

# WHERE HAVE ALL THE IPOs GONE? THE HARD LIFE OF THE SMALL IPO

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*We examine firm lifecycles of 3,081 IPOs from 1996–2012. We find that small IPOs have a different lifecycle than other, larger companies. Within five years of an IPO, only 55% of small capitalization companies remain listed on a public exchange, compared to 61% and 67% for middle and large capitalization companies, respectively. Small capitalization companies generally delist either voluntarily or involuntarily, while mid and large capitalization companies largely exit the public market through takeover transactions. Those small companies that remain listed largely fail to grow, remaining in the small capitalization category. We use our findings to examine various theories explaining the decline of the small IPO. We find only minor evidence that regulatory changes caused the decline of the small IPO. The decline appears instead to be more attributable to the historical unsuitability of small firms for the public market. Absent economic or market reforms that change small firm quality, further regulatory reforms to enhance the small IPO market are thus unlikely to be effective or bring firms into the public market that have the horsepower to remain publicly listed.*

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## INTRODUCTION

The small company initial public offering (IPO) is dead. In 1997, there were 168 exchange-listed IPOs for companies with an initial market capitalization of less than \$75 million. In 2012, there were seven such IPOs, the same number as in 2003.<sup>1</sup> While there is no doubt about the virtual disappearance of the small company IPO, the cause of this decline is uncertain and disputed.

The most prominent theory offered for the drop in small company IPOs, a regulatory theory, posits that the drop is related to federal regulatory choices, including the Sarbanes-Oxley Act of 2002 (Sarbanes-Oxley).<sup>2</sup> Other theories offer differing or complementary explanations. A theory, often paired with the regulatory theory, posits that heightened regulatory enforcement via public and private litigation has stunted the small IPO market. Market structure theories build on the regulatory explanation to assert that subsequent shifts in market structure have set up economic barriers to small company IPOs. Finally, economic scope theory posits that the cause of the small IPO's demise is neither related to regulation nor the structure of our capital markets, but rather due to shifting economic conditions that have provided alternative outlets for small IPOs.

While the theories are mixed, to date, the regulatory explanation has achieved prominence and attempts to "fix" the market have focused on unwinding regulation or lessening its burdens.<sup>3</sup> The most significant of these efforts is the recent "Jumpstart Our Business Startups Act" (the JOBS Act), signed into law on April 5, 2012.<sup>4</sup> The purpose of the JOBS Act is to improve "access to the public capital markets for emerging growth companies,"<sup>5</sup> which are defined as issuers "that had total annual gross revenues of

<sup>1</sup> Both figures are in inflation adjusted 2011 dollars.

<sup>2</sup> Sarbanes Oxley Act of 2002, Pub. L. No. 107-204, 116 Stat. 745.

<sup>3</sup> See *infra* notes 11-18 and accompanying text.

<sup>4</sup> Jumpstart Our Business Startups Act, Pub. L. No. 112-106, 126 Stat. 306 (2012) (codified in scattered sections of 15 U.S.C.).

<sup>5</sup> *Id.* at 306.

less than \$1,000,000,000.”<sup>6</sup> The JOBS Act attempts to do this in part by reducing certain regulatory burdens, particularly those related to the Sarbanes-Oxley Act.<sup>7</sup> The JOBS Act is primarily a response to the regulatory theory, but it also takes some aims towards market structure by loosening restrictions on research analysts.<sup>8</sup>

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<sup>6</sup> For purposes of the Securities Act of 1933 and the Exchange Act of 1934, “an issuer that is an emerging growth company as of the first day of that fiscal year shall continue to be deemed an emerging growth company until the earliest of (A) the last day of the fiscal year of the issuer during which it had total annual gross revenues of \$1,000,000,000 (as such amount is indexed for inflation every 5 years by the Commission to reflect the change in the Consumer Price Index for All Urban Consumers published by the Bureau of Labor Statistics, setting the threshold to the nearest 1,000,000) or more; (B) the last day of the fiscal year of the issuer following the fifth anniversary of the date of the first sale of common equity securities of the issuer pursuant to an effective registration statement under [the Securities Act of 1933] (C) the date on which such issuer has, during the previous 3-year period, issued more than \$1,000,000,000 in non-convertible debt; or (D) the date on which such issuer is deemed to be a ‘large accelerated filer’, as defined in section 240.12b-2 of title 17, Code of Federal Regulations, or any successor thereto.” *Id.* at 307.

<sup>7</sup> First, an emerging growth company (EGC) only needs to include two years of audited financial statements with the IPO registration statement, rather than the three years of financial statements required under prior law. EGCs also receive reduced burdens with respect to compliance with new or revised accounting standards and executive compensation disclosure requirements, and are temporarily exempted from compliance with Section 404(b) of Sarbanes-Oxley, which requires public company auditors to attest to and report on management’s internal control over financial reporting. 116 Stat. at 745. Not all of the JOBS Act is designed to get companies to an IPO more quickly. In fact, some provisions make capital raising easier for private companies, and thus might keep companies out of the public markets. For example, the JOBS Act increases the size and number of shareholder triggers that require registration. It is these triggers that partially explain the decisions of Google and Facebook to go public. See Steven M. Davidoff, *Facebook May Be Forced to Go Public Amid Market Gloom*, DEALBOOK (Nov. 29, 2011, 7:58 PM), [http://dealbook.nytimes.com/2011/11/29/facebook-may-be-forced-to-go-public-amid-market-gloom/?\\_r=0](http://dealbook.nytimes.com/2011/11/29/facebook-may-be-forced-to-go-public-amid-market-gloom/?_r=0). Under prior rules, the Securities and Exchange Commission (SEC) required 500 or more shareholders of record to begin filing reports, including audited financial information, with the SEC four months after the year it exceeds the 500 shareholder threshold. Under the JOBS Act, the shareholder threshold increases to either 2,000 shareholders total, or 500 shareholders who are not accredited investors. Importantly, the JOBS Act excludes from this count shareholders who received equity through an employee compensation plan. In theory, this should allow companies to come to market. *Id.*

<sup>8</sup> Following the Global Research Analyst Settlement in 2003, the SEC approved NASD and NYSE-passed rules designed to reduce analyst conflicts of interest. See NASD, *Notice to Members*, FINRA (Aug. 2003), <http://www.finra.org/web/groups/industry/ip/reg/notice/documents/notices/p003202.pdf>. Among other things, the rules “separate analyst compensation from investment banking influence,” “prohibit analysts from issuing ‘booster shot’ research reports,” and “prohibit analysts from soliciting investment banking business.” *Id.* Although the JOBS Act does not eliminate these provisions, it does provide that analysts may participate in meetings “with the management of an emerging growth company that is also attended by any other associated person of a broker, dealer, or member of a national securities association whose functional role is other than as a securities analyst.” Jumpstart Our Business Startups Act §105(c)(2). Because many of the restrictions on analyst activities are imposed by FINRA and not directly by the SEC, any FINRA-enforced regulations, such as the applicable NYSE rules, are not technically superseded by the JOBS Act. However, we share the opinion of Davis, Polk & Wardwell that “[a]lthough NYSE Rule 472, which imposes restrictions on research, is not technically affected by the JOBS Act, we believe the NYSE is likely to amend Rule 472 to conform with FINRA’s changes to its research rules.” *The JOBS Act: Implications for Capital Markets Professionals, Pre-IPO Companies and Private Offerings*, DAVIS POLK & WARDWELL LLP (Mar. 26, 2012), <http://www.davispolk.com/sites/default/files/files/Publica->

As the regulatory theory has driven the creation of the JOBS Act, the efficacy of the JOBS Act and its related brethren are thereby largely dependent upon the regulatory explanation for the demise of the small IPO market being correct. Unfortunately, this explanation has mixed empirical support.<sup>9</sup> In contrast, the market structure and economic scope arguments have garnered sometimes conflicting but greater support among researchers. The consequence is that there is no overwhelming empirical support for any of these explanations. Moreover, to date, research has largely focused on companies in pre-IPO stages, in an attempt to examine which companies do and do not go public. There has been limited study of what happens to these companies once they go public, an important piece to the puzzle of why the small IPO has disappeared.

This article seeks to fill the gap and further inform the empirical data necessary to these important policy decisions. It is the first study of the life-cycle of small-cap companies, which we define as companies that go public and list on a major exchange with a capitalization of less than \$75 million (small-cap companies). Using a dataset of 3,081 IPOs from 1996 through 2012, we compare companies arrayed in three significant regulatory categories—those with a small market capitalization of less than \$75 million, those with a middle market capitalization between \$75 and \$700 million (mid-cap companies), and those with a large market capitalization greater than \$700 million (large-cap companies).

We examine firm lifecycles from 1996–2012 and find that small-cap companies do indeed have a different lifecycle than other, larger companies. We find that small-cap companies have a shorter half-life: within five years of an IPO, only 55% of such companies remained listed on a public exchange, compared to 61% and 67% for middle and large capitalization companies, respectively. Of those that are no longer listed, the majority either voluntarily or involuntarily delist through a route other than a takeover. By contrast, mid- and large-cap companies generally exit the market through takeover transactions. Moreover, those small companies that remain listed largely fail to grow, remaining in the small-cap category. Over the life of our sample time period, the initial median market capitalization of small IPOs in year one is \$52 million while among the survivors in year five it falls to \$34 million and in year seven rises to only \$58 million.

We also perform a regression analysis to further determine delisting attributes for smaller IPOs. We find no indication that regulation and relatedly increased audit fee expenses spurred involuntary delistings due to bankruptcy and other distress events. We do find, however, that there was an uptick in voluntary delistings and takeover exits among small firms in the

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<sup>9</sup> See John C. Coates, IV & Suraj Srinivasan, *SOX After Ten Years: A Multidisciplinary Review* 19 (Accounting Horizons, Discussion Paper No. 758, 2014), available at <http://ssrn.com/abstract=2343108>.

time after the passage of Sarbanes-Oxley. These findings give mixed support to the regulatory theory. We also find that, on the whole, small-cap companies appear to be more likely to delist if their asset size is smaller, but we find no relationship between a delisting and revenue size, implying they are more prone to shocks but may be more capable than previously thought of incurring increased regulatory costs. We ultimately conclude that companies with small IPOs are simply different from companies with middle or large capitalization IPOs. They historically have not performed well in the market, are less stable due to their size, and are more susceptible to delisting for involuntary reasons.

We close by considering how our findings relate to the various theories regarding the decline of the small IPO and IPOs generally. We suggest that market forces independent of regulation are likely to explain almost the entire decline, supporting economic theories for the small IPO's demise. It simply appears that small IPOs historically have not been supportable by the market, as they have not been suitable to investors. The lack of new small IPOs arguably reflects this fact. This is not to say that Sarbanes-Oxley did not have any consequence for these companies, but rather that the effect does not appear to predominate. In this light, though it may be valid under independent efficiency grounds, regulation designed to improve the IPO market is not likely to be effective in spurring small IPOs.

Ultimately, we conclude that the evidence derived from the lifecycle of small-cap companies points to both demand and supply side changes as a primary reason for the vanished small IPO. In short, we believe that the primary reasons may have been on the demand side: investors simply tired of investing in these small IPOs due to their inability to survive and grow in the public markets.<sup>10</sup> The absence of investor demand alone, however, does not explain the collapse of the small IPO. Supply side forces may have still pushed these companies into the market despite decreased interest from investors. However, these supply side forces have diminished in light of technological and market structure changes, some of which are related to regulatory changes.<sup>11</sup>

We finish by examining the steps that may be needed to restart the small IPO market. We conclude that if a fix is to come, it will require creating a patient market environment that fosters growth in small companies both before and after a small company's IPO. Another potential solution is to create a market that restarts investor demand for small IPOs. Absent these changes, and assuming small companies can adequately raise capital through other sources, the loss of the small IPO may not be something to mourn.

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<sup>10</sup> We investigate other demand-side factors, including liquidity, in subsequent work. See Robert P. Bartlett III, Paul Rose & Steven Davidoff Soloman, *What Happened in 1998? The Demise of the Small IPO and the Investing Preferences of Mutual Funds* (unpublished manuscript), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2718862](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2718862).

<sup>11</sup> Future inquiry is necessary to determine whether this loss of capital supply has adversely affected small issuers or if alternative capital-raising methods have replaced the IPO.

This article proceeds as follows: in Part I, we further discuss the theories that seek to explain the decline in small IPOs. Part II provides a review of prior empirical work analyzing these theories and distinguishes our study. Part III sets forth our empirical findings. Part IV discusses the implications of our findings, including the utility of IPO-specific regulation like the JOBS Act, current pending Congressional legislation to further reform the IPO market, and the utility of staged regulation.

## I. THEORIES ON THE DECLINE OF SMALL IPOs

IPO market observers have developed numerous theories to explain the decline of small IPOs over the last two decades. In this section, we briefly review these theories. Although there is no shortage of explanations, we limit our discussion to the most prominent and credible explanations.

### A. *Sarbanes-Oxley*

One of the most well-known explanations for the decline in small IPOs is the notion that excessive regulation has increased the burden on public companies, while the benefits of public company status have not increased commensurately.<sup>12</sup> Much of the blame is focused on Sarbanes-Oxley, particularly Section 404. This section requires public companies to file with their annual reports an “internal control report” that must “state the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting” and must also “contain an assessment, as of the end of the most recent fiscal year of the issuer, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting.”<sup>13</sup> Additionally, the outside auditors must attest to and report on management’s internal controls assessment.<sup>14</sup> The teeth of Sarbanes-Oxley are in Section 906. This section states that the financial statements must be accompanied by a written statement from the chief executive officer and chief financial officer certifying that that the financial statements “fairly present[ ], in all material respects, the financial condition and results of operations of the issuer.”<sup>15</sup> If the chief executive officer or chief financial officer certifies the statements knowing they do not comport with

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<sup>12</sup> See, e.g., Thomas E. Hartman, Foley & Lardner LLP, *The Cost of Being Public in the Era of Sarbanes-Oxley* (Aug. 2, 2007), <https://www.foley.com/files/Publication/6202688d-eebc-42bc-8169-5dfb14ef3ced/Presentation/PublicationAttachment/666c1479-ea9c-4359-bb07-5f71a18166f6/Foley2007SOXstudy.pdf>. See also William J. Carney, *The Costs of Being Public After Sarbanes-Oxley: The Irony of “Going Private,”* 55 *Emory L.J.* 141, 141 (2006) (“The enactment of the Sarbanes-Oxley Act (SOX) in 2002 may represent the final act in regulation of corporate disclosure. By that I mean that the costs of regulation clearly exceed its benefits for many corporations.”)

