**Scientific Background: IPO Underpricing in an Era of Financial Giants**

IPO underpricing, a phenomenon where shares are sold in initial public offerings (“IPO”) at a price lower than the market price on the first day of trading, has surged to unprecedented levels in recent years. This research proposal aims to unveil a fundamental antitrust problem within the primary capital markets that sheds light on this phenomenon. Our main hypothesis is that the domination of several large institutional investors over capital markets has empowered them with substantial negotiation power in IPOs. Such power, particularly if utilized collectively and perhaps collusively, can be leveraged by these investors to force lower offer prices in IPOs, leaving substantial value unrealized by issuers.

To validate our hypothesis, we intent to conduct an empirical study aimed at examining the relationship between the joint participation of the largest, most dominant institutional investors in U.S. IPOs and the degree of underpricing. Our preliminary findings from an extensive dataset covering U.S. IPOs strongly supports our hypothesis, indicating a significant positive correlation between the participation of the three largest institutional investors—BlackRock, Vanguard, and Fidelity—and IPO, especially in the last decade. In also intend to identify strategic points in the IPO process where strategic actions by institutional investors can take place under the current regulatory environment, which may lead to price distortions. The final stage of our proposed research will include a comparative analysis of IPO underpricing across several countries, each employs different IPO pricing methods and has varying levels of institutional investor concentration.

The significance of this research extends to various domains. It fills a crucial gap in existing IPO underpricing theories by considering the meteoric rise of institutional investors, which was so far missing from the extensive literature on IPO underpricing. Our hypothesis on the potential existence of buyers’ cartels in capital markets is an important research venue, holding significance within both corporate finance and antitrust literature. Furthermore, our research challenges the efficacy of the traditional book-building method in contemporary U.S. capital markets, pointing to its susceptibility to collusion among dominant institutional investors. This study also contributes to the intersection of antitrust law and capital markets, emphasizing the impact of institutional frameworks and structures on capital markets competitiveness. By exposing the overlooked consequence of concentrated institutional power on IPO underpricing, the research also aims to offer normative recommendations to foster a more transparent and competitive IPO process.

**Research Program:** **IPO Underpricing in an Era of Financial Giants**

**I. Scientific Background**

Over the past few decades, the global stock markets have undergone significant transformations. Traditional retail investors have gradually ceded their positions to large institutional investors (Gilson & Gordon 2013, pp. 874-876; Çelik & Isaksson 2014, p. 54), who now have substantial ownership in listed equities worldwide (Franks 2020, pp. 7-8). This shift toward intermediated markets has been particularly pronounced in the United States where institutional investors own approximately two-thirds of the entire capital market (Lund 2022, p. 93). In a further shift, the asset management industry has become highly concentrated (Ben-David, Franzoni, Moussawi & Sedunov 2021), with a mere twenty-five institutional investors owning more than thirty percent of the U.S. capital market (Kahan & Rock 2019, pp. 939-940). Traditionally, scholarship has focused on the three largest index fund providers—The BlackRock Group (BlackRock), Vanguard Group (Vanguard), and State Street Global Advisors (State Street) who collectively manage 27.5% of equity in the S&P 500 stock index (Bebchuk & Hirst 2022, p. 1558) and are the largest shareholders in 88% of the S&P companies (Fichtner, Heemskerk & Garcia-Bernardo 2017, pp. 288-299). Recently, other scholars have noted that in terms of assets under management (AUM), Fidelity Investments (Fidelity) surpasses State Street, and is positioned to supplant it among the “big three” institutional investors. Combined, these three actors—BlackRock, Vanguard, and Fidelity—oversee assets exceeding $22 trillion (Lund & Robertson 2023, p. 14).

The paradigm shifts to intermediated markets in which powerful institutional investors wield enormous influence over our capital markets and the companies participating in them presents a myriad of economic, political, and social challenges (Bebchuk, Cohen & Hirst 2017; Azar, Tecu & Schmaltz 2018; Coates 2023; Brav, Malenko & Malenko 2023). A rapidly growing stream of theoretical and empirical literature has begun to identify these challenges, exploring how recent market changes may lead to price increases (Azar, Tecu & Schmeltz 2018; Elhauge 2016; Rock & Bluminfeld 2020), shortcomings in monitoring and stewardship (Gilson & Gordon 2013; Lund 2018; Bebchuk & Hirst 2019; Hu, Mitts & Sylvester 2020), inequality (Goshen & Levit 2022), compliance failures (Chaim 2023), and sustainability problems (Christie 2021). However, the twenty-first century capital markets comprised of giant institutional investors may inhibit disruptive effects and markets distortions in wider context that have not been identified, prompting the need for further research.

The proposed project responds to this imperative by revealing a fundamental antitrust problem in capital markets, specifically within the primary market in which companies issue new securities to public shareholders through initial public offerings (IPOs). Our central thesis posits that the domination of several large institutional investors over capital markets has empowered them with substantial negotiation power in IPOs. This negotiation power, particularly if utilized collectively and perhaps collusively, can be leveraged by these investors to force lower offer prices in IPOs, holding explanatory power for the increasing levels of IPO underpricing documented in recent years. IPO underpricing—measured as the difference between the offer price and the stock’s closing price on the first day of trading—has seen unprecedented levels in recent years. Over the past decade, it averaged nearly 25% (Ritter 2022, pp. 11-12), with enormous sums being “left on the table” by issuers, totaling over $90 billion (Ritter 2023, p.3). We intend to theoretically and empirically show that the participation of a core group of institutional investors in IPOs is linked to underpricing and introduce a novel theory explaining this correlation.

