

*Journal of***APPLIED CORPORATE FINANCE****In This Issue: Corporate Finance Addresses Uncertainty**

Eclipse of the Public Corporation or Eclipse of the Public Markets?	8	<i>Craig Doidge, University of Toronto, Kathleen Kahle, University of Arizona, Andrew Karolyi, Cornell University, and René Stulz, Ohio State University</i>
Fiduciary Duties of Corporate Directors in Uncertain Times	17	<i>Ira M. Millstein, Ellen Odoner, and Aabha Sharma, Weil, Gotshal & Manges</i>
Financial Flexibility and Opportunity Capture: Bridging the Gap Between Finance and Strategy	23	<i>Stephen Arbogast, University of North Carolina at Chapel Hill, and Praveen Kumar, University of Houston</i>
Say on Pay: Is It Needed? Does It Work?	30	<i>Stephen O'Byrne, Shareholder Value Advisors</i>
Internal Governance Does Matter to Equity Returns but Much More So During “Flights to Quality”	39	<i>Peter Brooke, Platypus Asset Management, Paul Docherty, Monash University, Jim Psaros, The University of Newcastle and Michael Seamer, The University of Newcastle</i>
Clawbacks, Holdbacks, and CEO Contracting	53	<i>Stuart Gillan, University of Georgia, and Nga Nguyen, Marquette University</i>
Fundamental Investors Reduce the Distraction on Management from Random Market “Noise”: Evidence from France	62	<i>Alexandre Garel, Auckland University of Technology, and Jean-Florent Rérolle, Morrow Sodali</i>
An Improved Method for Valuing Mature Companies and Estimating Terminal Value	70	<i>David Holland, University of Cape Town Graduate School of Business</i>
Biomarker of Quality? Venture-Backed Biotech IPOs and Insider Participation	78	<i>Hans Jeppsson, University of Gothenburg</i>
How to Evaluate Risk Management Units in Financial Institutions?	89	<i>Michael Gelman, Ben-Gurion University of the Negev, Doron Greenberg, Ariel University, and Mosi Rosenboim, Ben-Gurion University of the Negev</i>
Global Trade – Hostage to the Volatile US Dollar	98	<i>Brian Kantor, Investec</i>
Corporate Finance and Sustainability: The Case of the Electric Utility Industry	106	<i>Steven Kihm, Seventhwave and University of Wisconsin-Whitewater, Peter Cappers, Lawrence Berkeley National Laboratory, Andrew Satchwell, Lawrence Berkeley National Laboratory, and Elisabeth Graffy, Arizona State University</i>

Eclipse of the Public Corporation or Eclipse of the Public Markets?

by Craig Doidge, University of Toronto, Kathleen M. Kahle, University of Arizona, G. Andrew Karolyi, Cornell University, and René M. Stulz, Ohio State University

In a 1989 article entitled “The Eclipse of the Public Corporation” and published in the *Harvard Business Review*, Professor Michael Jensen concluded that the publicly held corporation was in decline and had outlived its usefulness in many sectors of the economy. Jensen argued that the conflict of interest between owners and managers can make public corporations an inefficient form of organization. He made the case that new private organizational forms promoted by private equity firms reduce this conflict and are more efficient for firms in which agency problems are severe. In 1989, there were 5,895 U.S. domiciled listed firms on the U.S. exchanges. Jensen’s prediction about the decline of public firms did not come true for the next several years, however, as the number of public firms actually increased until 1997. There were 7,509 public firms in the U.S. at the peak in 1997. But by the end of 2016, Jensen’s prediction seemed to have been validated as the number of U.S. listed firms had fallen sharply to 3,618. Since the 1997 peak, the number of listed firms has fallen every year but one (2014).

So, has Michael Jensen been vindicated about the eclipse of the public corporation that he predicted in the late 1980s? While the total number of public firms in the U.S. has declined, there are many hugely profitable and successful public companies such as Google, Apple, Amazon, Microsoft, and Facebook, each with market capitalizations that could conceivably reach \$1 trillion in the not too distant future. Paradoxically, we seem to have some of the most profitable and successful companies in the history of U.S. capital markets and, at the same time, a collapse in the number of public firms. One common characteristic of Google, Apple, Amazon, Microsoft, and Facebook is that these companies have vastly more intangible than tangible capital.

In this article, building on our previous work, we argue that U.S. public markets are not well-suited to satisfy the financing needs of young firms with mostly intangible capital.¹ In that sense, what we are really witnessing is an

eclipse not of public corporations, but of the *public markets* as the place where young, successful, American companies seek their funding. We first show how the number of listed firms has evolved in the U.S. and abroad. We next demonstrate that in the U.S. small firms have left the exchanges, and the propensity of these small firms to list has fallen sharply since 1997. We then show how listed firms have changed in the U.S. In the last section of the paper, we investigate whether the changes that have taken place represent an eclipse of the public corporation in the U.S., an eclipse of the public exchanges, or whether we need yet another explanation to make sense of them.

The Drop in U.S. Listings in Perspective

Figure 1 shows the evolution of the number of U.S. domiciled firms listed on the NYSE, Amex, and Nasdaq from 1975 to 2016.² In 1975, the U.S. had 4,818 listed firms. This number increased rather steadily until 1997, when it reached 7,509 listed firms. From that year onward, the number fell rapidly until 2003 and then at a slower pace. However, the number of listed firms kept falling until 2013, when it reached 3,657. From 2013 to 2014, the number of listed firms increased by 128, but then it fell again, so that in 2016 it was 3,618. At the end of 2016, the number of listed firms was 25% less than in 1975 and 52% less than its peak in 1997. It is especially striking that the number of firms has fallen so much given that during this time the population of the U.S. increased from 215 million in 1975 to 323 million in 2016. In 1975, the U.S. had 22.4 listed firms per million inhabitants. By 2016, it had just 11.2.