<sup>13</sup> Sarbanes Oxley Act of 2002, Pub. L. 107-204, 116 Stat. 745, § 404 (2002).

<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at § 906

these requirements, she or he will be subject to a fine of up to \$1,000,000 and imprisonment of up to ten years.<sup>16</sup> Willful violations bring a penalty of up to \$5,000,000 and imprisonment of up to twenty years.<sup>17</sup>

Under this explanation for the decline in IPOs, the increased costs of conducting both a more thorough internal assessment—made especially urgent by the threat of criminal penalties—and the additional costs imposed by the auditors' attestation are particularly burdensome to small companies, which typically do not have the revenues to support such significant fixed costs imposed by the requirements. The Securities and Exchange Commission (SEC) responded to these concerns by deferring compliance with Section 404 for the smallest public companies—those with less than \$75 million in public equity—but did not extend relief to companies beyond that very small size.<sup>18</sup> Thus in terms of descriptive data, the costs of Sarbanes-Oxley and other regulation may have a greater impact on small companies, at least greater than suggested by pure numbers.

Nonetheless, the numbers make clear that there have been increased costs to companies in the wake of Sarbanes-Oxley. The effect of Sarbanes-Oxley on companies can be measured by looking at audit fees for companies during this time period. Figure 1 shows the median total audit fees for companies of the three market capitalization classes:

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<sup>16</sup> *Id.*

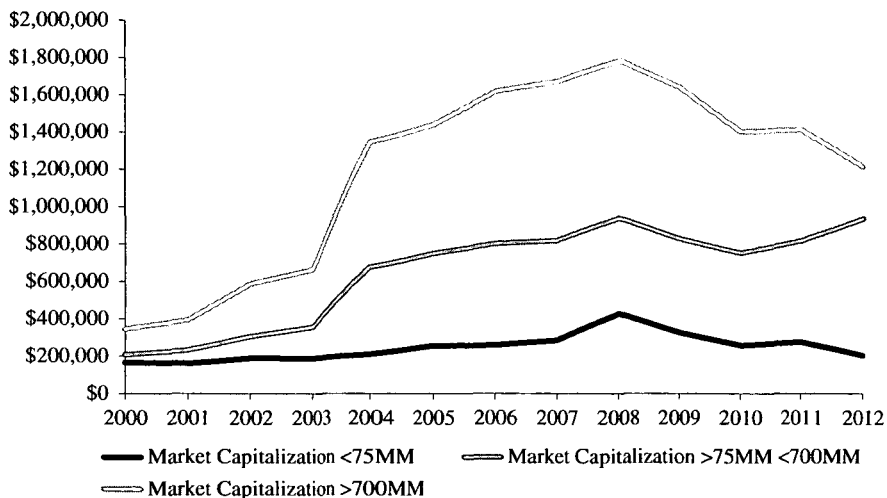
<sup>17</sup> *Id.*

<sup>18</sup> The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 provided permanent relief from part of these burdens to smaller companies. Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010) (codified in scattered titles of the U.S.C.) [hereinafter Dodd-Frank Act]. Under Section 989G, the auditor attestation required under Sarbanes-Oxley Section 404(b) no longer applies to “any audit report prepared for an issuer that is neither a ‘large accelerated filer’ nor an ‘accelerated filer.’” *Id.* § 989G. A large accelerated filer is defined in Rule 12b-2 as an issuer that, among other things, has “an aggregate worldwide market value of the voting and non-voting common equity held by its non-affiliates of \$700 million or more.” 17 C.F.R. § 240.12b-2(2)(i) (2012). An accelerated filer is defined in Rule 12b-2 as an issuer that, among other things, has “an aggregate worldwide market value of the voting and non-voting common equity held by its non-affiliates of \$75 million or more, but less than \$700 million.” *Id.* § 240.12b-2(1)(i). Section 989G of Dodd-Frank Act also states:

The Securities and Exchange Commission shall conduct a study to determine the Commission could reduce the burden of complying with section 404(b) of the Sarbanes-Oxley Act of 2002 for companies whose market capitalization is between \$75,000,000 and \$250,000,000 for the relevant reporting period while maintaining investor protections for such companies. The study shall also consider whether any such methods of reducing the compliance burden or a complete exemption for such companies from compliance with such section would encourage companies to list on exchanges in the United States in their initial public offerings.

*Id.* at § 989G.

FIGURE 1: MEDIAN AUDIT FEES BY MARKET CAPITALIZATION (2000-2012)



Source: Audit Analytics; CRSP.

In 2001, median audit fees for small-cap companies were \$165,972. This figure rose in the wake of Sarbanes-Oxley to \$428,759 in 2008, and then declined in 2012 to \$204,762. Mid- and large-cap companies exhibited a similar pattern, although mid-cap companies have not experienced the same decline in audit fees in recent years. For large-cap companies, median audit fees were \$395,580 in 2001. They rose to \$1,782,849 in 2008, and then declined to \$1,213,879 in 2012. For mid-cap companies, audit fees were \$233,702 in 2001, rose to \$940,280 in 2008, and then continued in that range. The figures indicate that while there were costs to Sarbanes-Oxley and its accompanying regulation, those costs have, in some cases, declined in recent years.<sup>19</sup>

### B. Market Ecosystem Theory

Other regulations thought to have increased burdens for smaller companies are Regulation FD, promulgated in 2000,<sup>20</sup> and the Global Research Analyst Settlement of 2002.<sup>21</sup> Regulation FD was designed to prohibit the

<sup>19</sup> See also U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-06-361, *SARBANES-OXLEY ACT: CONSIDERATION OF KEY PRINCIPLES NEEDED IN ADDRESSING IMPLEMENTATION FOR SMALLER PUBLIC COMPANIES* (2006); Thomas E. Hartman, Foley & Lardner LLP, *The Cost of Being Public in the Era of Sarbanes-Oxley*, *supra* note 10; Susan W. Eldridge & Burch T. Kealey, 2005, *SOX Costs: Auditor Attestation Under Section 404*, (Working Paper, 2005), available at <http://ssrn.com/abstract=743285>.

<sup>20</sup> 17 C.F.R. §§ 243.100–243.103 (2014).

<sup>21</sup> U.S. Sec. & Exch. Comm'n., Litigation Release No. 18438 (Oct. 31, 2003) <http://www.sec.gov/litigation/litreleases/lr18438.htm>; see also Press Release, U.S. Sec. & Exch. Comm'n., SEC, NY Attorney General, NASD, NASAA, NYSE and State Regulators Announce Historic



transmission of material, non-public information to preferred stockholders, analysts, and other specifically enumerated persons. It provides that whenever an issuer or person acting on its behalf discloses material nonpublic information to these enumerated persons, it must make such information publicly available.<sup>22</sup> The timing of this required public disclosure is determined by whether the selective disclosure to the enumerated person was intentional or unintentional.<sup>23</sup> Intentional disclosures must be accompanied by simultaneous public disclosure; in the case of non-intentional disclosures, the issuer must publicly disclose “promptly.”<sup>24</sup>

The Global Research Analyst Settlement was entered into by the SEC, New York Attorney General Eliot Spitzer, the North American Securities Administrators Association, the National Association of Securities dealers, the New York Stock Exchange, numerous state regulators, and the largest U.S. investment banking firms.<sup>25</sup> The agreement was designed to “insulate research analysts from investment banking pressure” by severing “the links between research and investment banking, including analyst compensation for equity research, and the practice of analysts accompanying investment banking personnel on pitches and road shows.”<sup>26</sup> Among other things, the settlement also banned IPO “spinning,” a practice that involves investment banks offering shares in hot IPOs to preferred customers in order to gain or retain business.<sup>27</sup>

Regulation FD and the Global Research Analyst Settlement have both been cited as a factor in the reduced number of IPOs by decreasing incentives to provide analyst coverage.<sup>28</sup> Regulation FD affects analyst coverage by discouraging the transmission of information through analysts, which affects the value of analyst coverage. The Global Research Analyst is thought to have decreased analyst coverage by severing a crucial funding source for analysts:

The mandated separation of investment banking and investment research reduced substantially the resources available to support sell-side research at a time when those resources were already declining due to industry consolidation and a downward trend in commission rates (driven in recent years by a shift to electronic

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Agreement To Reform Investment Practices; \$1.4 Billion Global Settlement Includes Penalties and Funds for Investors (Dec. 20, 2002), <http://www.sec.gov/news/press/2002-179.htm>.

<sup>22</sup> Selective Disclosure and Insider Trading, Exchange Act Release No. 7881, 73 SEC Docket 3 (Aug. 15, 2000).

<sup>23</sup> 17 C.F.R. § 243.100 (2014).

<sup>24</sup> *Id.*

<sup>25</sup> See Press Release, U.S. Sec. & Exch. Comm’n, *supra* note 21.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> See David Weild & Edward Kim, *Capital Market Series: Market Structure is Causing The IPO Crisis*, Grant Thornton LLP 9 (2009), <http://www.grantthornton.com/staticfiles/GTCom/Public%20companies%20and%20capital%20markets/Files/IPO%20crisis%20-%20Sep%202009%20-%20FINAL.pdf>.

trading, decimalization, and by increasing regulatory scrutiny of how investment managers were using their clients' commission [a.k.a. "soft"] dollars). The result has been a significant reduction in both the quantity and quality of sell-side research.<sup>29</sup>

In a study covering 549 initiations of analyst coverage from 1997–2005 in which 88% of the companies studied had a market capitalization of less than \$250 million, coverage has been estimated to increase a company's stock price by 5%.<sup>30</sup>

Finally, two other regulatory changes affecting brokerage activity are also cited as prime contributors to the decline in the IPO market. In 1996, the SEC promulgated new order handling rules. The "Display Rule"<sup>31</sup> requires broker-dealers to "display . . . customer limit orders priced better than a specialist's or over-the-counter market maker's quote or that add to the size associated with such quote."<sup>32</sup> The "Quote Rule"<sup>33</sup> requires market makers to "publish quotations for any listed security when it is responsible for more than 1% of the aggregate trading volume for that security and to make publicly available any superior prices that a market maker privately quotes through certain electronic communications networks . . . ."<sup>34</sup>

In a report summarizing the effects of regulatory changes on IPOs, the firm Grant Thornton observed that "[t]hese changes, applauded at the time, clearly were intended to increase transparency and create an even playing field for retail investors. The market impact, unforeseen as it may have been, was devastating. Stock spreads narrowed, and the economics to broker-dealers continued to erode."<sup>35</sup>

The second change was what critics call the "death star" of decimalization.<sup>36</sup> Decimalization is thought to have negatively impacted the liquidity of smaller public companies:

While it's difficult to argue in theory with the change from fractional to decimal increments, in hindsight the markets would have been better served by a reduction of increments to just 10 cents, rather than to the penny increments for which the SEC pushed. The resultant loss of 96 percent of the economics from the trading

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<sup>29</sup> Stanley (Bud) Morten, *Abolish the Global Research Settlement?*, INTEGRITY RESEARCH ASSOCS. (Jan. 25, 2011), <http://www.integrity-research.com/peal-the-global-research-settlement/>.

<sup>30</sup> Cem Demiroglu & Michael D. Ryngaert, *The First Analyst Coverage of Neglected Stocks*, 39 FIN. MGMT. 555 (2010).

<sup>31</sup> Order Execution Obligations, Exchange Act Release No. 37619A, 62 SEC Docket 2083 (Sept. 6, 1996). See also 17 C.F.R. § 240.11Ac1-4 (2014).

<sup>32</sup> 62 SEC Docket at 2083.

<sup>33</sup> 62 SEC Docket at 2084. See also 17 C.F.R. § 240.11Ac1-1 (1996).

<sup>34</sup> Order Execution Obligations, Exchange Act Release No. 37619A, 62 SEC Docket 2083 (Sep. 6, 1996).

<sup>35</sup> David Weild & Edward Kim, *Capital Market Series: Market Structure is Causing The IPO Crisis*, *supra* note 27.

<sup>36</sup> *Id.* at 8.

spread of most small cap stocks—from \$0.25 per share to \$0.01 per share—was too great a shock for the system to bear. Trade execution had to be automated. Market makers no longer exchanged information over the phone, scrambling to match buyers with sellers on the other side of a trade. Liquidity, supported by capital commitment, quickly was a thing of the past in the NASDAQ system. In the name of championing consumers, the damage was done.<sup>37</sup>

A related “market ecosystem” explanation of the decline in IPOs relates to important changes in the investor base in U.S. equity markets. From 1950 to 2010, the percentage of direct ownership by individual investors declined from 90% to less than 33%. At the same time, individual investors increasingly invested through online brokerage accounts rather than traditional full service brokers. An old Wall Street adage states that “stocks are sold, not bought;” if there is no longer a group of dedicated salespersons—in part because there is no market to sell to—then the secondary market will suffer (particularly where there is no analyst coverage for smaller companies) and IPOs will become less attractive.<sup>38</sup>

### C. Market Conditions

Another relatively simple explanation for the decrease in small IPOs focuses on poor market conditions. This explanation has two facets. First, IPOs may be depressed because poor market conditions may slow development of IPO candidate companies. Second, IPOs may also be depressed because poor market conditions for public companies dissuade otherwise viable candidate firms from going public. Under this explanation, “IPO volume will recover to the lofty levels of the 1980s and 1990s if and when public equity market valuations recover to their previous peaks. Part of the high volume of IPOs in the late 1990s could thus be attributable to unsustainably high market valuations on technology stocks.”<sup>39</sup>

### D. Litigation Environment

Litigation has also been thought to affect IPOs by imposing additional costs on public company status, although there has not been significant empirical work examining its effects. Anecdotally, however, “CEOs often cite

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<sup>37</sup> *Id.*

<sup>38</sup> Weild & Kim also state that one may reasonably hypothesize that the Dot Com Bubble masked problems in the market. The growth of sub-\$25 commission trades and self-directed online brokerage accounts “helped to cause the Bubble and destroyed the very best stock marketing engine the world had ever known.” Stockbrokers were forced to shift from traditional stockbrokerage to becoming fee-based “asset gatherers.” *Id.* at 5.

