The coefficient for retained earnings (RE) is positive. This is a surprising result that strongly goes against the pecking order theory. Tsyplakov (2008) finds that firms tend to accumulate retained earnings until the right time to purchase physical capacity due to time-to-build. His findings could be a likely explanation for the result here since firms will require some financing as they build up the right of funds.

4.2.1.4 Leverage

The coefficient for leverage (LEV) is positive but is not statistically significant. This is a surprising result that supports the pecking order theory rather than the trade-off theory because it indicates that firms are not attempting to adjust towards target leverage.

4.2.1.5 Firm Size

The coefficient for size (SIZE) is negative and is significant at the 5% level. This result is as we expected; Frank and Goyal (2009) find that firms tend to have higher leverage as size increases. Bessler et al. (2011) also find that likelihood to issue SEOs decreases as size increases. However, in their robustness tests, they found that this result did not hold for non-US firms in both legal jurisdictions.

4.2.1.6 Growth

The coefficient for sales growth (SALEG) is positive. This indicates that as firms experience higher sales growth, they become more likely to issue SEOs. As we speculated earlier, this is likely due to the need for financing to support the firm's growth. Howe and Zhang (2010) examine this variable at the aggregate or macro levels, and their result had a negative coefficient, which is against what they expect as they described the result to have the "wrong sign."

4.2.1.7 Tangibility

The coefficient for tangibility (TANG) is positive. This result is counter-intuitive, Frank and Goyal (2009) found that firms tend to have higher leverage as tangibility increases, leading to the conclusion that they are less likely to issue SEOs as tangibility increases. However, Frank and Goyal (2009) also believe that intangibility is becoming more important in recent periods. We can use this to conjecture that banks and other lenders are not considering tangible assets as

much as in the past to secure debts. Instead, they could use patents and other right to use assets, which is in line with our sample of the most recent data.

4.2.1.8 Market performance

The coefficient for stock returns over the past year (RUNUP) is positive. This result agrees with the findings of Baker and Wurgler (2002) that firms are more likely to issue equity after showing strong returns. Bessler et al. (2011) also find this variable to be positive and significant, and robust across all their subsamples.

4.2.1.9 Investor demand/ Anticipation of future growth

The coefficient for price-earnings ratio (PE) is negative and significant at the 5% level. However, the coefficient is minimal; therefore, it has very little economic significance. This indicates that although PE is a popular valuation ratio for investment managers, corporate managers do not consider this variable in their capital structure decision-making.

4.2.1.10 Cash flow control

The coefficient for accounts payables turnover (APTURN) is negative but is not statistically significant. This result goes against our belief that a rising AP turnover ratio could signal a firm attempting to control its cash flows, which could increase its likelihood to issue SEOs.

4.2.1.11 Profitability

The profit (PROFIT) coefficient is negative but is not significant. This indicates that an increase in profit does not affect the likelihood of issuing SEOs for firms in common law jurisdictions. Frank and Goyal (2009) find that firms with more profits tend to have high leverage; therefore, we expected the coefficient to be negative. In their results, Bessler et al. (2011) find that the coefficient for profit is negative, and it was largely robust across most of their samples, including their subsample of common law firms. Our results may vary because we are using a different period which we suspected that some results would vary over periods.

4.2.1.12 Shareholder profits

The coefficient for earnings per share (EPS) is negative. This indicates that firms are less likely to issue SEOs as EPS increases or more likely to issue SEOs as EPS decreases. This result agrees with the belief that investors do not like to have their EPS diluted.

4.2.1.13 Dividends

The dividend dummy (DIV) coefficient is negative. This result is counter-intuitive because it appears that firms paying dividends are less likely to issue equity. Frank and Goyal (2009) find that firms that pay dividends tend to have lower leverage; therefore, we expected this would increase the likelihood of issuing SEOs.

4.2.2 Interaction effects

This section will present the coefficients of the interaction variables between LAW and each of our independent variables which are presented in table 5. This is the primary test of differences across jurisdictions. The coefficients indicate the difference in log odds ratios between firms in civil and common law jurisdictions as the variable increases. This will give us an idea of which variables, if any, are more or less important in capital structure decisions for firms in different legal jurisdictions. Any significant result in this section would go against the results of Bancel and Mittoo (2004).

The magnitude of the coefficients of our interaction variables indicates that the overall effect for firms in civil law jurisdictions has the same direction for the variables that we find to be significant for firms in common law jurisdictions. However, many interaction effects have significant differences in the change of log odds ratios as variables increase. There are also some cases where the result is not significant in common law jurisdictions but is significant in common law jurisdictions. These are indications that there are differences in policies regarding SEOs across legal jurisdictions.

4.2.2.1 Overvaluation

The coefficient for INTMKTBV is negative, indicating that the increase in the likelihood of issuing SEOs as MKTBV increases is less for firms in civil law jurisdictions than those in common law jurisdictions. It appears that firms in civil law jurisdictions tend to time the market

less than those in common law jurisdictions. La Porta et al. (1997) find that civil law jurisdictions have narrower capital markets which makes this result an expected one.

4.2.2.2 Financial deficit

The coefficient INTOANCF is positive. Based on the magnitude of the coefficient, firms in civil law countries are also less likely to issue equity as OANCF increases, but the increase in the likelihood of firms in civil law countries to issue equity as OANCF decreases is less than the one in common law countries. Cotei et al. (2011) find that although firms in both legal jurisdictions follow the trade-off theory and adjust towards an optimal capital structure, the firms in civil law jurisdictions adjust slower. They explain that this can be due to a firm adjusting towards the optimal capital structure within the range of incremental pecking order decisions. This result coincides with their findings.

