IPOs and SPACs: Recent Developments

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Abstract

After two decades of low initial public offering (IPO) activity and a number of regulatory changes, the number of IPOs of both operating companies and special purpose acquisition companies (SPACs) boomed in the U.S. in 2021 before collapsing in 2022. In recent years, surging valuations have resulted in many private companies achieving "unicorn" status, a valuation of $1 billion or more, partly fueled by investments from mutual funds. Many of the unicorns that have gone public have done so with dual-class share structures. We compare three alternative mechanisms for going public, including traditional IPOs, mergers with SPACs, and direct listings. The most common exit for successful venture capital-backed companies, however, continues to be by merging with a larger company.

Keywords: Initial Public Offering, IPO, Special Purpose Acquisition Company, SPAC, Unicorn, Confidential filing, Direct listing, Dual-class shares

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Introduction

Initial public offerings (IPOs) of equity have an importance that far outweighs the dollar amount of money raised, which is dwarfed by that from bond offerings, bank loans, and venture capital and private equity investments. Although there was a surge in IPO activity in 2021, the number of IPOs in the United States has been much lower since 2000 than in the preceding two decades. According to the Center for Research in Security Prices (CRSP), the number of publicly listed domestic operating companies on the major U.S. exchanges dropped from almost 8,000 in 1997 to below 4,000 in each year from 2012 to 2020. The drop in the number of listed firms is mainly attributable to both the paucity of IPOs and a high level of merger activity, as documented by Doidge, Karolyi, & Stulz (2017) and Eckbo & Lithell (2022). The growth in the availability of venture capital money and investments in private companies by mutual funds has permitted firms to stay private longer, but the low level of IPO activity that has persisted for more than two decades cannot be attributed to companies merely delaying their IPOs.

Recent research has focused on the reasons for the low level of traditional IPOs; the growth of private equity capital in funding firms far beyond the startup stage; the effect, or lack thereof, of the 2012 Jumpstart Our Business Startups (JOBS) Act and other regulatory changes to spur IPO volume; and other topics. The emergence of special purpose acquisition companies (SPACs) as an important alternative path for a private company to go public has also attracted attention. This article discusses these developments, as well as other recent research related to IPOs.

The 2012 JOBS Act contains several provisions that apply to Emerging Growth Companies (EGCs), defined primarily as those with less than $1 billion in annual sales ($1.07 billion as of 2022) at the time of going public. Many of the provisions applying to EGC IPOs have been extended to all operating company IPOs since then.

In recent years, three methods of going public have been used. In a bookbuilt IPO, one or more underwriters help the issuer conduct a roadshow and survey investor demand before pricing and allocating shares. In the IPO literature, traditional bookbuilt IPOs have faced criticism for leaving too much money on the table (see Ritter, 2011). Practitioners, most notably venture capitalist Bill Gurley of Benchmark Capital, also often question the necessity of stellar underpricing. In a direct listing, a private company lists its common stock on an exchange directly, without using underwriters or the bookbuilding process, although the firm still conducts a marketing campaign. A SPAC raises capital via an IPO and then seeks a merger with a private operating company, which becomes public after the merger.

The U.S. Securities and Exchange Commission (SEC) has attempted to reduce the regulatory and cost burdens of going public and to encourage capital formation. At the same time, the booming SPAC market in 2020-2021 has led the SEC to tighten regulations, partly in response to concerns that retail investors were, on average, losing money in the period after a SPAC completes a merger.

IPO underpricing, typically measured as the percentage change from the offer price to the closing price on the first day of trading is of continuing interest, partly due to the high underpricing of IPOs in 2020–2022. In 2020, the average first-day return in the United States was 41.6% on an equally weighted basis, and an even higher 47.9% on a proceeds-weighted basis (see Ritter, 2023). In 2022, although IPO volume was meager, with only 39 operating companies going public, the equally weighted average first-day return was 49.9%, driven by some microcap IPOs that rocketed up and then collapsed. The proceeds-weighted average first-day return was a decidedly more modest 14.5%.

Lowry, Michaely, & Volkova (2017) and Hanley (2018) provide excellent reviews of U.S. IPOs up to 2016. This article focuses on IPO-related developments and empirical evidence since 2017, including the decline in IPO activity, traditional IPO investors' investments in private firms, changes in the going public process, the increased prevalence of dual-class share structures, the role of SPACs, IPO pricing, and the effects of IPOs on the broader economy. A more extensive review of recent research on IPOs is available in Huang and Zhang (2022). An informative book by journalist Dakin Campbell (2022) discusses both the history of IPOs and recent developments, using specific deals to illustrate changes in practice.

The Low Level of IPO Activity and the Growth of Venture Capital

Initially, the most popular explanation for the drop in the number of listed firms in the U.S. following the 1997 peak was that excessive regulation of public firms was responsible. The academic literature, however, does not offer much support for this explanation. Gao, Ritter, & Zhu (2013) find little evidence that the Sarbanes-Oxley Act of 2002, known as SOX, and the 2003 Global Settlement caused the decline in IPO activity, whose start predated regulations such as SOX. Chemmanur et al. (2020) show that the new regulations during the 2001–2003 window, including Reg FD, SOX, and the Global Settlement, did not appear to cause any drops in the final likelihood of IPOs. The relaxation of IPO regulations in the Jumpstart Our Business Startups (JOBS) Act, however, is largely based on the argument that regulatory burdens have caused significantly negative effects on capital formation in the U.S. capital market.

More recent explanations for the drop in the number of IPOs focus on cash flow channels and financing channels. The cash flow channel is discussed in Gao et al. (2013), who emphasize

the disadvantages facing small firms in many industries due to the increased importance of economies of scale and scope driven by technology. For an entrepreneur, whether to remain independent by going public or to sell the firm via a merger involves the choice of growing organically or immediately becoming part of a larger organization. A private target may be able to use an acquirer's established platform to bring a product to market more quickly. In many industries, due to a drop in communication and transportation frictions over time, getting big faster and being big have become increasingly important. Consistent with this economies of scope argument, Gao et al. show that more of the small firm IPOs since 1997 were unprofitable in the 3 years after their IPO than was previously the case. Importantly, Eckbo & Lithell (2022) find that the decline in U.S. public listings would disappear if one counted the target firms of public acquirers as independent firms.

Irani, Pinto, & Zhang (2022) posit that globalization can have a negative impact on IPO activity. It may be more costly to establish sales and supply channels in foreign countries than domestically. As a result, a firm operating in a more globalized industry may find it more cost effective to merge with an established partner. In other words, one would expect to observe less IPO activity in more globalized industries, everything else being equal. The authors use the average percentage of foreign sales over total sales of all Compustat-listed firms in an industry as a measure of industry-level globalization. They show that, in time series and cross-sectionally, this globalization measure is negatively associated with IPO activity in the industry. Using tariffs as an instrumental variable and the 1994 North American Free Trade Agreement (NAFTA) as an exogenous shock, they also show that the negative impact of globalization on IPO activity is likely to be causal.