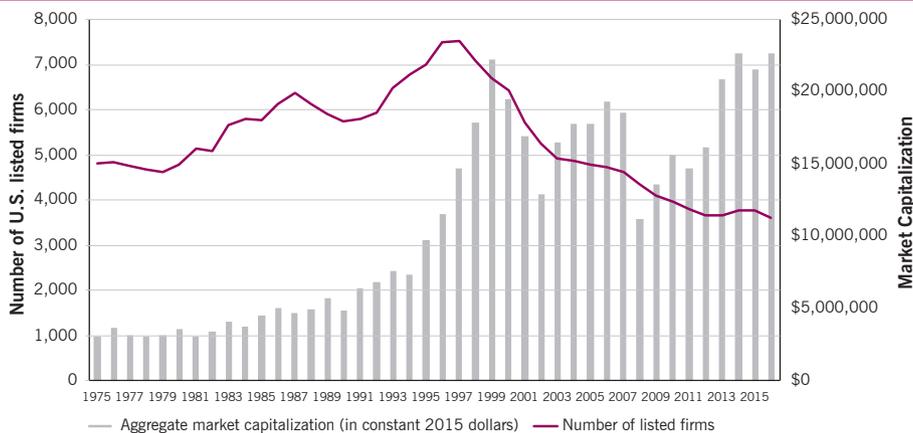
Figure 1 also shows that the inflation-adjusted aggregate market capitalization of listed firms was 7.4 times higher in 2016 compared to 1975, but the increase was not smooth, especially after 1999. In constant 2015 dollars, the aggregate market capitalization of listed firms was only \$434 billion dollars higher at the end of 2016 than it was at the end of 1999. Many academic studies use the ratio of the aggregate

1. See Craig Doidge, G. Andrew Karolyi, and René M. Stulz, “The U.S. Listing Gap,” *Journal of Financial Economics* 123(3): 464–87; 2017; and Kathleen M. Kahle and René M. Stulz, “Is the US Public Corporation in Trouble?” *Journal of Economic Perspectives* 31(3): 67-88; 2017.

2. We use two main data sources for our analysis of U.S. firms: CRSP and Compustat. From CRSP, we obtain all U.S. firms listed on the NYSE, AMEX, and Nasdaq, excluding investment companies, mutual funds, REITs, and other collective investment vehicles. When we examine Compustat data, we use the intersection of CRSP and Compustat

firms. For non-U.S. firms, we use data from the World Bank’s World Development Indicators database and from the World Federation of Exchanges. The construction of the database is described in Doidge, Karolyi, and Stulz (2017). To update the database used in Doidge, Karolyi, and Stulz (2017), we follow the approach described in that paper. Note that while it seems easy to figure out the number of listed firms in a country, it is not always so as a number of data choices must be made. For example, updates of public databases such as CRSP and Compustat can make retroactive changes to past counts that can lead to different estimates for the U.S.

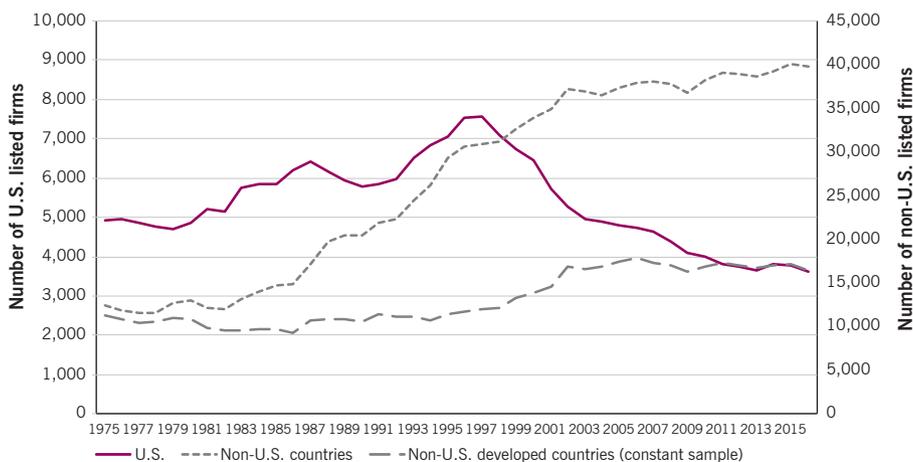
Figure 1 Number of listed U.S. firms and their aggregate market capitalization



Source: The Center for Research in Security Prices (CRSP).

Note: Listed firms include U.S. firms in CRSP that are listed on the NYSE, AMEX, and Nasdaq. Investment companies, mutual funds, REITs, and other collective investment vehicles are excluded. Aggregate market capitalization is in 2015 dollars. The sample period is from 1975 to 2016.

Figure 2 Number of listed firms



Source: Center for Research in Security Prices (U.S. firms) and the World Bank's World Development Indicators database and the World Federation of Stock Exchanges (non-U.S. firms).

Notes: Listing counts include domestic firms. They exclude investment companies, mutual funds, REITs, and other collective investment vehicles. There are 71 non-U.S. countries. Countries are classified as developed based on the MSCI classification scheme as of 2014. The constant sample of non-U.S. countries includes the 13 countries that are developed over the whole sample period. The sample period is from 1975 to 2016.

market capitalization of stocks to GDP as a measure of financial development.³ This ratio was 38.3% in 1975. It peaked at 153.5% in 1999, dropped to 69.2% in 2008, and increased back to 124.0% in 2016. The ratio in 2016 is 19% lower than at its peak.