4.2.2.3 Internal funds

The coefficient for INTRE is negative. This result indicates that the increase in the likelihood to issue SEOs as retained earnings increases is less for firms in civil law jurisdictions. While the overall direction goes against the pecking order theory, it appears that the forces of the pecking order theory have more of an effect in civil law jurisdictions.

4.2.2.4 Leverage

The coefficient INTLEV is positive. This indicates that, unlike firms in common law jurisdictions, firms in civil law jurisdictions consider leverage for their SEO policies. Firms in civil law jurisdictions are more likely to issue SEOs as leverage increases, which is the result that we had expected. However, we had expected it to be significant in both legal systems.

4.2.2.5 Firm Size

The coefficient INTSIZE is positive, indicating that the decrease in log odds ratio as size increases is smaller for firms in civil law jurisdictions. Moreover, the magnitude for this coefficient is large enough to almost completely negating the effect, which means that the decrease in probability to issue SEOs as size increases is nearly negligible for firms in civil law jurisdictions. In other words, size is not an economically significant factor for SEO decision-making in this legal system.

4.2.2.6 Growth

The coefficient for INTSALEG is negative, indicating that the increase in likelihood to issue SEOs as sales growth increases is smaller for firms in civil law jurisdictions than their common law counterparts. This, again, can be due to the more potent effects of the pecking order in civil law legal systems.

4.2.2.7 Tangibility

The coefficient for INTTANG is negative, indicating that the increase in log odds ratio for an increase in tangibility is less for firms in civil law jurisdictions. Since there are narrower capital markets, we can only assume that banks in civil law jurisdictions are lagging their common law counterparts to decrease the importance of tangible assets in their debt policies.

4.2.2.8 Market performance

The coefficient for INTRUNUP is negative. This indicates that the increase in the likelihood of issuing SEOs as RUNUP increases is smaller for firms in civil law jurisdictions than in common law jurisdictions. In simpler terms, firms in civil law jurisdictions do not time the market as much as their common law counterparts.

4.2.2.9 Investor demand/ Anticipation of future growth

INTPE is not significant, indicating that PE is not a relevant factor in SEO policy for firms in both legal systems.

4.2.2.10 Cash flow control

The coefficient for INTAPTURN is not significant, as for firms in common law legal systems, AP turnover is not an indicator of a change in a firm's likelihood to issue SEOs. This again goes against our initial belief that it would be.

4.2.2.11 Profitability

The coefficient for INTPROFIT is negative. This indicates that unlike firms in common law jurisdictions for which PROFIT did not explain SEOs behavior, the likelihood of issuing an SEO decreases as profit increases for firms in civil law jurisdictions. This result is yet another

indicator that the pecking order theory has more influence in countries with civil law legal systems.

4.2.2.12 Shareholder profits

The coefficient for INTEPS is positive. This indicates that as EPS increases, civil law firms are not as reluctant to issue SEOs and dilute their EPS as their common law counterparts. Therefore, we have another variable where firms in civil law jurisdictions appear to have an increased probability of issuing equity than those in common law jurisdictions.

4.2.2.13 Dividends

The coefficient for INTDIV is negative. This indicates that the decrease in the log odds ratio for dividend-paying firms is larger for firms in civil law jurisdictions. The overall direction of the dividend dummy was surprising, and this result is also against what we expected. Several variables showed that the effects of the pecking order might be stronger in civil law jurisdictions; however, this variable does not indicate that. Table 6 presents a summary of our results for the first 3 columns.

4.2.3 Robustness tests

A potential concern with our findings relates to the full sample that includes firms of varying sizes. Small firms can have different capital structure behavior compared to larger firms as examined by Psillaki and Daskalakis (2009). To address this concern, we divide our sample into two subsamples based on firm size: a sample of small firms that includes all firms that have a market value under $350 million US dollars and a sample of large firms that includes all firms above that market value. The results are presented in columns (2) and (3) of tables 4 and 5 and are mostly consistent across both subsamples.

When looking at the main effect variables, the differences were the following. The market to book ratio is only significant at the 10% level for the sample of larger firms. The coefficient of retained earnings is not significant for the sample of larger firms. Interestingly, leverage is significant for both subsamples, but each has a different direction, explaining why it is not significant in the entire sample. For the sample of large firms, leverage is positive, and for the

sample of small firms, leverage is negative. Size had a positive coefficient for the sample of larger firms. Tangibility has a negative coefficient in the sample of larger firms but is only significant at the 10% level. AP turnover has a positive coefficient for the sample of larger firms and a negative coefficient for the sample of smaller firms. Like the case with leverage, the opposite direction for each subsample can explain why it is not significant for the entire sample. We speculate that when smaller firms have cash flow problems, it becomes harder for them to find avenues to issue SEOs. EPS is not significant for the sample of smaller firms. Finally, the sample of larger firms has a positive coefficient for the dividend dummy and is significant at the 5% level. These results indicate that more study needs to be done on the differences in capital structure decisions between small and large firms building on the findings of Psillaki and Daskalakis (2009)

When examining the robustness of our interaction variables among the two subsamples, the results are mostly the same, with a few exceptions. INTMKTBV, INTTANG, and INTRE are not significant in the sample of larger firms. INTSIZE and INTPROFIT are significant at the 10% level for the sample of larger firms. INTAPTURN was significant in both subsamples but had different directions.

The results are also mostly robust across the two models that we used. They are presented in columns (4), (5), and (6) in tables 4 and 5. The differences are only among the subsamples. The results for columns (3) and (6) hold for all the variables.

When looking at the main effect variables, some variables are not reliable across both models. Leverage has a negative coefficient for the sample of smaller firms. Another variable that was not robust across all six regressions was size. The variable size2 is negative for the sample of large firms. EPS is significant at the 10% level for the sample of smaller firms.