Cash flow and economies of scope considerations are not the only reasons for the declining popularity of traditional IPOs in the U.S. Ewens & Farre-Mensa (2020) document that the supply of equity capital to private firms has increased since 1996, emphasizing this financing channel. More specifically, deregulation of securities laws, especially the National Securities Markets Improvement Act (NSMIA) in 1996, has increased the supply of capital to private firms and has enabled them to stay private longer. The increased supply of capital to private firms likely has a negative effect on IPO activity.

The increase in VC money during recent years is not only because of regulatory changes. Ewens and Farre-Mensa (2022) offer additional explanations. They suggest that the increase in VC funding is due to inflows of money into this asset class for two reasons. The first reason is that money chases past returns. In particular, the success of the "Yale model" widely attributed to David Swenson, the long-serving head of Yale University's endowment, has resulted in many university endowments and pension funds allocating a significant fraction of their assets to illiquid investments such as venture capital. The logic for why past returns were high is that the higher returns are earned from an illiquidity premium. The average public market equivalent (PME), using the S&P 500 as the benchmark, that limited partners have earned on VC investments has been 1.29.[1] The second reason for the inflow of money is that government pension plans, which bizarrely are allowed to calculate the present value of their liabilities at the expected return on their assets, no matter what the risk and maturity of the assets are, has created an incentive for these pension plans to place a larger fraction of assets in opaque and illiquid assets such as VC funds, for which the pension plans assume high expected returns.

[1] See Table 1B of Harris et al. (2022) using VC vintage years of 1984-2015 and returns through December 2020, using Burgiss data.

A recent working paper by Jackson, Ling, & Naranjo (2022) offers yet another reason for the growth of fund flows into private markets, in spite of the high fees charged by general partners. They posit that many investors desire assets for which there are overstated and smoothed returns, so that the investors (or their agents) can report higher risk-adjusted portfolio returns in the short run.

Even without regulatory changes, the increased importance of the technology and healthcare sectors, where start-ups are mainly investing in intellectual property, would have resulted in an increased reliance on venture capital to finance these companies (Stulz, 2020). Stulz (2020) and Fahlenbrach et al (2022) posit that startup firms with a lot of organizational capital as assets are better off staying private longer than other firms. This idea is consistent with the evidence that biopharma firms, which have high cash burn rates but only modest organizational capital, would go public at an earlier age than tech startups.[2]

Thus, the increased private equity investment in startup firms is a result of both supply and demand: higher demand from startups because many of these firms benefit from staying private longer, and higher supply from institutional investors such as endowments, government pension funds, and mutual funds. This financing explanation for why IPO activity has been low since 2000 has two testable implications. The first prediction, which is supported by the evidence, is that the median age of recent IPOs should be older than in the pre-2001 period. The second prediction, which is rejected by the evidence, is that after a pause of a few years, IPO volume should have returned to higher levels as the now-older firms conducted their delayed IPOs. The

[2] Table 4g of Jay Ritter's IPO Statistics (Ritter, 2023) reports a median age at the IPO of 6 years for 652 biopharma firms in 2001-2022. His Table 4a reports that for 851 tech companies going public during 2001-2022, the median age each year varies from 7 to 15 years, with 13 of the 22 years having a median age of 10 or more years.

failure of this second prediction suggests that the financing channel can explain only some of the dramatic decline in IPO activity that has occurred.

Using U.S. Census data to examine both private and IPO firms, Chemmanur et al. (2020) provide a comprehensive examination of the reasons behind the decline in IPO activity. They find that states and industries with more VC investment experience larger declines in IPO activity, a pattern consistent with the increase in the supply of private capital. They also find, as do Chemmanur et al. (2018), that IPO firms in manufacturing after 2000 had greater total factor productivity than those staying private or undergoing a merger. This evidence is consistent with the findings of Bowen, Frésard, & Hoberg (2022), and suggests that more innovative firms are more likely to use an IPO exit.

Public–Private Market Arbitrage: Public Market Institutional Investors' Investments in Private Companies

In addition to VC and private equity (PE) firms, institutional investors that have traditionally focused on public companies (e.g., mutual funds, hedge funds, and, to a lesser degree, pension funds) have also substantially increased investments in private companies in recent decades, essentially blurring the line between private and public listing status. Practitioners sometimes refer to such investments as "public–private market arbitrage." The logic is that because private companies should be priced at a discount to compensate investors for the reduced liquidity, there should be a jump in valuations when the private companies go public.

Private companies can benefit from investments by public market institutional investors. Founders of private companies may opt for an ownership structure with passive investors to

avoid losing control. VCs are often actively involved in guiding their portfolio companies on investing, operating, and financing decisions. Mutual funds, which are permitted to invest up to 15% of assets in illiquid investments, are less active than VCs.

By waiting to go public until they are more mature and profitable and can achieve a larger scale, private companies may be able to reduce the costs of going public. Public companies are required by regulations to disclose information that may benefit rivals. By delaying listing, private companies can postpone such disclosures and the associated costs.

Kwon, Lowry, & Qian (2020) document a dramatic increase from 1995 to 2016 in the number of mutual funds investing in private companies, with 39% of the VC-backed IPOs in 2016 receiving mutual fund financing prior to going public. They attribute this growth to firms' seeking extra capital to postpone public listing (increased demand for capital) and to mutual funds' seeking higher risk-adjusted returns (increased supply of capital). They document that mutual fund investments have been concentrated in companies at later stages of development, likely because mutual fund managers do not specialize in monitoring or nurturing young private companies. The 149 mutual funds in Kwon et al.'s sample invested $6 billion in 40 unicorns, defined as companies valued at $1 billion or more, as well as $4.5 billion in 230 non-unicorns.[3]

Chernenko, Lerner, & Zeng (2021) examine mutual fund investments in a sample of unicorn and "near unicorn" start-ups. They find that mutual funds with more stable funding are more likely to invest in private companies. Financing rounds with mutual fund participation issue securities that have stronger redemption and IPO-related rights, and the new investors have less board representation.

[3] See Fahlenbrach et al (2022) and Gahng (2022) for analysis of why startups seek unicorn status.

Huang et al. (2021) find that pre-IPO investments by public market institutional investors reduce underpricing and allow VCs to exit with a reduced price impact in the secondary market. Furthermore, VCs are more likely to offer fewer shares at the IPO when the owners include public market institutional investors, possibly because the VCs already sold some of their shares in pre-IPO transactions.