<sup>39</sup> Xiaohui Gao, Jay R. Ritter & Zhongyan Zhu, *Where Have All the IPOs Gone?*, 48 J. FIN. QUANTITATIVE ANALYSIS 1663, 1688 (2013).

the U.S. litigation environment as an important impediment to going public: 'If you go public, you get sued.' This increases direct costs for legal fees and insurance as well as the indirect costs of management time and effort diverted by litigation issues rather than running the business."<sup>40</sup> The U.S. Chamber of Commerce's Center for Capital Market Competitiveness argues that both private litigation and aggressive regulator enforcement reduce the competitiveness of U.S. public markets, noting that "[t]he United States has the toughest administrative enforcement of securities laws in the world, arguably one of the strengths of our markets, but the penalties have grown disproportionately large relative to their deterrent benefit."<sup>41</sup>

### E. Economic Scope Theory

Finally, Gao, Ritter, and Zhu have recently explained the decline in IPOs through what they have termed the economic scope theory.<sup>42</sup> Unlike theories that look to specific regulatory and intermediary changes to explain the decrease in IPOs, the economic scope theory sees broader, structural change in the market that favors big firms at the expense of small firms.<sup>43</sup> Ritter notes that:

Getting big fast is more important than it used to be, at least in some industries such as the technology industry, and . . . globalization and improvements in communications technology are behind the change. The implication is that being a small independent company and growing organically (that is, internally) is increasingly an inferior business strategy compared to an alternative strategy of getting big fast, which frequently can be accomplished most efficiently through mergers and acquisitions. This hypothesis implies that young firms are now more likely to make acquisitions or sell out in a trade sale than to go public.<sup>44</sup>

If correct, Gao, Ritter, and Zhu's theory suggests that regulatory changes designed to repair the "broken" market for smaller IPOs are unlikely to be successful. Gao, Ritter, and Zhu's theory is supported by another recent paper which finds that post-Sarbanes-Oxley smaller firms are more likely to be acquired than to undertake an IPO.<sup>45</sup>

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<sup>40</sup> James J. Angel, *What Happened to Our Public Equity Markets?*, CTR. STUDY FIN. REGULATION (Univ. of Notre Dame, Notre Dame, IN), Winter 2011, at 1.

<sup>41</sup> U.S. CHAMBER OF COMMERCE, COMM. ON CAPITAL MKTS. REGULATION, INTERIM REPORT OF THE COMMITTEE ON CAPITAL MARKETS REGULATION 11 (2006).

<sup>42</sup> Gao, Ritter & Zhu, *supra* note 33, at 4.

<sup>43</sup> *Id.*

<sup>44</sup> Jay R. Ritter, *Reenergizing the IPO Market*, in FINANCIAL RESTRUCTURING TO SUSTAIN RECOVERY 130 (Martin Neil Baily, Richard J. Herring & Yuta Seki eds., 2013).

<sup>45</sup> Francesco Bova, et al., *The Sarbanes-Oxley Act and Exit Strategies of Private Firms*, 31 CONTEMP. ACCT. RES. 818, 819 (2014).

The several theories introduced here are not an exhaustive list of the numerous explanations offered for the decline in small-cap IPOs. However, we have identified the most prominent theories for which reasonable evidence has been offered. In the next Part, we review the empirical literature that has tested these various theories, and distinguish our analysis and findings.

## II. PRIOR RESEARCH ON THE DECLINE IN EGCs

Empirical studies on the causes of the decrease in small IPO volume have produced conflicting results. Most studies have looked at the most prominent explanations of the decline, while other theories—such as the negative effects of the U.S. regulatory and litigation environment—have not been analyzed as standalone explanations. This Part reviews the empirical literature on small firm lifecycles and the IPO decline, beginning with theories on the effect of Sarbanes-Oxley. The Part then reviews studies on how regulatory changes have affected the market ecosystem for smaller companies and studies examining how market conditions and economies of scope affect IPOs.

### A. *Sarbanes-Oxley and Going-Private Decisions*

A number of studies have examined the costs of Sarbanes-Oxley, and in some cases have focused particularly on whether the costs have been disproportionately high for small public firms. A survey by Kamar, Karaca-Mandic, and Talley compiles evidence of the impact of Sarbanes-Oxley on smaller firms along a variety of different measures.<sup>46</sup> With respect to auditing, they note a general increase in costs following the enactment of Sarbanes-Oxley,<sup>47</sup> with average audit fees increasing by a larger percentage for smaller firms.<sup>48</sup> Other studies have examined the stock price impact of Sarbanes-Oxley. The study results have been mixed, with some studies find-

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<sup>46</sup> Ehud Kamar, Pinar Karaca-Mandic & Eric L. Talley, *Sarbanes-Oxley's Effects on Small Firms: What is the Evidence?* (Harv. L. & Econ. Discussion, Paper No. 588, 2007), available at [http://www.law.harvard.edu/programs/olin\\_center/papers/pdf/Kamar\\_588.pdf](http://www.law.harvard.edu/programs/olin_center/papers/pdf/Kamar_588.pdf).

<sup>47</sup> *Id.* at 11–13 (citing Sharad Asthana, Steven Balsam & Sungsoo Kim, *The Effect of Enron, Andersen, and Sarbanes-Oxley on the US Market for Audit Service*, 22 ACCT. RES. J. 4 (2009); Eldridge & Kealey, *supra* note 16).

<sup>48</sup> *Id.* at 13–14 (citing U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 16; Thomas E. Hartman, Foley & Lardner LLP, *The Cost of Being Public in the Era of Sarbanes-Oxley* (June 16, 2005); Thomas E. Hartman, Foley & Lardner LLP, *The Cost of Being Public in the Era of Sarbanes-Oxley* (June 15, 2006)). Kamar, Karaca-Mandic, and Talley note that while audit fee studies are useful in that they provide one measure of the actual costs imposed by Sarbanes-Oxley, they are also limited in important respects: "First, they present a challenge of discerning whether the increased costs are due solely to the new regulatory terrain or also reflect preexisting costs that had been previously expended elsewhere. Second, and perhaps more significantly, the accounting studies do not provide insights about the benefits of [Sarbanes-Oxley]." *Id.* at 15.

ing a positive return for firms most affected by Sarbanes-Oxley,<sup>49</sup> and others finding positive returns for firms least affected by Sarbanes-Oxley.<sup>50</sup>

On the other hand, stock price impact studies adjusting for size have found that Sarbanes-Oxley disproportionately and negatively impacted smaller firms.<sup>51</sup> Leuz suggests caution in interpreting these price fluctuations, however, as they may reflect broader market trends.<sup>52</sup> In contrast, a 2009 study by Ahmed, McAnally, Rasmussen, and Weaver examined the effects of Sarbanes-Oxley on corporate profitability by comparing profitability in the post-Sarbanes-Oxley period (2004–2007) to the pre-Sarbanes-Oxley period (2001–2002). Ahmed, McAnally, Rasmussen, and Weaver found that average cash flows declined by 1.3% of total assets after the passage of Sarbanes-Oxley. They also found that the costs were more significant for “smaller firms, for more complex firms, and for firms with lower growth opportunities.”<sup>53</sup>

A number of papers have also examined the impact of the Sarbanes-Oxley Act on firm listing, delisting, and going-private decisions. Kamar, Karaca-Mandic, and Talley report several studies that show an increase in deregistrations and going-private decisions following the enactment of Sarbanes-Oxley.<sup>54</sup> Kamar, Karaca-Mandic, and Talley also conducted their

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<sup>49</sup> *Id.* at 16 (citing Haidan Li, Morton Pincus & Sonja Olhoft Rego, *Market Reactions to Events Surrounding the Sarbanes-Oxley Act of 2002 and Earnings Management*, 51 J. L. & ECON. 111 (2008)).

<sup>50</sup> *Id.* (citing Pankaj K. Jain & Zabihollah Rezaee, *The Sarbanes-Oxley Act of 2002 and Capital-Market Behavior: Early Evidence*, 23 CONTEMP. ACCT. RES. 629 (2006)).

<sup>51</sup> *Id.* at 17 (citing Vidhi Chhaochharia & Yaniv Grinstein, *Corporate Governance and Firm Value: The Impact of the 2002 Governance Rules*, 62 J. FIN. 1789 (2007); Ellen Engel, Rachel M. Hayes & Xue Wang, *The Sarbanes-Oxley Act and Firms' Going-Private Decisions*, 44 J. ACCT. & ECON. 116 (2007); M. Babajide Wintoki, *Corporate Boards and Regulation: The Effect of the Sarbanes-Oxley Act and the Exchange Listing Requirements on Firm Value*, 13 J. CORP. FIN. 229 (2007)); see also Ivy Xiyang Zhang, *Economic Consequences of the Sarbanes-Oxley Act of 2002*, 44 J. ACCT. & ECON. 74 (2007); Peter Iliev, *The Effect of SOX Section 404: Costs, Earnings Quality, and Stock Prices*, 65 J. FIN. 1163, 1163 (2010) (“[a]s designed, Section 404 led to conservative reported earnings, but also imposed real costs. On net, [Sarbanes-Oxley] compliance reduced the market value of small firms.”).

<sup>52</sup> Christian Leuz, *Was the Sarbanes-Oxley Act of 2002 Really this Costly? A Discussion of Evidence from Event Returns and Going-Private Decisions*, 44 J. ACCT. & ECON. 146, 146 (2007). Leuz notes that “[w]hile it is not implausible that one-size-fits-all regulation imposes significant costs on firms, we presently do not have much [Sarbanes-Oxley]-related evidence supporting this conclusion. In fact, there is a growing body of evidence . . . that [Sarbanes-Oxley] has increased the scrutiny on firms and has produced certain benefits. But its net effects on firms or the U.S. economy remain unclear.” *Id.*

<sup>53</sup> Anwer S. Ahmed et al., *How Costly is the Sarbanes Oxley Act? Evidence on the Effects of the Act on Corporate Profitability*, 16 J. CORP. FIN. 352 (2010). (Working Paper, 2009), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1480394](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1480394).

<sup>54</sup> Kamar, Karaca-Mandic & Talley, *supra* note 39, at 19–20 (citing Stanley Block, *The Latest Movement to Going Private: an Empirical Study*, 14 J. APPLIED FIN. 36 (2004)); Engel, Hayes & Wang, *supra* note 44; Christian Leuz, Alexander J. Triantis & Tracy Yue Wang, *Why Do Firms Go Dark? Causes and Economic Consequences of Voluntary SEC Deregistrations*, 45 J. ACCT. & ECON. 181 (ECGI Fin. Working Paper, No. 155/2007, 2008), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=592421](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=592421); U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 16).

own study of the effects of Sarbanes-Oxley on going-private decisions.<sup>55</sup> Using foreign firms as a control group, they found that following Sarbanes-Oxley small firms were 53% more likely to be purchased by private acquirers rather than by public firms.<sup>56</sup>

Robert Bartlett notes that many studies of the effect of Sarbanes-Oxley on going-private decisions may not accurately identify a relevant sample of firms:

[These studies] suffer from a mistaken assumption that by going private, a publicly traded firm necessarily immunizes itself from [Sarbanes-Oxley]. In actuality, the need to finance a going-private transaction often requires firms to issue high-yield debt securities that subject the surviving firm to SEC reporting obligations and, as a consequence, most of the substantive provisions of [Sarbanes-Oxley].<sup>57</sup>

By examining a dataset indicating whether, in the financing of going-private transactions after 2002, firms transitioned away from high-yield debt to “other forms of ‘[Sarbanes-Oxley]-free’ finance,” Bartlett finds that “the use of high-yield financing marginally declined after 2002 for small- and medium-sized transactions, while significantly increasing for large-sized transactions.”<sup>58</sup> “These findings are consistent with the hypothesis that the costs of [Sarbanes-Oxley] have disproportionately burdened small firms.”<sup>59</sup>

In a recent study, Dambra, Field, and Gustafson find “evidence that, after controlling for market conditions, the JOBS Act has increased IPO vol-

<sup>55</sup> Ehud Kamar et al., *Going-Private Decisions and the Sarbanes-Oxley Act of 2002: A Cross-Country Analysis*, 25 J.L. ECON. & ORG. 107 (2009).

<sup>56</sup> *Id.* Another strand of research considers the effects of Sarbanes-Oxley by examining cross-listing decisions, particularly whether Sarbanes-Oxley reduced the competitiveness of U.S. capital markets. See, e.g., Steven M. Davidoff, *Regulating Listings in a Global Market*, 86 N.C. L. REV. 101 (2007). An important recent study by Doidge, Karolyi, and Stulz reviewed cross-listing decisions following the passage of Sarbanes-Oxley, finding that cross-listings have been falling on both U.S. exchanges and on the Main Market in London. Craig Doidge, G. Andrew Karolyi & René M. Stulz, *Has New York Become Less Competitive than London in Global Markets? Evaluating Foreign Listing Choices Over Time*, 91 J. FIN. ECON. 253, 253 (2009). However, they also find that:

[t]his decline in cross-listings is explained by changes in firm characteristics instead of by changes in the benefits of cross-listing. We show that after controlling for firm characteristics there is no deficit in cross-listing counts on US exchanges related to [Sarbanes-Oxley]. Investigating the valuation differential between listed and non-listed firms (the cross-listing premium) from 1990 to 2005, we find that there is a significant premium for US exchange listings every year, that the premium has not fallen significantly in recent years, and that it persists when allowing for time-invariant unobservable firm characteristics. In contrast, no premium exists for listings on London’s Main Market in any year.

*Id.*

<sup>57</sup> Robert P. Bartlett III, *Going Private but Staying Public: Reexamining the Effect of Sarbanes-Oxley on Firms’ Going-Private Decisions*, 76 U. CHI. L. REV. 7, 7 (2009).

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

ume by 21 IPOs per year, three-quarters of the increase is in biotech/pharma industry.”<sup>60</sup> The authors also find an increase in small issuers defined as those having less than \$50 million of revenue at the time of their IPOs.<sup>61</sup> The authors note that “[a]pproximately 45% of issuers conducting IPOs between April 2013 and March 2014” are small IPOs compared to “an average of 28% between 2001 and 2012.”<sup>62</sup> While the paper finds support for the regulatory explanation for reduced IPOs, at best it finds that the JOBS Act increased IPOs only about one per quarter outside the biotechnology and pharmaceutical industries, a far cry from the hundreds of small IPOs in the 1990s.<sup>63</sup>

### B. Market Ecosystem

As discussed above, Weild and Kim, writing for the public accounting firm Grant Thornton, have argued that market structure is primarily to blame for the decrease in the number of IPOs.<sup>64</sup> They cite several market and regulatory changes that impacted the structure of the ecosystem supporting small public companies.<sup>65</sup> For example, the authors claim that the rise of online brokerages, the SEC’s introduction of new order handling rules, Regulation FD, decimalization, and the Global Research Analyst Settlement have decreased the value of going public.<sup>66</sup>

Studies have documented the value of analyst coverage to firms,<sup>67</sup> and Jegadeesh and Kim find that analyst coverage—in terms of the number of firms covered by analysts and the total number of analysts—has declined since 2002.<sup>68</sup> However, Gao, Ritter, and Zhu do not find evidence of a change in the availability of analyst coverage over time; they document that analysts tend to maintain coverage over time, so that “the risk of being abandoned by analysts within a few years of going public has not increased.”<sup>69</sup>

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<sup>60</sup> Michael Dambra et al., *The JOBS Act and IPO Volume: Evidence that Disclosure Costs Affect the IPO Decision*, 116 J. FIN. ECON. 121, 123 (2015).