When it comes to the interaction variables, there are minor differences. INTRE is significant at the 10% level. INTASSG is insignificant for the sample of small firms. Finally, INTEPS is significant at the 10% level for the sample of smaller firms. The consistency of the interaction variables results across both models and subsamples is a solid robustness test considering that they are dependent on the other covariates.

We also redid all our regressions on an international sample that excludes the COMPUSTAT North America data and the results are presented in tables 7 and 8. The results are mostly the same, and the differences are mainly in the significance levels of some variables. There are only two variables where the main effect has a different sign. Retained earnings and profit have a negative coefficient in this sample. This result is more intuitive as we had expected this for all our regressions. Bessler et al. (2011) found that firms in the U.S usually do not favor internal over external financing, and this very well explains the difference in signs for these regressions. The interaction effects were also mostly the same. There are only three variables where the interaction effect had different signs. As expected, INTRE and INTPROFIT are two of the three variables. The third variable is INTDIV, which has a positive coefficient for the full sample and the sample of smaller firms. This indicates that the decrease in the likelihood to issue SEOs for dividend-paying firms is smaller for firms in civil law jurisdictions.

Although the corrected interaction effects are more accurate, they only give us a general overview of the interaction effect and its significance. To explore each interaction effect in further detail, one must investigate the graphs of the interaction effects and the graphs of their z-statistics. These graphs give us the interaction effect and its significance over the range of the predicted probability. As Ai et al. (2004) explain, the interactions depend on other covariates. All the graphs of our interaction effects and their z-statistics are available upon request and overall support our conclusions below.

5. Conclusion

The motivation of this paper is to fill in the gaps in the literature of SEOs and their determinants at the micro-level. We examine a large international sample that is very recent between January 1, 2009, and December 31, 2018. An advantage of using this sample this sample is that it is both more recent and so more reflective of current conditions, and more comprehensive in terms of the volume of data than extant studies on this topic. We use numerous variables in our model, some that are traditional capital structure variables, some previously used in studies involving equity issues, and some not used before in the literature on SEOs.

We confirm the findings of La Porta et al. (1998) that firms in civil law jurisdictions have narrower capital markets by showing that they are much less likely to issue SEOs than firms in

common law jurisdictions. Our results go against the findings of Bancel and Mittoo (2004) and Turk Ariss (2016), who argue that legal jurisdictions do not affect equity policies. We document a clear difference in which variables play an important role in SEO decision-making across legal jurisdictions.

Moreover, our results demonstrate that samples based on firm size measured by market value yield different results for some variables; therefore, looking at the full sample results does not give us a complete picture of firm behavior or SEO determinants. This builds on the study by Psillaki and Daskalakis (2009), who examine capital structure determinants of SMEs by highlighting a difference in what are important factors in SEO policies for firms of different sizes. These results indicate that further studies need to be performed around the subjects of firm size and capital structure or SEO policies.

Finally, we use a technique demonstrated by Ai and Norton (2003) to correct interaction variables in logit regressions. The results of the corrected interaction variables show that the interpretation of these variables would have been very different had they not been corrected. An excellent example of how incorrect interpretations would have been the interaction variable for net operating cashflows. Before the correction, we would have interpreted that for firms in civil law jurisdictions, the likelihood of issuing equity would have increased instead of decreased for an increase in net operating cash flows.

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Tables

Table 1: Sample distribution

Country	N	Legal system
USA	33990	Common law
Canada	6262	Common law
United Kingdom	8000	Common law
Japan	26475	Civil law
Korea	8813	Civil law
Singapore	4579	Common law
Australia	7775	Common law
Hong Kong	1209	Common law
France	4634	Civil law
Germany	4218	Civil law
Italy	1850	Civil law
Spain	951	Civil law
Total number of observations	108756	
Total common law observations	61815	
Total civil law observations	46941	
Total number of firms	17272	

Table 2: Variable descriptive statistics

Variable	Mean	Median	Std Dev	Minimum	Maximum
SEO	0.1020	0.0000	0.3026	0.0000	1.0000
LAW	0.4316	0.0000	0.4953	0.0000	1.0000
MKTBV	1.6693	0.7867	2.9638	-3.7897	14.3035
OANCF	0.0047	0.0014	0.1858	-0.8549	0.2831
RE	-0.8080	0.0023	3.0236	-17.2237	0.7683
LEV	0.2046	0.1618	0.2010	0.0000	0.8264
RUNUP	0.8709	0.0321	4.2916	-0.9753	28.0162
SIZE	19.0041	18.8079	2.1822	14.7329	23.9487
SIZE2	19.0713	19.2369	2.5030	12.0978	23.9044
SALEG	0.0935	0.0352	0.4262	-0.6985	2.1427
ASSG	0.0712	0.0288	0.3052	-0.5434	1.4032
TANG	0.2645	0.2078	0.2300	0.0031	0.8749
INTANG	0.1279	0.0308	0.1839	0.0000	0.6962
PE	11.6851	10.0000	32.8347	-81.1856	143.7845
APTURN	10.3576	6.8904	11.4725	0.3091	62.9886
EPSPI	0.7142	0.1603	2.1685	-3.9317	10.3877
PROFIT	-0.0603	0.0227	0.2942	-1.5260	0.2032
DIV	0.5109	1.0000	0.4999	0.0000	1.0000

