ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

Bachelor Thesis [Economics & Business Economics]

Title thesis: The Impact of Financial Globalization on Foreign IPO-Activity
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Date final version: 21-11-21
Abstract: This paper examines how the level of foreign initial public offerings (IPO) is impacted by financial globalization and to what extent financially open countries do make use of venture capitalists as financial intermediary from other countries over the years 1998-2021. Based on three different regression models we can conclude that financial globalization positively impacts the level of foreign IPOs on the world's level and U.S. level.

Contents

1 Introduction

An important event in the life of a firm is the transition from a private to a public firm. This is called an Initial Public Offering (IPO), the private firm issues shares on a security exchange such as the New York Stock Exchange or Nasdaq and becomes a public firm. There are several reasons for a company to decide to go public. The most important and obvious one is to raise additional capital to fund future growth. Some other reasons are because a private shareholder wants to sell their share or to improve the reputation of the firm. Doidge et al. (2013) showed that in the past two decades IPO activity strongly declined in the US compared to the rest of the world. This was partly due to the extraordinary growth of IPOs in countries other than the US in the 1990s. But in the 2000s global IPOs plays an important role in the dramatic shift in IPO activity around the world. A global IPO is an IPO in which some of the proceeds are raised outside the firm's home country. Furthermore, the paper finds that there's a positive effect between the quality of a country's institution and its domestic IPO activity, but it's negatively related to its global IPO activity. Another phenomenon which could influence IPO activity around the world is financial globalization. Financial globalization is an aggregate concept that refers to increasing global linkages created through cross- border financial flows (Prasad et al., 2005). Financial integration refers to an individual country's linkages to international capital markets.

Doidge et al. (2011) leaves open some important issues in their paper. To better understand the impact of financial globalization on IPO activity an investigation of the extent to which firms going public in financially open countries make use of institutions and resources from other countries could be very interesting. Lowry et al. (2017) also depict the fact that it is currently unclear whether globalization has caused companies to increasingly choose non-US markets over US markets. The main research question in the paper is the following:

What is the effect of financial globalization on foreign IPO activity around the world and to what extent do financially open countries make use of institutions and resources from other countries?

Furthermore, it raises the question of whether the relation between IPO activity and institutions is stable through time and holds up with the rapid globalization of financial markets and with the rise of IPO activity all around the world. There are good reasons that globalization decreases the importance of national institutions (Doidge et al., 2011). Another important aspect to account for which has an impact on IPO activity is the concept of IPO waves, IPOs are known for their cyclical behavior. There are so called 'hot issue IPO markets' in which there is a relatively high IPO activity compared to the normal state. In these hot issue periods, it is more attractive for a firm to go public and issue shares because there is more investor optimism during these hot issue periods (Chemmanur & He, 2011).

This research uses Bloomberg, the ThomsonOne (SDC) and the database from Warrington College of Business (based on Dealogic) to analyze domestic and foreign IPO-activity on the world's level and U.S. level over the years 1998-2021. The level of foreign IPO-activity increased strongly compared to domestic IPOs. Two different regressions will be performed to analyze the impact of financial globalization on the world and U.S. foreign IPO activity level and different control variables will be added to the models to prevent a possible omitted variable bias. Financial globalization is computed the same as Doidge et al. (2013) and Caglio et al. (2016) did in their papers, but on a much more recent sample. I find evidence that is consistent with the academic literature that the level of foreign IPO-activity is positively impacted by financial globalization. Also, financial globalization has a stronger effect on the number of IPOs when looking to the world compared with the U.S. and this is due to the fact that in the last decades the level of U.S. IPO-activity strongly declined compared to the rest of the world. Furthermore, to measure to what extent financial open countries make use of institutions and resources from other countries the level of venture backed foreign IPOs will be analyzed in a new regression model for the same period, with the same control variables. In the last couple of decades the level of venture capital backed foreign IPOs increased dramatically and this could be due to financial globalization. But unfortunately, the model is insignificant and therefore it still remains unclear to what extent companies make use of foreign institutions when they go public.

The remainder of the paper is organized as follows: section 2 argues the relevance of this research and offers a closer look at the underlying theory. The two different types of IPOs, measurement of financial globalization and venture capitalists as financial intermediary will and how I analyze and interpret it will be discussed in section 3. Section 4 describes how the data for the different variables is obtained and the results are presented in section 5. Last, the limitations will be discussed in section 6 and the paper concludes in section 7.

2 Relevance and Underlying Theory

In the last decades the world became more and more financially integrated which makes it easier for individual countries to make use of international capital markets. As stated in the introduction, IPO activity in the U.S. strongly declined compared to the rest of the world and a possible reason for this shift in IPO activity is the concept of financial globalization. It could be that firms found other ways to bypass their constraints of going public in their home country and use global markets to go public (Doidge et al., 2011). As said before, Doidge et al. (2011) showed that in the past two decades the IPO activity strongly declined in the US compared to the rest of the world, but they left open some important questions. One of them is the effect of financial globalization on the foreign IPO activity.

A more recent study examined the effect of globalization on global underwriter activity. Caglio et al. (2016) showed that home country financial globalization plays a stronger role on the amount and number of IPOs going public in a country compared to world globalization. Furthermore, global financial intermediaries play an important role in moving capital across different countries, and this is strongly related to financial globalization. One of the most important financial intermediaries are the global underwriters. Caglio et al. (2016) find that the use of global underwriters is an important determinant in the decision to go public outside the firm's home country and they find that foreign IPOs are more likely to make use of global underwriters. They conclude that these findings show that markets become more integrated through issuance and listing of new capital. They also find that foreign IPO issuers are more likely to

choose a global underwriter if the home country is less financially integrated.

Venture-capital-backed IPOs also plays an important role as financial intermediary in moving capital across countries. A venture-capital backed IPO is an initial public offering of shares of a company that is mainly supported by venture capital investors. Venture capital is a type of private equity. The so-called angel investors are looking for high-growth potential companies and they particularly invest in early-staged companies in exchange for an equity stake. The institutional investors aim to maximize their returns through an exit strategy, such a possible exit strategy is a venture capital-backed IPO. The venture capital investors wait for the most optimal moment in time to conduct an IPO to maximize their returns (Nguyen, 2018). Another study who examined the effect of globalization on capital markets is the one from Glavina (2015). She looked at the effect of globalization on the Warsaw Stock Exchange (WSE), a newcomer on the European stock market. The main findings of her research are that there is an increase in the number of foreign investor on the WSE and this is mainly due to the fact of emergence of the new international financial institutions and availability of financial services regardless of geographical jurisdictions and removal of restrictions. To the best of my knowledge there is very little research on the effect of financial globalization and the IPO activity around non-US markets and US markets which makes this study very relevant.