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 122.

<sup>63</sup> We have serious concerns about the econometric approach of this paper. While industry returns are used in models, general returns are not. In addition, there are no controls for hot and cold IPO markets. Furthermore, industry-fixed effects are not used in all models. We expect that including these controls in the analysis would undermine the findings of the paper.

<sup>64</sup> See Weild & Kim, *supra* note 27.

<sup>65</sup> *Id.* at 8–9.

<sup>66</sup> *Id.* at 4.

<sup>67</sup> See, e.g., Paul J. Irvine, *The Incremental Impact of Analyst Initiation of Coverage*, 9 J. CORP. FIN. 431 (2003).

<sup>68</sup> Narasimhan Jegadeesh & Woojin Kim, *Value of Analyst Recommendations: International Evidence* (2004), <http://www.ima.umn.edu/talks/workshops/W5.24-28.04/jegadeesh/Recommendations.pdf> (last visited Nov. 1, 2015).

<sup>69</sup> Gao, Ritter & Zhu, *supra* note 33, at 1666, 1681.



The empirical literature on decimalization suggests that broker incentives play a role in the success of small IPOs.<sup>70</sup> Schulz examines tick size after stock splits and finds an increase in small buy orders and trading costs.<sup>71</sup> He concludes this increase provides an incentive to brokers to promote stocks. Kadapakkam, Krishnamurthy, and Tse examine stock splits and tick size after decimalization and find that brokers had a greater incentive to promote stocks when tick sizes were larger.<sup>72</sup>

A recent study by Weild, Kim, and Newport also provides support for the importance of tick sizes to the market ecosystem.<sup>73</sup> They find that, contrary to some explanations, GDP growth rates tend to be a poor predictor of small firm IPO activity. Rather, they find evidence that aftermarket sales incentives (measured by tick size as a percent of share price) are highly predictive of small IPO activity.<sup>74</sup>

The SEC, however, is not convinced that it should rescind its decimalization rules. In its report to Congress on decimalization, the SEC reviewed the theoretical and empirical literature on this issue and concluded that “the impact of mandating an increase in the minimum tick size for small capitalization companies on the structure of our markets, and on the willingness of small companies to undertake initial public offerings is, at best, uncertain.”<sup>75</sup> In part, the SEC’s conclusion appears justified by the risk that, given current market structure, any roll-back of decimalization may have unintended consequences, including decreasing trading liquidity and increasing high-speed trading while having little effect on the IPO market.<sup>76</sup>

<sup>70</sup> See IPO Task Force, *Rebuilding the IPO On-Ramp: Putting Emerging Companies and the Job Market Back on the Road to Growth* 14 (2011) (“decimalization . . . put the economic sustainability of sell-side research departments under stress by reducing the spreads and trading commissions that formerly helped to fund research analyst coverage.”)

<sup>71</sup> Paul Schultz, *Stock Splits, Tick Size, and Sponsorship*, 55 J. FIN. 429, 430 (2000).

<sup>72</sup> Palani-Rajan Kadapakkam et al., *Stock Splits, Broker Promotion and Decimalization*, 40 J. FIN. QUANT. ANAL. 873, 875 (2005).

<sup>73</sup> David Weild, Edward Kim & Lisa Newport, *Making Stock Markets Work to Support Economic Growth: Implications for Governments, Regulators, Stock Exchanges, Corporate Issuers and their Investors* (OECD Corporate Governance Working Papers, Working Paper No. 10, 2013), <http://dx.doi.org/10.1787/5k43m4p6ccs3-en>.

<sup>74</sup> They note after the rise of alternative trading platforms, “bankable spreads and tick sizes quickly converged,” driving down spreads and tick sizes to only one cent per share, a level they argue is “grossly insufficient to sustain small company capital formation.” *Id.* at 16.

<sup>75</sup> U.S. Securities and Exchange Commission, *Report to Congress on Decimalization*, at 22 (2012). The Weild, Kim, and Newport study was published after the SEC’s report to Congress.

<sup>76</sup> See Robert P. Bartlett III & Justin McCrary, *Shall We Haggle in Pennies at the Speed of Light or in Nickels in the Dark? How Minimum Price Variation Regulates High Frequency Trading and Dark Liquidity* (Sep. 5, 2013) (unpublished draft) (on file with UC Berkeley School of Law) (finding that trading in sub-penny orders in stocks quoted below \$1 per share results in increased high-frequency trading and decreased overall trading liquidity).

### C. Market Conditions

A number of studies have investigated the determinants of IPO volume. Lerner shows that companies go public when equity market valuations are high and opt for private financings when public market valuations are lower.<sup>77</sup> IPO markets also tend to run hot and cold and to show industry clusters. Data suggest that IPOs “cluster during periods in which investors place relatively high values on firms, either those that are already publicly traded or those that are just being issued.”<sup>78</sup> Benninga, Helmantel, and Sarig argue that clustering in hot markets suggests that “entrepreneurs issue shares when the cash flows of their firms are relatively high, periods that coincide with high stock prices since cash flows are cross-sectionally correlated, especially within industries.”<sup>79</sup> Helwege and Liang find that hot markets differ from cold markets in the quantity of firms that go public rather than the type.<sup>80</sup> Their results suggest that hot markets are driven primarily by investor optimism.

### D. Economies of Scope

Finally, as noted earlier, Gao, Ritter, and Zhu have studied small IPOs between 1980 and 2009 and the performance of these firms post-IPO.<sup>81</sup> They categorize small companies as those for which the last twelve-month sales prior to the IPO, expressed in terms of 2009 purchasing power, is less than \$50 million.<sup>82</sup> They find that among small IPOs, the percentage of firms reporting negative profits in the three years after the IPO increased from an average of 58% in 1980–2000 to 73% in 2001–2009.<sup>83</sup> Furthermore, post-IPO returns on small-cap companies have underperformed a benchmark by an average of 17.3% in the three years following an IPO, compared to an outperformance of 3.1% for large-cap companies.<sup>84</sup> They also find that many firms are involved in M&A deals post-IPO, which they hold consistent with “an environment of ‘eat or be eaten,’ where slow organic growth as an independent company is less attractive than quickly achieving economies of scope via being acquired.”<sup>85</sup>

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<sup>77</sup> Joshua Lerner, *Venture Capitalists and the Decision to Go Public*, 35 J. FIN. ECON. 293 (1994).

<sup>78</sup> Simon Benninga, Mark Helmantel & Oded Sarig, *The Timing of Initial Public Offerings*, 75 J. FIN. ECON. 115, 117 (2005).

<sup>79</sup> *Id.* at 117–18.

<sup>80</sup> Jean Helwege & Nellie Liang, *Initial Public Offerings in Hot and Cold Markets*, 39 J. FIN. & QUANTITATIVE ANALYSIS 541 (2004).

<sup>81</sup> Gao, Ritter & Zhu, *supra* note 33.

<sup>82</sup> *Id.* at 1668–69.

<sup>83</sup> *Id.* at 1676.

<sup>84</sup> *Id.* at 1686.

<sup>85</sup> *Id.* at 1690.

Others studies have also noted an increased tendency for newly public firms to engage in acquisitions. Arikan and Stulz state that the acquisition rate of firms<sup>86</sup> “follows a u-shape through their lifecycle, as public firms, with young and mature firms being equally acquisitive but more so than middle-aged firms.”<sup>87</sup>

### III. EMPIRICAL FINDINGS

In this Section, we examine the lifecycle of small-cap companies. For comparative context, we also examine the lifecycle of mid- and large-cap companies.

#### A. Data Collection

To create our sample, we begin by identifying IPOs using the Capital IQ database. We confine our search to all IPOs for common stock during the period 1996–2012, whether on or off a major exchange. We select this period for two reasons. First, we are testing the market changes that occurred during this time period, and thus presume that this time span is sufficient to encompass those changes. Second, the market prior to this time and particularly in the 1980s was influenced by different factors. We then exclude all blank check companies, trusts, spin-offs, rights and unit offerings, American Depository Receipts (ADRs), closed-end funds, and Real Estate Investment Trusts (REITs) to arrive at 4,001 IPOs of which 3,081 IPOs initially list on the New York Stock Exchange (NYSE), NASDAQ, or American Stock Exchange (AMEX). We then merge in data from CRSP for stock prices for each exchange-listed IPO during the period 1996–2012. The SEC did not require audit information to be publicly reported until 2001.<sup>88</sup> We merge in accounting data from and after that year obtained from the Audit Analytics database. We also obtain historical accounting information for the sample period from the Compustat database.

#### B. Descriptive Statistics

In Table 1, we set forth characteristics of the IPO sample:

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<sup>86</sup> Arikan and Stulz define the acquisition rate as the number of acquisitions in an IPO cohort-year divided by the number of firms in that cohort-year. See Asli M. Arikan & René M. Stulz, *Corporate Acquisitions, Diversification, and the Firm's Lifecycle* 1 (Ohio State Univ. Fisher Coll. of Bus., Working Paper No. 2011-03-018, 2011), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1932190](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1932190).

<sup>87</sup> *Id.*

<sup>88</sup> 17 C.F.R. § 240.24b-1 (2014); see also Revision of the Commission's Auditor Independence Requirements, Exchange Act Release No. 1911, 73 SEC Docket 1885 (Nov. 21, 2000).

TABLE 1: SAMPLE DESCRIPTION<sup>89</sup>

Year	Amex, NYSE, Nasdaq IPOs	Median Underpricing %	Median			
			IPO Proceeds	%IPOs <75MM Mkt Cap	%IPOs >75MM Mkt Cap <700MM Mkt Cap	%IPOs >700MM MktCap
1996	191	5.13%	\$30.23	38.22%	58.12%	3.14%
1997	443	7.69%	\$29.67	37.92%	58.24%	3.16%
1998	306	3.57%	\$37.20	30.07%	61.11%	7.52%
1999	460	35.00%	\$55.88	12.83%	71.52%	14.13%
2000	335	47.06%	\$70.92	4.48%	73.43%	20.30%
2001	83	7.14%	\$85.30	14.46%	59.04%	25.30%
2002	78	1.83%	\$83.70	17.95%	65.38%	16.67%
2003	68	8.68%	\$87.66	10.29%	75.00%	13.24%
2004	176	6.35%	\$73.41	6.82%	78.41%	14.77%
2005	162	6.48%	\$92.07	10.49%	71.60%	15.43%
2006	177	5.29%	\$87.75	10.17%	69.49%	18.64%
2007	199	5.70%	\$97.65	9.05%	68.34%	21.61%
2008	39	-0.10%	\$149.65	12.82%	64.10%	20.51%
2009	44	6.15%	\$131.24	2.27%	59.09%	34.09%
2010	105	3.58%	\$84.63	14.29%	63.81%	20.95%
2011	100	5.33%	\$137.02	9.00%	57.00%	28.00%
2012	115	11.92%	\$105.84	6.09%	60.00%	33.04%
<b>Total</b>	<b>3,081</b>					
<b>Median Cohort</b>		<b>6.15%</b>		<b>10.49%</b>	<b>64.10%</b>	<b>18.64%</b>

The first two columns in Table 1 provide the IPO year and total number of IPOs in each year for exchange-listed IPOs. The sample is limited to exchange-listed IPOs—IPOs that initially list on AMEX, NYSE, or NASDAQ—due to the significance of these IPOs and the greater availability of stock price, accounting and auditing information from databases.

Three-quarters of the sample or 3,081 IPOs were initially listed on the exchanges. The number of IPOs over the sample period is consistent with media reports and other studies, which have found a decline in the number of IPOs over time. IPO numbers peaked in 1999 at 460 IPOs, with a sharp decline occurring after the implosion of the technology bubble.<sup>90</sup> In 2000, 335 IPOs occurred, declining sharply to 68 in 2003. IPOs then recovered to 199 in 2007; however, since the financial crisis, IPO figures have ranged in a lower band from 105 in 2010 to 115 in 2012.

<sup>89</sup> IPO proceeds are reported by Capital IQ. IPO underpricing is calculated as the initial return  $(P1 - P0) * 100 / P1$ , where P1 is the first-day closing price or bid-ask average from CRSP and P0 is the IPO offer price. AMEX, NYSE and NASDAQ IPOs are those recorded in the CRSP database and exclude IPOs conducted on Archipelago Exchange, the over-the-counter market, and the pink sheets. Initial market capitalization is defined as the IPO offer price as recorded in Capital IQ, multiplied by the number of outstanding shares held by the public as recorded by CRSP. All figures in this table are adjusted to 2011 Consumer Price Index (CPI) dollars. The figures for 1996 are only for part of that year because Capital IQ did not begin recording IPOs until the SEC commenced the EDGAR system mid-year 1996.

<sup>90</sup> Gao, Ritter & Zhu, *supra* note 32, at 6; see also Steven M. Davidoff, *Rhetoric and Reality: A Historical Perspective on the Regulation of Foreign Private Issuers*, 79 U. CIN. L. REV. 619, 628 (2011).

The decline in IPOs has been mirrored by a rise in median proceeds for IPOs in any given year. This is consistent with other studies that have found that the IPO decline is largely related to the disappearance of small IPOs.<sup>91</sup> Median IPO proceeds increased 350% from \$30.23 million in 1996 to \$105.84 million in 2012.

The last three columns show the number of exchange-listed IPOs by size. We divide IPOs into small capitalization IPOs (an initial market capitalization of \$75 million or below), medium capitalization IPOs (initial market capitalization between \$75 million and \$700 million), and large capitalization IPOs (initial market capitalization of \$700 million or above), as adjusted to 2011 Consumer Price Index (CPI) dollars.<sup>92</sup> Prior papers have categorized IPOs based on net proceeds from the IPO (for example, greater or less than \$50 million in net proceeds) or revenue of IPO candidates.<sup>93</sup> We believe that our approach better captures the phased nature of SEC regulation, which is based on these three categories. We do not separately categorize EGCs versus non-EGCs, but only 377 exchange-listed IPOs in our sample had first year revenue greater than \$1 billion, meaning 87.76% of the sample would have qualified as an EGC under the JOBS Act if revenue were measured in the first year of the IPO.<sup>94</sup> Additionally, of the companies that would not have qualified for the JOBS Act, 203 went public with a market capitalization greater than \$700 million.