The JOBS Act and the Going-Public Process

Confidential Filings, Testing the Waters, and Reduced Information Disclosure under the JOBS Act

The JOBS Act of 2012 relaxed some regulations on IPO filings, information disclosures, and communications. The JOBS Act permits confidential filings and "testing the waters." A confidential filing refers to a draft registration statement, essentially a preliminary prospectus, that can be reviewed confidentially by the staff of the SEC until the company publicly files. Testing the waters refers to permitting qualified issuers and their underwriters to communicate with institutional investors before formal marketing begins. With further amendments in 2017 of the relevant SEC rules under the JOBS Act, all IPOs can now confidentially file a Draft Registration Statement form (Form DRS) to begin their registration process. After receiving feedback from the SEC and perhaps from institutional investors, if the issuing firm decides against continuing with an IPO, it can withdraw the filing and the confidential filing will not be made public. If the firm decides to continue with the offering, it files an official registration using Form S-1. Both Form S-1 and Form DRS then become available to the public.

The relevant elements of the JOBS Act for IPOs can be grouped into two categories according to Dambra, Field, & Gustafson (2015). The first category is related to the reduced information disclosure for EGCs, which in 2012 were defined as firms with annual gross revenues of less than $1 billion during the most recently completed fiscal year. The threshold was increased to $1.07 billion in April 2017.[4] An example of reduced disclosure requirements is that an EGC needs to report only 2 years of financial information for its IPO instead of the typical 3 years. An EGC is also exempt from certain SOX regulations for a number of years.

The second category is related more directly to the IPO process. The 2012 JOBS Act permits EGCs to file a confidential draft registration for the SEC staff to review. This filing and any amendments need to be made public only 21 days before the start of the issuing firm's roadshow if it has decided to continue with the IPO and do an S-1 filing. Moreover, EGCs and their investment banks can engage in testing the waters communications with institutional investors in order to assess market demand.

Congress and the SEC have updated some of the second group of JOBS Act requirements for the IPO process. The 2015 FAST Act (Fixing America's Surface Transportation Act, which is primarily about transportation) reduced the 21-day window before starting the road show to 15 days. More importantly, as of July 10, 2017, the SEC expanded the eligibility for confidential filing to all companies.[5] On December 3, 2019, SEC Rule 163B became effective, allowing all issuers to use testing the waters communications with qualified institutional buyers (QIBs) and institutional accredited investors (IAIs).[6]

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[4] See https://www.sec.gov/smallbusiness/goingpublic/EGC for more details on the SEC's definition of EGCs.
[5] See https://www.sec.gov/corpfin/announcement/draft-registration-statement-processing-procedures-expanded for more details on this expansion.
[6] Detailed information on Rule 163B can be found at https://www.sec.gov/investment/secg-solicitations-interest-prior-registered-public-offering

The JOBS Act has not resulted in an increase in IPO volume in the U.S. From 2004-2007, an average of 162 operating companies conducted IPOs each year. From 2013-2021, an average of 154 per year did so. There are differences, however, in how companies go public. Dambra et al. (2015) show that, during the 2 years after the JOBS Act, 90% of eligible EGCs adopted confidential filing, and 68% used the testing the waters provision. One unintended effect of the testing the waters provision has been to shorten the length of IPO road shows from about 8 business days to 4-6 days in many cases. Because a firm can make its pitch to many potential institutional investors before the road show formally starts, and these investors do not want to hear the pitch again, the length of road shows has declined. Because most road shows start on a Monday, the day of the week that the IPO occurs on has also been affected. At the start of the Covid-19 pandemic in March 2020, all of these presentations to investors switched to virtual (on-line) meetings. It is not clear how many in-person presentations there will be in the future.

Chaplinsky, Hanley, & Moon (2017) compare a sample of 312 IPOs by EGCs from April 2012 to April 2015 with pre-JOBS Act IPOs. They show that the direct costs for IPOs of EGCs, including underwriting, accounting, and legal fees, did not decrease, despite the reduced information-reporting requirements. Meanwhile, they report that the indirect costs (the underpricing of EGC IPOs) increased. Chaplinsky et al. conclude that the JOBS Act may have increased the costs of going public for EGCs. Even-Tov, Patatoukass, & Yoon (2022), however, take issue with the interpretation that the JOBS Act resulted in higher IPO underpricing. Although the average IPO underpricing increased from before 2012 to after 2012, they show that this increase occurred for both the EGCs affected by the JOBS Act and large issuers that weren't affected. Beyond IPO market activity, Dambra & Gustafson (2021) examine whether the JOBS Act's reduced reporting requirements for EGCs has affected post-IPO investments. They use a

sample of IPOs between 2008 and 2013 and show that firms that benefited from these reduced reporting requirements tend to invest more in R&D after the JOBS Act.[7]

Recently, a modification of bookbuilding has been used by some companies going public, including Unity Software, DoorDash, and Airbnb, all of which went public in 2020. As discussed in Campbell (2022), these companies insisted that all institutional investors submit limit orders, specifying both the number of shares and the price that they wanted to purchase, rather than the more common market orders that only specify a number of shares. These companies also took more control of the allocation process, giving a preference to institutional investors with low portfolio turnover rates. All three IPOs saw high first-day returns, varying from Unity Software's 31.4% to Airbnb's 112.8%.

Direct Listings

Since 1999, over 20 U.S. IPOs have used auctions, including the IPOs of Google (now Alphabet), Morningstar, and Interactive Brokers Group. Direct listings appear to be a replacement for auction IPOs, which have not been used since 2013. Auctions and direct listings differ from bookbuilt (and best efforts) IPOs in that underwriters do not have discretion in the allocation of shares, which incentivizes underwriters using the traditional methods to set a lower offer price and thus leave money on the table. In April 2018, Spotify Technology was the first company to go public via a direct listing in the U.S. Since then, through October 2022, 11 other companies have followed suit. Direct listings are analogous to "introductions" on the London Stock Exchange, in which a firm lists its stock without an offer price being set (Derrien &

[7] The JOBS Act contains many other nuances. For example, Dambra et al. (2018) show that the affiliated analysts for EGC IPOs initiate firm coverage with more optimistically biased, but less accurate, reports. They suggest that the reason is the JOBS Act's relaxation of restrictions on affiliated analysts' participation in the IPO process for EGCs.

Kecskés, 2007). Huang & Zhang (2022) include an extensive description of direct listing mechanics, as does Ritter's (2022) case study of Amplitude's 2021 direct listing.

In a direct listing, a private company goes public by listing its common stock, with no offer price, on an exchange without using underwriters to help conduct roadshows and gauge investor demand, as would be the case in a traditional bookbuilt IPO. Listing companies can conduct "investor education" meetings that are similar to roadshow presentations, but are not followed up with underwriters' collecting indications of interest from potential investors, since there are no underwriters with shares to allocate. To date, none of the direct listings have involved newly issued shares; all of the shares available for selling have come from existing shareholders. The lack of direct listings that include raising capital is likely due to a listing rule limiting a company's capital raise to the range stated on its registration statement. In December 2022, the SEC approved a proposal from Nasdaq to ease the rule, making direct listings with a capital raise more attractive than they have been.[8]

Direct listings typically have not had lock-up periods, during which legacy (existing) shareholders cannot sell shares. In the U.S., lockup periods are not mandatory, although with traditional IPOs they are ubiquitous. With both direct listings and bookbuilt IPOs (and with SPAC mergers), it appears that there has been an increasing use of heterogeneous lockups, with small shareholders increasingly not subject to lockups, or subject to shorter lockups than larger shareholders and officers and directors.