3 Methodology

3.1 Domestic and Foreign IPO-activity

A similar methodological framework of Doidge et al. (2011) will be used in this study. First of all, the number of domestic and foreign IPOs per year need to be constructed to analyze the effect of financial globalization during the last decades. Doidge et al. (2011) obtained their data from the Securities Data Company's (SDC) Global New Issues Database to obtain the number of domestic, global and total IPO's. Caglio et al. (2016) obtained their data from Bloomberg to measure IPO activity. They looked at the total proceeds from foreign, global and domestic IPOs over the pe-

riod from 1995 through 2011. In this research Bloomberg and the ThomsonOne Database are used to obtain the data for domestic and foreign IPO-Activity around the world, which is the same database as Caglio et al. (2016) used in their research paper. The data provides me the number of domestic and foreign IPOs as well as the proceeds for the years 1998-2021. Furthermore, the database from Warrington College of Business, which is based on Dealogic is used to analyze the foreign IPO-activity in the U.S. and the impact of financial globalization on it.

3.2 Financial Globalization

Several studies focused on which indicators should be used to measure the financial openness and integration of different countries. There are three types of indicators, namely a de jure, de facto and a hybrid indicator. The indicator used in this research paper is a so called de facto indicator which is explained below. An alternative way to measure the financial openness and thus the level of a country's financial globalization is the KAOPEN-index (Chinn & Ito, 2008). To be more specific, the index measures a country's degree of capital account openness and is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions. This indicator is a so-called de jure measure, and it is based on the data constructed by the Annual Report on Exchange Rate Arrangements and Exchange Restrictions, published by the International Monetary Fund. De jure measures are set by limitations, which means that they do not always reflect the actual degree of financial integration of an economy into international capital markets. Furthermore, D. P. Quinn & Toyoda (2008), D. Quinn et al. (2011), Kose et al. (2009) stated that de jure measures do not capture the degree of enforcement capital controls. As said before, this paper measures the level of financial globalization in the same way as Lane and Milesi-Ferretti (2007) did, which is a de facto indicator. A de facto indicator is quantity-based indicator that uses actual flows to capture de facto integration for emerging markets and developing countries. But, also the facto indicators have their limitations. One of them is that a de facto indicator is inconsistent reporting and treatment of FDI across countries over time. Furthermore, a limitation of this indicator is that they may

fail to accurately reflect a government's policy stance. There is an important difference between de jure and de facto indicators which need to be accounted for. According to the research of Kose et al. (2009) there are differences in the average openness's between the two different measures. Namely, the average de jure openness did not change much in the last two decades but de facto integration did change dramatically. The results are thus different between de jure and de facto indicators (Estrada et al., 2015).

Thus, to measure the level of financial globalization, I will construct two different measures of financial globalization as done before in recent work. The first measure is the same formula as computed in the paper of Doidge et al. (2011) based on the data constructed by Lane & Milesi-Ferretti (2007). The second measure of globalization (Country Financial Globalization) is the same as Caglio et al. (2016) constructed in their paper. The measure is computed as the sum of the individual country's external assets and liabilities divided by its GDP.

To compute the level of World Financial Globalization the external assets and liabilities for each of the countries need to be summed and subsequently divided the total by the sum of the countries' GDP, this measure is the same for each country and only varies by year as Doidge et al. (2013) did. The data is obtained from the IMF Database and it contains the level of external assets and liabilities for the years 1998-2020. The 28 countries with the most active listing market are selected based on their IPO-activity. Doidge et al. (2013) used the database of Lane and Ferretti (2007) to compute World Financial Globalization, but their data only contains the level of external assets and liabilities and a countries GDP for the years 1992-2004. As the world becomes more financially integrated every year, decided is to construct the World Financial Globalization based on the data from IMF Database and it contains the level of external assets and liabilities for the years 1998-2020 which makes this research much more relevant. The World Bank World's Development Indicators (WDI) is used to obtain a countries GDP for the period 1998-2020.

The second measure of financial globalization is Country Financial Globalization. It is computed as the sum of an individual country's external assets and liabilities divided by its GDP (Doidge et al., 2013). A countries external assets and liabilities and GDP is com-

puted the same as by the variable World Financial Globalization. Combining the level of IPO activity and the two different measures of financial globalization makes it possible to investigate the impact of financial globalization on the IPO-activity. A regression will be performed with the number of foreign IPOs as the dependent variable and the world's financial globalization as the independent variable.

Doidge et al. (2011) and Caglio et al. (2016) differ in their methodology on including individual country globalization. Namely, Caglio et al. (2016) suggests that it may be an important determinant of underwriter activity in the home country while Doidge et al. (2011) states that the country-level measure, even if it is lagged, will likely be higher for countries that recently had global IPOs. However, Caglio et al. (2016) finds that the correlation is negative and very close to zero between the amount of global proceeds raised in a specific country in the last three years and the level of a country's financial globalization. Based on these findings I decided to include individual country globalization in my research. To control for the effect of financial globalization on the decision to go public and list abroad, Caglio et al. (2016) restricted their sample to only those IPOs that actually got listed in a foreign country and they find different results compared to the study of Doidge et al. (2011). They do not find a strong relationship between the level of world financial globalization and the choice between a domestic or foreign IPO. They found evidence that the extent to which the home country is integrated with the global economy reduces the benefits of making use of a foreign IPO and their institutions.

3.3 Venture Capital Backed IPOs

One of the main finding from Doidge et al. (2013) is that growth in importance of global IPOs could not have taken place without the increased integration of financial markets around the world. According to Caglio et al. (2016), global intermediaries such as investment banks are one of the primary mechanisms through which financial globalization occurs and they looked specifically into the role of global underwriters. They found a positive relationship between the level of foreign and global IPOs and the level of financial globalization. In this research, hypothesized is that venture capital

backed IPOs is another primary mechanism through which financial globalization occurs. The focus will be on the level of venture capital backed foreign IPOs, because when examining only the level of foreign IPOs it becomes clear to what extent financially open countries make use of institutions from other country's. The U.S. has the highest number of VC backed IPOs and Europe is the second biggest player. Europe has only a small number of countries that make use of venture capitalists, such as the United Kingdom and Sweden (Nguyen, 2018). Cumming et al. (2017) showed that the VC market in the U.S. is four times bigger compared to the of Europe, which means that Europe is still viewed as a developing and growing VC market. But as I will explain in section 4.4, the level of VC backed foreign IPOs dramatically increased in the last years and this could be due to financial globalization. The growing importance of venture capitalists as financial intermediaries for foreign IPOs makes it relevant to analyze what financial globalization has to do with it.