Table 3: correlation matrix

	LAW	MKTBV	OANCF	RE	LEV	SIZE	SALEG	TANG	RUNUP	PE	APTURN	PROFIT	EPS	DIV
LAW	1													
MKTBV	0.3053***	1												
OANCF	0.0482***	0.0371***	1											
RE	0.2256***	0.0416***	0.6821***	1										
LEV	0.0262***	0.0843***	0.0374***	0.0761***	1									
SIZE	0.0093***	0.2122***	0.3471***	0.3432***	0.0419***	1								
SALEG	0.0961***	0.1093***	0.0267***	0.0218***	0.0218***	0.0422***	1							
TANG	0.0072**	0.1461***	0.1314***	0.1192***	0.2476***	0.0535***	0.0144***	1						
RUNUP	0.086***	0.0137***	0.0088***	-0.0036	0.0049	0.0281***	0.0469***	-0.0044	1					
PE	0.0914***	0.0187***	0.1626***	0.1428***	0.0284***	0.1761***	0.0028	-0.012***	0.0054*	1				
APTURN	0.0432***	0.0131***	0.083***	0.0844***	-0.0031	0.0265***	0.0457***	0.0132***	0.0152***	0.0332***	1			
PROFIT	0.2041***	0.0232***	0.7716***	0.7338***	0.1156***	0.3639***	0.0007	0.0616***	0.0034	0.1892***	0.0875***	1		
EPS	0.1321***	0.0375***	0.2048***	0.1586***	0.0641***	0.3564***	0.0172***	-0.013***	0.0435***	0.1278***	0.0397***	0.2905***	1	
DIV	0.3002***	0.1449***	0.2025***	0.2508***	0.0377***	0.3192***	0.0721***	0.0779***	0.0098***	0.1532***	0.0279***	0.3053***	0.2375***	1

*** p<0.01, ** p<0.05, * p<0.1 significance levels.

Table 4: Results of the logistic regressions

VARIABLES	(1) Full sample	(2) Large firms	(3) Small firms	(4) Full sample	(5) Large firms	(6) Small firms
LAW	-3.2322***	-3.2986***	-3.5810***	-3.1850***	-3.0650***	-1.8315***
	(0.2509)	(0.7183)	(0.4903)	(0.2485)	(0.6137)	(0.3732)
MKTBV	0.0482***	0.0108*	0.0634***	0.0442***	0.0106*	0.0511***
	(0.0033)	(0.0059)	(0.0042)	(0.0032)	(0.0057)	(0.0041)
OANCF	-2.0215***	-3.0757***	-1.7283***	-1.5240***	-2.8272***	-1.1200***
	(0.0861)	(0.2490)	(0.0926)	(0.0862)	(0.2477)	(0.0930)
RE	0.0521***	0.0140	0.0484***	0.0689***	0.0334	0.0643***
	(0.0048)	(0.0231)	(0.0049)	(0.0047)	(0.0241)	(0.0048)
LEV	0.0678	0.8075***	-0.2721***	0.4687***	0.9254***	0.2402***
	(0.0566)	(0.1033)	(0.0699)	(0.0574)	(0.1057)	(0.0708)
SIZE	-0.0173**	0.0540***	-0.0674***			
	(0.0067)	(0.0185)	(0.0126)			
SALEG	0.2761***	0.5140***	0.2129***			
	(0.0196)	(0.0415)	(0.0223)			
TANG	0.3682***	-0.1650*	0.5730***			
	(0.0489)	(0.0866)	(0.0597)			
SIZE2				-0.1414***	-0.0711***	-0.2271***
				(0.0063)	(0.0143)	(0.0089)
ASSG				0.3462***	0.5968***	0.2073***
				(0.0292)	(0.0554)	(0.0349)
INTANG				0.5447***	0.1340	0.6953***
				(0.0580)	(0.0962)	(0.0737)
RUNUP	0.0216***	0.0433***	0.0145***	0.0166***	0.0409***	0.0087**
	(0.0031)	(0.0057)	(0.0038)	(0.0032)	(0.0057)	(0.0039)
PE	-0.0008**	0.0002	-0.0010*	-0.0004	0.0002	-0.0002
	(0.0004)	(0.0005)	(0.0006)	(0.0004)	(0.0005)	(0.0006)
APTURN	-0.0003	0.0065***	-0.0044***	0.0021**	0.0063***	0.0004
	(0.0010)	(0.0015)	(0.0014)	(0.0010)	(0.0015)	(0.0014)
PROFIT	-0.0134	0.1727	-0.0733	-0.0217	0.0069	0.0343
	(0.0584)	(0.2312)	(0.0611)	(0.0588)	(0.2325)	(0.0623)
EPS	-0.0395***	-0.0733***	0.0125	-0.0180**	-0.0514***	-0.0345*
	(0.0083)	(0.0113)	(0.0164)	(0.0086)	(0.0112)	(0.0188)
DIV	-0.2730***	0.0945**	-0.5719***	-0.1296***	0.1522***	-0.4418***
	(0.0297)	(0.0444)	(0.0446)	(0.0300)	(0.0445)	(0.0451)
INTMKTBV	0.0075	0.0853***	-0.0409***	0.0122	0.0956***	-0.0473***
	(0.0091)	(0.0167)	(0.0114)	(0.0092)	(0.0170)	(0.0117)
INTOANCF	0.3134	3.5179***	-0.4162	-0.0905	3.0433***	-0.7431***
	(0.2358)	(0.7031)	(0.2569)	(0.2399)	(0.7308)	(0.2600)
INTRE	0.0145	-0.1022	0.0299	0.0099	-0.1151	0.0366
	(0.0237)	(0.1350)	(0.0243)	(0.0238)	(0.1370)	(0.0244)
INTLEV	1.7594***	1.8104***	1.7458***	1.0977***	1.3888***	1.1774***

