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Initial Public Offerings: A Synthesis of the Literature and Directions for Future Research

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Contents

Initial Public Offerings: A Synthesis of the Literature and Directions for Future Research

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ABSTRACT

The purpose of this monograph is to provide an overview of the IPO literature since 2000. The fewer numbers of companies going public in recent years has raised many questions regarding the IPO process, in both academic and regulatory circles. As we all strive to understand these changes in the market, it is especially important to understand the dynamics underlying the IPO process. If the process of going public is too costly or the IPO mechanism is plagued by too many conflicts of interest among the various intermediaries, then private companies may rationally choose other methods of raising capital. In a related vein, it is imperative that new regulations not be based on research focusing solely on large,

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more mature firms. Newly public firms have unique characteristics, and an increased understanding of such issues will contribute positively to well-functioning public markets and further growth of the entrepreneurial sector.

We also provide a detailed guide to researchers on how to obtain a research-quality sample of IPOs, from standard data sources. Related to this, we tabulate important corrections to these standard data sources.

1

Introduction

Transitioning from private to public status is a watershed event in the life of any firm. For most firms and managers, the process of conducting an IPO is something they will only go through once. As such, there exists much uncertainty over the process, starting with the decision of whether to go public and including issues such as when to go public, who to select as advisors, how to price the offering and how to structure the governance of the newly public firm. A broad set of academic literature has studied all of these issues, and the purpose of this monograph is to review the existing evidence and also to suggest areas in which our understanding is less complete and which would benefit from further research.

We begin with a discussion of why firms go public. While the most obvious factor would seem to be the raising of capital, this is far from the only determinant and many studies conclude that it is not the most important determinant. A continuing debate in the literature concerns whether firms go public primarily to raise money for future investment or for other reasons such as market timing, *i.e.*, because they expect the market to value them higher than their ‘true’ value. We review the evidence on both sides of this debate and also discuss the myriad of other factors that potentially play at least some role in managers’ decisions to take their firms public: capital structure re-adjustment, providing liquidity for the owners, facilitating M&A, advantages of having a publicly observable stock price, compensation, and the credibility that comes with having multiple parties scrutinize the firm (*e.g.*, analysts, institutional investors, *etc.*).

Given the broad array of factors that motivate companies to go public, it is perhaps not surprising that the types of firms going public varies widely. In the interests of providing the reader with an informed overview of this market, we highlight a number of important stylized facts concerning the IPO market in Section 3. One of the many fascinating things about this market concerns the ways it has varied over time, and for this reason we disaggregate many of these stylized facts by time. Capital markets in the U.S. change and evolve at a relatively rapid pace, and consistent with this we observe strong differences in the types of companies choosing to go public and also in the ways in which they structure their offerings. It will perhaps be informative to consider jointly some of these time trends as a way to better understand the changes in our markets, including for example the lower frequency of IPOs over the past 15 years.

More than most corporate events, IPOs present a number of “puzzles”. For example, it is well known that IPOs are on average underpriced, with average first day returns of approximately 15% - but the reasons for such large one-day returns continue to be debated. Beyond this one-day return, the returns associated with IPOs over longer time intervals are more complex. Do IPOs underperform over the long-term, measured as the three or five years following the offering? The answer is yes if we compare them to a broad market index, but the answer is no if we compare them to firms of similar size and book-to-market.

The story becomes even more complex when we consider the strong time-series fluctuations within each of these pricing patterns. We know that many companies go public during some periods but relatively few in others. Over many decades, this variation was explained largely by fluctuations in companies’ demands for capital and by changing investor sentiment that influenced the price at which a company could sell itself. However, neither of these factors is sufficient to explain the dramatic fall in the number of IPOs since 2000. Finally, the type of company going public in “hot” versus “cold” markets is different and there is some evidence that companies going public during hot markets perform worse, but measurement issues can make definitive conclusions difficult.

These fluctuations in performance highlight the extent of uncertainty surrounding these companies. In fact, 37% of IPO firms delist within the first five years after the IPO, with 14% being due to poor performance and 23% because they are acquired. In addition, many companies that start the process to go public do not complete the process: 20% of IPOs are withdrawn, and of those that are withdrawn relatively few ever successfully complete an IPO.

Given this high uncertainty combined with the fact that most companies only ever conduct an IPO one time, intermediaries have the potential to play a particularly important role. The number of intermediaries involved in the months surrounding many firms' IPOs is large: venture capitalists, underwriter banks, lawyers, analysts, institutional investors, regulators, *etc.* While the effects of some of these intermediaries has received considerable attention, the influence of other parties, *e.g.*, regulators, is less understood. We both overview the current state of knowledge regarding the roles of these various entities, and comment on what we perceive to be gaps in our understanding.

Finally, an area of growing research concerns the governance of newly public firms. While multiple forces in the markets (*e.g.*, exchange listing requirements, pension fund recommendations, proxy advisory service company recommendations) have been pushing firms toward a common set of governance standards, there are reasons to believe that the governance demands of newly public firms are unique and very different from those of their more mature counterparts. Because the vast majority of corporate governance research is based on similar samples of mostly mature firms such as the S&P1500, the aforementioned recommendations are largely based on these more mature firms. We argue that these conclusions are frequently not appropriate for younger and smaller firms. We review the still nascent literature in this area, and encourage further research along this dimension.