3.4 Statistics

To investigate whether the conclusion of Caglio et al. (2016) still holds different regressions will be performed on the world's level and the U.S. country specific level, because the U.S. has the most active listing market. First, the relationship between foreign IPOs and world financial globalization will be analyzed, with foreign IPOs as the dependent variable and world financial globalization as the independent variable. Next, different control variables will be added to prevent a possible ommitted variable bias. The control variables that are added to the model are: the long-term interest rate, the log of GDP per capita, investor sentiment, the tariff rate and the total stock market value traded across the world. More specific information about the regression and different variables is explained in section 5.1. Furthermore, the same regressions will be performed but on the country specific level of the U.S, but there are slight differences in the model due to insignificant variables. The dependent variable in the model is the level of foreign IPOs in the U.S., the independent variable is the world's level of financial globalization and the control variables are: the U.S. long-term interest rate, U.S. GDP per capita and the U.S. total stock market traded. Last, a regres-

sion with the level of venture backed foreign IPOs as the dependent variable will be performed. The independent variable is again the level of world financial globalization and the control variables are: the long-term interest rate, log GDP per capita and the total stock market traded. The results of the different models are presented in section 5.2 and 5.3.

4 Data

4.1 The IPO Sample

4.1.1 Global IPO Overview

The data obtained to measure the IPO data comes from Bloomberg, and it contains the number of total IPOs and the total proceeds. The IPO sample consists of 48.797 IPOs that went public between 1992 – 2021. As Caglio et al. (2016) did I selected "priced IPOs" to exclude firms that announce a plan to do an IPO, but subsequently delay or cancel the IPO. Furthermore, I excluded closed-end funds, REITs, special purpose entities, and special-purpose acquisition companies. Also, I derived the number of IPOs and proceeds by country, and I selected out of 131 countries 30 countries that have the most active listing market. Those 30 countries account for a total of 45.882 IPOs. According to table 1, the top 3 countries which had the highest number of IPOs are The United States (9.878), China (6.074) and Canada (4.390). The table below shows that IPO activity fluctuates much during the period 1992 – 2021 and it peaks around the Dotcom Bubble in 2000 and the Financial Crises of 2008 reaching a high of 2540 and 2490 total IPOs. A possible explanation for the fluctuations is the concept of IPO-waves. There are so called 'hot issue IPO markets' in which there is a relatively high IPO-activity compared to the normal state. In these hot issue periods, it is more attractive for a firm to go public and issue shares because there is more investor optimism during these hot issue periods (Chemmanur & He, 2011).

Country	Number of IPOs	Proceeds
United States	9878	$1,670.00
China	6074	$1,170.00
Canada	4390	$156.47
Japan	3063	$280.10
Australia	2753	$152.09
United Kingdom	2673	$304.25
South Korea	2063	$99.77
Hong Kong	1589	$160.52
India	1553	$87.60
Taiwan	1549	$46.94
Malaysia	1044	$46.58
Poland	921	$43.53
France	909	$165.41
Germany	909	$180.12
Singapore	822	$56.19
Indonesia	720	$34.35
Thailand	674	$49.45
Sweden	665	$56.21
Czech Republic	525	$7.24
Italy	494	$117.53
Israel	320	$23.50
South Africa	302	$26.82
Norway	287	$39.89
Brazil	274	$125.13
Greece	266	$114.53
Turkey	254	$25.48
Vietnam	242	$8.27
Mexico	212	$41.70
Switzerland	200	$77.80
Netherlands	197	$74.09

Table 1: IPO-activity and proceeds (in billions of Dollars) of the 30 countries with the most active listing market

4.1.2 Foreign IPO-Activity around the World

To analyze the impact of financial globalization on IPO-activity there need to be made a distinction between two different types of IPOs. Namely, a domestic IPO and foreign IPO. A domestic IPO is an IPO that goes public in their home country but not in any foreign country. A foreign IPO is an IPO that goes public in at least one foreign country but not in their home country (Caglio et al., 2016). The data used for these two different types of IPOs is

obtained from the ThomsonOne SDC database. The sample covers the past two decades ranging from January 1998 to September 2021. The initial sample consists of 67.238 IPOs. To distinguish between a domestic and a foreign IPO the variable "Foreign Issue Flag" is set on "No" to obtain only domestic IPOs and is set on "Yes" to obtain the foreign IPOs. This resulted in a sample of 53.205 domestic IPOs and 14.033 foreign IPOs. Furthermore, not all firms reported their proceeds from their IPO and those firms are excluded from the sample. The final sample consists of 46.188 domestic and 5.469 foreign IPOs for the period 1998-2021, which is shown in table 2.

As said before, the level of IPO-activity fluctuates much during time, which you can also see in the level of domestic IPOs in graph 3 in the appendix. However, the level of foreign IPOs is less volatile than the level of domestic IPOs and has strongly increased in the last couple of years. In the years 1998-2003 the level of foreign IPOs was around 50 IPOs per year and reached a high in 2008 (246). Due to the Financial Crisis in 2008 the level of Foreign IPOs sharply decreased in 2009, but reached a new high of almost 400 IPOs in 2011. Since 2018 foreign IPOs have become very popular and in 2021 it reached a new high of 785, which is more than 300 IPOs compared to the previous year. A possible explanation for this is the concept of financial globalization. As the world becomes more financially integrated it is easier for companies to make use of foreign financial institutions. In section 4.2, the level of World Financial Globalization is computed for the years 1998-2021 and it is indeed strongly correlated with foreign IPO-activity, it has a correlation of 0.82 and is statistically significant at 0.05. Thus, the strong increase in foreign IPOs is partly due to World Financial Globalization. But World Financial Globalization is not the only factor that drives foreign IPO-activity across the globe. In section 5.1 different control variables are added to the model that also impacts the foreign IPO-activity.