	(0.1261)	(0.2429)	(0.1500)	(0.1203)	(0.2425)	(0.1422)
INTSIZE	0.1523***	0.1281***	0.1802***			
	(0.0133)	(0.0340)	(0.0276)			
INTSALEG	0.1003*	-0.0185	0.1440**			
	(0.0604)	(0.1387)	(0.0672)			
INTTANG	-1.1063***	-0.5863**	-1.2261***			
	(0.1244)	(0.2298)	(0.1481)			
INTSIZE2				0.1421***	0.1125***	0.0815***
				(0.0133)	(0.0293)	(0.0208)
INTASSG				0.4630***	0.3752**	0.4756***
				(0.0788)	(0.1581)	(0.0916)
INTINTANG				0.6364***	0.6680***	0.1242
				(0.1468)	(0.2508)	(0.1880)
INTEPS	0.0141	0.0460***	-0.0433**	0.0110	0.0353**	0.0050
	(0.0124)	(0.0178)	(0.0213)	(0.0125)	(0.0175)	(0.0233)
INTPE	-0.0006	-0.0004	-0.0009	-0.0008	-0.0004	-0.0017*
	(0.0007)	(0.0012)	(0.0009)	(0.0007)	(0.0012)	(0.0009)
INTAPTURN	0.0017	-0.0060	0.0063**	-0.0025	-0.0096**	0.0004
	(0.0021)	(0.0045)	(0.0025)	(0.0021)	(0.0045)	(0.0025)
INTPROFIT	-1.6577***	-2.0165***	-1.4517***	-1.8827***	-1.9484***	-1.5326***
	(0.1413)	(0.7227)	(0.1469)	(0.1468)	(0.7332)	(0.1545)
INTRUNUP	-0.0068	-0.0291***	-0.0000	-0.0040	-0.0289***	0.0031
	(0.0045)	(0.0087)	(0.0052)	(0.0045)	(0.0087)	(0.0053)
INTDIV	-0.8746***	-0.6762***	-0.8177***	-0.8544***	-0.6869***	-0.7391***
	(0.0556)	(0.0958)	(0.0746)	(0.0568)	(0.0963)	(0.0768)
Constant	-1.7404***	-3.3927***	-0.7931***	0.4098***	-0.9410***	1.8693***
	(0.1236)	(0.3847)	(0.2182)	(0.1095)	(0.2863)	(0.1470)
Observations	108,756	41,651	67,105	108,756	41,651	67,105

This table presents the results of our logistic regression model. The dependent variable is SEO, which takes the value of 1 if a firm issued an SEO in a given year, and 0 otherwise. Column (1) presents the results of our full sample, Column (2) presents the results of our sample of large firms, and Column (3) presents the results of our sample of smaller firms. Columns (4), (5), and (6) present the results of the same samples under our second model, which uses alternative measures for size, growth, and tangibility. The sample period is from 2009 to 2018. Standard errors are presented in the parentheses. *** p<0.01, ** p<0.05, * p<0.1 significance levels.

Table 5: Results of the corrected interaction variables

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Full sample	Large firms	Small firms	Full sample	Large firms	Small firms
INTMKTBV	-0.0060***	0.0007	-0.0095***	-0.0054***	0.0012	-0.0068***
	(0.0007)	(0.0012)	(0.0013)	(0.0007)	(0.0121)	(0.0012)
INTOANCF	0.2702***	0.0452***	0.2140***	0.1944***	0.4132***	0.0738***
	(0.0235)	(0.0683)	(0.0331)	(0.0208)	(0.0609)	(0.0303)
INTRE	-0.0064***	-0.0040	-0.0055***	-0.0086***	-0.0067*	-0.0048***
	(0.0012)	(0.0049)	(0.0014)	(0.0012)	(0.0051)	(0.0018)
INTLEV	0.0424***	-0.0526***	0.0888***	-0.0298***	-0.0756***	0.0312*
	(0.0115)	(0.0285)	(0.0152)	(0.01193)	(0.0284)	(0.0179)
INTSIZE	0.0114***	0.0057*	0.0146***			
	(0.0026)	(0.0051)	(0.0039)			
INTSALEG	-0.0329***	-0.0616***	-0.0237***			
	(0.0045)	(0.0121)	(0.0672)			
INTTANG	-0.0761***	0.0063	-0.1067***			
	(0.0093)	(0.0147)	(0.0145)			
INTSIZE2				0.0132***	0.0086***	0.0011***
				(0.0014)	(0.0019)	(0.0018)
INTASSG				-0.0318***	-0.0624***	0.0002
				(0.0641)	(0.0143)	(0.0087)
INTINTANG				-0.0529***	0.0020	-0.0610***
				(0.0118)	(0.0164)	(0.0189)
INTEPS	0.0055***	0.0097***	-0.0029	0.0026**	0.0069***	0.0035*
	(0.0014)	(0.0022)	(0.0002)	(0.0014)	(0.0019)	(0.0027)
INTPE	0.0001	-0.0004	0.0001	0.0001	-0.0002	-0.0005
	(0.0001)	(0.0001)	(0.0010)	(0.0001)	(0.0008)	(0.0008)
INTAPTURN	0.0001	-0.0090***	0.0007	-0.0003**	-0.0098***	-0.0002
	(0.0002)	(0.0002)	(0.0026)	(0.0002)	(0.0020)	(0.0002)
INTPROFIT	-0.0499***	-0.0676*	-0.0376***	-0.0582***	-0.0479	-0.0817***
	(0.0125)	(0.0407)	(0.0146)	(0.0131)	(0.0412)	(0.0175)
INTRUNUP	-0.0030***	-0.0058***	-0.0020***	-0.0022***	-0.0056***	-0.0007*
	(0.0054)	(0.0012)	(0.0007)	(0.0054)	(0.0011)	(0.0005)
INTDIV	-0.0082***	-0.0269***	-0.0437***	-0.0076	-0.0345***	-0.0269***
	(0.0064)	(0.0072)	(0.0156)	(0.0568)	(0.0963)	(0.0117)
Observations	108,756	41,651	67,105	108,756	41,651	67,105

This table presents the results of the corrected interaction variable based on (Ai et al., 2004). Column (1) presents the results of our full sample, Column (2) presents the results of our sample of large firms, and Column (3) presents the results of our sample of smaller firms. Columns (4), (5), and (6) present the results of the same samples under our second model, which uses alternative measures for size, growth, and tangibility. The sample period is from 2009 to 2018. Standard errors are presented in the parentheses. *** p<0.01, ** p<0.05, * p<0.1 significance levels.