Direct listings do not feature underwriters, but they do use a designated market maker (DMM) and one or more financial advisors. A DMM facilitates an orderly opening for the stock when it starts trading, as is also true for traditional IPOs. One or more financial advisors assist

[8] See https://www.sec.gov/rules/sro/nasdaq/2022/34-96443.pdf

the listing company with the registration and listing, including preparing investor communications and presentations in connection with investor education meetings and being available for consultation with the DMM. The advisors of direct listings often provide analyst coverage, just like the underwriters of traditional IPOs.

Given that there have been only 12 direct listings through the end of 2022, it is too early to conclude whether direct listings will suffer the fate of auctions and disappear, or whether they will continue to be used by some companies. Direct listings have not been used by most private companies that seek to go public, especially those with high cash burn rates. They appear to be most fitting for companies with strong brand recognition or easy-to-understand business models but no immediate need for additional capital, and for those that are likely to leave a lot of money on the table with a traditional IPO.

SPACs

Another option that a private company has for going public is to merge with a SPAC, which is a "blank-check" company. SPACs existed in the 1990s, but they became vastly more popular in 2020-2021. A sponsor, which can be an individual or an investment firm, first sets up a SPAC and raises capital via an IPO. The proceeds of the IPO are placed in an escrow account (trust), and the money is typically invested in short-term Treasuries. The SPAC then has 18 to 24 months to search for, and merge with, a private company, in the process taking the company public. This merger is often referred to as a deSPAC transaction. If a merger does not occur, a SPAC must liquidate and distribute the trust fund assets to public shareholders. Descriptions of the typical SPAC can be found in Huang & Zhang (2022), Klausner, Ohlrogge, & Ruan (2022), and Gahng, Ritter, & Zhang (2023).

SPAC IPOs are usually unit offerings. Each unit, almost always priced at $10, typically consists of a Class A common share and a fraction of a warrant. Each warrant in a SPAC IPO unit typically entitles the holder to buy a common share at an exercise price of $11.50 per share, with a maturity date five years after the completion of a merger.[9] SPAC shares and warrants are unbundled after the IPO and trade separately.

When a SPAC IPO occurs, there is a concurrent private placement, in which the sponsor purchases warrants or units at roughly a fair market price. Underwriters for SPAC IPOs usually earn 5.5% of the IPO proceeds as their commissions, with 2% paid at the time of the IPO and the other 3.5% deferred until completion of the business combination. The money from the private placement is used to cover the upfront underwriting fees and future expenses of searching for a merger partner, so that SPAC IPO investors begin with no less than $10 per share in their trust accounts. Importantly, these public shareholders have the right to redeem their shares for cash rather than convert their shares into shares of the merged company. Sponsor investments via private placement warrants or units are often referred to as at-risk capital, because these warrants or units will become worthless if the merger does not happen.

At the time of the IPO, the SPAC issues Class B shares to the sponsor at a nominal price (e.g., 0.5 cents per share). These sponsor shares, known as the "promote," typically amount to 20% of total post-IPO shares outstanding (Class A and Class B shares). The sponsor shares do not have redemption rights. When a merger occurs, the shares of the operating company and the SPAC's non-redeemed Class A and Class B shares convert into publicly traded shares of the merged entity.

[9] A SPAC IPO unit can also include rights, which are essentially warrants with a zero exercise price. For example, a one-tenth right would give an investor who owns 10 units one share of common stock in the event of a deSPAC.

Once a SPAC identifies a target company and reaches an agreement, the deSPAC process requires a vote by the SPAC's shareholders on whether to approve the proposed business combination. Note that public shareholders can vote yes on the merger but still sell or redeem their shares. Public investors are also allowed to keep (or sell) their warrants regardless of their redemption decisions. The redemption option provides a money-back guarantee for SPAC IPO investors, and these public shares also enjoy upside potential if a merger is successful. Thus, a SPAC unit is equivalent to a default-free convertible bond.

SPAC critics note that public shareholders have an incentive to approve mergers because they can redeem their shares and keep the warrants, which would otherwise be worthless if no merger occurs. All of the sponsors' compensation, including founder shares and private placement warrants/units, and more than half of the underwriters' fees, depend upon completing a merger. Therefore, the sponsor, the IPO underwriters, and pre-merger unit holders have strong incentives to consummate a merger regardless of whether the merger will be value-increasing for shareholders. Such incentives remove a useful check on the quality of proposed mergers.

Operating companies usually negotiate a minimum amount of cash that a SPAC must deliver, because redemptions that occur between the merger agreement and the closing can significantly reduce the amount of available cash in the trust account. Thus, a SPAC merger can fail if the SPAC cannot deliver enough cash to the target company. In many deSPAC transactions, investments from private investment in public equity (PIPE) investors are important. The minimum cash requirement gives sponsors a strong incentive to negotiate an attractive merger so that fewer public shareholders redeem their shares and more PIPE investors buy shares. PIPE investments could also provide certification that may encourage public market investors not to redeem. Gahng et al. (2023) explain many of the SPAC features as the outcome

of attempts to deal with agency problems. For example, the redemption option reduces the incentive of a sponsor to negotiate a bad merger.

Although they have not been common in other countries, rapid growth in SPACs has been observed in recent years in the U.S. Only 86 SPACs were listed on the major exchanges from 1997 to 2009, but there were 1,157 SPAC IPOs from 2010 to 2022, of which 248 and 613 occurred, respectively, in 2020 and 2021. Many people believe that this surge in SPAC IPO activity has been a bubble.

Of 458 SPAC IPOs between January 2010 and December 2020, Gahng et al. (2023) report that 321 completed a merger, 20 were liquidated, and 117 remained ongoing as of the end of December 2021. At the beginning of 2023, SPAC Research reports that there were 379 SPACs in search of a merger target, while 153 had announced but not completed a merger. The percentage of these 532 SPACs that end up in liquidation will almost certainly be much higher than the historical frequency. The low price of warrants in early 2023 on most announced deals suggests that the market assigns a low probability that the merger will be completed.