The fact that the market capitalization of the U.S. markets is not higher partly reflects the same phenomenon as the decrease in the number of listed firms. Since the peak in listings in 1997, U.S. firms have been repurchasing dramatically more equity than they have issued. The amount spent

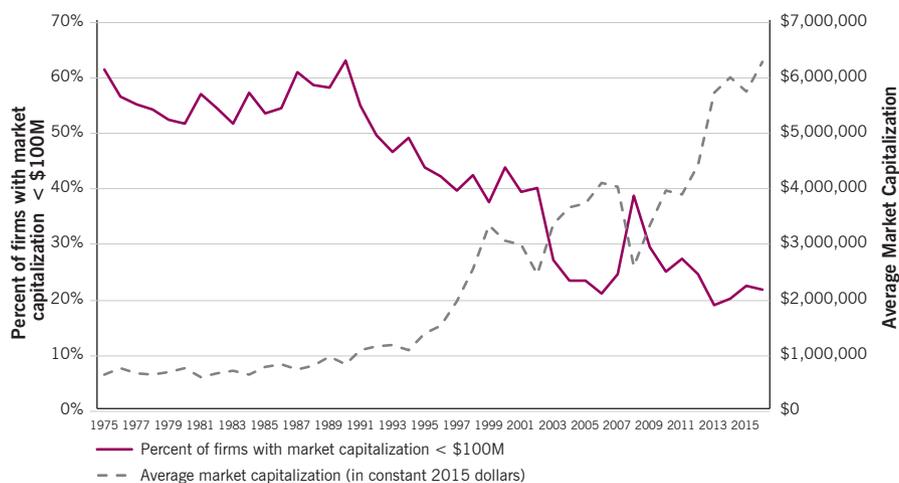
on share repurchases since 1997 is \$3.6 trillion greater than the amount raised from issuing equity over the same period. In other words, U.S. public firms returned significantly more equity capital to shareholders than they raised from them since 1997.

The decline in the number of listed firms raises the question of whether the U.S. now has too few listed firms relative to other countries.⁴ Figure 2 presents the latest data comparing the number of listed firms in the U.S. to the number of listed firms everywhere else in the world and to

3. See, for example, Ross Levine, "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature* 35(2): 688-726; 1997.

4. Doidge, Karolyi, and Stulz (2017) compile a database of listings across the world since 1990.

Figure 3 **Percentage of listed U.S. firms with market capitalization less than \$100M and average market capitalization**



Source: The Center for Research in Security Prices (CRSP).

Note: Listed firms include U.S. firms in CRSP on the NYSE, AMEX, and Nasdaq. Investment companies, mutual funds, REITs, and other collective investment vehicles are excluded. Market capitalization is in 2015 dollars. The sample period is from 1975 to 2016.

non-U.S. developed countries. The number of listed firms shows no sharp drop since the late 1990s, either in the world outside the U.S. as a whole or even just among non-U.S. developed countries. In fact, the number of listed firms outside the U.S. increased significantly, even among non-U.S. developed countries, but in these latter countries it has been fairly stagnant since 2003.

The law and economics literature argues that more prosperous countries, faster growing countries, and countries that protect investor rights better have more listed firms per capita.⁵ Professors Doidge, Karolyi, and Stulz,⁶ however, show that the U.S. now has relatively fewer listed firms than other countries with similar characteristics. They refer to this as “the U.S. listing gap” and show that the magnitude of this gap is large and has persisted since 2002.⁷ A listing gap in the U.S. does not mean that no other country has a listing gap, but confirms that the shortage of listed firms observed in the U.S. is not a global phenomenon.

Disappearing Small Firms

For the number of listed firms to decline, firms must be leaving public stock exchanges faster than others enter. The number of new lists in the U.S. has been extremely low for the last fifteen years and especially so since 2008. The average annual number of new lists from 2009 to 2016 is 179, according to data from the Center for Research in Security Prices (CRSP). In contrast, the average annual number of new lists around the peak listing year from 1995 to 2000 was 683.5.

In other words, since the global financial crisis, the average annual number of new lists is less than one third of what it was between 1995 and 2000.

Delisting counts have fallen also, but by less than new lists. Firms delist because their performance does not allow them to remain listed, because they voluntarily choose to delist, or because they are acquired. The most important cause of delists since the listing peak is mergers and acquisitions. Since the listing peak, there have been 8,620 delists, according to CRSP. Of these delists, 5,274, or 61.2% of the total, are due to mergers, 3,060, or 35.5%, are delists due to poor performance, and only 286, or 3.3%, are voluntary delists. Until the listing peak, both mergers and voluntarily delists were relatively less important, accounting for 55.2% and 1.7% of delists, respectively, from 1975 to 1997. Though much has been made of voluntarily delists in the media and popular press, there are simply too few firms that leave the exchanges of their own accord, and do so without being acquired, for them to be an important part of the explanation for the overall decline in listed firms.