Perhaps the issue that has garnered the most attention in recent years with respect to IPOs is the decreased number of them. Why are fewer companies choosing to raise public equity on US markets? While new companies are being founded on a regular basis, these small private companies are with increasing frequency being acquired by large, already public companies. As a result, a smaller number of companies are controlling an increasing percentage of entrepreneurial activity. From an antitrust perspective, this raises obvious concerns. A lack of sufficient competition has the potential to put a downward bias on future innovative activity. We hope that a more complete understanding of many dynamics surrounding IPOs, as overviewed in this monograph, will help guide researchers in efforts to better address these issues. To the extent that companies are increasingly concluding that the costs issuing public equity for the first time exceed the benefits, it is clear that we need a better understanding of these costs and benefits and the ways they have changed over time.

The literature on going public is rich and vast. Given the depth and breadth of the literature we made a decision to concentrate this review mainly on research published in the 21st century and with a particular focus on U.S. markets. And even within this prism we were not able to both cover all grounds and keep this review within a manageable length, while delving into some of the topics more deeply. To facilitate discussion and analysis of the most important facets of the IPO process, we also decided to replicate some of the main empirical results concerning IPOs ourselves using the most comprehensive coverage in terms of the length of the sample period and the cross section of firms included. This enables us to see how some of the empirical regularities have changed over time and how others are more immune to the time period one examines.

The rest of this review is structured as follows. We start in Section 2 by reviewing the reasons that firms go public. Having established firms' basic motivations for public listing, Section 3 provides an empirical overview of the key aspects of the IPO process, over the past 45 years, 1972 – 2016. Section 4 provides a detailed discussion of the institutional details surrounding the IPO process, which are key to understanding this market. Section 5 reviews the rich literature, on the pricing of IPOs, and the role the underwriter in the process. Section 6 discusses the role of intermediaries throughout the IPO process. Sections 7 and 8 review the literature and evidence on post-IPO returns and cycles in the IPO market, respectively. Finally, Section 9 discusses the burgeoning literature on the governance of newly public firms, and Section 10 concludes.

References

Aggarwal, R. 2000. "Stabilization Activities by Underwriters after Initial Public Offerings". *The Journal of Finance*. 55(3): 1075–1103.

Aggarwal, R. 2003. "Allocation of Initial Public Offerings and Flipping Activity". *Journal of Financial Economics*. 68(1): 111–135.

Aggarwal, R. K., L. Krigman, and K. L. Womack. 2002a. "Strategic IPO Underpricing, Information Momentum, and Lockup Expiration Selling". *Journal of Financial Economics*. 66(1): 105–137.

Aggarwal, R., N. R. Prabhala, and M. Puri. 2002b. "Institutional Allocation in Initial Public Offerings: Empirical Evidence". *The Journal of Finance*. 57(3): 1421–1442.

Allen, F. and G. R. Faulhaber. 1989. "Signalling by Underpricing in the IPO Market". *Journal of Financial Economics*. 23(2): 303–323.

Altı, A. 2005. "IPO Market Timing". *Review of Financial Studies*. 18(3): 1105–1138.

Amihud, Y., S. Hauser, and A. Kirsh. 2003. "Allocations, Adverse Selection, and Cascades in IPOs: Evidence from the Tel Aviv Stock Exchange". *Journal of Financial Economics*. 68(1): 137–158.

Arugaslan, O., D. O. Cook, and R. Kieschnick. 2010. "On the Decision to Go Public with Dual Class Stock". *Journal of Corporate Finance*. 16(2): 170–181.

Asker, J., J. Farre-Mensa, and A. Ljungqvist. 2015. Corporate Investment and Stock Market Listing: A Puzzle? *Review of Financial Studies*.

Aussenegg, W., P. Pichler, and A. Stomper. 2006. "IPO Pricing with Bookbuilding and a When-Issued Market". *Journal of Financial and Quantitative Analysis*. 41: 04.

Baker, M. and P. A. Gompers. 2003. "The Determinants of Board Structure at the Initial Public Offering". *The Journal of Law and Economics*. 46(2): 569–598.

Baker, M. and J. Wurgler. 2000. "The Equity Share in New Issues and Aggregate Stock Returns". *The Journal of Finance*. 55(5): 2219–2257.

Baranchuk, N., R. Kieschnick, and R. Moussawi. 2014. "Motivating Innovation in Newly Public Firms". *Journal of Financial Economics*. 111(3): 578–588.

Baron, D. P. 1982. "A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues". *The Journal of Finance*. 37(4): 955–976.

Beatty, R. P. and J. R. Ritter. 1986. "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings". *Journal of Financial Economics*. 15(1-2): 213–232.

Beatty, R. P. and I. Welch. 1996. "Issuer Expenses and Legal Liability in Initial Public Offerings". *The Journal of Law and Economics*. 39(2): 545–602.

Benartzi, S., R. Michaely, R. H. Thaler, and W. C. Weld. 2007. "The Nominal Price Puzzle". Unpublished Working Paper, University of California, Los Angeles.

Benninga, S., M. Helmantel, and O. Sarig. 2005. "The Timing of Initial Public Offerings". *Journal of Financial Economics*. 75(1): 115–132.