There are three major players in a SPAC and its consequent merger with an operating company: the investors who buy the units from the SPAC IPO, the sponsor of the SPAC, and the operating company that merges with the SPAC. Some stylized facts arise for these players. Gahng et al. (2023) find that investors who buy the SPAC units at the offer price and sell at the time of the merger or liquidation have earned on average an equally weighted (EW) annualized return of 23.9%. Even the worst-performing SPAC provided a positive return of 0.5% per year, making 23.9% an attractive average return. The annualized return number is only slightly lower if the purchases are done at the first day's closing price, since most SPAC IPOs start to trade at

very close to their offer price. The average annualized return number will almost certainly be much lower for more recent SPAC IPOs, due to a much higher liquidation rate.

For investors who purchase the shares of the merged company, or for investors in the SPAC IPO who decide to hold their shares after the merger, the postmerger returns tend to be very negative. According to Gahng et al. (2023), for a sample of 152 SPAC mergers from 2010 to December 2020, if an investor bought shares of all the merged companies after the merger in an equal dollar amount, the average 1-year return would be -11.3%, far below the average return of 19.4% on the CRSP value-weighted market index. SPAC investors, however, tend to have higher redemption rates for mergers that look less attractive. As a result, if the deSPACs are weighted by the amount of post-redemption cash from public market investors, the average one-year deSPAC return is -3.0% rather than the EW return of -11.3%. For a more recent sample of 243 deSPAC mergers between July 2020 and December 2021, Klausner, Ohlrogge, and Tao (2022) report an EW average post-merger return of -62% as of December 2022.

Lin et al. (2021) and others document patterns in the cross-section of deSPAC returns that largely correspond to the patterns seen with traditional IPOs, such as higher returns when higher reputation intermediaries are present.

From a private operating company's point of view, on average it is more expensive to merge with a SPAC than to go public via a traditional bookbuilt IPO, according to Table 1 of Gahng et al (2023).[10] In 2021, however, in the U.S. 311 operating companies went public with a traditional IPO, 6 went public with a direct listing, and 199 went public via merging with a SPAC. These

[10] See Klausner et al. (2022) for an alternative point of view. Gahng et al. (2023) measure underpricing costs based on the first closing price after the merger, whereas Klausner et al. measure underpricing costs based on a later price. They suggest that the costs of merging with a SPAC on average are low because the merger terms are negotiated using overvalued legacy stock.

findings raise the question: If it is more costly for a private firm to go public and raise capital by merging with a SPAC, then why have so many operating companies done so?

The conventional wisdom suggests that, with the "dry powder" in the trust account from its IPO, a private firm can list its shares and obtain new capital more quickly and with less uncertainty by merging with a SPAC than by doing a traditional IPO. The evidence, however, is that on average merging with a SPAC is no quicker and no more certain.

SPAC proponents note that a traditional IPO in the U.S. normally does not provide forecasted numbers to investors, whereas most SPAC mergers do. A reason for this difference is the "regulatory arbitrage" that the legal environment in the U.S. has created—for mergers, plaintiff lawyers have the burden of proving that forward-looking statements that turn out to be overoptimistic were knowingly false, whereas for security offerings, plaintiff lawyers do not have this burden of proof.[11] It is frequently argued that such forward-looking statements are important for valuing private firms with high growth potential. Dambra, Even-Tov, & George (2022) document that the forecasts for deSPACs tend to be exceedingly optimistic. In March of 2022, the SEC moved to eliminate the regulatory arbitrage on the grounds that the capital raise and the public listing associated with a SPAC merger is functionally equivalent to an IPO.[12]

Gahng et al. (2023) discuss some other advantages that SPAC proponents frequently mention. In contrast, Klausner et al. (2022) argue that SPACs are a poorly designed vehicle for bringing companies public. They report that, for 47 deSPAC mergers from 2019 through June

[11] For traditional IPOs, underwriters do not allow an issuer to make projections or other forward-looking statements because they are potentially liable, too. The banks make up for the lack of issuer projections, however, by having their analysts make forecasts.
[12] See the SEC press release at https://www.sec.gov/news/press-release/2022-56

2020, the median SPAC delivered only $4.10 in cash for a $10 face value of the shares they received from the merged company.[13]

Although deSPAC returns have been low, SPAC sponsors are often criticized for receiving very lucrative returns. Gahng et al. (2023), in their Table 10, report than the mean sponsor investment is $7.5 million at the time of the IPO and receives securities that are conservatively worth at least $51 million more one year after the merger or liquidation, producing an annualized return of at least 113%. Their sample period, however, had a much lower liquidation rate than will be true for more recent SPAC IPOs.

Because SPACs can be a poor vehicle for private companies to go public, largely because the middlemen take too big a piece of the pie, and because they have been an unattractive investment for long-term investors in deSPAC companies, there is a question of whether SPACs will disappear. Unless the structure of SPACs changes to lower the middlemen's piece of the pie and improve the alignment of incentives with public shareholders, it is likely that SPAC IPOs will revert to being a niche product, at best. And just as with traditional mergers, the valuations that acquirers pay must adjust so that deSPAC investors earn competitive risk-adjusted returns.

IPO Underpricing

For the 9,127 IPOs in the U.S. from 1980-2022, the equally weighted average underpricing is 19.0%, and the proceeds weighted average is 20.5% (Ritter, 2023). Theories of IPO underpricing can be categorized as based on, or not based on, information asymmetry. Information

[13] Klausner et al. (2022) extend their analysis (on page 295) to deSPACs through November 2021 and report average cash per share of $6.40. The higher number is due to lower redemption rates and larger PIPE investments in the July 2020 – November 2021 period.

asymmetry-based theories suggest that IPO underpricing can arise to offset the disadvantages of less informed investors (e.g., Rock, 1986), to incentivize investors to reveal information (e.g., Benveniste & Spindt, 1989), or to compensate investors for information production costs (e.g., Sherman & Titman (2002). In both Rock's adverse selection model and Benveniste & Spindt's mechanism design model, the average level of equilibrium underpricing can be reduced if underwriters bundle IPOs by allocating future IPOs based on the past behavior of investors. Thus, both models are unable to explain high levels of underpricing. Theories based on agency problems, issuer complacency (Loughran & Ritter, 2002), and underwriter power do not rely on information asymmetry as the motivating factor for underpricing, and can potentially explain high levels of underpricing.

In agency theories of IPO underpricing, underwriters have an incentive to excessively underprice when bookbuilding is used because they can allocate hot IPO shares in return for quid pro quos (Loughran & Ritter, 2002; Nimalendran, Ritter, & Zhang, 2007; Reuter, 2006; and Jenkinson, Jones, & Suntheim, 2018). That is, rent-seeking investors are willing to overpay on other transactions, creating an indirect revenue stream, in return for allocations of underpriced shares. Because issuers can observe underwriter track records, however, one might think that reputation effects would constrain the ability of underwriters to excessively underprice, as Beatty & Ritter (1986) posit. Although there is free entry to investment banking, Liu & Ritter (2011) posit that underwriters act as if there are local oligopolies because of their differentiated services. For example, some investment banks have a star analyst who can provide research coverage on the issuer's stock, but many others do not.