Year	Domestic IPOs	Foreign IPOs	Total IPOs
1998	1792	57	1849
1999	2525	40	2565
2000	3292	58	3350
2001	1464	30	1494
2002	1338	41	1379
2003	1293	68	1361
2004	2132	115	2247
2005	2110	102	2212
2006	2307	160	2467
2007	2808	236	3044
2008	1274	246	1520
2009	1093	120	1213
2010	2539	333	2872
2011	2174	397	2571
2012	1341	280	1621
2013	1222	229	1451
2014	1586	277	1863
2015	1781	310	2091
2016	1544	234	1778
2017	2273	235	2508
2018	1953	368	2321
2019	1709	303	2012
2020	2033	445	2478
2021	2605	785	3390
Total	46188	5469	51657

Table 2: Domestic and Foreign IPO-Activty 1998-2021

Table 3 below shows the proceeds from the two different types of IPOs. In the years 1998-2002 foreign IPO proceeds accounted for less than 10 percent of total IPO proceeds in that period. Foreign IPO proceeds reaches a peak in 2008, around the Financial Crisis of almost 86.172 (in million of Dollars), which accounted for 43 percent of all IPO proceeds. During the crisis foreign IPO proceeds sharply decreased and only accounted in 2009 for 18 percent of all IPOs. After the crisis the percentage has steadily increased to reach a new high in 2018 of 68 percent of all proceeds. In the last 3 years, the percentage dropped a bit but still accounts for approximately half of all IPO proceeds. You can clearly see that in the beginning domestic IPOs dominated the foreign IPO proceeds, but in the last 10 years foreign IPO proceeds accounted for more than half of all IPO pro-

ceeds. Thus we can conclude that the importance of foreign IPOs strongly has increased in the last decades which makes it relevant to analyze which factors drove these changes in IPO-activity.

Year	Domestic IPO Proceeds	% of Total	Foreign IPO Proceeds	% of Total	Total Proceeds
1998	$ 125,178	94%	$ 8,306	6%	$ 133,484
1999	$ 189,574	97%	$ 5,659	3%	$ 195,234
2000	$ 216,068	95%	$ 11,921	5%	$ 227,989
2001	$ 100,310	90%	$ 11,321	10%	$ 111,631
2002	$ 88,842	91%	$ 8,966	9%	$ 97,808
2003	$ 94,661	80%	$ 24,266	20%	$ 118,928
2004	$ 170,091	85%	$ 30,453	15%	$ 200,544
2005	$ 198,930	88%	$ 27,755	12%	$ 226,685
2006	$ 278,947	87%	$ 42,290	13%	$ 321,237
2007	$ 362,024	85%	$ 64,433	15%	$ 426,457
2008	$ 112,782	57%	$ 86,172	43%	$ 198,954
2009	$ 116,423	82%	$ 25,512	18%	$ 141,935
2010	$ 286,452	80%	$ 72,080	20%	$ 358,532
2011	$ 191,754	63%	$ 114,336	37%	$ 306,089
2012	$ 39,607	42%	$ 53,829	58%	$ 93,435
2013	$ 43,289	47%	$ 49,033	53%	$ 92,323
2014	$ 54,033	35%	$ 98,846	65%	$ 152,879
2015	$ 53,066	38%	$ 86,601	62%	$ 139,666
2016	$ 34,269	43%	$ 45,084	57%	$ 79,354
2017	$ 55,791	58%	$ 40,477	42%	$ 96,268
2018	$ 49,011	32%	$ 103,314	68%	$ 152,324
2019	$ 53,579	47%	$ 59,792	53%	$ 113,371
2020	$ 126,217	53%	$ 113,456	47%	$ 239,674
2021	$ 235,735	54%	$ 197,956	46%	$ 433,690
Total	$ 3,276,635		$ 1,381,857		$ 4,658,491

Table 3: Domestic and Foreign IPO Proceeds 1998-2021

4.1.3 Foreign IPO-Activity in the U.S.

It is interesting and relevant to analyze the impact of financial globalization on the U.S. IPO-activity, because according to Bloomberg the U.S. had a total of 9.878 IPOs for the period 1992-2021 and therefore has the most active listing market. But, U.S. IPO-activity strongly declined compared to the rest of the world and a possible explanation for this is the concept of financial globalization, because as the world becomes more financially integrated it is easier for companies to make use of foreign financial institutions. Doidge et al (2013) concluded that the decline of U.S. IPO activity is partly due to the fact that it is associated with a reduction in the importance of the quality of a countries institutions as a determinant of its IPO-activity. In the years 1998 and 1999 the U.S. accounted for approximately 24 percent of all IPOs, but in the years after, this percentage more than halved and in the last 3 years the U.S. accounted only for about 10 percent of all IPOs. The Database from Warrington

College of Business (based on Dealogic) breaks down IPO-activity in the number of domestic and foreign IPOs for the period 1998-2020, which is shown in table 4 below. The data exclude IPOs with an offer price below 5.00 per share, unit offers, SPACs, REITs, closed end funds, natural resource partnerships, small best effort IPOs, banks and SL, and IPOs not listed on CRSP, which means that the sample is based on the data from NASDAQ, Amex and NYSE. The most active foreign countries in the U.S. are Bermuda, Canada, China, Greece, Israel, the Netherlands, and the United Kingdom. The level of foreign IPOs in the U.S. fluctuates much in the period 1992-2020. It reached a high of 82 foreign IPOs in 2000 around the Dotcom-bubble and sharply decreased reaching a low in 2002 of 5 foreign IPOs. In the years after the number of foreign IPOs steadily increased until 2007 where it reached a total of 52 IPOs. Due to the Financial Crises the number dropped to 6 IPOs in 2008. In the years after 2008 the number of foreign IPOs fluctuates much which could be due to the so called 'hot issue IPO markets' in which there is relative high IPO activity compared to the normal state. In these hot issue periods, it is more attractive for a firm to go public and issue shares because there is more investor optimism during these hot issue periods (Chemmanur & He, 2011). The number of foreign IPOs in the U.S. has a upward trend which makes it relevant to analyze what drives the increasing number of foreign IPOs.

Year	Number of IPOs	Domestic IPOs	Foreign IPOs	Percentage Foreign IPOs
1998	294	256	38	12.9%
1999	501	450	51	10.2%
2000	418	336	82	19.6%
2001	83	74	9	10.8%
2002	68	63	5	7.4%
2003	66	60	6	9.1%
2004	189	160	29	15.3%
2005	172	142	30	17.4%
2006	172	138	34	19.8%
2007	190	138	52	27.4%
2008	24	18	6	25.0%
2009	49	38	11	22.4%
2010	125	80	45	36.0%
2011	93	70	23	24.7%
2012	97	85	12	12.4%
2013	168	140	28	16.7%
2014	225	176	49	21.8%
2015	126	104	22	17.5%
2016	83	68	15	18.1%
2017	125	94	31	24.8%
2018	166	119	47	28.3%
2019	138	100	38	27.5%
2020	198	147	51	25.8%
Total	**3770**	**3056**	**714**	**18.9%**