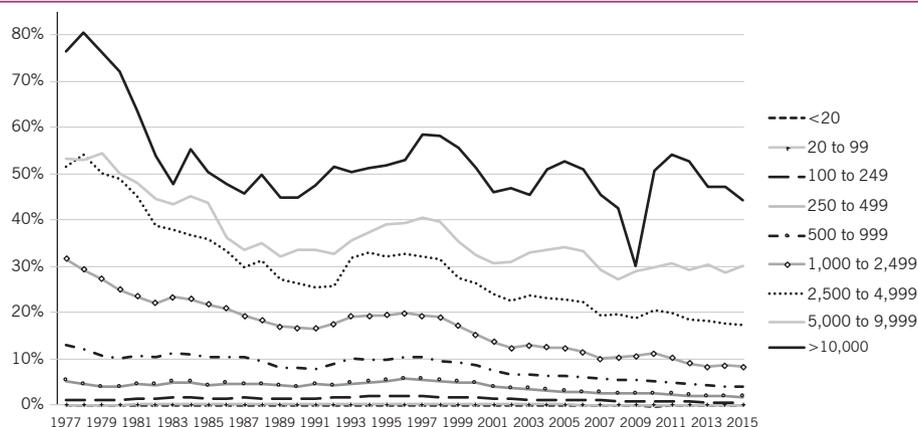
Everything else equal, research shows that new lists are smaller firms, and smaller firms are more likely to delist. Hence, a drop in new lists means *relatively* fewer small, young firms. As a result of fewer new lists and more delists, the disappearance of small firms from public exchanges has been dramatic. As shown in Figure 3, the percentage of firms with market capitalization below \$100 million in 2015 dollars has collapsed over the last forty years. From 1975

5. For example, Simeon Djankov, Rafael LaPorta, Florencio Lopez-de-Silanes, and Andrei Shleifer, “The Law and Economics of Self-Dealing,” *Journal of Financial Economics* 88(3): 430-65; 2008.

6. Doidge, Karolyi, and Stulz (2017).

7. Doidge, Karolyi, and Stulz (2017) conclude that if the U.S. had as many listed firms per capita as countries with similar GDP per capita, GDP growth, and quality of protection of investor rights, in 2012 it would have had 9,538 listings instead of 4,102.

Figure 4 Firm size, industry, and listing propensity



Source: The Center for Research in Security Prices (CRSP), Compustat, and the U.S. Census Bureau's Longitudinal Business Database.

Notes: Listed firms include U.S. firms in CRSP and Compustat on the NYSE, AMEX, and Nasdaq that we can assign to an employee size group. Investment companies, mutual funds, REITs, and other collective investment vehicles are excluded. The percentage of firms that are listed in each employee size group equals listed firms/total firms, where total firms includes public and private firms. The sample period is from 1977 to 2015.

to 1991, more than 50% of firms had a market capitalization of less than \$100 million. After 1991, this percentage drops steadily. In 1997, it falls below 40% for the first time during our sample period. Since 2003, that percentage never exceeds 30%. In 2016, it is 22%. If there are fewer small firms on public exchanges, the average market capitalization must have increased. Indeed, it has done so dramatically. In 2015 dollars, the average market capitalization in 1975 was \$662 million. At the peak of listings, it was about \$2 billion. Since the number of listings started collapsing, the average market capitalization has basically tripled, as it now exceeds \$6 billion.

Young firms are more likely to delist and new lists tend to be small firms. Having more delists than new lists implies that small, young firms drop out of exchanges more frequently than they enter. Therefore, it is not surprising that the age of listed firms has increased substantially. At the peak of listings, the average age of a listed firm was 12 years. In 2016, the average age was 20 years. Older firms tend to be less dynamic and more set in their ways.⁸

This disappearance of small firms on U.S. exchanges and the associated increase in the size of listed firms is not accompanied by a disappearance of smaller firms outside the public exchanges. Data on private firms is hard to obtain, but there is good data for the distribution of firm size, when size is measured by the number of employees.⁹ Tiny firms with fewer than 20 employees are extremely unlikely to be listed at any point in time. In 2015, the U.S. had almost 4.5 million firms with less than 20 employees and 615,048 firms with more

than 20 employees. Since tiny firms are not relevant for our analysis of the overall propensity to list on major exchanges, we exclude tiny firms from our analysis.

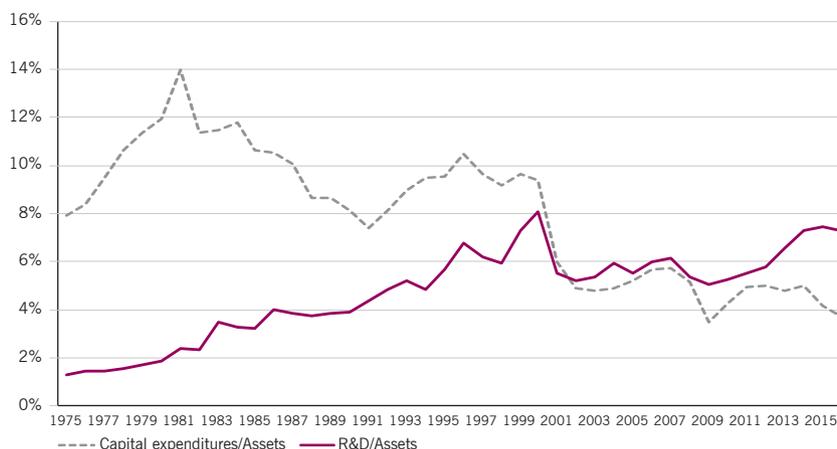
In aggregate, the number of firms with more than 20 employees has increased since the listing peak. In 1997, the U.S. had 560,861 firms with more than 20 employees. By 2015, this number increased to 615,048. At the same time, the rate of increase in new firms has been dramatically slower since the listing peak. From 1977 to 1997, the number of firms with 20 or more employees increased at an average annual rate of 3.2% per year. From 1998 to 2015, the average annual rate of increase is half a percent per year. The drop in the average annual rate of increase after the listing peak gives an excessively pessimistic view of the growth in the number of firms because the financial crisis adversely impacted the number of firms. The number of firms with 20 employees or more reached a peak of 636,904 in 2007. It then fell to a trough of 569,569 in 2011. From 2011 to 2015, the number of firms increased at the rate of 2% per year, which is slightly larger than the average rate of increase of 1.5% from the peak to the crisis.