These columns starkly highlight the decline in small IPOs. Small exchange-listed IPOs have sharply decreased both in number and percentage of IPOs over time. In 1996, 73 IPOs (38.22% of all exchange-listed IPOs) were small capitalization IPOs compared to 7 IPOs (6.09% of IPOs) in 2012. The cliff for small IPOs was from 1998 to 1999: small IPOs declined from 92 (30.07% of IPOs) to 59 (12.83% of IPOs). This decline partly reflected the rapid increase in stock prices from October 1998 to March 2000, a period when the NASDAQ index more than doubled. Thereafter, the number of small IPOs fluctuated between 1 and 18 (2.27% to 17.95% of all IPOs) in any given year.

During this same time period, large IPOs grew to comprise a significantly greater portion of the market, indicating a market preference for large IPOs. Large IPOs increased from 6 (3.14% of IPOs) in 1996 to 38 (33.04%

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<sup>91</sup> See, e.g., Gao, Ritter & Zhu, *supra* note 33, at 8.

<sup>92</sup> These categories are designed to match the SEC's own categories for staged application of regulation. The SEC defines a "smaller company" as, among other things, a reporting company with less than \$75 million in public float. 17 CFR 229.10 – Item 10(f). The SEC defines an "accelerated filer" as an issuer with a public float between \$75 million and \$700 million. 17 CFR 240.12b-2(1). A "large accelerated filer" is an issuer with \$700 million or more in public float. 17 CFR 240.12b-2(2).

<sup>93</sup> For example, Gao, Ritter, and Zhu used a revenue threshold of \$50 million (in 2009 purchasing power) in the prior annual year to define a small IPO. Gao, Ritter & Zhu, *supra* note 33; Kamar, Karaca-Mandi & Talley, *supra* note 40; Iliev, *supra* note 45.

<sup>94</sup> The JOBS Act measures revenue by looking at the preceding year, so this is a rough approximation.

of IPOs) in 2012. In comparison, mid-cap IPOs remained relatively steady during the sample time period. 111 IPOs (58.12% of IPOs) were mid-cap in 1996 compared to 69 (60.00% of IPOs) in 2012.

In Table 2, we examine the survival rate of small-cap companies during the sample period of 1996–2012:

TABLE 2: IPO SURVIVAL RATE FOR SMALL IPOs

IPO Year	Total # IPOs	Event Year																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1996	73	1.00	0.99	0.86	0.77	0.73	0.56	0.52	0.47	0.44	0.44	0.37	0.34	0.34	0.30	0.29	0.25	
1997	168	0.98	0.93	0.77	0.63	0.48	0.43	0.36	0.30	0.27	0.23	0.21	0.20	0.18	0.16	0.14		
1998	92	1.00	0.96	0.80	0.67	0.59	0.47	0.42	0.37	0.34	0.25	0.23	0.22	0.21	0.21			
1999	59	1.00	0.92	0.76	0.56	0.49	0.46	0.36	0.31	0.29	0.22	0.19	0.19	0.15				
2000	15	0.93	0.73	0.67	0.40	0.40	0.40	0.40	0.40	0.33	0.20	0.20	0.20					
2001	12	1.00	0.92	0.83	0.67	0.50	0.50	0.50	0.42	0.42	0.33	0.20	0.20					
2002	14	1.00	0.93	0.93	0.79	0.71	0.71	0.64	0.57	0.50	0.50							
2003	7	1.00	0.71	0.43	0.43	0.29	0.29	0.29	0.29	0.14								
2004	12	1.00	1.00	0.92	0.92	0.83	0.58	0.42	0.42									
2005	17	1.00	0.94	0.88	0.76	0.53	0.47	0.47										
2006	18	1.00	0.94	0.83	0.72	0.67	0.61											
2007	18	1.00	0.94	0.67	0.56	0.44												
2008	5	1.00	1.00	1.00	1.00													
2009	1	1.00	1.00	0.00														
2010	15	1.00	0.93															
2011	9	0.89																
2012	7	1.00																
All Cohort Survival Rate																		
<75MM Mkt Cap		0.99	0.94	0.79	0.66	0.55	0.48	0.41	0.36	0.33	0.28	0.24	0.23	0.21	0.20	0.19	0.25	
All Cohort Survival Rate																		
>75MM<700MM Mkt Cap		0.996	0.937	0.810	0.698	0.613	0.553	0.493	0.436	0.388	0.343	0.309	0.271	0.256	0.252	0.222	0.225	
All Cohort Survival Rate																		
>700MM MktCap		0.993	0.949	0.829	0.740	0.671	0.594	0.526	0.469	0.425	0.386	0.350	0.313	0.343	0.256	0.200	0.167	

Table 2 sets forth the survival rate for companies with an initial market capitalization of less than \$75 million as adjusted to 2011 CPI dollars. Survival is measured in terms of the fraction of exchange-listed companies for each year remaining listed on a major exchange. Event Year 1 is the first full year-end after which the IPO occurred. Later Event Years are measured as the presence of a company in the CRSP database and not recorded as delisted. The figures for the cohort survival rate at the bottom of the chart are the weighted averages of the survival rates for each year.

Our main conclusion from the table data is that the typical life span of a small-cap company is short. By Event Year 5, the survival rate for all cohorts is 55%, meaning that by the end of their fifth full year in existence, 45% of small-cap companies are no longer listed on a major exchange. In comparison, the median survival rate at Event Year 5 for all mid-cap companies is 61.3%, rising to 67.1% for large-cap companies.<sup>95</sup> In Event Year 10, the total cohort survival rate for small-cap companies is 28%, compared to 34.3% for mid-cap companies and 38.6% for large-cap companies. By Event Year 15, the small IPO cohort has 80% of its companies delisted.

Surprisingly, there does not seem to be significant variability among cohort years in long-term survival rates. For example, the 2000 technology bubble cohort had only 73.3% of post-IPO companies surviving by Event Year 2, but by Event Year 10, the survival rate was 20% compared to the 25% median survival for all small IPO cohorts in that year.

Table 3 further explores the findings from Table 2 by setting forth the status for each post-IPO company as of June 30, 2013 and the reason for the firm's delisting:

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<sup>95</sup> These figures compare to a general five-year survival rate for companies from prior studies. See Stavros Peristiani & Gijoon Hong, *Pre-IPO Financial Performance and Aftermarket Survival*, 10 FED. RES. BANK N.Y. CURRENT ISSUES ECON. & FIN (2004); Utpal Bhattacharya, Alexander Borisov & Xiaoyun Yu, *Firm Mortality and Natal Financial Care*, 50 J. FIN. & QUANTITATIVE ANALYSIS 61 (2015); Lucian A. Bebchuk, Alon Brav & Wei Jiang, *The Long-Term Effects of Hedge Fund Activism*, 115 COLUM. L.REV. 1085 (2015).



TABLE 3: IPOs AND DELISTINGS<sup>96</sup>

	All IPOs (1996-2000)						All IPOs (2001-2005)						All IPOs (2006-2012)					
	<75MM		>700M		>75MM<		<75MM		>700M		>75MM<		<75MM		>700M		>75MM<	
	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%	Mkt Cap	%
Listed	16.2%	22.5%	28.4%	28.4%	35.5%	49.4%	49.4%	53.00%	67.1%	72.8%	81.3%	67.1%	72.8%	81.3%	67.1%	72.8%	81.3%	81.3%
Acquired/Merged	40.0%	53.6%	48.5%	48.5%	19.4%	38.3%	38.3%	40.00%	4.1%	16.3%	14.8%	4.1%	16.3%	14.8%	4.1%	16.3%	14.8%	14.8%
Involuntarily Delisted	36.6%	22.6%	22.2%	22.2%	38.7%	9.9%	9.9%	7.00%	20.5%	6.4%	3.0%	20.5%	6.4%	3.0%	20.5%	6.4%	3.0%	3.0%
Voluntarily Delisted	6.1%	1.2%	1.0%	1.0%	6.5%	1.7%	1.7%	-	4.1%	0.2%	-	4.1%	0.2%	-	4.1%	0.2%	-	-
Total	99.02%	100.00%	100.00%	100.00%	99.99%	99.25%	99.25%	100.00%	95.89%	95.63%	99.01%	95.89%	95.63%	99.01%	95.89%	95.63%	99.01%	99.01%

<sup>96</sup> Data on delisting is from CRSP and three digit delisting codes are collapsed into the first digit listing signifier. CRSP categorizations of voluntary or unexplained delistings may be related to the financial distress of the company and are therefore involuntary. We manually coded delistings as voluntary or unexplained (codes 520, 570 and 574). Acquired/Merged means the company was the subject of a takeover. The table excludes IPOs that are listed as Exchanged (the issue was acquired in exchange for another security or other consideration) or Liquidated (the company was liquidated). For this reason, percentage numbers do not add up to 100%.

Table 3 sets forth the status, as of June 30, 2013, of each exchange-listed company segregated by the three categories of CPI-adjusted initial market capitalization utilized in Tables 1 and 2. The table further segregates the data into three periods: 1996–2000, 2001–2005, and 2006–2012.

Among IPOs from the period 1996–2000, small-cap companies were less likely to remain listed than mid- and large-cap companies and are also more likely to delist involuntarily. 16.2% of small-cap companies that completed IPOs during the period 1996–2000 remained listed as of June 30, 2013 (to put it another way, 83.8% were delisted). In comparison, 22.4% of mid-cap companies and 27.9% of large-cap companies remained listed, showing a higher survivorship rate as companies increase in initial IPO size. Companies were also involuntarily delisted at lower rates as their size increased. For the period 1996–2000, of those companies that delisted by June 30, 2013, 36.6% of small-cap companies had been involuntarily delisted and 6.1% had voluntarily delisted, while 40% of these small-cap companies had been acquired. In comparison, 22.5% of mid-cap companies and 21.8% of large-cap companies had been involuntarily delisted. The main delisting avenue for larger capitalization companies during this time period was also via an acquisition: 53.2% of mid-cap companies and 47.7% of large-cap companies exited the markets through an acquisition.

IPO cohorts from 2001–2005 and 2006–2012 show a similar pattern. Once again, smaller capitalization companies from those periods were less likely to stay listed than larger capitalization companies, and when they did delist they were significantly more likely to be involuntarily delisted. This pattern not only holds for more recent IPOs from 2006–2012, but the rate of involuntary delisting given the recent time-frame appears surprisingly high. Only 67.1% of small-cap companies during the period 2006–2012 remained listed. This compares to 72.8% for mid-cap companies and 81.3% for large-cap companies. For small companies that did delist during this later time period, 20.5% were involuntarily delisted. In comparison, 6.4% of mid-cap companies and only 3% of large-cap companies were involuntarily delisted. Mid-cap companies from this time frame were most likely to delist due to a takeover—16.3% of the medium IPO cohort delisted for this reason, as did 14.8% of large-cap companies.

Smaller capitalization companies also voluntarily delisted in greater numbers than larger companies. In the 1996–2000 cohort, 6.1% of small-cap companies delisted voluntarily compared to 1.2% of mid-cap companies and 1% of large-cap companies. For IPOs from 2001–2005, 6.5% of small-cap companies voluntarily, 1.7% of mid-cap companies, and no large-cap companies delisted. These numbers provide support for the argument that post-Sarbanes-Oxley, small-cap companies may have chosen in greater numbers to exit the market due to a heightened regulatory environment. However, alternative explanations may exist, including the presence of unique market conditions during the post-technology bubble time period. The general rate of voluntary delisting appears to have also remained unchanged both before

and after Sarbanes-Oxley, supporting an alternative explanation. Regardless, in all cases, large-cap and mid-cap companies voluntarily delisted at a much lower rate, indicating that the phenomenon is related to scale. We will explore these theses in our regressions in Tables 5 through 7.

Ultimately, these figures show that small-cap companies have lower survival rates than larger capitalization companies. Additionally, they are involuntarily delisted in greater relative numbers than larger companies and they are less likely to delist because of an acquisition. In Table 4, we turn from analyzing IPO outcomes to examining the growth in market capitalization of IPOs over the life of the sample period<sup>97</sup>:

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<sup>97</sup> Market capitalization data is taken from Compustat, adjusted to 2011 CPI dollars, and computed as total common shares outstanding at year-end multiplied by year-end per share closing price or the average of the final year-end recorded bid-ask spread.

TABLE 4: MEDIAN IPO MARKET CAPITALIZATION FOR SMALL IPOs

IPO Year	Total # IPOs	Event Year																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1996	58	\$59	\$78	\$45	\$49	\$30	\$62	\$66	\$130	\$176	\$138	\$153	\$212	\$80	\$146	\$166	\$179	\$637
1997	135	\$65	\$46	\$35	\$23	\$22	\$23	\$56	\$74	\$66	\$87	\$86	\$34	\$36	\$64	\$87	\$133	
1998	83	\$42	\$39	\$27	\$35	\$47	\$73	\$86	\$91	\$111	\$115	\$74	\$165	\$217	\$160	\$170		
1999	52	\$65	\$40	\$47	\$41	\$72	\$87	\$60	\$92	\$58	\$46	\$55	\$65	\$57	\$70			
2000	14	\$29	\$48	\$58	\$64	\$107	\$109	\$97	\$74	\$28	\$167	\$180	\$255	\$345				
2001	9	\$44	\$21	\$34	\$34	\$414	\$421	\$452	\$330	\$450	\$433	\$554	\$462					
2002	13	\$32	\$40	\$69	\$88	\$99	\$64	\$36	\$163	\$237	\$176	\$197						
2003	6	\$38	\$43	\$123	\$148	\$111	\$54	\$90	\$131	\$64	\$74							
2004	11	\$62	\$78	\$45	\$43	\$7	\$17	\$12	\$9	\$18								
2005	17	\$56	\$48	\$45	\$13	\$25	\$49	\$61	\$58									
2006	17	\$54	\$54	\$23	\$38	\$34	\$29	\$31										
2007	18	\$38	\$20	\$16	\$21	\$11	\$34											
2008	4	\$42	\$53	\$41	\$35	\$42												
2009	1	\$54	\$61	-	-	-												
2010	11	\$41	\$32	\$37														
2011	7	\$34	\$48															
2012	7	\$42																
Median Mkt Cap <75MM																		
Mkt Cap		\$52	\$46	\$36	\$34	\$34	\$47	\$58	\$86	\$103	\$121	\$114	\$81	\$77	\$80	\$133	\$133	\$637
Median Mkt Cap >75MM																		
<700MM Mkt Cap		\$384	\$283	\$246	\$244	\$269	\$326	\$349	\$387	\$372	\$319	\$322	\$276	\$331	\$372	\$457	\$593	\$1,051
Median Mkt Cap >700MM																		
MktCap		\$1,764	\$1,594	\$1,449	\$1,353	\$1,409	\$1,797	\$2,001	\$2,194	\$1,856	\$1,736	\$2,197	\$2,077	\$1,643	\$1,791	\$2,070	\$2,304	\$2,953

Table 4 sets forth the market capitalization for IPOs that remained listed on an exchange and with an initial market capitalization less than \$75 million as adjusted to 2011 CPI dollars. Event Year 1 is the year in which the IPO occurred. Later Event Years are measured as the presence of a company in the CRSP database and not recorded as delisted. The bottom three columns set forth median revenue for each Event Year for all IPO cohorts segregated by the three categories of market capitalization.