Table 4: The Market Share of Foreign Companies among U.S. Listings, 1998-2020

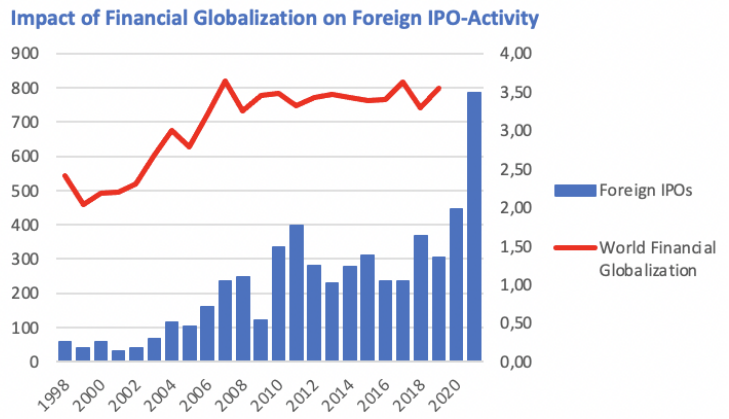
4.2 Measurement of Financial Globalization

As said in the introduction, Financial Globalization is an aggregate concept that refers to the increasing global linkages created through cross- border financial flows (Prasad et al., 2005). In this research paper I use two different measures of Financial Globalization. First, I computed Country Financial Globalization for the U.S., it is computed as the sum of an individual country's external assets and liabilities divided by its GDP (Doidge et al, 2013). The data is obtained from the IMF Database and it contains the level of external assets and liabilities for the years 1998-2020. The same countries are selected I derived earlier for the IPOs that had the most active listing market. I ended up with a selection of 28 countries because

there was no data available for Vietnam and Taiwan. Doidge et al. (2013) used the database of Lane and Ferretti (2007) to compute World Financial Globalization, but their data only contains the level of external assets and liabilities and a countries GDP for the years 1992-2004. As the world becomes more financially integrated every year, I decided to construct World Financial Globalization based on the data from IMF Data to make this research much more relevant. A similar methodology was used to measure a countries GDP, but the data is obtained from The World Bank World's Development Indicators (WDI).

The second measure is world financial globalization. To compute the level of World Financial Globalization I need to sum the external assets and liabilities for each of the countries and divide the total by the sum of the countries' GDP, this measure is the same for each country and only varies by year as Doidge et al. (2013) did. The results are based again on the IMF Database and The World Bank World's development Indicators (WDI).

The level of World Financial Globalization is shown the graph below. As expected, the graph of the World's Financial Globalization has a clear upward trend which means that the world became more financially integrated in the past 20 years. In the beginning of 1998 the level of World Financial Globalization was around 2.41 and reached a high of 3.64 in 2008. In the years after financial globalization declined a bit but in the last years it is back around 3.69. The question now is if this upward trend in financial globalization impacts foreign IPO activity.



Graph 1: Impact of Financial Globalization on Foreign IPO-Activity

4.3 Other Macroeconomic Factors that could Influence Foreign IPO-Activity

As seen in the previous section, financial globalization is positively correlated with the level of foreign IPOs, but this is not the only factor that could have an impact on the level of domestic and foreign IPOs. There are different other macroeconomic factors that could influence the decision for a company to list abroad and it is important to control for these variables to prevent possible omitted biases. An important macroeconomic factor that could influence foreign IPO-activity is financial liberalization. Financial liberalization is defined as the removal of government intervention from financial markets. Liberalization includes eliminating the restrictions listed in the previous section—bank interest rate ceilings; compulsory reserve requirements; barriers to entry, particularly foreign financial intermediaries; and credit allocation decisions (Masci, 2008). According to previous research on this concept, there has been found a strong correlation between capital markets development and foreign access to capital markets (Group, 2020). Thus, financial liberation could influence the level of foreign IPO-activity. Important to understand is the difference between globalization and liberalization, because they are two different concepts. Globalization is the expansion of interconnected trades in the largely unregulated international market and liberalization is the state of easing rules of government on

trades and businesses to ensure capitalist expansion (Masci, 2018).

A variable that is strongly related to financial liberalization and the trade openness of a country is measured by the average tariff rates. The index uses average tariff rates when they are available and implicit weighted tariff rates to extrapolate the missing values. The index is normalized to be between zero and one (Hauner & Prati, 2008). The data is obtained from the World Bank for the period 1998-2017, unfortunately the data is not available for the years after 2017.

According to the academic literature, the variables stock market capitalization to GDP (in percents) and the stock market turnover ratio (in percents) of a country have an impact on the decision for a company to list abroad. These two variables are different measures to analyze financial market development. Doidge et al. (2013) and Caglio et al. (2016) also used these variables in their model to analyze the effect of financial globalization on IPO-activity. Caglio et al. (2016) find in their paper a positive relationship between the probability of listing outside the home country and the two variables to measure financial market development, the variables thus have an impact on the level of foreign IPOs. Due to significance levels decided is to only include the stock market capitalization relative to it's GDP as control variable to prevent a possible omitted variable bias. In line with past literature, a positive relationship between foreign IPO-activity and the world's stock market capitalization is found.

GDP per capita, which breaks down a country's economic output per person is a well known variable that has an impact on foreign IPO-activity. Doidge et al. (2013) find in their paper a positive relationship between the log GDP per capita and IPO-activity. To prevent a possible bias, the log of GDP per capita is included in my model as a control variable. The data is extracted from the World Bank for the years 1998-2017 and is in current U.S. Dollars.

Another important variable that has an impact on foreign IPO-activity is investor sentiment. Investor sentiment is described as the market participants' beliefs regarding future cash flows relative to some objective norm, namely the true fundamental value of the underlying asset. There are a lot of different studies on how to measure investor sentiment in the market and one of them is the indirect market-based proxies for sentiment method (Zhang, 2008).

The indicator used in my research is the CBOE Volatility Index (The VIX) also knows as the fear index. The index is driven by option prices, a rising VIX means an increased need for insurance in the market. If traders feel the need to protect against risk, it's a sign of increasing volatility (Bandopadhyaya et al., 2008). The data to measure the VIX for the period 1998-2021 is obtained from Yahoo Finance.

The long-term interest rate on government debt is expected to have a negative relationship on foreign IPO-activity because firms will go public when the interest rate is high to reduce costs and the opposite is true when the interest rate is low (Jovanovic & Rousseau, 2004). Therefore, this variable is added to the model as a control variable to prevent a possible bias. The data is obtained from OECD data. Unfortunately, the data set does not contains data of every country and therefore I decided to obtain the data for 19 different countries in Europe and the U.S. for the period 1998-2021.

