Public versus Private Equity

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René M. Stulz
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Abstract

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Keywords: Public equity, private equity, listing, agency costs, IPO, intangible assets

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René M. Stulz*
Professor of Finance
The Ohio State University, Fisher College of Business
806A Fisher Hall, 2100 Neil Avenue
Columbus, OH 43210, United States
phone: +1 614 292 1970
e-mail: stulz.1@osu.edu

*Corresponding Author

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ABSTRACT

The last twenty years or so have seen a sharp decline in public equity. I present a framework that explains the forces that cause the listing propensity of firms to change over time. This framework highlights the benefits and costs of a public listing compared to the benefits and costs of financing with private equity. With this framework, the decline in public equity is explained by the increased supply of funds for private equity and changes in the nature of firms. The increase in the importance of intangible assets makes it costlier for young firms to be public when the alternative is funding through private equity from investors who have specialized knowledge that enables them to better understand the business model of young firms and contribute to the development of that business model in contrast to passive public equity investors.

* Fisher College of Business at The Ohio State University, NBER, and ECGI. I am grateful to Leandro Sanz for scientific assistance.

1. Introduction.

Over the last twenty-five years, the U.S. has undergone a dramatic transformation in the role of public equity. Starting in 1997, the number of listed firms has fallen sharply (Doidge, Karolyi, and Stulz, 2017). Though the decrease was extremely rapid initially and eventually slowed down, the number of listed firms has fallen every year except in 2014 and 2018. At the end of 2018, the U.S. had 3,613 listed firms. By comparison, in 1975, the U.S. had 4,927 listed firms and the peak number of listed firms in 1997 was 7,576. Not only has the number of listed firms plummeted, but the listed firms have returned capital to shareholders on net. In other words, they have repurchased more shares than they have issued, and by extremely large amounts. Specifically, from 1998 to 2016, U.S. firms repurchased shares in excess of share issuance for an amount of $3.6 trillion (Doidge, Kahle, Karolyi, and Stulz, 2018).

While the U.S. has experienced a particularly dramatic decrease in the number of listings, other countries subsequently saw their number of listings decrease. The U.K. reached a peak in the number of listings in 2006, but since then the number of listings has dropped by almost one third. In contrast to the drop in the number of listings, private equity has increased rapidly. According to McKinsey (2019), the number of companies backed by private equity (PE) funds doubled from 2006 to 2017 in the U.S. Further, PE net asset value has grown at twice the rate of public market capitalization globally over that period.

Why is it that public markets appear to be struggling while private markets are expanding rapidly and attracting considerable capital? Does this contrasting evolution mean that the public form of corporate organization is less suited to the business models of firms in the 21st century than it was to the business models of firms last century? Or is it that regulatory changes have decreased the advantage of the public form of organization? Another way to put this is: Are public markets doing less well because firms have changed or because public and/or private markets have changed?

In this article, I first show how the public markets have evolved, especially in the U.S. I then develop a framework to understand the choice between public equity and private equity. I then turn to changes in firms and changes in the composition of investors that help understand the growth of private equity relative to public equity.

2. The evolution of public equity.

Public equity is equity that anybody can acquire. Shares of public equity are generally listed on a public exchange where they can be traded at any time when the exchange is open. To be listed, firms have to meet requirements of the exchange on which they are listed. In most countries, public firms also have to meet disclosure standards as well as governance standards imposed by laws and regulations. Public firms are generally required to have audited financial statements and to make these statements available to the public.

At any time, public firms co-exist with private firms. The equity of private firms is not listed on an exchange or traded frequently. Generally, transfer of private equity is subject to restrictions, so that it is not the case that any investor interested in a private firm's equity can acquire it. In many countries, purchase of private equity by the public is restricted because private firms are not regulated in the same way that public firms are. For instance, in the U.S., the number of shareholders that a private firm can have is limited, but that limit has become larger over time. A U.S. private firm cannot engage in an offering of equity to the public without becoming a public firm in the process. When a private firm raises equity, only investors meeting specific standards can subscribe to the offering. Though some countries have public records of private firms that are informative about their assets and liabilities, other countries do not. In particular, the U.S. has no requirement that private firms make public information about their balance sheet.

At all times, there are many more private firms than there are public firms. In the U.S., in 2016, there are more than five million firms in total. Of all these firms, 0.07% or 3,781 are listed on an exchange. Viewed this way, almost no firm is a public firm. At the same time, however, public firms are extremely important from an economic perspective. In 2012, 98% of private firms have less than 100 employees in the U.S. In contrast, 28% of public firms have more than 5,000 employees. Yet, of all the firms with 5,000 employees or more, only 27% are publicly listed. 1977 is the first year for which these data are available. In that year, 50% of the firms with 5,000 employees or more are publicly listed. Doidge, Karolyi, and Stulz (2017) define the listing propensity for a category of firms as the fraction of firms that are listed within that category. For large firms, the listing propensity falls sharply over the last forty years.