The important takeaway from these counts is that, excluding tiny firms, the propensity to be listed on a major exchange fell by 54% from the listing peak in 1997 to 2015. Figure 4 shows the drop in the propensity to list arises across firm size categories. Though the drop in the propensity to list is smaller for the largest firms, the propensity has fallen for all firm sizes since the listing peak. This evolution implies that the distribution of firm size for listed firms has tilted more

8. See Claudio Loderer, René Stulz, and Urs Waelchi, "Firm rigidities and the decline of growth opportunities," *Management Science* 63(9): 3000-20; 2017.

9. Doidge, Karolyi, and Stulz (2017) show that the main driver of the drop in listings is not a shift in the population of firms but rather a drop in the propensity of firms to be listed. Their data starts in 1977 and stops in 2012. We update this data through 2015, which is the last year for which it is available from the Longitudinal Business Database (LBD) of the U.S. Census Bureau.

Figure 5 Capital expenditures versus research and development expenditures



Source: The Center for Research in Security Prices (CRSP) and Compustat.

Note: Listed firms include U.S. firms in CRSP and Compustat on the NYSE, AMEX, and Nasdaq. Investment companies, mutual funds, REITs, and other collective investment vehicles are excluded. Capital expenditures/Assets equals capital expenditures divided by lagged assets. R&D/Assets equals R&D divided by lagged assets. If R&D is missing, it is set equal to 0. The sample period is from 1975 to 2016.

towards large firms than before the listing peak. In 1997, 0.23% of the firms with 20 to 99 employees were listed on exchanges. By the end of 2015, that percentage fell by 67% to 0.076%. The percentage of firms that choose to list has fallen by more than 60% for firms with less than 1,000 employees. It has fallen for larger firms as well, but by a slower rate. For instance, in 1997, 58% of firms with more than 10,000 employees were listed. In 2015, this percentage was 44%, a 24% drop since 1997.

The same U.S. Census data that we use to estimate the listing propensity by firm size also contains information that allows us to estimate the listing propensity by coarse industry categories up to 2014. We confirm that the propensity to list falls across all industry categories.

How Listed Firms Have Changed

As Professors Kahle and Stulz show, listed firms now are quite different from listed firms in the 1970s.¹⁰ In 1975, the average U.S. listed firm¹¹ spent six times as much on capital expenditures as on research and development. But in 2016, average R&D expenditures were 7.3% of assets while capital expenditures were only 3.8% of assets. That is, 2016 capital expenditures were, on average, just 51% of a firm's R&D expenses. Capital expenditures accumulate on a firm's balance sheet as tangible assets. On a balance sheet, fixed assets are assets that are purchased for long-term use, such as land, building, and equipment. In 1975, the average listed firm had fixed assets corresponding to 34.4% of its assets. But in 2016, fixed assets are just 19.6% of total assets.

As shown in Figure 5, R&D expenditures for the average

firm exceeded capital expenditures for the first time in 2002. And, since 2002, R&D expenditures have exceeded capital expenditures every year. The ratio of average capital expenditures to average R&D expenditures was lowest in 2016. In contrast, from 1975 to 2016, the highest the ratio ever reached was 6.85-to-1 in 1978. The decrease in the ratio of capital expenditures to R&D expenditures can be explained by a decrease in capital expenditures as well as by an increase in R&D expenditures. The ratio of capital expenditures to assets fell sharply starting in 2001. In 2016, average capital expenditures to assets was 3.8%, which is the lowest ratio in any year since 1975 except for 2009. In contrast, the average ratio of R&D expenditures to assets was 7.3% in 2016, which is the second highest ratio in any year, but just slightly lower than the peak ratio of 7.4% in 2015.

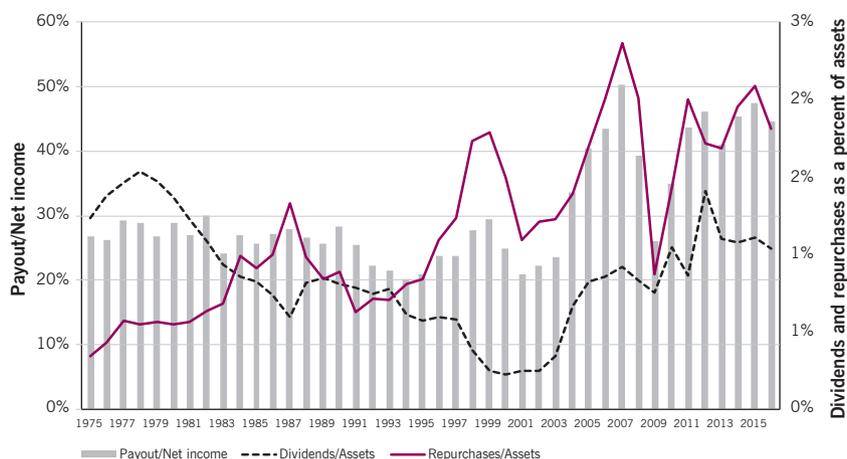
Though we focus on firm averages, it is important to note that there is large variation across firms in R&D spending. Many large firms spend little on R&D (including Walmart, Berkshire Hathaway, AT&T, Verizon, and Exxon). It follows that examining averages across firms can overstate the importance of R&D compared to capital expenditures for the economy as a whole, since the ratio of R&D to assets is negatively correlated with size. In aggregate dollar terms, R&D expenditures are still less than capital expenditures, but there are many small public firms for which R&D is much more important than capital expenditures.