Benveniste, L. M., A. Ljungqvist, W. J. Wilhelm, and X. Yu. 2003. "Evidence of Information Spillovers in the Production of Investment Banking Services". *The Journal of Finance*. 58(2): 577–608.

Benveniste, L. M. and P. A. Spindt. 1989. "How Investment Bankers Determine the Offer Price and Allocation of New Issues". *Journal of Financial Economics*. 24(2): 343–361.

Bernstein, S. 2015. “Does Going Public Affect Innovation?” *The Journal of Finance*. 70(4): 1365–1403.

Bernstein, S., X. Giroud, and R. Townsend. 2016. “The Impact of Venture Capital Monitoring: Evidence from a Natural Experiment”. *The Journal of Finance*.

Bodnaruk, A., E. Kandel, M. Massa, and A. Simonov. 2008. “Shareholder Diversification and the Decision to Go Public”. *Review of Financial Studies*. 21(6): 2779–2824.

Boeh, K. K. and C. G. Dunbar. 2014. “IPO Waves and the Issuance Process”. *Journal of Corporate Finance*. 25: 455–473.

Boehmer, B., E. Boehmer, and R. Fishe. 2006. “Do Institutions Receive Favorable Allocatins in IPOs with Better Long-Run Returns?” *Journal of Financial and Quantitative Analysis*. 41(4): 809–828.

Boone, A. L., L. C. Field, J. M. Karpoff, and C. G. Raheja. 2007. “The Determinants of Corporate Board Size and Composition: An Empirical Analysis”. *Journal of Financial Economics*. 85(1): 66–101.

Boone, A. L., I. V. Floros, and S. A. Johnson. 2016. “Redacting Proprietary Information at the Initial Public Offering”. *Journal of Financial Economics*. 120(1): 102–123.

Bradley, D. J., B. D. Jordan, and J. R. Ritter. 2003. “The Quiet Period Goes Out with a Bang”. *The Journal of Finance*. 58(1): 1–36.

Bradley, D. J., B. D. Jordan, and J. R. Ritter. 2008. “Analyst Behavior Following IPOs: the “Bubble Period” Evidence”. *Review of Financial Studies*. 21(1): 101–133.

Bradley, D., B. Jordan, H. Yi, and I. Roten. 2001. “Venture Capital and IPO Lockup Expiration: an Empirical Analysis”. *Journal of Financial Research*. 24(4): 465–493.

Brau, J. C. and S. E. Fawcett. 2006. “Initial Public Offerings: an Analysis of Theory and Practice”. *The Journal of Finance*. 61(1): 399–436.

Brau, J., R. Couch, and N. Sutton. 2012. “The Desire to Acquire and IPO Long-Run Underperformance”. *Journal of Financial and Quantitative Analysis*. 47(3): 493–510.

Brau, J., B. Francis, and N. Kohers. 2003. “The choice of IPO versus takeover: Empirical evidence”. *Journal of Business*. 76: 583–612.

Brav, A., C. Geczy, and P. A. Gompers. 2000. "Is the Abnormal Return Following Equity Issuances Anomalous?" *Journal of Financial Economics*. 56(2): 209–249.

Brav, A. and P. A. Gompers. 1997. "Myth or Reality? the Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Non-venture Capital-Backed Companies". *The Journal of Finance*. 52(5): 1791–1821.

Brav, A. and P. A. Gompers. 2003. "The Role of Lockups in Initial Public Offerings". *Review of Financial Studies*. 16(1): 1–29.

Brav, O. 2009. "Access to Capital, Capital Structure, and the Funding of the Firm". *The Journal of Finance*. 64(1): 263–308.

Busaba, W. Y., L. M. Benveniste, and R. J. Guo. 2001. "The Option to Withdraw IPOs During the Premarket: Empirical Analysis". *Journal of Financial Economics*. 60(1): 73–102.

Carter, R., F. Dark, and A. Singh. 1998. "Underwriter Reputation, Initial Returns, and the Long-Run Performance of IPO Stocks". *Journal of Finance*. 53(1): 285–311.

Carter, R. and S. Manaster. 1990. "Initial Public Offerings and Underwriter Reputation". *The Journal of Finance*. 45(4): 1045–1067.

Chahine, S. and M. Goergen. 2011. "The Two Sides of CEO Option Grants at the IPO". *Journal of Corporate Finance*. 17(4): 1116–1131.

Chahine, S. and M. Goergen. 2013. "The Effects of Management-Board Ties on IPO Performance". *Journal of Corporate Finance*. 21: 153–179.

Chahine, S. and M. Goergen. 2014. "Top Management Ties with Board Members: How They Affect Pay–Performance Sensitivity and IPO Performance". *Journal of Corporate Finance*. 27: 99–115.

Chang, C., Y. M. Chiang, Y. Qian, and J. R. Ritter. 2016. "Pre-Market Trading and IPO Pricing". *Review of Financial Studies*.

Chemmanur, T. J. and J. He. 2011. "IPO Waves, Product Market Competition, and the Going Public Decision: Theory and Evidence". *Journal of Financial Economics*. 101(2): 382–412.

Chemmanur, T. J., S. He, and D. K. Nandy. 2009. "The Going-Public Decision and the Product Market". *Review of Financial Studies*: Hhp098.