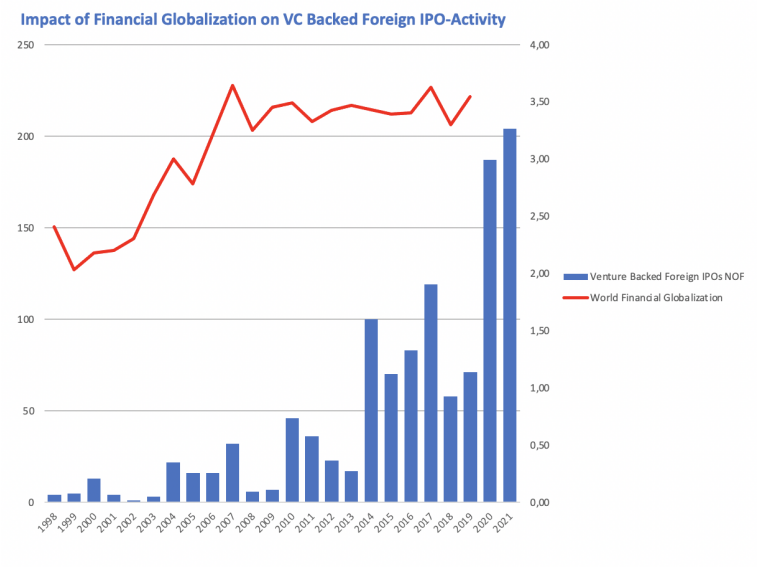
4.4 Venture Capital Backed IPOs

It is widely known that financially intermediaries play an important role in moving capital across countries. Caglio et al. (2016) showed in their research paper that the primary channel for financial globalization in security offerings are these so-called financial intermediaries. One of the most important financial intermediaries are global underwriters, they are an important determinant in the decision to go public outside a firm's home country and Caglio conclude that foreign IPOs are more likely to make use of global underwriters.

Another financial intermediary IPOs makes use of are venture capitalists, as said in the introduction a Venture-capital-backed IPO is an initial public offering of shares of a company that is mainly supported by venture capital investors (Barry et al., 1990). The Thomson One SDC databases is used to obtain data for the venture backed IPOs. Again, the issue type is set on IPO's for the period 1998-2021. The foreign issue flag is set on "yes", because we are interested in to what extent financially open countries make use of institutions and resources form other countries, thus I only look at foreign IPOs. Last, the venture capital backed IPO issue flag is set on "yes" to have an sample with only venture capital backed IPOs. I ended up with a sample that consists of 1143 IPOs. Unfortunately,

the ThomsonOne SDC Database did not have any data of venture capital backed foreign IPOs in the U.S. and therefore the impact of financial globalization is only analyzed at the world's level.

The number of VC backed foreign IPOs was very low in the years up to 2013, it peaked just before the financial crisis in 2007 around 32 IPOs. But in the years after 2013 venture capitalists as financial intermediary for IPOs became more important. The number of IPOs dramatically increased in 2014 to a total of 100 IPOs and this number almost doubled in 2020 and 2021. Furthermore, venture capital backed foreign IPOs is positively correlated with the level of financial globalization (0,61), thus this increase could be partly due to the fact that the world became more financially integrated in the last couple of decades.



Graph 2: Impact of Financial Globalization on VC Backed Foreign IPO-Activity

5 Results

5.1 World Foreign IPO-activity and Financial Globalization

To analyze the impact of financial globalization on foreign IPO-activity the control variables which are discussed in the previous section are added to the model. The specific regression that will be used is presented by the following:

$$\textit{Foreign IPOs}=a+B_1 * WorldFinGlob + B_2 * Tariff_Rate + B_3 * MarketCap + B_4 * LOG.GDPperCap + B_5 * VIX$$

WorldFinancialGlobalization is defined as the sum across countries of the U.S. dollar-denominated value of external assets and liabilities divided by the world's GDP. The *TariffRate* is the simple mean applied tariff is the unweighted average of effectively applied rates for all products subject to tariffs calculated for all traded goods (The World Bank). The *World's Market Capitalization* is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values converted to U.S. dollars using corresponding year-end foreign exchange rates (The World Bank). *LOGGDPpercap* is log-adjusted, although GDP per capital accounts for the size of nations, by dividing GDP by the population, it is still desirable to take the natural logarithm of this variable to provide more a more meaningful coefficient that is representative for all countries. The coefficients from the independent variables are represented by x. Table 5 shows the summary statistics of the model.

First of all, World Financial Globalization is positively correlated with Foreign IPOs (0.8172) and has a coefficient of 89.54 like the empirical literature suggests. A 1 percent increase in World Financial Globalization would lead to a 89,539 percent increase in the level of Foreign IPOs in the world. Furthermore, the coefficient has a P-value of 0.065 and therefore is statistical significant at the 10 percent significance level. Thus we can conclude that the level of World Financial Globalization positively impacts the level of foreign IPOs across the world.

Also, the model includes different control variables to prevent a omitted variable bias. The first control variable that is added to the model is The World's Tariff Rate. The variable has a p-value of 0.032 and is therefore statistically significant at the 5 percent significant level. Next, *MarketCapitalization* is also significant, but only at the 10 percent significance level, the P-value of this control variable is 0.067. LOGGDPperCapita has a P-value of 0.001 and is therefore also statistically significant. Only the last variable, VIX, is not statistically significant because it has a P-value of 0.323.

The R-squared depicts how well the regression model fits the observed data. The R-squared of my model is 0.8853, which means that the variables in the model explain 88,53 percent of the variation in the dependent variable.

All of the variables in the model except for the VIX, which measures investor sentiment are statistically significant at the 5 or 10 percent significance level. Therefore we can conclude that the level of foreign IPOs is positively impacted by the level of world financial globalization. Furthermore, different control variables are added to the model because financial globalization is not the only factor that has an impact of foreign IPO-activity. Foreign IPOs are also positively impacted by the world's tariff rate and log GDP per capita and is negatively impacted by the world's stock market capitalization, it has a coefficient of -2.82. Because the world became more financially integrated in the last decades, more companies decided to list their stocks abroad which resulted in a rise of foreign IPOs across the world. Now that it is clear that there exists a positive relationship between the two, the question is to what extent do financially open countries make use of institutions and resources form other countries, which will be examined in section 5.3.