The changing ratio of capital expenditures to R&D expenditures is indicative of deeper changes in corporate America. For many firms, intangible assets are now more important than tangible assets. Firms invest in intangible

10. Kahle and Stulz (2017).

11. Listed firms include those that are covered by both CRSP and Standard & Poor's Compustat database.

Figure 6 Firm payout policy



Source: The Center for Research in Security Prices (CRSP) and Compustat.

Note: Listed firms include U.S. firms in CRSP and Compustat on the NYSE, AMEX, and Nasdaq. Investment companies, mutual funds, REITs, and other collective investment vehicles are excluded. Dividends/Assets equals ordinary cash dividends divided by lagged assets. Repurchases/Assets equals the purchase of stock minus any decrease in preferred stock, divided by lagged assets. Payout/Net income equals dividends plus repurchases, divided by net income. The sample period is from 1975 to 2016.

assets when they train their employees, improve their organizational structure, develop new systems, build their brand, and so on. If a firm spends \$1 on research that could lead to a profitable new product, its current profitability falls by \$1 and its assets fall by \$1 because it spent cash (ignoring taxes for simplicity's sake). If a firm spends an additional \$1 on new machinery, its total assets are unaffected as the decrease in cash is offset by an increase in fixed assets. Spending an additional \$1 on capital expenditures has no impact on current profitability as that expenditure is capitalized instead of being treated as an expense. But because U.S. Generally Accepted Accounting Principles (GAAP) generally require R&D investments to be expensed, it is difficult to assess the value of a firm's intangible assets. Although difficult to measure precisely, researchers estimate that, on average across firms, intangible assets accounted for 10% of net assets (assets minus cash holdings) in 1970, but exceeded 50% in 2010.¹²

When Jensen wrote his article in 1989, he was concerned that public company managers would hoard and waste resources rather than return cash to shareholders. He called this problem "the agency cost of free cash flow." Back in 1989, U.S. firms held on average 13.6% of their assets in cash. In contrast, in 2016, the average ratio of cash holdings to assets was 21.5%, which was the highest ratio from 1975 to 2016. The increase in cash holdings of U.S. firms is an important change in the composition of assets of these firms, the cause of which has been widely debated.

It may still be, as Jensen feared, that CEOs simply

want to hoard resources that they cannot reinvest profitably rather than pay out profits to shareholders. But we think there are two legitimate reasons to doubt that the increased cash holdings are the result of CEOs hoarding resources at the expense of shareholders. First, one would expect firms to hold more cash as intangible assets become more important.¹³ A firm can use tangible assets as collateral to borrow against, but it may find it much more difficult, if not impossible, to use intangible assets. This economic logic predicts that the increase in the importance of intangible assets leads to an increase in cash holdings.

A second reason to doubt that high corporate cash levels are the result of agency problems is that U.S. firms have extremely high payout rates in recent years, which is another important way in which firms have changed over time. In 1975, 63% of firms paid dividends and, on average, dividends were 1.3% of assets. The percentage of firms paying dividends reached a low of 30% in 2000, but this percentage increased to 42.4% in 2016. Further, while dividend payouts relative to assets averaged 0.4% in the early 2000s, they are now approximately 1%. In 1975, payouts were almost exclusively in the form of dividends. In 2016, repurchases represented a larger proportion of payouts than dividends. Figure 6 shows that throughout the 2000s, repurchases have exceeded dividends as a fraction of assets, typically by a ratio of more than two to one.

Another useful way to see the change in how U.S. firms return capital to shareholders is to look at payouts relative to

12. See Antonio Falato, Dalida Kadyrzhanova, and Jae W. Sim, "Rising Intangible Capital, Shrinking Debt Capacity, and the U.S. Corporate Savings Glut," *Finance and Economics Discussion Paper* 2013-67, Board of Governors of the Federal Reserve System; 2013.

13. See Thomas W. Bates, Kathleen M. Kahle, and René M. Stulz, "Why Do U.S. Firms Hold So Much More Cash than They Used To?" *Journal of Finance* 64(5): 1985-2021; 2009.

net income. Figure 6 shows the ratio of payouts to net income. In 1975, the average percentage of net income paid out by firms was 26.8%. This percentage reached a low of 20.1% in 1994, only a few years after Jensen's article was published. The percentage increased after 1994, but then fell again to 20.9% in 2001. However, in 2016 it was 44.6%. To put this number in perspective, the first year since 1975 that the payout to net income ratio exceeded 30% was in 2004. Since 2004, this ratio has fallen below the 30% threshold only once (2009). In recent years, this ratio has always been above 40%.

In the above analysis, we focus on averages across firms and over time. Such an analysis provides only a partial understanding of the magnitude of the flows from corporations to shareholders through repurchases in the years since the listing peak because large, successful firms tend to pay out more than other firms. In four of the twenty years since 1997, U.S. firms have repurchased more equity than they have issued. The net amount of repurchases over issuance from 1997 to 2016, which represents the net flows going from all corporations to shareholders, amounted to \$3.6 trillion in 2015 dollars. In other words, in the typical year since the listing peak, the corporate sector has returned equity capital to shareholders. In contrast, from 1975 to 1996, the corporate sector issued more equity than it repurchased in 15 out of 22 years. This shift makes it hard to believe that hoarding of cash by empire-building CEOs is either a problem for the corporate sector as a whole or that it explains the drop in listings. We must acknowledge, however, there are many cases in which increased ownership concentration or going private transactions were motivated by the existence of agency costs of free cash flow at particular firms.

Which Eclipse is the Real One?