The decline in the listing propensity of large firms reflects a broader phenomenon, which is the decrease in the number of listed firms in the U.S. Figure 1 shows the evolution of the number of listed firms in the

U.S. Some choices have to be made in assessing the number of listed firms. I use data from the Center for Securities Prices (CRSP) for the U.S. to ensure that I have only U.S. corporations and because I can identify new lists and delists corresponding to the data for listed firms. However, irrespective of the choices made, the number of listed firms peaks in the second half of the 1990s and falls sharply since then. Figure 1 shows the evolution of the publicly listed firms in the U.S. from 1975 to 2018. In 1975, there are 4,927 listed firms. This number increases steadily until 1997 when it reaches a maximum of 7,576. After 1997, the number of listed firms falls sharply. In the ten years following 1997, the number of public firms falls by 2,931 or by 39%. From 2007 to 2018, the number of firms keeps falling, but at a much more moderate pace. In 2007, there are 4,645 public firms. By 2018, there are only 3,613. From 1997 to 2013, the number of public firms falls every year. After 2013, the number of public firms increases in two years. The number increases by 133 in 2014 and by 15 in 2018. The evolution of the number of public firms in recent years is especially striking because stock market valuations have been very high, which usually corresponds to a time when many firms go public (Lowry, 2003). As a result of this large decrease in the number of public firms, the U.S. has now fewer public firms than in 1975 despite considerable growth in the size of the economy and in the size of the population. Doidge, Karolyi, and Stulz (2017) show that the number of listed firms per million inhabitants in the U.S. falls from 26 to 11 from 1997 to 2012.

Each year, the change in the number of public firms is the difference between the number of new lists and the number of delists. The typical new list is a firm that chooses to go public through an IPO. Firms can delist for three main reasons. First, a firm can be acquired and hence cease to exist as an independent entity (merger delist). Second, a firm can fail in that it no longer meets the listing requirements of the exchange (delist for cause). Third, a firm can choose to delist (voluntary delist). From 1975 to 1996, new lists exceed delists on average, which explains the increase in the number of listings. Specifically, the average number of new lists is 542 and the average number of delists is 427. After 1996, there are much fewer new lists as new lists average 302 per year. In contrast, there are more delists, as delists average 555 per year.

The decrease in the number of new lists means that firms do not want to be public as much as they used to. The number of IPOs is especially low after the global financial crisis. In 1996, there were 987 new lists.

In 2012, the number is 152. Turning to delists, Doidge, Karolyi, and Stulz (2017) show that the most likely reason for a delist is a merger. Delists for cause are the second most frequent reason. There has been much discussion in the U.S. that firms voluntarily chose to leave exchanges because of increases in regulation resulting from the Sarbanes-Oxley (SOX) law adopted in 2002. The number of cases of firms choosing voluntarily to leave an exchange is small, so that voluntary delists not associated with a merger are relatively unimportant and do not contribute meaningfully to the decrease in the number of listings. However, firms may choose to delist by being acquired by a private vehicle, which would be a buyout vehicle. Such buyouts would be classified as mergers rather than voluntary delists. Buyouts of public firms are more important than voluntarily delists.

I now turn to a comparison of the evolution of the number of listings in the U.S. to the evolution of the number of listings outside the U.S. I use World Bank data for non-U.S. countries. Is the drop in the number of listings in the U.S. unique to the U.S.? Figure 1 shows part of the answer. In contrast to the dramatic drop in listings of the U.S., the number of listings outside the U.S. does not experience a drop starting in 1997. However, both for the world outside the U.S. and for developed countries, the number of listings peaks before 2018. For the world outside the U.S., the number of listings peaks in 2015 at 40,128 and falls to 39,310 by 2018. This decrease in the number of listings is much milder than the decrease in the number of listings in the U.S. after 1997. Turning to developed countries, listings reached a peak of 17,857 in 2006. Since then, the number of listings has fallen to 15,930. There are five years where the number of listings increases. Looking at Western Europe, the listing peak is 9,885 in 2006. The number of listings is 7,940 in 2018. With the World Bank data, the fall in listings is particularly large for the United Kingdom, as the number of listings falls by 29% from 2006 to 2018.

In summary, the number of listed firms peaked in the U.S. in 1997 and has fallen sharply since then. For other countries, the number of listings outside the U.S. peaked in 2015 and has dropped slightly since then. However, the number of listings in developed countries peaked in 2006 and has fallen by 20% since. Since 2015, the drop in listings for developed markets exceeds the drop in listings for the world outside the U.S., so that listings in emerging markets keep increasing since 2015. It follows from this that the U.S.

experiences a drop in listings before the other developed countries on average, but these countries appear to follow the U.S. in having fewer listings.

3. The choice between being private or public.

In this section, I discuss why some firms are public and others are private. The framework I present makes it possible to understand why fewer firms find it advantageous to become public firms. The origin of this framework is the work of Jensen and Meckling (1976) on agency conflicts. A formal model of some of the arguments is Shleifer and Wolfenson (2002). Stulz (2005) expands the latter model.

Consider an entrepreneur who has a project that is valuable but requires an initial investment. The project is scalable so that, if the funding available is low, the initial scale of the project is small. The entrepreneur could fund the project using her own funds. In this case, the firm would be very small. Over time, the entrepreneur could re-invest profits in the firm, so that the size of the firm would grow. The entrepreneur could also borrow to leverage her investment, but by doing so she would increase the risk of the firm and the risk of losing her initial investment. The entrepreneur could choose to find investors who would participate as equity-holders in the funding of the project. She might find friends or family members. She might try to convince other people she knows. In general, there will be a limited amount of funding that an entrepreneur can put together this way.