Chemmanur, T. J., G. Hu, and J. Huang. 2010. "The Role of Institutional Investors in Initial Public Offerings". *Review of Financial Studies*. 23(12): 4496–4540.

Chemmanur, T. J. and I. Paeglis. 2005. "Management Quality, Certification, and Initial Public Offerings". *Journal of Financial Economics*. 76(2): 331–368.

Chemmanur, T. J., K. Simonyan, and H. Tehranian. 2014. The Role of Management Quality in the IPOs of Venture-Backed Entrepreneurial Firms.

Chemmanur, T. and A. Yan. 2009. "Product Market Advertising and New Equity Issues". *Journal of Financial Economics*. 92(1): 40–65.

Chen, H. C. and J. R. Ritter. 2000. "The Seven Percent Solution". *The Journal of Finance*. 55(3): 1105–1131.

Chiang, Y. M., D. Hirshleifer, Y. Qian, and A. E. Sherman. 2011. "Do Investors Learn from Experience? Evidence from Frequent IPO Investors". *Review of Financial Studies*. (Hhq151).

Chiang, Y. M., Y. Qian, and A. E. Sherman. 2010. "Endogenous Entry and Partial Adjustment in IPO Auctions: Are Institutional Investors Better Informed?" *Review of Financial Studies*. 23(3): 1200–1230.

Chod, J. and E. Lyandres. 2011. "Strategic IPOs and Product Market Competition". *Journal of Financial Economics*. 100(1): 45–67.

Cliff, M. T. and D. J. Denis. 2004. "Do Initial Public Offering Firms Purchase Analyst Coverage with Underpricing?" *The Journal of Finance*. 59(6): 2871–2901.

Coles, J. L., N. D. Daniel, and L. Naveen. 2007. "Boards: Does one size fit all?" *Journal of Financial Economics*. 87: 329–356.

Cornelli, F. and D. Goldreich. 2001. "Bookbuilding and Strategic Allocation". *The Journal of Finance*. 56(6): 2337–2369.

Cornelli, F. and D. Goldreich. 2003. "Bookbuilding: How Informative Is the Order Book?" *The Journal of Finance*. 58(4): 1415–1443.

Corwin, S. A. and P. Schultz. 2005. “The Role of IPO Underwriting Syndicates: Pricing, Information Production, and Underwriter Competition”. *The Journal of Finance*. 60(1): 443–486.

Dambra, M., L. C. Field, and M. T. Gustafson. 2015. “The JOBS Act and IPO Volume: Evidence That Disclosure Costs Affect the IPO Decision”. *Journal of Financial Economics*. 116(1): 121–143.

Dambra, M., L. C. Field, M. Gustafson, and K. J. Pisciotta. 2016. Pre-IPO Communications and Analyst Research Evidence Surrounding the JOBS Act.

Daniel, K. and S. Titman. 1997. “Evidence on the Characteristics of Cross Sectional Variation in Stock Returns”. *Journal of Finance*. 52(1): 1–33.

D’Avolio, G. 2002. “The Market for Borrowing Stock”. *Journal of Financial Economics*. 66(2): 271–306.

Degeorge, F., F. Derrien, and K. L. Womack. 2007. “Analyst Hype in IPOs: Explaining the Popularity of Bookbuilding”. *Review of Financial Studies*. 20(4): 1021–1058.

Degeorge, F., F. Derrien, and K. L. Womack. 2010. “Auctioned IPOs: the US Evidence”. *Journal of Financial Economics*. 98(2): 177–194.

Demers, E. and K. Lewellen. 2003. “The Marketing Role of IPOs: Evidence from internet Stocks”. *Journal of Financial Economics*. 68(3): 413–437.

Derrien, F. 2005. “IPO Pricing in ’Hot’ Market Conditions: Who Leaves Money On the Table?” *The Journal of Finance*. 60: 487.

Derrien, F. and A. Kecskes. 2007. “The Initial Public Offerings of Listed Firms”. *The Journal of Finance*. 62(1): 447–479.

Derrien, F. and K. L. Womack. 2003. “Auctions Vs. Bookbuilding and the Control of Underpricing in Hot IPO Markets”. *Review of Financial Studies*. 16(1): 31–61.

Diether, K. B., K. H. Lee, and I. M. Werner. 2009. “Short-Sale Strategies and Return Predictability”. *Review of Financial Studies*. 22(2): 575–607.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2013. “The US Left Behind? Financial Globalization and the Rise of IPOs Outside the US”. *Journal of Financial Economics*. 110(3): 546–573.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2017. “The US Listing Gap”. *Journal of Financial Economics*. 123(3): 464–487.

Dunbar, C. G. 2000. “Factors Affecting Investment Bank Initial Public Offering Market Share”. *Journal of Financial Economics*. 55(1): 3–41.

Dunbar, C. G. and S. R. Foerster. 2008. “Second Time Lucky? Withdrawn IPOs That Return to the Market”. *Journal of Financial Economics*. 87(3): 610–635.

Edelen, R. M. and G. B. Kadlec. 2005. “Issuer Surplus and the Partial Adjustment of IPO Prices to Public Information”. *Journal of Financial Economics*. 77(2): 347–373.

Edwards, A. K. and K. W. Hanley. 2010. “Short Selling in Initial Public Offerings”. *Journal of Financial Economics*. 98(1): 21–39.