Our main conclusion from the data in Table 4 is that small IPOs largely remain small-cap companies if they do not delist. In Event Year 1, the median market capitalization of a surviving small-cap companies is \$52 million. By Event Year 5, the median market capitalization of a surviving small-cap company is \$34 million. The figure grows to \$121 million in Event Year 10, and by Event Year 15, surviving small-cap companies have a median market capitalization of \$133 million.

The far column lists median market capitalization across the life of each small capitalization IPO cohort. Median market capitalization largely stays below \$75 million for the life of the majority of small-cap companies. Small IPO cohort median values range from \$82 million for the 1996 cohort of IPOs to \$24 million for the 2007 cohort. Except for the 2003 crop (median IPO value of \$80 million across 10 years), the 2001 crop (median IPO value of \$79 million across 12 years), and the 1996 crop (median IPO value of \$82 million across 17 years), the remaining small IPO cohorts all stay below a median value of \$75 million.

The tendency to stay within initial market capitalization ranges also occurs with medium IPOs and large IPOs. The first year median market cap for mid-cap companies is \$384 million with median market capitalization staying in the \$200 million to \$300 million range for all Event Years, except Event Years 15, 16 and 17. The median market capitalization figures for large-cap companies have similar year-to-year volatility as well as growth, with large-cap companies having a median market capitalization of \$1.764 billion in Event Year 1, falling to \$1.353 billion in Event Year 4 and rising back to \$1.736 billion in Event Year 10.

In unreported figures, we examine revenues for each IPO cohort. Surviving small-cap companies experience an increase in revenue as opposed to market capitalization, and revenue increases at a greater rate for small-cap companies than larger companies. In Event Year 1, the median revenue for small-cap companies is \$24 million. This figure rises to \$40 million in Event Year 5 and \$88 million in Event Year 10. Mid- and large-cap companies also experience revenue growth over their lifecycle. For mid-cap companies, median revenues in Event Years 1, 5, and 10 are \$77 million, \$168 million, and \$263 million, respectively. For large-cap companies, median revenues in Event Years 1, 5, and 10 are \$454 million, \$915 million, and \$1.499 billion, respectively.

*C. Empirical Analysis*

Our descriptive data thus far show that small-cap companies tend to have a short half-life, and if they do delist they delist involuntarily more often than larger companies. Small companies that complete an IPO also tend to remain small-cap companies if they survive, but they experience significant revenue growth over their life spans. In order to further examine the lifecycle of these companies, we next examine in Table 5 the factors that lead small-cap companies as opposed to large-cap companies to be involuntarily delisted. We also examine in Table 5 the regulatory effects on the probability of delisting voluntarily.

TABLE 5: FIRM INVOLUNTARY DELISTING PROBABILITY<sup>98</sup>

	Market Cap < 75MM			Market Cap >= 75 MM < 700MM			Market Cap > 700MM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Revenue (Log)	0.135 (0.27)	0.074 (0.67)	-0.318 *** (0.00)	-0.334 *** (0.00)	-0.751 *** (0.00)	-0.395 (0.13)			
Assets (Log)	0.00	-0.413 * (0.07)	-0.03 (0.75)	0.015 (0.89)	0.406 * (0.09)	0.62 ** (0.05)			
Net Income / Assets	-0.887 *** (0.00)	-0.649 ** (0.03)	-1.208 *** (0.00)	-0.819 *** (0.00)	-0.864 (0.11)	0.259 (0.71)			
Leverage	2.011 *** (0.00)	1.94 *** (0.00)	2.366 *** (0.00)	2.029 *** (0.00)	3.399 *** (0.00)	2.23 ** (0.01)			
Asset Growth Yr	-0.459 ** (0.04)	-0.369 (0.31)	-0.400 * (0.06)	-0.234 (0.34)	-0.898 (0.18)	-0.636 (0.36)			
Revenue Growth Yr	0.06 (0.50)	0.10 (0.44)	-0.067 (0.38)	-0.052 (0.55)	0.42 ** (0.04)	0.21 (0.43)			
Age	-0.034 (0.22)	-0.01 (0.78)	-0.104 *** (0.00)	-0.056 * (0.09)	-0.121 (0.17)	-0.114 (0.36)			
Sarbox	-0.528 ** (0.02)	-0.36 (0.20)	-0.48 *** (0.01)	-0.317 (0.10)	-0.004 (0.99)	0.428 (0.48)			
Audit Fees / Net Income	0.213 (0.75)	0.213 (0.75)	0.213 (0.75)	0.213 (0.75)	0.213 (0.75)	0.213 (0.75)			
Annual Return	-0.94 *** (0.00)	-0.94 *** (0.00)	-0.88 *** (0.00)	-0.88 *** (0.00)	-0.88 *** (0.00)	-0.88 *** (0.11)			
Cumulative IPO Return	-1.701 *** (0.00)	-1.701 *** (0.00)	-1.701 *** (0.00)	-1.701 *** (0.00)	-1.701 *** (0.00)	-1.701 *** (0.01)			
Observations	3430	2295	8958	7254	1137	982			
Pseudo R-squared	0.2333	0.3497	0.2619	0.291	0.2556	0.4649			

<sup>98</sup> Revenue (Log) is the log of total revenues for the firm in each year as recorded in the Compustat database and adjusted to 2011 CPI dollars. Assets (Log) is the log of firm total assets in each year as recorded in the Compustat database and adjusted to 2011 CPI dollars. Leverage is total liabilities of the firm for a given year as recorded in the Compustat database. Net Income/Assets is net income of the firm divided by total assets of the firm for a given year as recorded in the Compustat database. Asset Growth Yr is the year over year percentage increase in total assets of the firm over year percentage increase in total revenue of the issuer. Annual Return is the annual return for the firm based on information in the CRSP database. Cumulative IPO Return is the cumulative buy and hold return for the firm since its IPO date based on information in the CRSP database. All regressions have industry fixed effects using two-digit SIC codes from the Compustat database. The variables Revenue (Log), Assets (Log) Net Income / Assets, Leverage, Asset Growth Yr and Revenue Growth Yr are winsorized at the 1% level. P-values are in parentheses, with \*\*\*, \*\*, and \* denoting statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5 sets forth logit regressions for the sample time period (1996–2012) where the dependent variable equals 1 if the firm is involuntarily delisted in the following year by the stock exchange and 0 otherwise. Involuntary delistings are those related to firm distress such as bankruptcy, liquidation, or a delisting by the exchange due to a failure to meet listing requirements such as minimum share price.

Columns 1 and 2 represent small-cap companies, while Columns 3 and 4 represent mid-cap companies, and Columns 5 and 6 represent large-cap companies. The main difference between the two columns for each class of capitalization is that the first in each model does not include the audit fees / net income variable and variables related to IPO returns.<sup>99</sup>

The coefficient on asset size for small companies in both columns 1 and 2 is negative and statistically significant, meaning that when the year-end assets for a small-cap company are higher, the probability of involuntary delisting in the following year is lower. However, the coefficients on the revenue variable in columns 1 and 2 are not significant, indicating that the amount of revenue is not a material determinant in predicting whether a small-cap company is involuntarily delisted in the following year. In contrast, for medium and large companies in columns 3, 4, 5 and 6 respectively, the results are reversed. The coefficients for the revenue variable are negative and significant while the coefficients on the asset variable are not for mid-cap companies and positive and significant for large-cap companies. A possible reason for this difference may be that the survival of smaller companies is dependent upon shock resistance and a higher asset base is important to resisting such shock. But for bigger companies, asset size is already significant and so revenue flow may be a more important determinant in the company's ability to avoid an involuntary delisting event.

The coefficients on the leverage variable are positive and significant across all models. When a firm is more leveraged, it is more likely to delist in the following year. These findings are consistent with finance theory and prior studies, that the greater debt load for a company, the more likely it is to experience insolvency or distress.<sup>100</sup> For mid-cap companies, a company's age also does appear to be a determinant in whether it is involuntarily delisted. The age variable is negative and significant in columns 3 and 4 for mid-cap companies. The findings on age are consistent with research, which has found that age is an indicator of involuntary delistings.<sup>101</sup>

In unreported models, we examine whether IPOs during the 1996–1998 period, roughly corresponding to the height of the small IPO phase, are more

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<sup>99</sup> The models in this table are based on the analysis and model developed in Tyler Shumway, *Forecasting Bankruptcy More Accurately: A Simple Hazard Model*, 74 J. Bus. 101 (2001).

<sup>100</sup> *Id.* at 18-22.

<sup>101</sup> See, e.g., Stavros Peristiani & Gijoon Hong, *Pre-IPO Financial Performance and Aftermarket Survival*, *supra* note 95, at 5 (finding that firm age is a fairly good predictor of aftermarket survival).



likely to delist. We find that only mid-cap companies from this period are more likely to delist, which goes along with the concentration of technology IPOs in this category during this time period. Similarly, in unreported regressions, we examine whether IPOs during hot periods are more prone to delist.<sup>102</sup> We find that this is not the case for small and large firms, but mid-cap firms are more likely to delist if they occur in hot IPO periods, when using models without stock market return variables

With respect to cumulative returns, we unsurprisingly find that the coefficients on returns are negative and significant for all sizes, but that the coefficient is particularly large for large firms. This is unsurprising because an involuntary delisting is often triggered by a share price decline (below \$5 per share on NYSE or \$1 per share on NASDAQ) or a distress event. Stock prices will indicate both. We find similar results based on a company's annual return in the prior year.

We conclude by examining the regulatory effects on post-IPO companies in two ways. First, we examine whether companies were involuntarily delisted in greater amounts before the passage of Sarbanes-Oxley and after. To examine the Sarbanes-Oxley effect, we use a variable that equals 1 if the involuntary delisting occurred between June 1, 2002 and October 1, 2007, and 0 otherwise.<sup>103</sup> We find that post Sarbanes-Oxley, small- and mid-cap companies are actually less likely to be involuntarily delisted. The counter effect of Sarbanes-Oxley may be because of changing markets or perhaps better quality IPOs after the passage of the Act. It may also be that Sarbanes-Oxley spurred better accounting and business practices leading to less firm distress. To test this in unreported regressions, we examine whether small companies that had an IPO before Sarbanes-Oxley were more likely to delist after the effective date of the Act or after June 1, 2002. We find no effect for small-cap companies, indicating that the lower rate of delisting is not due to differing types of IPOs before and after Sarbanes-Oxley.

Audit fees are a proxy for the regulatory expenses incurred by an issuer due to Sarbanes-Oxley, though they admittedly do not encompass all such expenses. Nonetheless, as Figure 1 shows, audit fee expenses for all classes of companies rose in the wake of the passage of Sarbanes-Oxley. This increase in audit fee expenses implies increased regulatory costs; an effect which may have a greater impact on small-cap companies.<sup>104</sup>

In this case, we proxy the relative impact of audit expenses by using a variable that equals annual net income divided by annual audit expenses for

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<sup>102</sup> In categorizing hot IPO periods, we use the definition put forth by Helwege & Liang, *supra* note 72, at 548. This is the "we use the three-month centered moving averages of the number of IPOs scaled by new business formations for each month in the sample."

<sup>103</sup> This is the same variable used in Ritter. See Gao, Ritter & Zhu, *supra* note 33.

<sup>104</sup> We acknowledge that audit fees do not capture all costs, but we view them as a reliable indicator of relative costs. For a more thorough analysis, see Anwer S. Ahmed et al., *How Costly is the Sarbanes Oxley Act? Evidence on the Effects of the Act on Corporate Profitability* (Working Paper, September 2009), <http://ssrn.com/abstract=1480394>.

each company. We choose this metric because it takes into account the relative size and capacity of a company to afford increased regulatory expenses. We find that the coefficients on this variable in all models are insignificant. This indicates that the documented increase in audit fees post-Sarbanes-Oxley does not appear to have caused either an increase or decrease in the probability of a firm being involuntarily delisted in the following year. For a robustness test, we run the models using audit fees divided by revenue and find similar results.

We thus find no evidence that companies in any class are more likely to be involuntarily delisted after the passage of Sarbanes-Oxley and any other heightened regulation put in place thereafter. In fact, we find the opposite—the small and medium-cap companies in our sample are less likely to be involuntarily delisted after the passage of Sarbanes-Oxley.

In the wake of Sarbanes-Oxley, studies found a rise in voluntary delistings,<sup>105</sup> supporting the claim that firms were leaving the market due to heightened regulatory burdens. It may therefore be that while involuntary listings are unaffected by the regulatory effects of recent years, voluntary listings are more effected because they involve firm choice. In Table 6 we examine factors that lead small-cap companies as opposed to large-cap companies to voluntarily delist. We also examine regulatory effects on the probability of companies to voluntarily delist.

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<sup>105</sup> See, e.g., Peter Hostak, Emre Karaoglu, Thomas Z. Lys & Yong George Yang, *An Examination of the Impact of Sarbanes-Oxley Act on the Attractiveness of US Capital Markets for Foreign Firms*, 18 *Rev. Account. Stud.* 522 (2013); Christian Leuz, Alexander J. Triantis & Tracy Yue Wang, *Why Do Firms Go Dark? Causes and Economic Consequences of Voluntary SEC Deregistrations*, *supra* note 54.