To fund the project so that it has a larger scale, the entrepreneur has to find many investors. To convince investors to become shareholders, the entrepreneur has to find ways to make the equity attractive to them. Most importantly, she has to organize the firm so that shareholders will receive a return from their investment (Shleifer and Vishny, 1997). The most that investors will be willing to pay for shares is the present value of the payments they expect to receive back from the firm over time. If investors believe that these payments will be low, they will pay little for the shares and the entrepreneur will receive little funding. A firm's corporate governance arrangements are designed to ensure that shareholders will receive a return from their investment.

If the entrepreneur raises funds from investors, an obvious temptation for the entrepreneur is to use some of the funds for her own benefit (Jensen and Meckling, 1976). For instance, she could decide to

overindulge in perks instead of using the funds for productive investments. In such a case, the investors would not receive a return on their investment. When an entrepreneur raises funds from investors, there is an agency conflict between the entrepreneur and the shareholders in that the interests of the entrepreneur and the interests of the shareholders are not the same. The entrepreneur can make herself better off by taking advantage of shareholders. This agency problem is much less important when ownership is concentrated. If the entrepreneur is the sole shareholder, she has no incentive to overindulge on perks because she has to pay for the perks fully out of her own pocket. If the entrepreneur is not the only shareholder, but there are few shareholders, these shareholders can monitor the entrepreneur closely so that she has only limited ability to overindulge on perks.

With a public firm, ownership is dispersed. The individual shareholders find it much more difficult to monitor the entrepreneur because their access to information is limited. Further, a small shareholder who monitors management has to pay the whole cost of monitoring but receives only a small fraction of the benefit, so that monitoring will typically not be cost effective. Consequently, it can be much easier for the entrepreneur to overindulge on perks. One way for the public company to limit this problem is for the entrepreneur to have a sizeable stake in the firm. This way the entrepreneur pays for more of the perks she consumes than if she had a small stake. However, if the entrepreneur has to have a large stake in the firm, the size of the firm is limited by the ability of the entrepreneur to co-invest with other shareholders.

A number of additional steps can help manage the agency conflict between the entrepreneur and the other shareholders. A firm can commit to disclose information about its activities and performance that makes it easier for outsiders to assess whether the entrepreneur overindulges on perks. The firm can also choose to have a board of directors. These directors will have incentives to monitor the entrepreneur's consumption of perks. Laws can also help shareholders recover funds spent by the entrepreneur for other purposes than those they were given for.

For an entrepreneur to raise funds in large amounts from small investors, these investors have to be able to trust that the entrepreneur will operate the firm to generate a return for the investors. It is not straightforward for an entrepreneur to set up the firm in a way that assures small shareholders that the firm will be operated so that they will earn a return. Public markets are a way that enables entrepreneurs to raise

funds so that investors are protected by laws and institutions that make them more comfortable that they will earn a return. An entrepreneur can commit to hire auditors to audit the firm's financial statements, but such a commitment can be reneged on. With the laws and regulations that are associated with public markets, firms have to provide disclosures in a way that is harder to escape. Exchanges also have governance requirements that further help investors have confidence that they will earn a return.

If a firm remains private, the investors who provide funding for the firm have to be patient to receive their return. There is typically no liquid market for their claims. When an entrepreneur seeks large amounts of funding from dispersed investors, these investors will be concerned about their ability to sell their investment if they face liquidity needs. Absent liquidity, the supply of capital from investors will be lower. Public markets make it possible for investors to trade shares. The disclosure and governance commitments that are intrinsic to public firms enhance the liquidity of the shares. Absent disclosure and absent governance commitments, an investor would have to expand considerable resources to assess a firm before investing in shares of that firm. It would be essential for that investor to conduct careful due diligence involving visits of the firm and interviews with the entrepreneur and other members of the management team. In such a situation, trades of shares at a price anywhere close to the fundamental value of the shares would take considerable time and the shares would not be liquid.

Public markets make it possible for entrepreneurs to raise large amounts of funding from dispersed investors. However, not all firms can do so or find it profitable to do so. An important determinant of whether a firm can go public profitably is the extent of the information asymmetries between insiders and potential investors. With a large established firm, there is considerable information available for shareholders to evaluate. The firm has a track record. It has hard assets that can be sold if the firm fails. It is followed by analysts who monitor management. It has established products that have known value and prospects that can be assessed by outsiders. The situation of a young firm is different. A young firm may not have any products yet. If it has products, it has yet to show that there is a broad market for them or that there will be continuing demand for them. These products may not have been on the market long enough for outsiders to assess their strengths and weaknesses. Information asymmetries tend to be much higher for younger firms that do not have an established track record. This means that such firms may find it

impossible to go public or may find that they cannot go public on terms they find acceptable. When outsiders know too little about a firm, they will typically discount the price of shares to account for the fact that there is a risk that the value of the shares is much lower than it appears to be.