It is hard to reconcile the belief that the public corporation is in eclipse with the strong capital market performance of the top firms. In 1975, the top five listed U.S. firms by market capitalization had a total market capitalization of half a trillion in 2015 dollars. In 2016, the top five firms had a total market capitalization of \$2.3 trillion. The winners in public markets are doing very well indeed.

It may not be so much public corporations that are in eclipse but, rather, that public markets are. The fact that there are ever fewer public firms, that they are older, and that on net they return more equity to shareholders than they raise suggests that small young firms either do not want to raise capital publicly or believe that they can obtain such funding on better terms elsewhere. It also means that these small young firms believe that their owners can cash out on better

terms by being acquired than by going public.

It is often argued that firms do not want to be public because of regulations such as the Sarbanes-Oxley Act of 2002, Regulation Fair Disclosure (Reg FD), and other restrictions imposed on firms and the financial services community in the early 2000s. The biggest problem with this argument is that the peak for listings was in 1997, well before Sarbanes-Oxley and these other major regulatory events. If any regulatory actions played a role in the decrease in listings in the 1990s, it was the *deregulatory* action that increased the number of investors beyond which a firm has to register its securities.¹⁴ In other words, this deregulation made it easier for firms to raise funds while staying private. Further deregulatory actions took place after the 1990s.

Public companies may benefit from having their securities registered with the U.S. Securities and Exchange Commission (SEC). Registration allows them to issue more shares, to issue public debt under favorable conditions, and to use their equity as a form of currency to make acquisitions. It allows insiders to reduce their stakes and to diversify their holdings. However, public firms are also subject to strict disclosure rules and have to follow U.S. GAAP accounting rules. Both the disclosure rules and GAAP accounting can be problematic for firms that are heavy in intangible assets.¹⁵

Required disclosure imposes different burdens on different companies depending upon the nature of their businesses. A firm can disclose that it is building a new plant without fearing that someone will steal the plant. But an intensive R&D program is different. By disclosing details of that program, a firm may allow competitors to steal ideas. And if a public firm reveals as little sensitive information as possible, it may be that public market investors cannot assess its value correctly and are likely to value it at a discount. As a result, the firm is stuck between the proverbial rock and hard place. If it discloses too much, its value falls because outsiders can use what it discloses to enrich themselves, but if it discloses too little, its shares are discounted due to investor uncertainty.

GAAP accounting creates problems of its own. Accounting rules, by definition, are conservative. If a firm acquires a building, it will record it at cost. The belief is that the building was acquired at a market price and could be sold at that market price. However, if a firm spends a lot of money on salaries of researchers, accounting does not treat these salaries as an investment in a research project that is an asset on its balance sheet. Rather, these salaries are treated as a cost that decreases the profitability of the firm. Some notable accounting scholars have argued that GAAP has an inherent bias against intangible assets.¹⁶ Accounting is not as informative

14. See Elisabeth de Fontenay, "The Deregulation of Private Capital and the Decline of the Public Company," *Hastings Law Journal* 68: 445-502; 2016. She points out that a 1996 change in section 3(c)(7) of the Investment Company Act effectively removed the 100-investor cap on private investment funds, which in turn made possible the existence of vastly larger funds.

15. See Christian Leuz and Peter Wysocki, "The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research," *Journal of Accounting Research* 54(2): 525-622; 2016.

16. See Baruch Lev and Feng Gu, "The End of Accounting and the Path Forward for Investors and Managers," John Wiley & Sons; 2016.

for firms with intangible assets as it is for firms with tangible assets. Public investors rely, among other things, on accounting data to assess the value of a firm. If that accounting data is not very informative, these investors will be more skeptical about the value of a firm. Conservative accounting is valuable for firms that want to issue public debt as it provides a better approximation of the collateral available to protect the debtholders. However, firms with large amounts of intangible assets typically do not issue public debt. Intangible assets are usually poor collateral for loans.

Jensen believed that concentrated ownership is valuable in reducing agency costs of free cash flow. It helps resolve other issues as well. A firm with valuable intangible assets can better convey information about the value of these assets without worrying about expropriation when it can do so confidentially with large private equity investors rather than when it has to do so through SEC mandated public disclosures. It is even better able to convey important information if investors have specialized knowledge about the type of intangible capital the firm is developing, which would generally be the case for venture capitalists and private equity investors. Hence, private forms of equity financing are likely to be preferred by non-public firms that are involved in building intangible assets because they can provide better information to non-public capital providers, and these non-public capital providers are in a better position to assess the value of the intangible assets the firm is building. Viewed from this perspective, accessing the public markets to obtain equity capital can only be a second-best solution.

If private funding were not easily available, there would be more public offerings, even by firms investing heavily in intangible capital. But, if public offerings were to increase only because private funding was not available, that would likely be bad for innovation since public funding involves important frictions. Private funding has become more readily available so that now firms can avoid going to public markets early in their lives.

There are at least three reasons for that. First, as already discussed, regulatory changes have made it easier to raise funds privately.¹⁷ Second, technological changes have made it much easier to search for investors and to gather information. Third, young firms do not require as much capital in their build-up phase as they used to.¹⁸ So it should not surprise us that, as Caltech Professor Michael Ewens and researcher Joan Farre-Mensa write, privately-held startups can now “achieve capital raising (...) historically available only to their public peers.”¹⁹

The internet has dramatically reduced the costs of search. Not only is finding investors much cheaper but, perhaps more importantly, the greater ability to outsource has made it possible for young firms to find and contract for a wide variety of services that they previously would have had to build in-house at great expense. A firm with a good idea for a manufacturing product can easily get it produced abroad without having to build a plant. A firm that needs lots of computing power can lease it at low cost. A firm can now more easily rent a back office. All these changes mean that the early stages of the life of a firm require much less capital than they used to. In a world where a young firm has to manufacture all its own inputs, it would have to raise a large amount of capital to build and outfit an enormous plant.