Table 6: Summary of the results

	Full sample		Large firms		Small firms	
Variables	Common law	Civil law	Common law	Civil law	Common law	Civil law
MKTBV	Increases	Less	Increases*	No difference	Increases	Less
OANCF	Decreases	Less	Decreases	Less	Decreases	Less
RE	Increases	Less	No effect	No difference	Increases	Less
LEV	No effect	Increases	Increases	Less	Decreases	Less
SIZE	Decreases	Less	Increases	More*	Decreases	Less
SALEG	Increases	Less	Increases	Less	Increases	Less
EPS	Decreases	Less	Decreases	Less	No effect	No difference
TANG	Increases	less	Decreases*	No difference	Increases	Less
PE	Decreases	No difference	No effect	No effect	Decreases	No difference
APTURN	No effect	No effect	Increases	less	Decreases	Less
PROFIT	No effect	Decreases	No effect	Decreases*	No effect	Decreases
RUNUP	Increases	Less	Increases	Less	Increases	Less
DIV	Decreases	More	Increases**	Less	Decreases	More

This table presents the summary of results from table 4 and table 5 for the first 3 Columns. If the coefficient of each variable presented is significant for common law firms, the direction of the coefficient (increase/decrease) is shown. If the coefficient for the interaction variable is significant, the direction of the difference of log odds ratio is shown for the civil law firms. If the coefficient is not significant for the common law firms, the entry will show "no effect." If the coefficient was significant for common law firms, but the coefficient of the interaction variable is not significant, the entry will show "no difference" for the civil law firms. If the coefficient is not significant for the common law firms and the coefficient of the interaction variable is also not significant, the entry will have "no effect" for the civil law firms. If the coefficient is not significant for the common law firms and the coefficient of the interaction variable is significant, the direction of the coefficient (increase/decrease) is shown for the civil law firms. If the coefficients for the variable or the interaction variables are less significant than the 1% level, we put ** $p<0.05$, * $p<0.1$ significance level

Table 7: Results of the logistic regressions for the sample without North American data

VARIABLES	(1) Full sample	(2) Large firms	(3) Small firms	(4) Full sample	(5) Large firms	(6) Small firms
LAW	-3.6346***	-6.8863***	-3.4819***	-3.8423***	-5.5199***	-1.8969***
	(0.3035)	(1.0162)	(0.5489)	(0.2824)	(0.7657)	(0.4042)
MKTBV	0.0842***	0.0571***	0.0934***	0.0544***	0.0118	0.0558***
	(0.0078)	(0.0162)	(0.0094)	(0.0075)	(0.0166)	(0.0089)
OANCF	-2.1543***	-2.3362***	-2.0386***	-1.3328***	-1.6490***	-1.1588***
	(0.1561)	(0.5170)	(0.1665)	(0.1600)	(0.5435)	(0.1702)
RE	-0.0493***	-0.1746*	-0.0438***	0.0038	-0.1656*	0.0150
	(0.0132)	(0.0908)	(0.0137)	(0.0132)	(0.0926)	(0.0135)
LEV	-0.1146	0.6554***	-0.2564**	0.4951***	0.8254***	0.4251***
	(0.1007)	(0.2531)	(0.1110)	(0.1055)	(0.2626)	(0.1163)
SIZE	-0.0078	-0.0845**	-0.0263			
	(0.0119)	(0.0385)	(0.0189)			
SALEG	0.3814***	0.7900***	0.3328***			
	(0.0378)	(0.1171)	(0.0401)			
TANG	1.0582***	0.1036	1.2526***			
	(0.0731)	(0.1792)	(0.0808)			
SIZE2				-0.1412***	-0.1638***	-0.1848***
				(0.0101)	(0.0271)	(0.0124)
ASSG				0.6682***	0.8751***	0.5703***
				(0.0570)	(0.1467)	(0.0621)
INTANG				0.9543***	1.0768***	0.8884***
				(0.0858)	(0.1811)	(0.0982)
RUNUP	0.0053***	0.0030	0.0068***	0.0042**	0.0030	0.0049**
	(0.0017)	(0.0030)	(0.0021)	(0.0017)	(0.0030)	(0.0022)
PE	0.0001	0.0015	-0.0004	0.0002	0.0008	-0.0003
	(0.0006)	(0.0011)	(0.0007)	(0.0006)	(0.0011)	(0.0007)
APTURN	-0.0089***	-0.0095**	-0.0084***	-0.0068***	-0.0071*	-0.0055***
	(0.0018)	(0.0041)	(0.0021)	(0.0018)	(0.0041)	(0.0020)
PROFIT	-1.1702***	-0.9416*	-1.1852***	-1.4749***	-1.1582**	-1.4131***
	(0.1147)	(0.5502)	(0.1193)	(0.1215)	(0.5701)	(0.1276)
EPS	-0.1257***	-0.1536***	-0.0538	-0.0795**	-0.1313***	-0.0819
	(0.0330)	(0.0499)	(0.0537)	(0.0350)	(0.0509)	(0.0716)
DIV	-0.5287***	-0.1824**	-0.7082***	-0.3430***	-0.1023	-0.5635***
	(0.0495)	(0.0918)	(0.0627)	(0.0491)	(0.0937)	(0.0629)
INTMKTBV	-0.0130	0.0705***	-0.0715***	0.0197	0.1301***	-0.0564***
	(0.0131)	(0.0252)	(0.0165)	(0.0131)	(0.0256)	(0.0167)
INTOANCF	0.6205**	2.6134***	-0.1282	-0.0407	1.7553**	-0.6907**
	(0.3008)	(0.8587)	(0.3325)	(0.3072)	(0.8944)	(0.3378)
INTRE	0.1268***	0.1086	0.1297***	0.0922**	0.0920	0.1059***
	(0.0379)	(0.1589)	(0.0395)	(0.0379)	(0.1608)	(0.0394)
INTLEV	2.0587***	2.0731***	1.8533***	1.1525***	1.5845***	1.0901***