The strongest empirical pattern related to U.S. IPO underpricing, first documented by Hanley (1993), is that a positive revision from the midpoint of the file price range to the offer

price is positively related to underpricing. Lowry et al. (2017) report average underpricing of more than 50% for more than 1,700 IPOs with offer prices above the file price range from 1983 to 2016 in their Table 3. This pattern suggests that positive information is only partially incorporated into the offer price, consistent with Benveniste & Spindt's (1989) information acquisition model.

Loughran & Ritter (2002) provide an alternative explanation for this partial adjustment pattern. They suggest that the issuer's major shareholders become complacent when the stock valuation has increased. The underwriters take advantage of this complacency by only partially incorporating the positive information into the offer price.[14] Consistent with this view, Ince (2014) documents that, when offer prices are revised upward, the estimated adjustment rate of public information is only 21%, significantly less than the 28% rate for private information. These adjustment rates are inconsistent with the Benveniste & Spindt (1989) model's prediction of a 100% adjustment rate for public information because underwriters do not need to reward investors for revealing information that is already known, such as whether the stock market has recently gone up or down.

New Evidence Supporting Non-Information Asymmetry-Based Theories

Many of the patterns observed in IPO underpricing can be explained by regulations, underwriter–issuer agency conflicts, underwriter power, and issuer complacency, even without assumptions of information asymmetry. Regulations can have a large impact on IPO underpricing. For example, in many time periods, the China Securities Regulatory Commission imposed limits on offer prices based on price to earnings (P/E) ratios. Qian, Ritter, & Shao (2022) document that

[14] Underwriters also take advantage of investor inertia by allocating extra shares to investors to boost share demand. Zhang (2004) show that such overallocations can help increase IPO offer prices.

the upper limits for many IPOs over the last 30 years were far below what investors were willing to pay, resulting in severe underpricing.

Evidence in several recent papers is consistent with agency theories of IPO underpricing. Using a sample of IPOs from 2002 to 2013, Boeh & Dunbar (2016) find that a growing pipeline of the bookrunner is negatively related to offer prices, consistent with underwriter power and agency theories. Busy underwriters can gain extra power to push for lower offer prices.

Taiwan's Emerging Stock Market (ESM) is the only mandatory pre-IPO market in the world. Chang et al. (2017) find that the ESM P/E ratio shortly before an IPO explains about 90% of the variation in the offer P/E ratio, indicating little valuation uncertainty. However, the average IPO underpricing is high, at 55%, which they attribute to agency conflicts between underwriters and issuers. They also find that regulations influence the relative bargaining power of players and therefore IPO pricing.

Using allocation data of 220 U.K. IPOs, Jenkinson et al. (2018) find that brokerage payments are an important determinant of investors' IPO allocations and profits, providing strong support for the existence of the quid pro quo theory.

Chahine et al. (2020) document that the percentage of IPOs for which the issuers hired an investor relation (IR) consultant prior to the offer date steadily increased from 18% in 2006 to 48% in 2016. They find that IR consultants help create positive news coverage before IPOs, as reflected in the more optimistic tone of published media. Circumventing quiet period restrictions might have motivated some issuers to hire IR consultants. They also provide evidence that the presence of IR consultants increases underpricing, suggesting that underwriters and VCs may have pressured some issuers to hire IR consultants.

While the literature on IPO underpricing focuses on in-sample analysis, Huang et al. (2022) conduct out-of-sample predictions for the underpricing of U.S. IPOs and emphasize the magnitude of underpricing to test theories of IPO underpricing. They begin with a long list of predictors without assuming any prior knowledge of their relative predictive power. Using the IPOs in a rolling 10-year window to predict the underpricing of the IPOs in the subsequent year and sort them into 10 groups based on the predicted underpricing, they document extreme average underpricing for the top group identified ex ante, with the magnitude being too large to be explained by theories that assume no issuer-underwriter conflicts. Huang et al. also find that the revision from the file price range to the offer price, as well as its several variants, have primary out-of-sample predictive power, partly because of the correlation between the price revision and pre-pricing public information. Even when only pre-pricing public information is used, the average underpricing for the top group is high, inconsistent with Benveniste & Spindt's (1989) model, in which public information does not predict underpricing.

New Evidence Supporting Information Asymmetry-Based Theories

Bajo et al. (2016) find that well-connected IPO underwriters are associated with larger absolute values of offer price revisions, greater IPO and after-market valuations, higher IPO initial returns, greater institutional investor equity holdings and analyst coverage immediately post-IPO, greater stock liquidity post-IPO, and better long-run stock returns. They posit that well-connected underwriters can use their connections to help disseminate information to, or extract information from, potential investors.[15] There are alternative explanations, however, for at least

[15] Bajo et al. (2016) construct several measures to capture the relative position of each underwriter in the network of investment banks. For example, one measure is the number of other unique investment banks that the lead IPO underwriter had connections with (either as a lead IPO underwriter or as a member of an IPO syndicate) in the 5-year period prior to the IPO year. As with many academic papers, the analysis in the paper is a bit of a black box

some of their findings. For example, underwriters' connections may serve to increase their bargaining power to push for low file prices and offer prices. In competing for mandates, underwriters face a tradeoff. By pitching a higher valuation, they increase the probability of being hired, but they then find it difficult to recommend a lower file price range and offer price without disappointing the issuer. Liu & Ritter (2011) develop a model of oligopolistic competition and show that underwriters with greater bargaining power find it optimal to pitch a lower valuation, resulting in higher average underpricing.

Jia et al. (2021) examine 859 IPOs in the Chinese market from 2009 to 2012 and find that pre-trading analyst coverage for an IPO was positively related to its offer price revision, first-day return, and long-run stock performance, suggesting that pre-IPO analyst coverage plays a useful role in information production. Yang & Yuan (2022) posit that trademarks reduce asymmetric information, and report that companies with more trademarks are underpriced less in the U.S..

New Evidence Supporting Both Information Asymmetry and Agency Theories

It is not simple for empirical studies to separate information asymmetry and agency effects on IPO underpricing. For example, media coverage can reduce underpricing either because it can reduce information asymmetry or because it can reduce underwriter–issuer conflicts by monitoring the issuer and underwriters. Information asymmetry and agency problems could vary more across countries than within a particular country. Chen et al. (2020), Chen, Goyal, & Zolotoy (2022), and Duong et al. (2022) examine IPOs in several countries.

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because the only underwriters that are identified by name are in an example from 1980, with many of those underwriters defunct for many decades. In recent years, the underwriters with the largest market shares (and presumably highest centrality) are Goldman Sachs, JPMorgan, and Morgan Stanley.