TABLE 6: FIRM VOLUNTARY DELISTING PROBABILITY<sup>106</sup>

	Market Cap < 75MM		Market Cap > 75 MM < 700MM		Market Cap > 700MM	
	(1)	(2)	(3)	(4)	(5)	(6)
Revenue (Log)	0.297 (0.45)	0.322 (0.48)	-0.037 (0.89)	0.101 (0.79)		
Assets (Log)	-1.146 *** (0.01)	-1.303 *** (0.01)	-0.702 ** (0.02)	-0.827 ** (0.04)		
Net Income / Assets	1.551 ** (0.04)	1.18 (0.14)	-0.054 (0.94)	0.18 (0.85)		
Leverage	2.663 *** (0.00)	2.988 *** (0.00)	-0.392 (0.68)	-0.408 (0.76)		
Asset Growth Yr	-1.37 (0.20)	-0.781 (0.48)	0.26 (0.58)	0.69 (0.19)		
Revenue Growth Yr	0.000 (1.00)	-0.261 (0.71)	0.113 (0.66)	0.279 (0.36)		
Age	0.169 *** (0.01)	0.139 * (0.06)	0.117 (0.11)	0.213 ** (0.04)		
Sarbox	1.425 *** (0.00)	0.883 * (0.07)	-0.884 (0.19)	-0.745 (0.40)		
Audit Fees / Net Income		0.666 (0.50)		-2.932 * (0.07)		
Annual Return		-1.09 * (0.09)		-2.18 ** (0.03)		
Cumulative IPO Return		-0.052 (0.82)		0.019 (0.83)		
Observations	2575	1557	3656	1605		
Pseudo R-squared	0.2006	0.204	0.1135	0.2663		

<sup>106</sup> All variables are as defined in Table 5. All regressions have industry fixed effects using two-digit SIC codes from the Compustat database.

Table 6 sets forth logit regressions for the sample time period (1996–2012) where the dependent variable equals 1 if the firm is voluntarily dropped by the stock exchange from listing in the following year and 0 otherwise. All models are otherwise identical to Table 5. No figures are provided for columns 5 and 6 because there were insufficient voluntary delisting observations to perform a regression.

Once again, the coefficient for assets for small firms is negative and significant, meaning that smaller asset size leads to a higher probability of both voluntary and involuntary delistings. Leverage is also positive and significant, implying that small-cap firms with greater leverage are more likely to voluntarily delist and be involuntarily delisted. The significant distinction between involuntary and voluntary delistings is that longer firm age is an indicator for a higher probability of a voluntary delisting. The coefficients for small-cap companies in columns 1 and 2 and in column 4 for mid-cap companies imply that there is a higher probability of delisting voluntarily as the company ages. This contrasts with involuntary delistings where we find the opposite: younger firms have a higher probability of being delisted involuntarily. This discrepancy may imply that markets evolve and voluntary listings are more likely to occur when the company is no longer suitable for the public markets. In contrast, involuntarily delistings are more likely to encompass younger firms that fail to achieve sufficient traction to succeed in the public markets.

The results in Table 6 also imply that these older companies had a higher probability of delisting voluntarily in light of regulatory and other changes in the new millennium. This finding is supported by the positive and significant results on the Sarbanes-Oxley variable. Consistent with other studies, there was an uptick in voluntary delistings in the wake of Sarbanes-Oxley solely among small-cap companies. However, using our audit fees variable, we do not find any indication that this uptick in delistings was due to increased regulatory costs as proxied through audit fees.<sup>107</sup>

The lifecycle of a company after an IPO can also end through an acquisition. In Table 7, we examine the takeover probability of a company in any given year post-IPO. Our purpose here is to examine whether the same factors as those indicating an increased probability of a delisting are present.

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<sup>107</sup> Again, for a robustness check we run the model using audit fees/revenue and find similar results.

TABLE 7: FIRM TAKEOVER PROBABILITY<sup>108</sup>

Firm Acquired in Following Year	Market Cap < 75MM		Market Cap > 75 MM < 700MM		Market Cap > 700MM	
	(1)	(2)	(3)	(4)	(5)	(6)
Revenue (Log)	0.22 (0.27)	0.22 (0.28)	0.092 (0.63)	0.051 (0.44)	0.383 ** (0.04)	0.41 ** (0.03)
Assets (Log)	-0.044 (0.82)	0.03 (0.88)	-0.068 (0.34)	-0.018 (0.81)	-0.453 ** (0.01)	-0.427 ** (0.02)
Net Income / Assets	1.395 ** (0.03)	1.29 ** (0.04)	0.368 * (0.06)	0.355 * (0.07)	0.645 (0.29)	0.671 (0.29)
Leverage	0.399 (0.49)	0.364 (0.53)	-0.022 (0.92)	-0.082 (0.70)	0.032 (0.95)	-0.053 (0.92)
Asset Growth Yr	-1.036 ** (0.03)	-1.118 ** (0.02)	-0.268 * (0.06)	-0.223 (0.11)	-0.47 (0.28)	-0.458 (0.29)
Revenue Growth Yr	-0.106 (0.73)	-0.104 (0.74)	-0.116 (0.20)	-0.108 (0.22)	0.114 (0.61)	0.136 (0.52)
Age	0.011 (0.76)	0.009 (0.80)	0.004 (0.82)	0.012 (0.50)	-0.052 (0.28)	-0.048 (0.32)
Sarbox	1.038 *** (0.00)	1.019 *** (0.00)	0.06 (0.72)	0.068 (0.69)	0.313 (0.51)	0.23 (0.63)
Audit Fees / Net Income	0.23 (0.63)	0.191 (0.70)	-0.094 (0.74)	-0.093 (0.74)	-1.128 (0.33)	-1.124 (0.33)
Liquidity	0.50 (0.15)	0.44 (0.21)	0.111 (0.48)	0.12 (0.46)	0.04 (0.93)	0.10 (0.82)
Annual Return		0.163 (0.10)		-0.007 (0.89)		0.138 (0.32)
Cumulative IPO Return		-0.029 (0.42)		-0.12 *** (0.01)		-0.172 (0.23)
Observations	2321	2321	7715	7715	1286	1286
Pseudo R-squared	0.0438	0.058	0.0052	0.0084	0.0299	0.0347

<sup>108</sup> All variables are as defined in Table 5 or in the accompanying text. All regressions have industry fixed effects using two-digit SIC codes from the Compustat database.

Table 7 sets forth logit regressions for the sample time period (1996-2012) where the dependent variable equals 1 if the firm is dropped from listing on a stock exchange in the following year due to a takeover and 0 otherwise. The columns and variables are structured identically to those of Table 5 and 6, except that a liquidity variable is included, consistent with other studies.<sup>109</sup> This variable tracks capital liquidity by measuring the rolling, four-quarter average of the spread between the rate on Commercial & Industrial (C&I) loans minus the Federal Funds rate.

Table 7 shows that different variables drive probable delistings due to takeovers than involuntary or voluntary delistings. Variables which increase the probability of involuntary and voluntary delistings, such as age, assets, revenue, and leverage, do not appear to affect the probability that a small-cap firm is acquired. Higher income versus assets for small- and mid-cap firms is associated with a higher probability of a takeover, indicating that generally more productive companies are targeted for takeovers. As in the case of voluntary delistings, the coefficient on the Sarbanes-Oxley variable is positive and significant for small-cap firms, signifying a higher probability that a small-cap company delists due to a takeover after Sarbanes-Oxley's passage. As in Tables 5 and 6, we did not find any indication that takeover probability is related to the size of a firm's audit fees.

#### IV. IMPLICATIONS FOR THE SMALL IPO MARKET

##### A. *Assessing the Implications of our Findings for the IPO Drought*

Our analysis of the lifecycle of public companies shows that small-cap companies are different than large-cap companies. They have a shorter life span, are more likely to be involuntarily delisted, and are usually delisted for different reasons than the larger companies. More interestingly, the small-cap companies that stay listed tended to remain small. This effect also holds true for both mid- and large-cap companies, which tended to remain their initial IPO size for both market capitalization and revenue throughout the sample period.

In addition, our evidence shows that regulation—particularly Sarbanes-Oxley—has an uncertain effect on the ability of small-cap companies to remain public. It appears that the probability of a takeover or voluntary delisting increased after passage of Sarbanes-Oxley, whereas the probability of an involuntary delisting did not significantly change. It does not appear that increased audit fees drove delistings during this time period. We find no evidence that regulation has led small-cap companies to be involuntarily delisted in increased numbers, but we find some indication that regulation may have driven more voluntary delistings and takeovers.

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<sup>109</sup> See, e.g., Jarrad Harford, *What Drives Merger Waves?*, 77 J. FIN. ECON. 529 (2005).

Our findings thus provide mixed support for the regulatory explanation for the IPO drought. If regulation were the explanation for a lack of IPOs, one would also expect that the companies which were listed before the regulation to have delisted in greater numbers. Similarly, small-cap companies should delist in greater numbers unless there is some change in their composition. We find evidence contrary to this hypothesis: the decline in small IPOs happened before the heightened regulation imposed by Sarbanes-Oxley. Involuntary delistings also did not increase (in fact they declined) in the wake of Sarbanes-Oxley and other regulations that we proxy through audit costs.

As for the heightened level of delistings due to takeovers and voluntary reasons, we do not believe this provides definitive support for the regulatory explanation. In the case of takeovers, the increase in delistings occurred during the sixth takeover wave and, therefore, may be influenced by regulatory reasons.<sup>110</sup> In the case of voluntary delistings, there are several plausible explanations for the increase. One may be that heightened regulation indeed drove companies to delist. Yet, if this were the case, we would expect to find some significance between voluntary delistings and increased audit costs. We do not find such a relationship. Thus, instead, companies that were unsuitable for the market may have taken advantage of the heightened scrutiny of Sarbanes-Oxley to delist. Though regulatory costs were a factor, the controversy gave these companies cover or a reason to justify their market exit. This conclusion is supported by our regressions, which show that firms with a higher involuntarily delisting probability had small asset bases and poor prior year returns, indicating that they may have already been at risk of delisting. These companies may have been acting preemptively.

Kamar, Karaca-Mandic, and Talley offer the explanation that the rise in small firm voluntary delistings may have been a short-term effect due to the closing of capital liquidity in the wake of the market downturn after Sarbanes-Oxley.<sup>111</sup> To test their hypothesis, in unreported regressions, we reran the same models as in Table 6, but limited the Sarbanes-Oxley variable to the period June 1, 2002 through December 31, 2004. We find that the variable remains significant in column 1, but is no longer significant in column 2, implying that the increased probability of a voluntary delisting during this time period may be more attributable to a small firms' poor returns. We also do not find any drop in involuntary or voluntary delistings in the wake of the subsequent easing of Sarbanes-Oxley's main burdens, nor do we find any downtick (or uptick) in takeovers. We thus conclude that while there is some support for the regulatory explanation for the small IPO drought, it does not appear to be overwhelming. The evidence is limited to

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<sup>110</sup> See generally George Alexandridis, *How Have M&As Changed? Evidence from the Sixth Merger Wave*, 18 EUR. J. FINANCE. 663 (2011) (noting that the sixth M&A wave began in 2003 and ended in 2007).

<sup>111</sup> Kamar, Karaca-Mandic & Talley, *supra* note 49 at 14.

an uptick in acquisitions and involuntary delistings during this time period. However, this uptick may not be entirely due to heightened regulatory costs but rather other firm-related factors and the general condition of the capital markets during this time.

While the regulatory evidence is mixed, evaluating the explanation that small IPOs have declined in frequency because of a damaged market ecosystem is more complex. As explained earlier, under this theory, the incentives of crucial market participants, including brokerages and analysts, were undermined by regulatory efforts. Our results do not allow us to rule out market ecosystem explanations; however, we do have evidence that leads us to suspect that these explanations are incomplete. We find that the type of companies that go public in terms of their basic metrics (except size) has not changed significantly over time. We also see similar firm lifecycles. In other words, it does not seem that changes in general market conditions have driven these companies to delist more.

We therefore theorize that the decline in small IPOs appears to be more likely attributable to both demand- and supply-side transformations. In this scenario, small IPOs were being fed to market by forces that, because of regulatory and market changes (including the rise of online brokerages), are now in decline. Brokers were taking rents and creating an artificial supply of smaller companies that then languished in the market.<sup>112</sup> Now that these supply-side forces are gone, the false supply is also gone. Coupled with a lack of demand predominantly due to the high failure rates and lack of growth for these firms, the market for small IPOs has reached equilibrium at a much lower level.

The decrease in demand is convincingly explained by small-cap company performance post-IPO. Gao, Ritter, and Zhu find that market-adjusted returns for the IPO cohort from 1980–2009 were -35.6% for small-cap companies (defined as pre-IPO last twelve months sales of less than \$50 million in 2009 inflation adjusted dollars), compared to -3.3% for large-cap companies.<sup>113</sup> This article adds evidence to this demand-side explanation by examining the post-IPO lifecycle of these firms. In short, it may be that investors simply do not view these companies as appropriate investments for the public markets. Their performance and lifecycle justify this conclusion.

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<sup>112</sup> We are not aware of any study that has looked at this issue. However, in 1995 there were 5,553 NASD Member firms, 60,151 branch offices of these firms, and 534,989 registered representatives. NAT'L ASS'N OF SEC. DEALERS, INC., 1995 NASD ANNUAL REPORT 3 (1996). Today FINRA reports 4,146 member firms, 160,573 branch offices, and 635,837 registered representatives. *FINRA Statistics and Data*, FINRA (Dec. 17, 2013), <http://www.finra.org/Newsroom/Statistics/>. The decline in member firms is likely attributable to industry consolidation and the rise of the on-line brokerages. See Katrina Ellis, *Who Trades IPOS? A Close Look at the First Days of Trading*, 79 J. FIN. ECON. 339 (2006).

<sup>113</sup> *Id.*



*B. Putting Our Results in Context*

In the face of this evidence we ask a larger question, which is whether the hand wringing over the loss of these IPOs to the public markets is justified. It may be that these IPOs were never appropriate, but that shifts in market structure ended the forces of supply, which previously had fed them to the market. In this regard, we exclude IPOs marked in the Capital IQ database as reverse IPOs and special purpose acquisition companies (SPACs) from our study.<sup>114</sup> There is evidence that these channels have picked up this slack through equally relevant supply-side mechanisms that create false demand. In particular, SPACs have had a poor showing with one database finding that their returns are negative. SPAC Analytics reports that since 2003, SPACs that have completed an acquisition have had a -14.1% return compared to 5.9% for the Russell 2000 index.<sup>115</sup> It may very well be that the SPAC is the new small IPO.