Ellis, K., R. Michaely, and M. O’Hara. 1999. “a Guide to the Initial Public Offering Process”. *Corporate Finance Review*.

Ellis, K., R. Michaely, and M. O’Hara. 2000. “When the Underwriter Is the Market Maker: an Examination of Trading in the IPO Aftermarket”. *The Journal of Finance*. 55(3): 1039–1074.

Fama, E. F. and K. R. French. 1993. “Common Risk Factors in the Returns on Stocks and Bonds”. *Journal of Financial Economics*. 33(1): 3–56.

Fama, E. F. and K. R. French. 2004. “New Lists: Fundamentals and Survival Rates”. *Journal of Financial Economics*. 73(2): 229–269.

Field, L. C. and G. Hanka. 2001. “The Expiration of IPO Share Lockups”. *The Journal of Finance*. 56(2): 471–500.

Field, L. C. and J. M. Karpoff. 2002. “Takeover Defenses of IPO Firms”. *The Journal of Finance*. 57(5): 1857–1889.

Field, L. C. and M. Lowry. 2009. “Institutional Versus Individual Investment in IPOs: The Importance of Firm Fundamentals”. *Journal of Financial and Quantitative Analysis*. 44: 03.

Field, L. C. and M. Lowry. 2017. *Contrasts in Governance Newly Public Firms Versus Mature Firms*.

Field, L. C., M. Lowry, and A. Mkrtchyan. 2013. “Are Busy Boards Detrimental?” *Journal of Financial Economics*. 109(1): 63–82.

Field, L. C. and D. P. Sheehan. 2004. "IPO Underpricing and Outside Blockholdings". *Journal of Corporate Finance*. 10(2): 263–280.

Gao, H., J. Harford, and K. Li. 2013a. "Determinants of Corporate Cash Policy: Insights from Private Firms". *Journal of Financial Economics*. 109(3): 623–639.

Gao, X., J. R. Ritter, and Z. Zhu. 2013b. "Where Have All the IPOs Gone?" *Journal of Financial and Quantitative Analysis*. 48: 06.

Geczy, C. C., D. K. Musto, and A. V. Reed. 2002. "Stocks Are Special Too: An Analysis of the Equity Lending Market". *Journal of Financial Economics*. 66(2): 241–269.

Gilje, E. and J. Taillard. 2016. *Does Hedging Affect Firm Value? Evidence from a Natural Experiment.*

Goldstein, M. A., P. Irvine, and A. Puckett. 2011. "Purchasing IPOs with Commissions". *Journal of Financial and Quantitative Analysis*. 46: 05.

Gompers, P. A. 1996. "Grandstanding in the Venture Capital Industry". *Journal of Financial Economics*. 42(1): 133–156.

Gompers, P. A. and J. Lerner. 2003. "The Really Long-Run Performance of Initial Public Offerings: the Pre-Nasdaq Evidence". *The Journal of Finance*. 58(4): 1355–1392.

Gompers, P. and J. Lerner. 1998. "Venture Capital Distributions: Short-Run and Long-Run Reactions". *The Journal of Finance*. 53(6): 2161–2183.

Gonzalez, L. and C. James. 2007. "Banks and Bubbles: How Good are Bankers at Spotting Winners?" *Journal of Financial Economics*. 86(1): 40–70.

Griffin, J. M., J. H. Harris, and S. Topaloglu. 2007. "Why are IPO Investors Net Buyers through Lead Underwriters?" *Journal of Financial Economics*. 85(2): 518–551.

Grinblatt, M. and C. Y. Hwang. 1989. "Signalling and the Pricing of New Issues". *The Journal of Finance*. 44(2): 393–420.

Grossman, S. J. and J. E. Stiglitz. 1980. "On the Impossibility of Informationally Efficient Markets". *The American Economic Review*. 70(3): 393–408.

Grullon, G., Y. Larkin, and R. Michaely. 2017. The Disappearance of Public Firms and the Changing Nature of US Industries.

Habib, M. A. and A. P. Ljungqvist. 2001. "Underpricing and Entrepreneurial Wealth Losses in IPOs: Theory and Evidence". *Review of Financial Studies*. 14(2): 433–458.

Hanley, K. W. 1993. "The Underpricing of Initial Public Offerings and the Partial Adjustment Phenomenon". *Journal of Financial Economics*. 34(2): 231–250.

Hanley, K. W. and G. Hoberg. 2010. "The Information Content of IPO Prospectuses". *Review of Financial Studies*. 23(7): 2821–2864.

Hanley, K. W. and G. Hoberg. 2012. "Litigation Risk, Strategic Disclosure and the Underpricing of Initial Public Offerings". *Journal of Financial Economics*. 103(2): 235–254.

Hansen, R. S. 2001. "Do Investment Banks Compete in IPOs?: the Advent of the "7% Plus Contract"". *Journal of Financial Economics*. 59(3): 313–346.

Hao, Q. 2007. "Laddering in Initial Public Offerings". *Journal of Financial Economics*. 85(1): 102–122.

He, P. 2007. "a Theory of IPO Waves". *Review of Financial Studies*. 20(4): 983–1020.

Hellmann, T. and M. Puri. 2002. "Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence". *The Journal of Finance*. 57(1): 169–197.