Duong et al. (2022) find a negative relation between democracy and IPO underpricing for a large sample of IPOs across 45 countries. They argue that democracy tends to alleviate information-asymmetry and agency problems. Chen et al. (2020) also examine IPOs across different countries and find that pre-IPO media coverage is negatively related to IPO underpricing. While they interpret their findings as consistent with the role of pre-IPO media coverage in reducing information asymmetry, the coverage may also reflect media freedom and media monitoring that help reduce issuer-underwriter conflicts. The effect of media coverage on IPO underpricing is not a settled topic, however. The findings of Chen et al. contrast with those of Chahine et al. (2020).

As with direct listings, with traditional IPOs there is a lot of uncertainty about the price at which an IPO will start to trade. Starting in 2006, Nasdaq introduced the "IPO Cross" system to determine an opening price, as described by Aggarwal and Wu (2022). The authors report that this multi-step opening auction results in an opening price that, on average, results in no further intraday price trends for hot IPOs, but slightly overestimates the closing price for cold IPOs.

IPO Long-run Performance

In the three years after going public, for the 8,775 IPOs from 1980 to 2020, the average IPO underperforms the market by -17.1% on an EW basis, measured from the first closing market price (Ritter, 2023). Using firms matched by market cap and the book-to-market ratio for style adjustments, Ritter reports that the average style-adjusted 3-year buy-and-hold return is a more modest -6.8%. Furthermore, the EW average 3-year market-adjusted return for the 60% of the sample with pre-IPO inflation-adjusted annual sales of less than $100 million is -29.9%, whereas the 40% of the sample with sales of $100 million or more outperform the market by 2.2%, a

difference of 32.1%. This spread of 32.1% in market-adjusted returns is wider than the spread of 21.1% in style-adjusted returns that Ritter reports in his Table 16. In his Table 16b, Ritter reports a spread of 23.1% in the style-adjusted 3-year buy-and-hold returns of profitable vs unprofitable IPOs, with the profitable firms doing better. These patterns suggest that the underperformance of IPOs is being driven by small, unprofitable companies.

Bessembinder & Zhang (2013) and Bessembinder, Cooper, & Zhang. (2019) propose characteristics-based matching methodologies for examining long-run performance following corporate events. They conclude that IPO firms do not underperform firms with similar characteristics, using market cap, book-to-market, return momentum, a measure of illiquidity, and the rate of capital investment.

Although they do not examine IPOs directly, Huang & Ritter (2022) find that underperformance following net equity issues is concentrated in months 11 to 22 after issuance.[16] Ritter (2023, Table 20) shows that post-IPO long-run underperformance follows a similar pattern. Many papers, including that by Bessembinder & Zhang (2013), form portfolios in which IPO firms enter the portfolio immediately after the IPO and remain for 3 years or more, with both the early entering and delayed departure dates reducing the power of detecting abnormal returns by combining event periods with zero abnormal returns and event periods that display underperformance. Kolari, Pynnonen & Tencez (2022) also address the Bessembinder & Zheng (2013) methodology. They report that the normalization procedure that the authors use, in which

[16] Huang & Ritter (2022) use data from cash-flow statements to define net equity issues. They examine stock returns starting from the fifth month after the end of the fiscal year. If a firm issued equity in the middle of the fiscal year, they measure the stock return in months 11 to 22 after the issuance. There are two reasons for why issuers on average do not underperform in the first few quarters after issuing. The first reason is that insiders frequently are locked up for 180 calendar days after issuing, and thus have an incentive to postpone releasing bad news. The second reason is that companies try to avoid negative earnings surprises soon after issuing, partly to avoid costly litigation.

variables are transformed into percentile ranks, inflates the standard errors, making it easier to find no statistically significant abnormal performance.

Several recent papers on IPO long-run performance focus on the underperformance of certain subgroups of IPOs. Bajo et al. (2016) find that well-connected underwriters are associated with better long-run post-IPO stock returns. It is likely that their measure of connectedness (inclusion in many syndicates with different underwriters) is highly correlated with market share. It is well known that IPOs using underwriters with large market shares have better long-run performance.

Dambra, Gustafson, & Quinn (2020) study a hand-collected sample of pre-IPO trusts for 1,942 IPOs between 1997 and 2013. In this sample, 23% of CEOs transferred some portion of their share ownership into a pre-IPO tax-advantaged trust. Conditional on using a trust, CEOs transferred approximately 38% (or $78 million) of their equity wealth into such a trust. Dambra et al. find that trust use is associated with 12% higher 1-year post-IPO returns but is not significantly related to IPO valuations, filing price revisions, or underpricing. As with much of the long-run performance literature, the theoretical reason for why this measure should be associated with subsequent stock returns is not clear.

Liu & Wu (2021) study price and share information hand-collected from prospectuses and find that IPO firms inflate "core" earnings immediately prior to IPOs via classification shifting (e.g., misclassifying core expenses as income-decreasing special items). This earnings inflation is positively associated with price revisions from the midpoint of the initial price range to the final offer price, and negatively associated with post-IPO stock returns. Thus, pre-IPO classification shifting influences IPO price formation.

Ozmel, Trombley, and Yavuz (2019) find that limited partners of lead venture capital funds obtain high abnormal returns when they invest in newly listed stocks backed by their funds. Cox, Van Ness, & Van Ness (2022) examine post-IPO liquidity. They report that whether trading is fragmented across markets or not has little impact on liquidity.

In general, one can interpret the findings of these recent studies, as well as the evidence from earlier papers, as consistent with the notion that IPOs that are marketed primarily to institutional investors are, once trading starts, priced fairly efficiently. Offerings for which the marginal investor might be a retail trader rather than an institution tend to be initially overpriced in the market, as reflected in low subsequent returns.

Corporate Governance of IPO Firms

Field & Lowry (2022) document that IPO firms increasingly use classified boards and dual-class shares, although the percentage of mature listed firms with these governance structures has declined by over 40% since 1990. It is difficult to determine whether adopting these governance structures is optimal in terms of maximizing firm value, however, because we cannot observe the counterfactuals. Field & Lowry study the voting patterns of mutual fund investors and suggest that dual-class shares do not necessarily maximize shareholder value, although dual-class shares clearly give the founders of these IPO firms more control.

Aggarwal et al. (2022) also document the increased frequency of dual-class IPOs, and suggest that the increased incidence of dual-class IPOs is due to the increased supply of venture capital in recent years, which has improved the bargaining position of founders.

If investors are concerned that managerial entrenchment will harm firm value, dual-class shares should be priced at a discount, or else the return will be low. Table 24 in Ritter (2023) documents that public market investors have had superior post-IPO returns on dual-class IPOs, which suggests that concerns about founders extracting private benefits of control at the expense of investors with inferior voting rights are, on average, unwarranted in the U.S.

Using international data, Masulis, Pham, & Zein (2020) show that family business groups often use IPOs to raise capital for their subsidiary firms. This scenario is more likely if an SEO, despite being less costly, causes the family to lose control. This paper clearly shows that nonpecuniary benefits of control are a factor in firms' going-public decisions.