Information asymmetries magnify agency conflicts between the entrepreneur and shareholders. If shareholders are well informed about a firm, they can devise contracts that force insiders to pursue policies in the interest of shareholders. However, if the firm is a black box, shareholders have no such ability. In such a situation, the entrepreneur may not be able to raise much funding. Further, even to raise limited funding, the entrepreneur may have to disclose information that may hinder the growth of the firm. Consider a firm that is in the process of developing a product and requires funding to do so. If that firm wants to raise funds by selling shares, it has to provide enough information that potential investors will find these shares to be valuable. In the process of providing this information, the firm may give valuable information to competitors as well. As a result, the firm may be less valuable than it would be if it could raise funding without such disclosures.

Firms that go public can do so for other reasons than raise funds to invest in projects. The existing empirical evidence shows that a powerful motive for firms to go public is to allow existing owners to reduce their stake and diversify their holdings (Pagano, Panetta, and Zingales, 1998). This motive for going public raises similar issues to the ones I have discussed when a firm sells equity to finance a project. When insiders sell shares, insiders hold less of the firm's equity and outsiders who buy shares have to be comfortable that they will earn a return on the shares they buy. Another important motive for going public is that being public provides firms with a currency, public equity, to make acquisitions. The empirical evidence shows that firms acquire intensely early in their life (see Arikan and Stulz, 2016, for evidence on the acquisition rate of firms throughout their lifecycle). One more motive to go public is that equity prices of a public company can be used in compensation contracts for managers and that public equity is generally more attractive to managers as compensation instrument than private equity (Holmstrom and Tirole, 1993).

I have focused on the tradeoffs that arise when a firm considers going public. However, firms that have been public for an extended time may also conclude that the costs of being public exceed the benefits. This is the case for at least two separate reasons. With public firms that have a large body of atomistic

shareholders, CEOs have considerable discretion as it is difficult for these atomistic shareholders to organize to monitor management. As a result, a CEO may pursue an agenda that does not involve increasing shareholder wealth aggressively. For instance, the CEO may be more focused on growing firm size through acquisitions in industries where the firm does not have a comparative advantage. With such a firm, going private could be a way to increase the monitoring of management and to set better incentives for management. Typically, such a transaction would take place in the form of a buyout where a non-operating private company would acquire the public company.

Because public firms are regulated more intensely than private firms, regulatory costs can lead firms to stay private and changes in regulatory costs can lead public firms to reconsider their decision to be public. In the U.S., the governance of public firms is regulated while the governance of private firms is not. Changes in regulation can increase the costs of being public. For instance, it is often argued in the U.S. that the adoption of SOX led some firms to decide to drop out of the public markets.[1] It is important to note, however, that the success of public markets depends crucially on investors in these markets believing that they will receive a return on their investment and that they will be treated fairly in participating in the markets. If these conditions are not met, participation in public markets decreases and the value of being public for a firm falls.[2]

Lastly, it is important to note that when the common stock of a firm is publicly traded, investors can influence the actions of management by buying and selling the stock. They can also monitor management more directly if they have larger positions (see Edmans and Holderness, 2019, for a review of theories and evidence concerning the role of blockholders). Management can learn from changes in the price of the stock (Bond, Edmans, and Goldstein, 2012). For instance, management can believe that an action is beneficial but the stock market may react poorly to the announcement of that action. In such a situation, management may conclude that it should change what it planned to do. Bennett, Stulz, and Wang (2019) show that firms whose stock price incorporates more information are more productive. At the same time, however, there

[1] See, for instance, Pinelli and Muscat (2007).
[2] See Guiso, Sapienza, and Zingales (2008).

are concerns that actions by investors may force firms to focus on the short-term.[3] If indeed that is the case, this would be another cost of being public.

With the framework I have discussed, there are costs and benefits to public equity. With private equity, there are few owners so that the firm's management can be monitored closely and information about the firm can be communicated easily to the non-management owners without incurring the risk of also communicating that information to the competition. However, there is a limit to the extent that firms can be funded privately in part because the market for private equity is illiquid and in part because of the search costs of finding private equity investors. With public equity, more funds can be raised and investors are more willing to invest because their holdings are more liquid than with private equity. However, when a firm is public, its disclosures are public, so that they help investors as well as competitors. Further, public firms have greater agency costs as they have more dispersed shareholders than private firms. To increase their value, public firms commit to disclosure and governance, but as a result their flexibility can be reduced and they may be pushed to take actions that management may think are not in the firm's long-run interest.

In the next two sections, I show that the tradeoffs firms face between being funded with private equity or public equity have changed considerably over the last few decades. First, firms have changed and done so in a way that makes it more advantageous for them to remain private longer or to be acquired. Second, the supply of private equity funding has increased considerably, so that it is much easier for private firms to grow large without having public equity and to go private through buyout transactions.

4. Changing firm characteristics.

On April 9, 2012, Instagram was acquired by Facebook for $1 billion. The firm was funded in June 2010 by Kevin Systrom and Mike Krieger. In October 2010, the firm released its app for IOS. It had one million users after two months and 10 million within a year. On April 3, 2012, it released an app for Android. The app had one million downloads the first day. Yet, on April 9, 2012, when it was acquired, it had 13 employees. When Facebook made the acquisition, it was not a public firm. It used one third of its

[3] See, for instance, Foroohar (2016).

cash reserves for the acquisition. Two years later, after having gone public, it acquired WhatsApp for $19 billion. At that time, WhatsApp had 55 employees.