Ultimately, these conclusions may provide some support for the economic scope argument. It may very well be that small-cap companies are finding more economic support through alternative channels, as Gao, Ritter, and Zhu hypothesize.<sup>116</sup> This may have led them to forgo the IPO channel. Yet, the IPOs from before 2000 do not seem to have had more or less successful lifecycles across all sizes. In addition, the lifecycle of small-cap companies supports a lack of demand argument. After all, why would investors invest in small IPOs if they were not appropriately compensated for the large risk of failure that we document? The failure of a supply channel may have left these IPOs bereft of both demand and supply, an interpretation supported by the sudden drop-off in small IPOs after 1998. This article thus provides more support for the market ecosystem explanation, but we cannot definitively rule out the influence of the economic scope argument.

Finally, we find little support for the theory that the reduction of regulatory burdens enabled by the JOBS Act drove small-cap companies to enter the market and grow. We do not find any evidence that reduced regulatory burdens drove small-cap companies to enter the IPO market. Moreover, the small-cap companies that remained listed have tended to stay small. As a result of these findings, to the extent reduced regulation does indeed benefit small-cap companies, it would appear wiser to maintain the reduced burden for as long as these companies remain small rather than remove reductions, as the current regulation does, after a set number of years.

This article is grist for further study on three fronts. Study is needed both on the demand side and regarding the investing preferences of inves-

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<sup>114</sup> For more on SPACs and their rise to prominence, see generally Steven M. Davidoff, *Black Market Capital*, 2008 COLUM. BUS. L. REV. 172, 224-28; Usha Rodrigues & Mike Stegemoller, *Exit, Voice, and Reputation: The Evolution of SPACs*, 37 DEL. J. CORP. L. 849 (2013).

<sup>115</sup> See SPAC ANALYTICS, <http://www.spacanalytics.com> (last visited Oct. 21, 2013).

<sup>116</sup> Gao, Ritter & Zhu, *supra* note 33.

tors. Future studies should investigate whether the reduction in small IPOs was driven by lower demand, especially among institutional investors, for these IPOs. Study is also needed regarding the changes that occurred in supply forces in the late 1990s. For example, a future study could identify the investment banks that underwrote these small IPOs during that time period and their subsequent histories. Such a study should ask, did they disappear such that this avenue is no longer available? Or did they turn to other means to provide capital to companies? Additional study is also needed regarding the ability of already public small-cap companies to raise additional capital through follow-on offerings. This investigation leads to a second line of inquiry: to the extent that the IPO channel is no longer open to small companies and appears likely to remain closed, does this mean that these companies are being deprived of needed capital? More study is necessary to determine whether the lack of small IPOs is decreasing social welfare because no other capital outlet is available. In other words, should we subsidize the small IPO market by creating a better ecosystem for brokers? If so, from where would such a subsidy come? Our results suggest that investors would pay for such a subsidy through poor returns, while companies would seem to benefit very little from such a subsidy.

*C. Assessing our Results and the Effect of Current Regulatory Reform on the IPO Market*

Our findings also inform recent and proposed regulatory reforms to restore the IPO market to its level of activity from the mid-1990s. However, we do not feel that these current proposals will produce a meaningfully greater number of small IPOs because we do not find convincing evidence that regulatory events have affected the survival and growth of small IPOs or theorize that other factors are causing the demise of the small IPO. This conclusion has been borne out by recent evidence.

*1. The JOBS Act and Its Effect on IPOs*

The question of whether the JOBS Act has had an effect on the IPO market remains open. However, 2013 was by all measures a good year for both the stock and IPO markets.<sup>117</sup> The S&P 500 closed up 30% excluding dividends.<sup>118</sup> In addition, in 2013, there were 179 IPOs on NASDAQ, NYSE,

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<sup>117</sup> See Michael de la Merced, *Ebullience Over 2013 I.P.O. Market Spills Into New Year*, N.Y. TIMES DEALBOOK, Jan. 2, 2014, <http://dealbook.nytimes.com/2014/01/02/ebullience-over-2013-i-p-o-market-spills-into-new-year/>.

<sup>118</sup> Adam Shell, *Investors Cheer Record-Setting Year on Wall St.*, USA TODAY (Dec. 31, 2013), <http://www.usatoday.com/story/money/markets/2013/12/31/market-year-end-high/4263237/>.

and the successor to AMEX that met our sample criteria.<sup>119</sup> Of these IPOs, 9 or 5% were small IPOs, while 88 or 49% were medium IPOs and 80 or 46% were large IPOs. Percentagewise, the number of small IPOs was the second lowest since 1996.<sup>120</sup> The trend toward larger IPOs also continued. In 2013, there was the highest number of large IPOs in our sample time period measured on both a percentage and numerical basis.<sup>121</sup> The results provide further evidence that the turn away from small IPOs is likely due to non-regulatory reasons that the JOBS Act did not remedy. In particular, while the JOBS Act may have affected the ability of larger companies to IPO, as Dambra, Field, and Gustafson find, it does not appear to have had any effect on the small IPO market.

Although further study is necessary, the increase in IPOs in 2013 appears more due to the fact that stocks had one of the best years on record.<sup>122</sup> Even if the JOBS Act ultimately encourages more small IPOs, we still have the issue of the poor lifecycle performance of small-cap companies. Companies and investment banks may be able to offer the shares in these IPOs and some investors may be willing to take a gamble on some smaller companies. However, without some wholesale change in the type of company going public, the ultimate result will be the same: most small-cap companies will wither on the vine.

## 2. *Current Proposals to Revive the IPO Market*

In the past year, market participants have suggested additional regulatory adjustments to support the JOBS Act. Some of these proposed regulatory actions address perceived deficiencies in the JOBS Act, while others attempt to address broader structural issues.<sup>123</sup> One of the “major disappointments” of the JOBS Act is its failure to apply EGC status retroactively to companies that went public before December 8, 2011.<sup>124</sup> This disappointment highlights a general concern that the JOBS Act enables small compa-

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<sup>119</sup> For these purposes, we used the same criteria for our main study and used the Capital IQ database, except that we did not adjust dollar figures to 2011 CPI, instead using nominal figures.

<sup>120</sup> See *infra* Table 1.

<sup>121</sup> *Id.*

<sup>122</sup> Prior studies have found a strong correlation between the stock market and the IPO market. See Michell Lowry, *Why Does IPO Volume Fluctuate So Much?*, 67 J. FIN. ECON. 3 (2003); Chris Yung et. al., *Cycles in the IPO Market*, 89 J. FIN. ECON. 192 (2008).

<sup>123</sup> See, e.g., Richard McDonald, Mark A. Metz & Robert Murphy, *SEC Fulfills Final JOBS Act Mandate by Proposing Changes to Regulation A*, DYKEMA GOSSETT PLLC (Jan. 17, 2014), <http://www.lexology.com/library/detail.aspx?g=86ee577e-6ecd-4824-91f6-c74c6ea9bd-c6>.

<sup>124</sup> THOMAS J. KEATING, KEATING INVESTMENTS, *THE JOBS ACT: SHIFTING INTO GEAR AND ACCELERATING UP THE IPO ON-RAMP* (2012), <http://keatingcapital.com/wp-content/uploads/2012/05/The-JOBS-Act-Shifting-into-Gear-and-Accelerating-Up-the-IPO-On-Ramp-May-2012.pdf>.

nies to complete an IPO, but does not provide adequate structural support for these companies to survive after going public.<sup>125</sup>

Other concerns and related recommendations also reinforce this point. A group called the Equity Capital Formation Task Force, comprised of issuers and investor relations personnel, investors, venture capitalists, academics, bankers and securities attorneys, argues that the small companies need capital formation options beyond the IPO. The task force notes that despite the JOBS Act, the IPO process remains expensive. Additionally, in accord with our findings that smaller companies tend to remain small post-IPO, the task force notes that “for the smallest companies, the five-year window for scaled compliance may close before the company has built sufficient revenue to meet the costs of full public company compliance.”<sup>126</sup> The registration process remains expensive and time-consuming, and such firms are not able to access inexpensive capital through loans or other conventional fundraising activities. The task force suggests expanding access to capital for smaller firms by completing the JOBS Act’s mandates to expand Regulation A<sup>127</sup> and resolve conflicts with state laws.<sup>128</sup>

The task force also contends that the “aftermarket support system”<sup>129</sup> on which public companies depend is particularly flawed for smaller firms. These firms suffer from an “illiquidity tax”<sup>130</sup> that prevents investment by institutional investors and other traders who require a liquid trading market. They believe that “while narrower spreads and lower transaction costs have benefitted many investors,”<sup>131</sup> these effects come with costs that “are being borne disproportionately by small-cap companies and fundamentals-based investors—both institutional and individual—who want to buy, sell or hold small-cap stocks as part of a long-term investment strategy.”<sup>132</sup> They propose to improve the structure of the market for smaller companies’ stocks by creating special trading rules for such that the stock public companies with

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<sup>125</sup> Daniel M. Gallagher, Commissioner, Sec. & Exch. Comm’n, Remarks at FIA Futures and Options Expo (Nov. 6, 2013), <http://www.sec.gov/News/Speech/Detail/Speech/1370540289361#.Ut63fbQo71U>.

<sup>126</sup> EQUITY CAPITAL FORMATION TASK FORCE, FROM THE ON-RAMP TO THE FREEWAY: REFUELING JOB CREATION AND GROWTH BY RECONNECTING INVESTORS WITH SMALL-CAP COMPANIES (2013), <http://www.equitycapitalformationtaskforce.com/files/ECF%20From%20the%20On-Ramp%20to%20the%20Freeway%20vF.pdf>.

<sup>127</sup> Title IV requires the SEC to, among other things, “add a class of securities to the securities exempted pursuant to this section in accordance with the following terms and conditions: (A) The aggregate offering amount of all securities offered and sold within the prior 12-month period in reliance on the exemption added in accordance with this paragraph shall not exceed \$50,000,000. (B) The securities may be offered and sold publicly. (C) The securities shall not be restricted securities within the meaning of the Federal securities laws and the regulations promulgated thereunder.” Jumpstart Our Business Startups Act, Pub. L. No. 112-106, 126 Stat. 306, 324 (2012).

<sup>128</sup> EQUITY CAPITAL FORMATION TASK FORCE, *supra* note 109, at 13.

<sup>129</sup> *Id.* at 11.

<sup>130</sup> *Id.* at 14.

<sup>131</sup> *Id.* at 19.

<sup>132</sup> *Id.*

market capitalizations of below \$750 million should be quoted at “minimum increments of five cents,” and “that they should trade at only the bid price, the ask price, or the mid-point between the two.”<sup>133</sup>

The push by this group has led to legislation being introduced in Congress to provide for a rollback of decimalization and the quotation of stocks in fractions at five cent or ten cent increments for companies with market capitalizations of less than \$500 million.<sup>134</sup> Putting aside market manipulation issues, which initially led the SEC to require decimalization, the evidence does not point to such a change improving the market for small IPOs.<sup>135</sup> As Bobby Bartlett and Justin McCrary have written, such a change may instead drive trading off the exchanges and into dark pools.<sup>136</sup> Even if it did produce more small IPOs, given the evidence we find here, we question whether this would again create a false supply of IPOs unsuitable for the markets. In considering these further reforms, Congress should therefore look beyond the simple question of encouraging small IPOs to examining a more salient question: what type of IPOs and company quality should the law encourage?

#### *D. Can the Small IPO Market be Fixed?*

The final question remains whether there is any way to fix the small IPO market. A major assumption underlying the JOBS Act is that over-regulation has impeded small companies from entering public markets; the regulatory solution in the JOBS Act is the creation of an “on-ramp” that provides access to smaller companies and allows them a chance to gather speed as they transition to public markets. Our findings suggest that even with the on-ramp, a more fundamental problem remains: many smaller companies do not seem to have the horsepower to stay in public markets, and those that do tend to languish in the slow lane. Consequently, regulatory efforts designed to get companies to the public markets may be less successful than structural changes that focus more on the overall market environment for smaller companies. Put another way, the primary issue is not how to get companies to market, which may merely create a false supply, but how to create a regulatory and market environment that fosters growth in small companies.

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<sup>133</sup> *Id.* at 22.

<sup>134</sup> Spread Pricing Liquidity Act of 2013, H.R. 1952, 113th Cong. (1st Sess.). In the wake of this proposal, the SEC has announced that it will be conducting its own pilot program. See Herbert Lash, *U.S. SEC to decide soon how to enact ‘tick size’ pilot program*, REUTERS (May 14, 2014, 12:34pm), <http://www.reuters.com/article/2014/05/14/us-sec-pilotprogram-idUSBR EA4D01120140514>.

<sup>135</sup> The impetus for decimalization was a 1994 study, which found evidence of collusion in the quotation of stocks in fractions. See William G. Christie et al., *Why Did NASDAQ Market Makers Stop Avoiding Odd-Eighth Quotes?*, 49 J. FIN. 1841 (1994).

<sup>136</sup> See Bartlett & McCrary, *supra* note 76.

More research is needed to determine optimal regulatory and market structures for smaller companies and to understand how the changes implemented by the JOBS Act have affected smaller company capital formation. Additional regulatory scaling may hold promise for these companies, but our results suggest that regulation in the form of disclosure and audit obligations is not the dominant driver in decisions to become and remain a public company. Any such efforts may be useful at the margins; however, changes to the market ecosystem in which small companies grow and develop will likely be more important. Some of these changes may be regulatory in nature, such as the tick size changes suggested by the Equity Capital Formation Task Force. In contrast to the IPO orientation of the JOBS Act, our findings suggest that further efforts should be focused on creating conditions to foster growth in the aftermarket for smaller companies as well as ensuring that conditions exist to foster IPOs of small companies that succeed in the public markets, rather than on fixing the IPO market just for the sake of more IPOs. In particular, without reviving demand for these IPOs, we struggle to see how regulatory changes will succeed.

#### CONCLUSION

In this article, we have taken a novel approach to studying the oft-talked about dearth of small IPOs: we have examined the lifecycle of post-IPO companies. Our findings do not support the regulatory explanation for that scarcity. Instead, we theorize that the evidence supports a decline in investor demand. These small-cap companies have simply not performed well. They delist at high rates and remain small when listed. This evidence undermines the theory that legislation, such as the JOBS Act or other regulatory tinkering, has had any material effect on the lifecycle of post-IPO companies or the IPO market itself. Rather, our conclusions support a counter-narrative that the small IPO drought is simply due to market judgments and changes in the market ecosystem. Investor interest in these opportunities has declined because the return is not commensurate with the risk taken. With the decline of demand- and supply-side forces that pushed these IPOs into the market, small-cap companies have disappeared due to their inability to survive and grow in the public markets. Future inquiry should examine whether this loss of capital supply has adversely affected small issuers or whether alternative capital-raising methods have replaced the IPO. Absent such negative findings, the loss of the small IPO may be an economic development that legislators and regulators likely should not struggle to reverse.