Some financial economists also argue that economies of scope have become more important and that firms have a shorter window to take advantage of them because of the widening threat of greater competition.²⁰ If this is true, firms may be better off being acquired by a larger firm rather than accessing the public markets to raise capital. The role of economies of scope is closely tied in to the importance of intangible capital. One key fact is that intangible assets are scalable in a way that tangible assets are not.²¹ If a car manufacturer wants to produce twice as many cars, it has to double its manufacturing plant, which requires a large amount of capital. Being acquired by another car company would not make a manufacturing plant available unless that company had idle capacity. By contrast, a firm with a new software tool can increase its sales of that tool at a marginal cost that is close to zero. Hence, its main concern is to sell as much of that tool as possible until it is replaced by a better tool. Having access to a platform with broader visibility and distribution ability would be valuable to such a firm.

Exit through acquisition rather than exit through public markets has another important advantage for a firm rich in hard-to-value intangible assets. To access public markets, the firm has to convince dispersed shareholders of its value without giving away too much information about its intangible assets. After all, competitors can exploit that public information to gain an advantage. In contrast, to be acquired, a firm only has to convince potential acquirers of its value. In this setting, the firm can disclose more with less risk. Further, it can disclose to potential buyers with specialized knowledge who can assess the value of the firm’s intangible assets with greater precision than dispersed shareholders.

Other developments have also played a role in the decrease in the number of listed firms. As we saw, mergers

17. See de Fontenay (2016).

18. See, among others, Gerald F. Davis, “The Vanishing American Corporation,” Berrett Koehler Publishers, 2016.

19. Michael Ewen and Joan Farre-Mensa, “The Evolution of the Private Equity Market and the Decline in IPOs,” available at SSRN: <https://ssrn.com/abstract=3017610>.

20. See Xiaohui Gao, Jay R. Ritter, and Zhongyan Zhu, 2013, “Where Have All the IPOs Gone?,” *Journal of Financial and Quantitative Analysis* 48(6): 1663-1692; 2013.

21. Jonathan Haskel and Stian Westlake, “Capitalism Without Capital,” Princeton University Press; 2017.

are the main factor leading to an increase in delistings. While historically the literature in financial economics has emphasized the role of mergers in improving efficiency by creating synergies, it is not clear how well this view of mergers applies to the kind of mergers that took place in the 2000s. There is increasing evidence that gains from mergers are due to increased margins, which means the benefits come from a *decrease* in competition.²² Such a decrease in competition might adversely affect the ability of small firms to succeed on their own.

Some Speculation About the Future of Public Equity Markets

Public markets are better suited for firms with mostly tangible assets than for firms with mostly intangible assets. This is especially true when the usefulness of the intangible assets has yet to be proven on a large scale. Sometimes the market is extremely optimistic about some intangible assets, which confers a window of opportunity on firms with such assets to go public. But otherwise, firms with unproven intangible assets may very well be better off funding themselves privately. Accounting information conveyed by U.S. GAAP for such firms is of limited use because GAAP treats investments in intangible assets mostly as expenses, so these assets may not show up on firms' balance sheets. Private funding allows firms to convey information about intangible assets more directly to potential investors who often have specialized knowledge, something that they could not convey publicly.

Much of the public debate about the lack of new public offerings has focused on the intensity of capital market regulation. One might be tempted to say that if part of the problem is disclosure, then we should relax mandated disclosure rules. This would be a misinterpretation of our argument. The issue with disclosure of intangible assets is not what firms have to disclose. Rather, it has to do with the nature of the intangible assets they need to disclose. Once an idea is made public it becomes possible for other firms to copy it. Changing disclosure rules that ends up reducing the trust that investors have in public markets will not lead to more new offerings in the long run.

Investment in intangible assets is highly sensitive to the legal environment in which a firm operates and to the pace of

financial development it experiences. A plant is hard to steal. A new idea is not. The U.S. is a country in which some firms make massive investments in intangible assets. It is a fact that the most R&D intensive firms in U.S. public markets generally do not have counterparts in foreign public markets.²³ As intangible assets continue to increase in importance, it should not surprise us to see a further eclipse of public markets in a country like the U.S.

This evolution has a downside: investors limited to public markets are cut off from investing in high intangible-asset firms. Additionally, as fewer firms remain publicly listed, fewer firms will be transparent to society, which may limit overall support for the corporate sector in the long-run. U.S. financial development has evolved in such a way that some types of firms can be financed more efficiently through private sources than through public capital markets because the intrinsic properties of intangible assets make it more costly for them to be financed publicly. No deregulatory action is likely to restore the public markets in this case. Instead, we should focus on creating a fertile ground for investment in intangible assets by having appropriate laws and appropriate financing mechanisms, as these assets appear to be the way of the future for corporations.

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22. See the important paper by Bruce A. Blonigen and Justin R. Pierce, "Evidence for the Effects of Mergers on Market Power and Efficiency," *NBER Working Paper*, 2016. See also Gustavo Grullon, Yelena Larkin, and Roni Michaely, "Are U.S. Industries Becoming More Concentrated?" *Working Paper*, Rice University, 2017.

23. See, among others, Lee Pinkowitz, René M. Stulz, and Rohan Williamson, "Do US firms hold more cash than foreign firms do?" *Review of Financial Studies* 29(2): 309-348; 2016.

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