Both for Instagram and WhatsApp the funding rounds were small. WhatsApp was founded in 2009. Five friends of the founders Acton and Koum put up $250,000 in 2009. Sequoia invested $8 million in 2011. By 2013, the company had 200 million active users. At that time Sequoia invested another $50 million at a valuation of the company of $1.5 billion.[4] The total outside funding of Instagram appears to have been $57.5 million.[5]

The stories of Instagram and WhatsApp are not typical. The amounts of wealth created in a short of period of time are extraordinary. At the same time, these stories are instructive because they are very different from a firm that requires funding to build plants and buy hard assets. Best Buy, a retail company, had its NYSE IPO in 1987. At that time, it had 24 stores, sales of $239 million, and earnings of $7 million. Compared to Instagram and WhatsApp, it had hard assets, a track record, and positive earnings. Its business model at the IPO was much easier to understand; its growth plans were straightforward. In contrast, just before Instagram's acquisition by Facebook, it had no significant revenue and "some top venture-capital firms have decided to pass [on the funding round] because of the app's high valuation and immaturity of its business" according to the *Wall Street Journal*.[6] Besides having few employees, WhatsApp and Instagram had almost no hard assets. Their funding needs before being acquired were minimal. One wealthy investor could easily have funded each one of these firms. They had no need to go to public markets to raise massive amounts to build large plants or acquire large amounts of real estate for stores.

The evolution of firms towards having more intangible assets is critical to understand the change in the funding of firms. In the U.S., capital expenditures for the average public firm have fallen sharply over the last twenty years. One way to see this is to use the statistics in Kahle and Stulz (2018). The average ratio of

[4] "WhatsApp was valued at ~$1.5B in final round before sale," by Alexia Tsotsis, Techcrunch.com, February 22., 2014.
[5] "Right Before Acquisition, Instagram Closed $50M At A $500M Valuation From Sequoia, Thrive, Greylock And Benchmark," by Alexia Tsotsis, Techcrunch.com, April 9, 2012.
[6] "Financing to value Instagram at $500 million," by Spencer E. Ante, *Wall Street Journal*, March 9, 2012.

capital expenditures to assets from 1975 to 1996 is 10% for public firms in the U.S. From 1997 to 2015, this ratio is 5.91%. This means that capital expenditures in the 2000s are 41% lower than they are before. The exact opposite happens with R&D expenditures. The average of R&D expenditures from 1975 to 1996 is 3.4%. It is 6.1% afterwards. Critically, average capital expenditures are lower than R&D expenditures before 1997 and are higher afterwards.

R&D expenditures are not the only intangible investment firms make. Apple has sold more than 2 billion iPhones. The production of the iPhone involves an extremely complex supply chain. While the majority of iPhones are assembled in Shenzhen, the parts come from companies located all around the world. The construction and maintenance of such a supply chain involves considerable investments. The supply chain and all the knowledge acquired to make it work is one of Apple's most valuable intangible assets. Company processes and practices are valuable intangible assets. Their reputation is a valuable intangible asset. Economists find it difficult to value a company's intangible assets beyond capitalizing the value of its R&D investments. When economists try to capitalize the value of a firm's intangible assets, they find a dramatic increase in intangible assets. A recent study by Falato et al. (2018) finds that in the 1970s the average ratio of intangible assets to book assets net of cash was about 20%. Since then, this ratio has grown by a factor of five, so that in the 2000s the ratio is about 100%. Other researchers find that intangible assets are as important as tangible assets for firms (e.g., Corrado, Hulten, and Sichel, 2009). Falato et al. (2018) distinguish between knowledge intangible assets and organizational intangible assets. Apple's supply chain would be an organizational intangible asset. R&D is a knowledge intangible asset. They find that organizational intangible assets are a larger component of intangible assets than knowledge intangible assets.

Public markets can value intangible assets. Many firms, starting with Apple, have extremely high valuations compared to their tangible assets. Consequently, the growing importance of intangible assets is not by itself a reason for firms to use private equity instead of public equity. Public markets can assess intangible assets best when the productivity of these assets can be observed or when a firm has a track record of productive investment in such assets. Valuation of intangible assets that have yet to demonstrate

their productivity is harder for public markets. When firms invest in the development of new products or practices, there is generally considerable uncertainty. There is also an important agency problem. The entrepreneur who started a firm to develop and market a new product must decide when it is no longer optimal to keep spending on the new product. For instance, if the firm is developing a new drug and not having success, at some point it makes sense to stop. However, an entrepreneur financing research with other people's money has incentives to keep spending as the downside is that the investors lose their money and the upside is that the entrepreneur succeeds.

Young firms whose success depends mostly on investments in intangible assets are likely to find it difficult to raise funds in public markets and if they succeed are likely to be constrained by public market investors who find it difficult to assess whether the firm is spending their money effectively and will want to see concrete results to gain comfort that their money is well spent. When raising money for intangible investments from public markets, firms face the difficult problem that the more they disclose to investors, the more information they give to potential competitors. As a result, in their effort to convince potential investors that they have a valuable project, they may decrease the value of the project by helping their competition beat them to a successful outcome. A related issue is that the young firm has to convince public investors who may not have specialized knowledge that helps them assess the firm's project, so that these investors may be willing to pay little for it.