	(0.1554)	(0.3419)	(0.1785)	(0.1531)	(0.3467)	(0.1747)
INTSIZE	0.1482***	0.2693***	0.1542***			
	(0.0167)	(0.0490)	(0.0312)			
INTSALEG	0.1205	-0.1160	0.1364			
	(0.0777)	(0.1965)	(0.0852)			
INTTANG	-1.7867***	-0.8282***	-1.9034***			
	(0.1373)	(0.2811)	(0.1599)			
INTSIZE2				0.1519***	0.2088***	0.0575**
				(0.0156)	(0.0375)	(0.0228)
INTASSG				0.4231***	0.3205	0.3972***
				(0.1028)	(0.2307)	(0.1165)
INTINTANG				0.1610	-0.3945	-0.0583
				(0.1634)	(0.2979)	(0.2035)
INTEPS	0.1175***	0.1397***	0.0451	0.0840**	0.1243**	0.0731
	(0.0339)	(0.0511)	(0.0549)	(0.0357)	(0.0521)	(0.0725)
INTPE	-0.0011	-0.0016	-0.0011	-0.0009	-0.0009	-0.0012
	(0.0008)	(0.0015)	(0.0010)	(0.0008)	(0.0015)	(0.0010)
INTAPTURN	0.0107***	0.0100*	0.0104***	0.0066**	0.0038	0.0062**
	(0.0027)	(0.0060)	(0.0030)	(0.0027)	(0.0060)	(0.0030)
INTPROFIT	-1.6362***	-1.3830	-1.4561***	-1.6877***	-1.2781	-1.2935***
	(0.1969)	(0.8778)	(0.2064)	(0.2082)	(0.8956)	(0.2215)
INTRUNUP	-0.0018	0.0010	-0.0036	-0.0012	0.0005	-0.0022
	(0.0019)	(0.0035)	(0.0023)	(0.0019)	(0.0035)	(0.0024)
INTDIV	-0.5365***	-0.3522***	-0.6097***	-0.5640***	-0.3943***	-0.5577***
	(0.0691)	(0.1254)	(0.0874)	(0.0695)	(0.1270)	(0.0890)
				(0.0858)	(0.1811)	(0.0982)
Constant	-1.5584***	0.0331	-1.2633***	0.7649***	1.3543**	1.5013***
	(0.2062)	(0.7894)	(0.3218)	(0.1689)	(0.5310)	(0.2025)
Observations	68,504	21,250	47,254	68,504	21,250	47,254

This table presents the results of our logistic regression model for the sample that excludes the North American observations. The dependent variable is SEO, which takes the value of 1 if a firm issued an SEO in a given year, and 0 otherwise. Column (1) presents the results of our full sample, Column (2) presents the results of our sample of large firms, and Column (3) presents the results of our sample of smaller firms. Columns (4), (5), and (6) present the results of the same samples under our second model, which uses alternative measures for size, growth, and tangibility. The sample period is from 2009 to 2018. Standard errors are presented in the parentheses. *** p<0.01, ** p<0.05, * p<0.1 significance levels.

Table 8: Results of the corrected interaction variables for the sample without North American data

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Full sample	Large firms	Small firms	Full sample	Large firms	Small firms
INTMKTBV	-0.0130***	0.0022	-0.0168***	-0.0070***	0.0046**	-0.0088***
	(0.0019)	(0.0020)	(0.0031)	(0.0018)	(0.0022)	(0.0022)
INTOANCF	0.3461***	0.1251**	0.2987***	0.1885***	0.1504**	0.0824***
	(0.0462)	(0.0728)	(0.0634)	(0.0404)	(0.0980)	(0.0465)
INTRE	0.0124***	0.0059	0.0118***	0.0031	0.0116	0.0039
	(0.0033)	(0.0096)	(0.0035)	(0.0030)	(0.0135)	(0.0032)
INTLEV	0.1041***	0.0701**	0.1183***	-0.0290*	0.0116	0.0218
	(0.0230)	(0.0285)	(0.0270)	(0.0229)	(0.0473)	(0.0288)
INTSIZE	0.0099***	0.0196***	0.0120***			
	(0.0027)	(0.0141)	(0.0037)			
INTSALEG	-0.0052***	-0.0119	-0.0440***			
	(0.0101)	(0.0208)	(0.0126)			
INTTANG	-0.2092***	-0.0327**	-0.2489***			
	(0.0222)	(0.0152)	(0.0347)			
INTSIZE2				0.0165***	0.0207***	0.0122***
				(0.0014)	(0.0036)	(0.0021)
INTASSG				-0.0789***	-0.0305***	-0.0370**
				(0.0162)	(0.0412)	(0.0199)
INTINTANG				-0.1302***	-0.0661**	-0.0955***
				(0.0225)	(0.0461)	(0.0309)
INTEPS	0.0232***	0.0081*	0.0098	0.0148**	0.0069***	0.0121
	(0.0232)	(0.0059)	(0.0102)	(0.0066)	(0.0019)	(0.0111)
INTPE	0.0001	-0.0001	0.0001	0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
INTAPTURN	0.0018***	0.0005	0.0017***	0.0015***	0.0005	0.0009**
	(0.0003)	(0.0004)	(0.0026)	(0.0003)	(0.0005)	(0.0003)
INTPROFIT	0.1025***	-0.0456	0.1117***	0.1371***	0.0034	0.0708**
	(0.0332)	(0.0407)	(0.0445)	(0.0376)	(0.0815)	(0.0473)
INTRUNUP	-0.0008***	0.0001	-0.0012***	-0.0006**	-0.0001	-0.0006*
	(0.0003)	(0.0002)	(0.0004)	(0.0003)	(0.0003)	(0.0004)
INTDIV	0.0464***	-0.0149**	0.0779***	0.0183**	-0.0138*	0.0493***
	(0.0157)	(0.0087)	(0.0264)	(0.0124)	(0.0104)	(0.0193)
Observations	108,756	41,651	67,105	108,756	41,651	67,105