Variable	**Variable Name**	**Mean**	**Std. Dev.**	**Min**	**Max**
Foreign IPOs	*ForeignIPOs*	227.875	171.0123	30	785
World Financial Globalization	*WorldFinGlob*	3.073	0.529	2.034	3.643
VIX	*VIX*	20.487	6.202	11.046	31.793
The Tariff Rate	*Tariff_Rate*	3.722	0.902	2.59	5.38
Total Stock Market Value Traded	*MarketCap*	50.998	19.65	22.803	93.686
Log GDP per Capita	$LOG\dot{G}DPcap$	9.032	0.285	8.572	9.341

Table 5: Descriptive Statistics

Variable	Foreign IPO-Actvity
World Financial Globalization	89,539*
	(44,774)
VIX	-3.565
	(3,478)
The Tariff Rate	116,886**
	(49,174)
Total Stock Market Value Traded	-2,82*
	(1,420)
Log GDP per Capita	666,463***
	(169,188)
R-squared	0.885

Table 6: Regression Results

5.2 U.S. Foreign IPO-activity and Financial Globalization

In my model the impact of World Financial Globalization on Foreign IPOs in the U.S. is analyzed and different macroeconomic factors are added to the model as control variables to prevent a possible omitted variable bias. I expect that there is a strong positive relationship between the level of foreign IPOs in the U.S. and the level of World Financial Globalization, because in the last couple of years it is easier for firms to make use of financial institutions in foreign countries and consequently go public in that specific country. The specific regression that I will use is presented by the following:

$$U.S.\ Foreign\ IPOs = a_i + B_1 * WorldFinancialGlobalization + B_2 * U.S.LT.InterestRate + B_3 * LOG.GDPpercap + B_4 * U.S.StockMarketCap$$

Again, *WorldFinancialGlobalization* is defined as the sum across countries of the dollar-denominated value of external assets and liabilities divided by the world GDP. The *U.S.LT-Interestrate* is defined as the U.S. long term interest rate on government debt and is stated in percentages. *GDPpercap* is defined as in the previous section, but now it is only measured for the U.S. The *U.S.TotalStockMarketTraded* represents the value in percentages of the total stock market value in the U.S. traded relative to it's GDP. The coefficients from the independent variables are represented by x. Table 7 en 8 presents the results from the regression of U.S foreign IPOs on financial globalization.

The first thing we see is that the level of foreign IPOs in the U.S. is positively correlated with the level of world financial globalization, namely the correlation is 0.524. The correlation is three tents smaller compared to the level of foreign IPOs around the world, which means that financial globalization is less important in the U.S. Furthermore, foreign IPos has a coefficient of 17.342, which means that a 1 percent increase in World Financial Globalization would lead to a 17.342 increase in the level of Foreign IPOs in the U.S. It has a p-value of 0.42 and is statistical at the 5 percent significance level. Thus we can conclude that the level of World Financial Globalization postively impacts the level of foreign IPOs in the U.S.

Next, the model again adds different control variables to the model as we did in the previous section. The first control variable is the U.S. long term interest rate on government debt. The variable has a coefficient of 19.210 and has a P-value of 0.001 which is statistically significant at the 1 percent significance level. Also, the log GDP per capita is included in the model and has a coefficient of 25.772. The variable has a P-value of 0.0013 and is thus statistically ad the 5 percent significance level. The last control variable that is added to the model is the U.S. stock market capitalization relative to it's GDP and it has a coefficient of 0.3425. It has a P-value of 0.077 which means it is only statistically significant at the 10 percent significance level. The R-squared depicts how well the regression model fits the observed data. The R-squared of my model is 0.6470, which means that the variables in the model explain 64,70 percent of the variation in the dependent variable.

Altogether, the dependent variable and two out of three control variables are statistically significant at the 5 percent significance level and one control variable is statistically significant at the 10 percent significance level. Furthermore, the model has good explanatory power because of the fairly high R-squared. We can conclude that World Financial Globalization positively impacts the level of Foreign IPOs in the U.S.

When comparing the U.S. results with the world's results it comes clear that financial globalization stronger impacts the level of foreign IPO on the world level compared to the of the U.S. Namely, the world's coefficient is more than 5 times bigger compared to the coefficient of the U.S and is stronger correlated. This means that financial globalization has less importance on the U.S. foreign IPO market.

But we need to keep in mind that U.S. total IPO-activity strongly declined in the last decades according to Doidge et al. (2013). Thus there can be concluded that financial globalization has an important role in determining the level of foreign IPOs, but this effect has less impact on the U.S. market which is most likely due to the fact that in the last years more and more IPO's shifted away from the U.S. market.

Variable	Variable Name	Mean	Std. Dev.	Min	Max
Foreign IPOs	*ForeignIPOs*	31.044	19.436	5	82
World Financial Globalization	*WorldFinGlob*	3.073	0.529	2.034	3.643
U.S. Long-Term Interest Rate	*LT_Interest_Rate*	3.497	1.395	0.894	6.029
U.S. Log GDP per Capita	*LOG_GDPcap*	9.181	0.548	8.195	9.837
U.S. Total Stock Market Value Traded	*MarketCap*	127.369	16.929	92.763	153.211

Table 7: Descriptive Statistics

Variable	Foreign IPO-Actvity
World Financial Globalization	17,342**
	(7,818)
U.S. Long-Term Interest Rate	19,210***
	(4,485)
U.S. Log GDP per Capita	25,772**
	(9,134)
U.S. Total Stock Market Value Traded	0,343*
	(0,181)
R-squared	0.647

Table 8: Regression Results

5.3 Venture Capital Backed IPOs and Financial Globalization

This section examines the effect of financial globalization on to what extent these companies make use of foreign financial intermediaries. A regression will be performed with the level of foreign venture capital backed IPOs as the dependent variable. The independent variable is again world financial globalization and the following control variables are added again to the model to prevent a possible bias: the long-term interest rate, log GDP per capita and the total stock market value traded relative to it's GDP This results in the following regression:

Venture Bakced Foreign IPOs = $a_i + B_1 * WorldFinancialGlobalization + B_2 * LT_I nterestRate + B_3 * LOG.GDPpercap + B_4 * U.S.StockMarketCap$

The first thing that stands out is the small negative correlation between the level of venture backed foreign IPOs and world financial globalization, namely it has a correlation of -0.072. Which suggests, in the last decades when the world became more financially integrated, the level of VC backed foreign IPOs is negatively impacted by the level of financial globalization. But, world financial globalization has a P-value of 0.731 and is therefore not statistically significant. Also, the standard error is almost twice as high as the coefficient. The long-term interest rate has also a negative relationship with the level of IPOs, but has a P-value of 0.096 which is statistically significant at the 10 percent significance level. Furthermore, the log GDP per capita has a P-value of 0.786 and is therefore not statistically significant and again, the standard error is higher than the coefficient itself. The last variable that is added to the model is the total stock market value relative to it's GDP. The variable has a P-value of 0.043 which is significant at the 5 percent significance level. The R-squared of my model is 0.7567, which means that the variables in the model explain 75,67 percent of the variation in the dependent variable.