A young firm that raises funds privately rather than publicly to fund a project does not have to disclose information to the public about the project. As a result, it is less likely to help competitors through disclosures and less likely to raise funds at a low valuation because of a lack of disclosure. The firm can raise funds from a small number of investors who can sign non-disclosure agreements. It can deal with investors who have specialized knowledge, so that they can understand the project better. These investors can monitor management closely, so that they can decide when investment in the project should stop or should be increased. The problem for the firm is to find investors who are willing to invest privately and to do so for a long enough period and in amounts that are large enough that the firm can succeed. In the next

section, I explain how the availability of funds for private equity has changed over the last thirty years, so that raising large amounts of private equity is much easier than it used to be.

So far, I have focused on the choice between raising public equity or private equity. An entrepreneur faces a third choice, which is to sell the project to an established firm. Such an approach is like using private equity, but with loss of control. The examples of Instagram and WhatsApp are striking. These firms sold out to a larger firm when they were extremely young. It seems inconceivable that either one of these firms could have gone public with a valuation similar to what it received from Facebook. A sale to an existing firm can enable the new firm to reach scale faster than it could if it chose the route of going public. As Gao, Ritter, and Zhu (2013) argue, the acquiring firm may already have the infrastructure and know-how that it can exploit the project of the new firm on a global scale quickly. With WhatsApp and Instagram, the firms achieved scale on their own. They were global quickly. Their problem was more how to make money out of their products. These products had considerable value for Facebook, but not necessarily for stand-alone firms. In a world where there is considerable value to reach global scale first with a product, the route of going public and raising funding slowly to reach global scale may well be too slow compared to the route of being acquired or of raising private equity with its better control of agency conflicts.

Investment in hard assets produces collateral for investors. If the firm's project fails, there is still liquidation value. With intangible assets, the same may not be true. But some firms with intangible assets can have valuable patents that they can monetize. Doing so has been the business model of Blackberry after the market for its main product collapsed. However, this may not be the case for the typical young firm. It is quite unlikely to be the case if a young firm's intended product is dominated by some other firm's new product before the young firm ever manages to fully develop its product.

5. Back to the future.

At the end of the 19th century, U.S. bankers such as J.P. Morgan took long-term stakes in corporations, controlled their capital raising, and sat on their boards (de Long, 1991). When AT&T had to raise a large amount of capital, the price exacted by investment bankers was that AT&T would have a CEO that they

could have confidence in. Though investment bankers raised funds from many investors on behalf of corporations, their presence on the board of these corporations helped mitigate agency conflicts between management and investors. In many ways, these investment bankers acted like general partners in private equity funds in the 21st century, but often for public firms. This influence of investment bankers decreased in the 21st century before eventually laws were adopted that made it impossible for executives of depository banks to underwrite securities and control corporations in the same way that J.P. Morgan could. In addition to the passage of the Glass-Steagall legislation (which was a component of the Banking Act of 1933) that separated commercial banking from investment banking, the Great Depression also saw laws adopted that created the SEC and limited the ability of firms to raise equity outside the public markets. These laws also require periodic disclosures from public firms as well as disclosures when they intended to issue new securities.

In the U.S., the Securities Act of 1933 requires new security issues to be registered with the SEC. Once securities are issued publicly, they obligate the issuer to periodic disclosures. This process is costly both in terms of compliance costs but also in the form of indirect costs, such as making information available to competitors. After the creation of the SEC, public firms were heavily regulated compared to private firms when it came to disclosures and to fund raising. The main constraint on private firms was that they could not raise funds publicly and were severely limited in the number of shareholders they could have before having to become public. They could not advertise a security issue.

The laws had a way for partnerships and corporations to intermediate between investors and firms. A partnership could be created that would invest in the equity of private firms. In various ways, this partnership could have a larger number of investors even though it amounted to only one shareholder in the firm in which it took a stake. These partnerships became private equity funds. They replaced investment in the equity of firms by banks. Private equity funds were started after World War II. The first fund appears to be the American Research and Development Corporation (ARDC) funded by Georges Doriot, a Harvard Business School Professor born in France, in 1946. This fund is most famous for its early investment in Digital Equipment Corporation.

Private equity's influence grew over time. It went through periods of boom and bust. It was helped by deregulation that made it easier for firms to stay private as the number of shareholders they have grows (de Fontenay, 2016). Regulation D in 1982 allowed partnerships such as private equity funds or hedge funds to have up to 100 investors. However, a condition was that these investors had to hold their stake for investment. Eventually, restrictions on the number of shareholders and the number of investors in investment vehicles were relaxed. In 1996, the cap of 100 investors for investment vehicles was removed. Ewens and Farre-Mensa (2019) provide evidence that the 1996 law change played an important role in the decrease of IPOs. By 2012, a private firm could have 500 shareholders without having to go public. At that time, Facebook was reaching that threshold. Its unhappiness with that threshold contributed to further deregulation as Congress passed the Jumpstart Our Business Startups (JOBS) Act that increased the threshold to 2,000 shareholders. Hence, at this time, a firm can have 2,000 shareholders and still be private.