This table presents the results of the corrected interaction variable for the sample that excludes the North American observations based on (Ai et al., 2004). Column (1) presents the results of our full sample, Column (2) presents the results of our sample of large firms, and Column (3) presents the results of our sample of smaller firms. Columns (4), (5), and (6) present the results of the same samples under our second model, which uses alternative measures for size, growth, and tangibility. The sample period is from 2009 to 2018. Standard errors are presented in the parentheses. *** p<0.01, ** p<0.05, * p<0.1 significance levels.

Appendix A: Corrected interaction effects

Variable	Description	Source
SEO	Dummy Variable that takes the value 1 if the firm issued a seasoned equity offer and the value 0 if it did not	SDC
LAW	Dummy variable that takes the value 1 if the firm is in a civil law jurisdiction and the value 0 if the firm is in a common law jurisdiction	
Market to Book (MKTBV)	Market price of Equity over book price of Equity	COMPUSTAT
Sales growth (SALEG)	change in sales	COMPUSTAT
Asset growth (ASSG)	change is assets	COMPUSTAT
Leverage (LEV)	total debt divided by total assets	COMPUSTAT
Operating cashflows (OANCF)	Net operating cashflows divided by Total assets	COMPUSTAT
Retained earnings (RE)	Retained earning divided by Total assets	COMPUSTAT
Size 1 (SIZE1)	Natural log of market value	COMPUSTAT
Size 2 (SIZE2)	Natural log of Sales	COMPUSTAT
Runup (RUNUP)	Stock return over the last fiscal year	COMPUSTAT
Tangibility (TANG)	Net tangible assets/ Total assets	COMPUSTAT
Intangibility (INTANG)	Net intangible assets/ Total assets	COMPUSTAT
Price-earnings ratio (PE)	Pricer per share divided by Earnings per share	COMPUSTAT
AP Turnover (APTURN)	Average accounts payables divided by the cost of goods sold	COMPUSTAT
Profit (PROFIT)	Net earnings over total assets	COMPUSTAT
Earnings per share (EPS)	Earnings per share	COMPUSTAT
Dividend Dummy (DIV)	Dummy variable that takes the value 1 if the firm pays dividends and the value 0 if it does not	COMPUSTAT
INTMKTBV	Interaction variable between LAW and MKTBV	
INTOANCF	Interaction variable between LAW and OANCF	

INTRE	Interaction variable between LAW and RE
INTLEV	Interaction variable between LAW and LEV
INTSIZE	Interaction variable between LAW and SIZE
INTSIZE2	Interaction variable between LAW and SIZE2
INTSALEG	Interaction variable between LAW and SALEG
INTASSG	Interaction variable between LAW and ASSG
INTEPS	Interaction variable between LAW and EPS
INTTANG	Interaction variable between LAW and TANG
INTINTANG	Interaction variable between LAW and INTANG
INTPE	Interaction variable between LAW and PE
INTAPTURN	Interaction variable between LAW and APTURN
INTPROFIT	Interaction variable between LAW and PROFIT
INTRUNUP	Interaction variable between LAW and RUNUP
INTDIV	Interaction variable between LAW and DIV

Appendix B: Corrected interaction effects

To illustrate why the interaction effects should be corrected as demonstrated by Ai et al. (2004), we provide the equations for calculating the marginal effect of the interaction term between two continuous variables.

We begin by presenting the equation for the expected value of the dependent variable y

$$E[y|x_1, x_2, X] = \Phi(\beta_1 x_1 + \beta_2 x_2 + \beta_{12} x_1 x_2 + X\beta) = \Phi(u)$$

Where Φ is the standard normal cumulative distribution, X is independent of x_1 and x_2, and u denotes $\beta_1 x_1 + \beta_2 x_2 + \beta_{12} x_1 x_2 + X\beta$.

In a linear model the marginal effect of the interaction term $x_1 x_2$ is the derivative of the expected value of y

$$\partial\Phi(u)/\partial (x_1 x_2) = \beta_{12}\Phi'(u)$$

In nonlinear models, many researchers interpret the interaction effect the same way. However, the full interaction effect is the cross-partial derivative of the expected value of y, which is a dummy variable in this case.

$$\partial^2\Phi(u)/\partial x_1 \partial x_2 = \beta_{12}\Phi'(u) + (\beta_1 + \beta x_1 x_2)(\beta_2 + \beta_{12} x_1)\Phi''(u)$$

As we can see from the above two equations, the interaction effects are not equal and therefore should not be interpreted based on the linear model intuition.