Unfortunately, the independent variable and not all control variables are significant in the model. Thus, I cannot draw any conclusions on the impact of financial globalization on venture backed foreign IPOs. Which means it remains unclear to what extent financially open countries make use of foreign financial intermediaries.

Variable	**Variable Name**	**Mean**	**Std. Dev.**	**Min**	**Max**
VC Backed Foreign IPOs	*VC_IPOs*	47.625	56.367	1	204
World Financial Globalization	*WorldFinGlob*	3.073	0.529	2.034	3.643
Long-Term Interest Rate	*LT_Interest_Rate*	3.256	1.56	0.213	5.439
Log GDP per Capita	*LOG_GDPcap*	9.032	0.285	8.572	9.341
Total Stock Market Value Traded	*MarketCap*	50.998	19.65	22.803	93.686

Table 9: Descriptive Statistics

Variable	VC Backed Foreign IPO-Actvity
World Financial Globalization	-6.855
	(19,62)
Long-Term Interest Rate	-9,338*
	(5,305)
LOG GDP per Capita	-12,690
	(46,0429)
Total Stock Market Value Traded	1,303**
	(0,595)

Table 10: Regression Results

6 Discussion

This study contributes to the literature by investigating the shift from domestic IPOs to foreign IPOs due to financial globalization. Doidge et al. (2013) and Caglio et al. (2016) found a positive relationship between the number of foreign IPOs and financial globalization. This paper confirms these findings but on a much more recent sample. Caglio examined the relationship for the period 1995-2011 and in this research the foreign IPOs are analyzed for the period 1998-2021. Also, there is very little research on to what extent financially open countries make use of financial institutions abroad. This paper examined the role of venture capitalists on the IPO-market, but unfortunately the results of the model were not significant so I cannot make any conclusion's about the impact of financial globalization and the use of venture capitalists with an IPO, which is an drawback of this research.

Second, to compute the level of financial globalization a de facto indicator is used and this indicator has is limitations. The first limitation is that a de facto indicator is inconsistent reporting and treatment of FDI across countries over time. Furthermore, a limitation of this indicator is that they may fail to accurately reflect a government's policy stance.

Another area to improve this research is data availability. The Thomson One Database did not contain data about venture backed foreign IPOs in the U.S. As stated earlier, the U.S. has still the most active listing market for IPOs compared to the rest of the world, which makes it relevant to look at the level of venture backed foreign IPOs and the impact of financial globalization on it. Thus, further

research could usefully explore how U.S. foreign IPOs are affected by financial globalization. Also, it could be interesting to analyze how other financial intermediaries next to global underwriters and venture capitalists are affected by financial globalization.

7 Conclusion

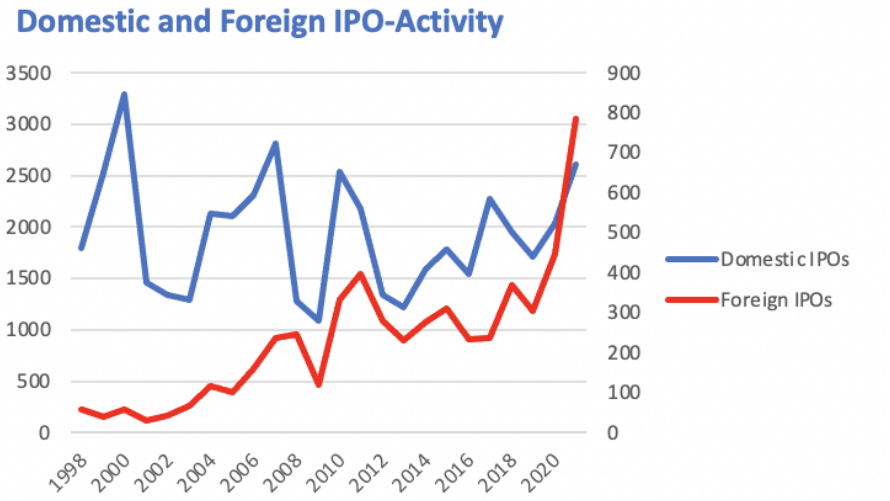
This paper examines the impact of financial globalization on foreign IPO-activity for the years 1998-2021. The findings in this paper are consistent with the results that Doidge et al. (2013) and Caglio et al. (2016) found in their research. Namely, the level of foreign IPOs is positively impacted by financial globalization. The relation between the two variables is analyzed on a world level and on the of the U.S. The results from both models are statistically significant which means we can conclude that the level of foreign IPOs is positively affected by financial globalization. Also, financial globalization has a stronger effect on the number of IPOs when looking at the world compared with the U.S. and this is due to the fact that in the last decades the U.S. IPO-activity strongly declined compared to the rest of the world.

Thereafter, I examined to what extent financially open countries make use of institutions and resources from other countries. Caglio et al. (2016) argued that one of the most important financial intermediary is the role of global underwriters. Another important intermediaries are venture capitalists. In the last years the number of venture capital backed foreign IPOs grew rapidly and this could be due to the impact of financial globalization. But unfortunately, the results of the regression were not all significant so we cannot draw any conclusions on the effect of financial globalization on venture backed foreign IPOs. It remains still unclear to what extent companies make use of foreign financial institutions when they go public. Further research should aim to find a way to analyze this and examine the effect of financial globalization on it.

8 Appendix

Variable	Description	Source
Domestic IPO	An IPO that goes public in their home country but not in any foreign country.	Thomson One (SDC)
Foreign IPO	An IPO that goes public in at least one foreign country but not in their home country	Thomson One (SDC)
U.S. Foreign IPO	An IPO that goes public in the U.S. but not in their home country	Dealogic
Country Financial Globalization	External assets and liabilities for each country divided by the country's GDP	IMF Database
World Financial Globalization	Sum of the external assets and liabilities across each of the countries in our sample and divide the total by the sum of the countries' GDP	IMF Database
Tariff Rate	Simple mean applied tariff is the unweighted average of effectively applied rates for all products subject to tariffs calculated for all traded goods	The World Bank
Stock Market Capitalization	The share price times the number of shares outstanding (including their severalclasses) for listed domestic companies	The World Bank
GDP per Capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products	The World Bank
Investor Sentiment	CBOE Volatility Index (The VIX) alsoknows as the fear index	Yahoo Finance
Long-Term Interest on Government Debt	Long-term interest rates refer to government bonds maturing in ten years. Rates are mainly determined by the price charged by the lender, the risk from the borrower and the fall in the capital value	OECD Data

Table 11: Summary Variables



Graph 3: Number of Domestic and Foreign IPOs

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