Deregulation made it easier for private equity funds to raise funds to invest. It also made it easier for private firms to grow and expand their number of shareholders. Both evolutions mean that constraints that led firms to go public were relaxed. A private firm can become extremely large before the constraint of 2,000 shareholders becomes binding. At the time that Uber Technologies went public in May 2019, its valuation was $69 billion. I have seen no indication that Uber went public because it was constrained by the 2,000 shareholders limit. Another indication that this limit is unlikely to be constraining is that in May 2019 there were 196 U.S. private startups valued at $1 billion or more according to Crunchbase.

One factor that explains the large number of highly valued private firms is the deregulation that took place, so that constraints that would have forced firms to go public or give up on fast growth earlier are no longer binding. However, the relaxation of these constraints alone would not be enough to explain the current state of private equity. Two additional considerations are essential. First, it must be that the companies that choose to stay private are worth more to their owners being private than going public. Second, there must enough funding for private equity that private equity investors are not in a position where they have to force firms to go public. I examine each of these two factors in turn.

As discussed earlier, there are costs and benefits for a firm to be organized as a private firm rather than as a public firm. If a firm is private, the liquidity of its claims is more limited and its ability to raise funds is limited. The benefit for a firm of being organized as a private firm is that agency costs are generally better controlled because the firm has concentrated ownership (Jensen, 1989). Even though Uber had many shareholders before its IPO, a small number of shareholders controlled the firm. This is generally the case for all unicorns. As we saw also, private firms are not subject to the laws and regulations that govern public firms. In particular, they do not have to disclose their financial statements to the public. The value of being private is higher when potential agency conflicts are stronger and when the costs of disclosure are higher. In general, these benefits will be high for firms that are developing products and do not have a track record. Large established firms that need to repeatedly raise funds will generally find it more advantageous to access public markets instead. However, large established firms that are mostly generating large cash flows from existing assets and have poor investment opportunities may benefit from being private, especially if they benefit from focusing more on their core activities. Jensen (1986) described the agency problem of these firms as the agency costs of free cash flow.

The evolution of firms that I describe in the previous section means that more young firms are building intangible assets in such a way that public ownership may be costly and may be limiting growth. In the absence of the deregulation of investment vehicles and of the number of shareholders of private companies, many of these firms would likely be smaller and be public, but they might also be worth less because being organized as public firms would have obvious costs for these firms.

With deregulation of investment vehicles and the growing institutionalization of investment, collective investment funds can accumulate vast amounts of money to invest. It is therefore not surprising that private equity funds have become extremely large, so that they can acquire control of extremely large firms. There are also extremely well endowed investors who can invest along private equity funds, such as asset management firms, endowments, sovereign funds, and wealthy investors. As a result, limits on the size of investments by investment vehicles have been relaxed. The largest buyout as of now is TXU for $31.8 billion in 2007. Adjusting for inflation, the amount would have been $35.7 billion in 2015. In 2015, only

119 U.S. firms had a greater market capitalization. Though a private equity transaction could not acquire the largest firms in the U.S., at this time it is reasonable to think that any firm smaller than the top 100 firms could potentially be acquired through a leveraged buyout. At year-end 2018, the dry power of private equity funds was $2 trillion. Private equity funds use leverage, so that they could make acquisitions for a multiple of their dry powder.

An important development with private equity is the increased ability of private equity investors to trade their investments in private equity funds if they need or want to. An obvious advantage of public equity for investors is that they can trade shares of common stock easily whenever they want to for most publicly traded firms. The equity of the largest listed firms in the U.S. is extremely liquid, so that large amounts can be traded relatively quickly with little price impact. In contrast, typically investments in private equity funds were not tradeable. There was no market for such investments and regulations made it difficult to sell such investments. Recent development of trading platforms for investments in private equity funds have increased the liquidity of such investments, so that one cost of investing in private equity as opposed to public equity has decreased and can be expected to decrease further (see Nadauld et al., 2019).

5. Past, present, and future

As I showed, the number of public firms is now much lower in the U.S. than at any time over the last forty years. The number of public firms seems to have peaked across Western developed countries. With the framework I developed, there are costs and benefits for a firm to be public. Among the costs I emphasize are agency costs from diffused ownership and costs from disclosure. The main benefits involve the ability to raise large amounts of funding, the use of public equity in M&A and managerial compensation, the price discovery from public markets, and the ability of insiders to decrease the risk they are exposed to and diversify their wealth.

The number of public firms can fall for two distinct reasons. First, the propensity to list can decrease, so that fewer existing firms choose to be public. Second, firms can delist, so that the number of listed firms can fall even if firms are as inclined to list as before. At least in the U.S. before the global financial crisis,

the evidence is that the drop in listings is caused mostly by a drop in the propensity to list. However, part of the reason for the drop in listed firms is that there is a high rate of mergers among public firms, so that surviving firms are larger and industries more concentrated. Another reason for the drop in listed firms is that there are few IPOs, so that firms that cease to be listed are not replaced by young firms that list.

Much has been made in the U.S. of changes in laws that, it is argued, have increased the costs of being public. It is important to note that the largest decreases in the number of public firms happened before the adoption of SOX in 2002 and much before the implementation of some of its provisions to small firms, which was repeatedly postponed. The U.S. adopted the JOBS Act in 2012 to relieve startups going public from some of the regulatory burden that was thought to explain the low rate of firms going public. This Act appears not to have stemmed the decrease in the number of public firms as can be seen in Figure 1. In the two years following adoption of the Act, the number of IPOs was elevated, but after these two years the number of IPOs has been lower each year than in any year from 2004 to 2007.