Helwege, J. and N. Liang. 2004. "Initial Public Offerings in Hot and Cold Markets". *Journal of Financial and Quantitative Analysis*. 39(3): 541–569.

Hermalin, B. E. and M. S. Weisbach. 1998. "Endogenously Chosen Boards of Directors and Their Monitoring of the CEO". *The American Economic Review*: 96–118.

Hermalin, B. and M. Weisbach. 2003. "Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature." *Economic Policy Review*. 9: 39–68.

Hoberg, G. 2007. "The Underwriter Persistence Phenomenon". *The Journal of Finance*. 62(3): 1169–1206.

Hochberg, Y. V. 2012. "Venture Capital and Corporate Governance in the Newly Public Firm". *Review of Finance*. 16(2): 429–480.

Hochberg, Y. V., A. Ljungqvist, and Y. Lu. 2007. "Whom You Know Matters: Venture Capital Networks and Investment Performance". *The Journal of Finance*. 62(1): 251–301.

Hsieh, J., E. Lyandres, and A. Zhdanov. 2011. "A Theory of Merger-Driven IPOs". *Journal of Financial and Quantitative Analysis*. 46: 05.

Ibbotson, R. G. and J. F. Jaffe. 1975. "Hot Issue Markets." *The Journal of Finance*. 30(4): 1027–1042.

Ibbotson, R. G., J. L. Sindelar, and J. R. Ritter. 1988. "Initial Public Offerings". *Journal of Applied Corporate Finance*. 1(2): 37–45.

Ibbotson, R. G., J. L. Sindelar, and J. R. Ritter. 1994. "The Market's Problems with the Pricing of Initial Public Offerings". *Journal of Applied Corporate Finance*. 7(1): 66–74.

Iliev, P. and M. Lowry. 2015. "Are Mutual Funds Active Voters?" *Review of Financial Studies*. 28(2): 446–485.

Iliev, P. and M. Lowry. 2016. *Venturing Beyond the IPO Venture Capitalists' Investments in Newly Public Firms.*

James, C. and J. Karceski. 2006. "Strength of analyst coverage following IPOs". *Journal of Financial Economics*. 82: 1–34.

James, C. and P. Wier. 1990. "Borrowing Relationships, Intermediation, and the Cost of Issuing Public Securities". *Journal of Financial Economics*. 28(1): 149–171.

Jenkinson, T. and H. Jones. 2004. "Bids and Allocations in European IPO Bookbuilding". *The Journal of Finance*. 59(5): 2309–2338.

Jenkinson, T. and H. Jones. 2009. "Competitive IPOs". *European Financial Management*. 15(4): 733–756.

Jenkinson, T., H. Jones, and F. Suntheim. 2016. Quid Pro Quo? What Factors Influence IPO Allocations to Investors?

Jenkinson, T., A. D. Morrison, and W. J. Wilhelm. 2006. "Why are European IPOs so Rarely Priced Outside the Indicative Price Range?" *Journal of Financial Economics*. 80(1): 185–209.

Johnson, W. C., J. M. Karpoff, and S. Yi. 2015. “The Bonding Hypothesis of Takeover Defenses: Evidence from IPO Firms”. *Journal of Financial Economics*. 117(2): 307–332.

Johnson, W. C., J. M. Karpoff, and S. Yi. 2016. *The Lifecycle Effects of Firm Takeover Defenses*.

Kadan, O., L. Madureira, R. Wang, and T. Zach. 2009. “Conflicts of Interest and Stock Recommendations: The Effects of the Global Settlement and Related Regulations”. *Review of Financial Studies*. 22(10): 4189–4217.

Kandel, S., O. Sarig, and A. Wohl. 1999. “The Demand for Stocks: An Analysis of IPO Auctions”. *Review of Financial Studies*. 12(2): 227–247.

Khanna, N., T. H. Noe, and R. Sonti. 2008. “Good IPOs Draw in Bad: Inelastic Banking Capacity and Hot Markets”. *Review of Financial Studies*. 21(5): 1873–1906.

Kim, H. and R. Michaely. 2017. Are Dual-Class Firms Riskier?. *Working paper*.

Kim, W. and M. S. Weisbach. 2008. “Motivations for Public Equity Offers: An International Perspective”. *Journal of Financial Economics*. 87(2): 281–307.

Krigman, L., W. H. Shaw, and K. L. Womack. 2001. “Why Do Firms Switch Underwriters?” *Journal of Financial Economics*. 60(2): 245–284.

Krishnan, C. N. V., V. I. Ivanov, R. W. Masulis, and A. K. Singh. 2011. “Venture Capital Reputation, Post-IPO Performance, and Corporate Governance”. *Journal of Financial and Quantitative Analysis*. 46: 05.

Kutsuna, K. and R. Smith. 2004. “Why Does Book Building Drive Out Auction Methods of IPO Issuance? Evidence from Japan”. *Review of Financial Studies*. 17(4): 1129–1166.

Kwon, S., M. Lowry, and Y. Qian. 2017. “Mutual Fund Investments in Private Firms”. *Working paper*.

Lee, P. M. and S. Wahal. 2004. “Grandstanding, Certification and the Underpricing of Venture Capital Backed IPOs”. *Journal of Financial Economics*. 73(2): 375–407.