Strong board oversight may alleviate agency problems by monitoring officers and other decision makers, who may be tempted by underwriters to leave money on the table. Strong board oversight may also mitigate information asymmetry by improving the quality of financial reporting. Chen et al. (2022) document that global board reforms have strengthened board oversight in issuing firms, reducing IPO underpricing significantly. They find that the effect on underpricing is stronger for IPOs with greater agency problems, and weaker for IPOs certified by prestigious intermediaries, those with greater disclosure specificity, and those in countries with better shareholder protection and more stringent financial reporting regulations.

Financial sponsors often have significant ownership and serve as board members of newly public firms, influencing their investing and financing decisions (Iliev and Lowry, 2020). Amini et al. (2022) document that post-IPO VC ownership delays the firm's initiation of dividends, frequency of acquisitions, and entry to the corporate bond market. Huang, Ritter, & Zhang (2016) document that, compared to non-PE-backed companies, PE-backed companies obtain

lower yield spreads on their bonds post-IPO and implement more conservative investment and dividend policies after bond offerings.

The IPO Effect

An IPO can be a watershed event for a firm, bringing significant changes in many aspects of its operations. Su, Zhang, & Zhang (2020) show that IPO firms with greater underpricing have lower post-IPO borrowing costs if they operate in industries with above-median expenses on advertisements. Newly public firms also demonstrate different investment behavior (see Bernstein 2022, Gilje & Taillard 2016).

Two recent papers provide new insights into the connections between IPOs and product market competition. Firms may decide to go public to compete more effectively with rival firms. When products are less distinct, it is easier for one firm to steal another's customers. As Spiegel & Tookes (2020) find, the majority of IPO firms and their rivals experience post-IPO performance declines. This pattern reflects industry trends, as consumers increasingly view products as less distinct. However, sometimes IPO firms' performance improves at the expense of their rivals.

It is not easy for researchers to identify a firm's competitors in large sample empirical studies. Aghamolla & Thakor (2022) use data from the drug-development industry and identify a firm's competitors through similarity in drug-development projects based on disease targets. They find that a private firm is significantly more likely to go public after the recent IPO of a direct competitor, especially when the firms operate in more competitive areas. Their findings suggest that achieving a competitive advantage is an important motive for going public.

Several recent papers focus on the spillover effects of IPOs, especially in the labor market. Butler, Fauver, & Spyridopoulos (2019) show that IPOs have positive spillover effects on local labor markets, business environments, consumer spending, real estate, and migration. They use restrictive geographic fixed effects and a matching procedure to mitigate endogeneity concerns about unobserved heterogeneity. Conditional on going public, raising more capital is associated with additional new jobs and establishments in the local area. A private firm that receives equity capital either through VC funding or an IPO will stimulate local economic activity, but an IPO is also a liquidity event for employees that own shares or options.

Nickerson (2017) finds that the demand for CEOs goes up as more firms go public. A 1-standard-deviation increase in IPO activity is associated with a 6% increase in pay-size elasticity, with the effect being stronger in specialized industries. Increased IPO activity also results in a greater likelihood of executive transitions between firms. Borisov, Ellul, & Sevilir (2021) show that relaxing firms' financial constraints after an IPO results in more investment in human capital and greater employment growth. It is difficult to know, however, how much greater the effects are than if there had been an equivalent infusion of equity capital from venture capitalists.

Liang et al. (2021) present evidence that public listings enhance workplace safety, because public firms are more closely monitored by media and regulators than private firms. The causal relation is supported by their finding that in counties with local newspaper closures, public firms experience greater increases in injury rates after the closures than their local private counterparts. Compared to private firms, public firms are also associated with a higher likelihood of nonroutine regulatory inspections, and larger regulatory penalties on detected violations.

Conclusions

This article examines recent developments in the IPO market and provides a review of recent evidence related to the processes, pricing, and consequences of IPOs. Although IPO activity fluctuates dramatically from year-to-year, the IPO market continually evolves. In recent years, private companies have increasingly been able to raise equity capital from both venture capitalists and traditional public market investors such as mutual funds and other sources without listing shares. This makes going public less attractive. On the other hand, the use of virtual investor education meetings and IPO roadshows triggered by the Covid-19 pandemic may be more efficient and less time-consuming than traditional in-person meetings. This would reduce the costs of going public.

Private companies that wish to go public can choose among a traditional IPO, a direct listing, merging with a SPAC, or being acquired by a public company. Although the decline in the number of listed companies from its peak in 1997 continues to be a topic of concern to policymakers, Eckbo & Lithell (2022) document that the increased acquisition rate by public firms of both public and private companies, including some startups that might otherwise have chosen to go public themselves, can account for almost all of the decline. Thus, an investor that holds the value-weighted market portfolio effectively holds the same portfolio as if many of these acquired firms had remained independent and were publicly traded.

After existing as a relatively small niche for many years, SPAC activity exploded in 2020-2021 in the U.S. before collapsing along with the rest of the IPO market in 2022. There is no widely held explanation for the huge boom that occurred. Future research should explore the boom in SPACs, cryptocurrencies, and so-called “meme” stocks (e.g., GameStop and AMC) that occurred at roughly the same time.

Although the market appears to be relatively efficient at pricing larger companies that go public, smaller companies have low returns in the 2-3 years after the IPO. There continues to be debate regarding how much of the lower returns are associated with observable characteristics that are related to average returns on all stocks, and how much of the low returns are an IPO effect. In 2021 and 2022, a number of microcap IPOs rocketed up several hundred percent or more on the first day of trading, only to collapse later on. Similar behavior has been observed over the years in Japan and Hong Kong, but was rare in the U.S.

In addition to the evolving menu of going-public mechanisms, other recent IPO-related developments in the U.S. include confidential filings, testing the waters, and institutional investors' pre-IPO investments. All issuers are now allowed to use confidential filings and to test the waters. These developments have important implications for information production and the decisions, mechanisms, and costs of going public. Future research in this direction can help policymakers and practitioners improve efficiency and lower the costs.

Information-asymmetry-based theories help explain low average underpricing. But theories based on agency problems, underwriter power, and issuer complacency better explain the high average underpricing of 19.0% of U.S. IPOs from 1980 to 2022, as well as the severe average underpricing of over 50% for large subsamples of U.S. IPOs that can be identified ex ante. In 2020, the proceeds-weighted average first-day return in the U.S. reached 47.9%, a level as high as during the internet bubble of 1999-2000. Agency problems exist in all countries, although they tend to be less severe in countries that are more democratic, allow more media freedom, and have better governance mechanisms in place. Heavy-handed regulations are responsible for severe underpricing in some countries (e.g., China). To move the literature on IPO underpricing

forward, future research could focus on the predictability and magnitude of IPO underpricing, issuer–underwriter conflicts, and the implications of regulations.

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