From our framework, the number of listed firms falls when the benefits of being public fall and the costs increase. We saw that the growth of private equity has made it easier for firms to raise funding privately, so that firms that otherwise would have gone public to raise funds no longer have to do so. We also saw that the raise of intangible capital makes it costlier for firms to go public, which again decreases the benefit for firms to go public. These two important evolutions imply that firms find it much less compelling to incur the costs of being public, at least early in their life. The increase in the financing capacity of private equity also means that existing firms that conclude that going private would allow them to raise value find it easier to do so. The peak number of public to private transactions for Western developed economies is 174 in 2007.[7] Since 2011, this number has been lower than 100 every year.

Looking to the future, there is no reason to think that the evolution that has taken place over the last twenty years will be reversed soon. Public policy could make it more attractive for firms to be public, but it is unlikely that measures to decrease the transaction costs of going public will have much of an impact

[7] "Take-private buyouts on pace for decade low in 2018," by Kevin Dowd, PitchBook, September 12, 2018.

on the number of public firms as evidenced by the JOBS Act. Even if going public involved no transaction costs, firms would still have to disclose information that might be used advantageously by their competitors, so that firms might want to wait until they are established to do so. Having firms disclose less to public markets does not really solve the problem because when firms disclose less, they may receive less value for their equity compared to selling equity to specialized investors to whom they can disclose more. Going public, firms give information away. Staying private, they are able to have investors who have specialized knowledge that can help them develop. This does not mean that there are no risks to the growth of private equity and the decrease in public equity. Price discovery is much poorer in private markets, so that bubbles can develop and there is a high potential for misvaluations. Though there has been progress in making private equity investments more liquid, it is not possible to sell such investments short. It is well-known from the finance literature that securities that cannot be sold short can be overvalued as investors who believe the securities to be overvalued have no way to take advantage of their knowledge.

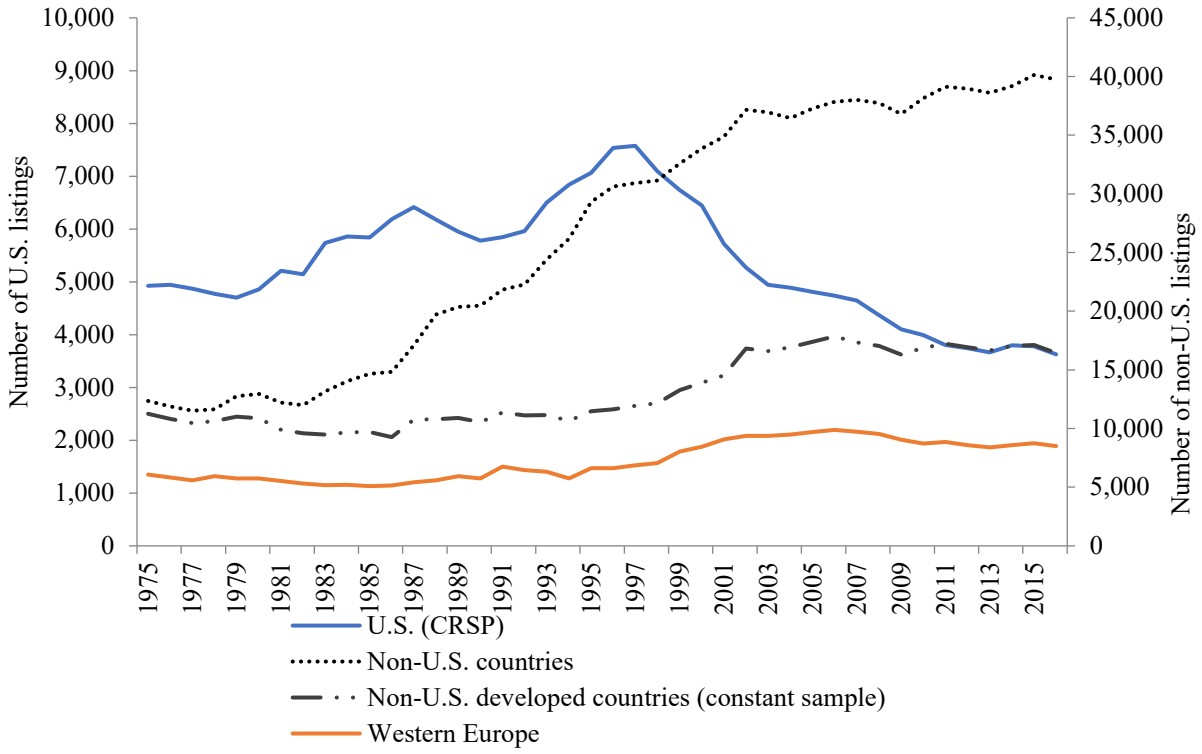

Figure 1. Evolution of the number of listed firms across the world.

The numbers in the Figure for the number of listed firms in various countries are from the Center For Research in Security Prices for the U.S. and from the World Development Indicators for the other countries.

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