Lewellen, K. 2006. "Risk, Reputation, and IPO Price Support". *The Journal of Finance*. 61(2): 613–653.

Liu, X. and J. R. Ritter. 2010. "The Economic Consequences of IPO Spinning". *Review of Financial Studies*. 23(5): 2024–2059.

Liu, X. and J. R. Ritter. 2011. "Local Underwriter Oligopolies and IPO Underpricing". *Journal of Financial Economics*. 102(3): 579–601.

Ljungqvist, A., F. Marston, and W. J. Wilhelm. 2006a. "Competing for Securities Underwriting Mandates: Banking Relationships and Analyst Recommendations". *The Journal of Finance*. 61(1): 301–340.

Ljungqvist, A., F. Marston, and W. J. Wilhelm. 2009. "Scaling the Hierarchy: How and Why Investment Banks Compete for Syndicate Co-Management Appointments". *Review of Financial Studies*. 22(10): 3977–4007.

Ljungqvist, A., V. Nanda, and R. Singh. 2006b. "Hot Markets, Investor Sentiment, and IPO Pricing". *The Journal of Business*. 79(4): 1667–1702.

Ljungqvist, A. and W. J. Wilhelm. 2003. "IPO Pricing in the Dot-Com Bubble". *The Journal of Finance*. 58(2): 723–752.

Lo, A. W. and J. Wang. 2009. "Stock Market Trading Volume". *Handbook of Financial Econometrics*. 2: 241–342.

Loughran, T. and J. R. Ritter. 1995. "The New Issues Puzzle". *The Journal of Finance*. 50(1): 23–51.

Loughran, T. and J. R. Ritter. 2000. "Uniformly Least Powerful Tests of Market Efficiency". *Journal of Financial Economics*. 55(3): 361–389.

Loughran, T. and J. R. Ritter. 2002. "Why Don't Issuers Get Upset About Leaving Money On the Table in IPOs?" *The Review of Financial Studies*. 15(2): 413–443.

Loughran, T. and J. R. Ritter. 2004. "Why Has IPO Underpricing Changed Over Time?" *Financial Management*: 5–37.

Lowry, M. 2003. "Why Does IPO Volume Fluctuate So Much?" *Journal of Financial Economics*. 67(1): 3–40.

Lowry, M., R. Michaely, and E. Volkova. 2016. Information Revelation Through Regulatory Process Interactions Between the SEC and Companies Ahead of the IPO.

Lowry, M. and K. J. Murphy. 2007. “Executive Stock Options and IPO Underpricing”. *Journal of Financial Economics*. 85(1): 39–65.

Lowry, M., M. S. Officer, and G. W. Schwert. 2010. “The Variability of IPO Initial Returns”. *The Journal of Finance*. 65(2): 425–465.

Lowry, M. and G. W. Schwert. 2002. “IPO Market Cycles: Bubbles Or Sequential Learning?” *The Journal of Finance*. 57(3): 1171–1200.

Lowry, M. and G. W. Schwert. 2004. “Is the IPO Pricing Process Efficient?” *Journal of Financial Economics*. 71(1): 3–26.

Lowry, M. and S. Shu. 2002. “Litigation Risk and IPO Underpricing”. *Journal of Financial Economics*. 65(3): 309–335.

Manso, G. 2011. “Motivating Innovation”. *The Journal of Finance*. 66(5): 1823–1860.

Maug, E. 2001. “Ownership Structure and the Life-Cycle of the Firm: a Theory of the Decision to Go Public”. *European Finance Review*. 5(3): 167–200.

Megginson, W. L. and K. A. Weiss. 1991. “Venture Capitalist Certification in Initial Public Offerings”. *The Journal of Finance*. 46(3): 879–903.

Michaely, R. and W. H. Shaw. 1994. “The Pricing of Initial Public Offerings: Tests of Adverse-Selection and Signaling Theories”. *Review of Financial Studies*. 7(2): 279–319.

Michaely, R. and K. L. Womack. 1999. “Conflict of Interest and the Credibility of Underwriter Analyst Recommendations”. *Review of Financial Studies*. 12(4): 653–686.

Miller, E. M. 1977. “Risk, Uncertainty, and Divergence of Opinion”. *The Journal of Finance*. 32(4): 1151–1168.

Mitchell, M. L. and E. Stafford. 2000. “Managerial Decisions and Long-Term Stock Price Performance”. *The Journal of Business*. 73(3): 287–329.

Modigliani, F. and M. H. Miller. 1958. “The Cost of Capital, Corporation Finance and the Theory of Investment”. *The American Economic Review*: 261–297.

Modigliani, F. and M. H. Miller. 1961. “Dividend Policy, Growth, and the Valuation of Shares”. *The Journal of Business*. 34(4): 411–433.

Muscarella, C. J. and M. R. Vetsuypens. 1989. "a Simple Test of Baron's Model of IPO Underpricing". *Journal of Financial Economics*. 24(1): 125–135.

Myers, S. C. and N. S. Majluf. 1984. "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have". *Journal of Financial Economics*. 13(2): 187–221.

Nagel, S. 2005. "Short Sales, Institutional Investors and the Cross-Section of Stock Returns". *Journal of Financial Economics*. 78(2): 277–309.

Nahata, R. 2008. "Venture Capital Reputation and Investment Performance". *Journal of Financial Economics*. 90(2): 127–151.

Nimalendran, M., J. R. Ritter, and D. Zhang. 2007. "Do Today's Trades Affect Tomorrow's IPO Allocations?" *Journal of Financial Economics*. 84(1): 87–109.

Ofek, E. and M. Richardson. 2003. "Dotcom Mania: the Rise and Fall of Internet Stock Prices". *The Journal of Finance*. 58(3): 1113–1137.

Pagano, M., F. Panetta, and L. Zingales. 1998. "Why Do Companies Go Public? An Empirical Analysis". *The Journal of Finance*. 53(1): 27–64.

Pástor, L., L. Taylor, and P. Veronesi. 2009. "Entrepreneurial learning, the IPO decision, and the post-IPO drop in firm profitability". *Review of Financial Studies*. 22(8): 3005–3046.

Pástor, L. and P. Veronesi. 2005. "Rational IPO Waves". *The Journal of Finance*. 60(4): 1713–1757.

Patatoukas, P. N., R. G. Sloan, and A. Y. Wang. 2016. Short-Sales Constraints and Aftermarket IPO Pricing.

Pontiff, J. and A. Woodgate. 2008. "Share Issuance and Cross-sectional Returns". *Journal of Finance*. 63(2): 921–945.

Pukthuanthong, K., R. Roll, and T. Walker. 2007. "How Employee Stock Options and Executive Equity Ownership Affect Long-Term IPO Operating Performance". *Journal of Corporate Finance*. 13(5): 695–720.

Purnanandam, A. K. and B. Swaminathan. 2004. "Are IPOs Really Underpriced?" *Review of Financial Studies*. 17(3): 811–848.

Reuter, J. 2006. “Are IPO Allocations for Sale? Evidence from Mutual Funds”. *The Journal of Finance*. 61(5): 2289–2324.

Ritter, J. 2011. “Equilibrium in the IPO market”. *Annual Review of Financial Economics*. 3: 347–374.

Ritter, J. 2017. *Website*. URL: https://site.warrington.ufl.edu/ritter/ipo-data/.

Ritter, J. R. 1991. “The Long-Run Performance of Initial Public Offerings”. *The Journal of Finance*. 46(1): 3–27.

Ritter, J. R. and I. Welch. 2002. “a Review of IPO Activity, Pricing, and Allocations”. *The Journal of Finance*. 57(4): 1795–1828.

Ritter, J. R. and D. Zhang. 2007. “Affiliated Mutual Funds and the Allocation of Initial Public Offerings”. *Journal of Financial Economics*. 86(2): 337–368.

Rock, K. 1986. “Why New Issues Are Underpriced”. *Journal of Financial Economics*. 15(1-2): 187–212.

Romano, R. 1985. “Law as a Product: Some Pieces of the Incorporation Puzzle”. *Journal of Law, Economics, and Organization*. 1(2): 225–283.

Schenone, C. 2004. “The Effect of Banking Relationships On the Firm’s IPO Underpricing”. *The Journal of Finance*. 59(6): 2903–2958.

Schnitzlein, C., M. Shao, and A. Sherman. 2016. “Come On In, the Water’s Fine!” An Experimental Examination of Hybrid IPO Auctions with a Public Pool. *Working Paper*.

Sherman, A. E. 2000. “IPOs and Long-Term Relationships: An Advantage of Book Building”. *Review of Financial Studies*. 13(3): 697–714.

Sherman, A. E. 2005. “Global Trends in IPO Methods: Book Building Versus Auctions with Endogenous Entry”. *Journal of Financial Economics*. 78(3): 615–649.

Sherman, A. E. and S. Titman. 2002. “Building the IPO Order Book: Underpricing and Participation Limits with Costly Information”. *Journal of Financial Economics*. 65(1): 3–29.

Smart, S. B. and C. J. Zutter. 2003. “Control as a Motivation for Underpricing: a Comparison of Dual and Single-Class IPOs”. *Journal of Financial Economics*. 69(1): 85–110.

Sørensen, M. 2007. “How Smart Is Smart Money? A Two-Sided Matching Model of Venture Capital”. *The Journal of Finance*. 62(6): 2725–2762.

Tinic, S. M. 1988. “Anatomy of Initial Public Offerings of Common Stock”. *The Journal of Finance*. 43(4): 789–822.

Torstila, S. 2003. “The Clustering of IPO Gross Spreads: International Evidence”. *Journal of Financial and Quantitative Analysis*. 38: 03.

Wang, W. and C. Yung. 2011. “IPO Information Aggregation and Underwriter Quality”. *Review of Finance*. 15(2): 301–325.

Welch, I. 1989. “Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings”. *The Journal of Finance*. 44(2): 421–449.

Welch, I. 1992. “Sequential Sales, Learning, and Cascades”. *The Journal of Finance*. 47(2): 695–732.

Yung, C. 2005. “IPOs with Buy-And Sell-Side Information Production: The Dark Side of Open Sales”. *Review of Financial Studies*. 18(1): 327–347.

Yung, C., G. Çolak, and W. Wang. 2008. “Cycles in the IPO Market”. *Journal of Financial Economics*. 89(1): 192–208.

Zingales, L. 1995. “Insider Ownership and the Decision to Go Public”. *The Review of Economic Studies*. 62(3): 425–448.