IPO underpricing has long been a prominent focus of academic and popular press attention, with an extensive body of research exploring its correlates (Ibbotson & Jaffe 1975; Rock 1986; Ibbotson, Sindelar & Ritter 1988; Grinblatt & Hwang 1989; Welch 1989; Welch 1992; Ritter 1998; Aggarwal 2000; Loughran & Ritter 2002; Aggarwal, Prabhala & Puri 2002; Aggarwal 2003; Corwin & Schultz 2005; Colaco, Ghosh, Knopf & Teall 2009). Yet, the vast existing literature has not fully grasped the primary drivers of underpricing (Katti & Phani 2016, p. 35). In fact, as we will demonstrate in the remainder of this section, some of the leading theories explaining IPO underpricing have limited applicability given current market conditions, economic trends, and the regulatory environment.

1. Information asymmetry theories

Over the years, researchers have identified and modeled information asymmetry as a crucial determinant of IPO underpricing (Baron 1982; Welch 1992; Rock 1986). One of the most prevalent theories in this realm is Rock’s winner’s curse theory, which stipulates that IPO underpricing occurs because the winning bidder in an IPO auction typically overestimates the value of the stock. To avoid the curse of overpaying, the winning bidder may demand a lower price, leading to underpricing (Rock 1986).

However, Rock’s theory encounters significant limitations when applied to today’s capital markets. First, Rock’s theory is primarily relevant to situations with strict pro-rata allocation and is irrelevant to the book-building method (Ljungqvist 2007, p. 389). Today, in the U.S. and in an increasing number of countries, underwriters bringing issues to the market usually follow a book-building approach (Sherman 2005, p. 615; Jovanovic & Szentes 2007, p. 1; Jagannathan, Jirnyi & Sherman 2015, pp. 285-291; Kati & Phani 2016, p. 41), which is designed to mitigate the magnitude of information asymmetry (Ljungqvist 2007, p. 391). Under this method, offer prices are conditioned on nonbinding pre-offer indications of interest, allowing prospective investors to place flexible bids within a predetermined price range (Kati & Phani 2016, p. 43).

Moreover, the prevalent assumption in the literature is that, under certain conditions, the book-building approach incentivizes investors to report their information accurately (Benveniste & Spindt 1989, pp.347-354; Benveniste & Wilhelm 1990, pp. 193-195; Spatt & Srivastava 1991, pp. 710-721). The incentive arises because under book-building, underwriters can allocate IPO shares in a discriminatory fashion, favoring investors who reveal positive information and bid aggressively, while allocating fewer (or no) shares to those who bid conservatively (Ljungqvist 2007, p. 390). Yet, the evidence shows that despite the prevalence of the book-building approach in the United States, IPO underpricing has been persistent over the years and even surged dramatically in the last decade (Ritter 2023). Outside the United Stated, countries that adopted the book-building method for public offerings, including Israel,[[1]](#footnote-1) have also experienced increases in IPO underpricing (Hanafi 2021; Lehmann & Weber 2021; Utami & Irawan 2022).

1. Principal-agent theories

In the context of IPO underpricing, researchers have explored the phenomenon through the lens of two principal-agent relationships. The first pertains to the relationship between issuers (the principals) and underwriters (the agents), while the second involves the managers of issuers (the agents) and post-IPO shareholders (the principals).

*The agency relationship between issuers and underwriters*. Principal-agent theories on IPO underpricing related to the role of underwriters mainly revolve around the argument that underwriters may misuse their discretionary power in allocating shares during IPOs (Loughran & Ritter 2004, pp. 8-9; Ljungqvist 2007, pp. 396-397). This misuse can take the form of favoring specific bidders, mainly institutional investors with whom underwriters maintain business relationships as buy-side investors (Reuter 2006; Loughran & Ritter 2004).

The empirical evidence supports the idea that underwriters’ rent-seeking behavior contributes to IPO underpricing (Ritter 1984; Muscarella & Vetsuypens 1989; Ljungqvist 2003; Ljungqvist & Wilhelm 2003; Loughran & Ritter 2004; Griffin, Harris & Topaloglu 2007). However, the ever-rising participation of institutional investors in IPOs (Field & Lowery 2009, p. 493), who now account for approximately ninety percent of share allocation in IPOs,[[2]](#footnote-2) and the way these investors’ growing domination over the primary market affects the behavior of rent-seeking underwriters, was so far overlooked.

Additionally, while several agency framework IPO theories recognize the market power of underwriters (West 1965; Ritter 1984; Chalk & Peavy 1987) and the potential for collusion between underwriters and informed investors (Biais, Bossaerts & Rochet 2002), the rising market power of the institutional investors to whom underwriters sell shares in IPOs, and the potential for coordination among them, was largely disregarded. Our proposed project intends to address this scholarly gap.

*The agency relationship between issuers and shareholders.* Another principal-agent relationship explored in the context of IPO underpricing, though to a limited extent, is that between issuers and their shareholders. Two principal models with opposing perspectives are available. According to Brennan and Franks, underpricing serves as a means for issuers to entrench managerial control by allocating shares in a way that avoids large monitoring shareholders (Brennan & Franks 1997). The theory’s core premise is that because underpricing leads to excess demand, owner-managers can ration investors and reduce the size of new shareholdings held by large investors who are more likely to scrutinize rent-seeking behavior (Shleifer & Vishny 1986).

For a number of reasons, the Brennan and Franks model in not very useful in explaining underpricing in the current capital market. First, it only holds to the extent that outside investors do not assemble large blocks following the IPO (Linquinest 2007, p. 410). In recent years, however, institutional shareholders own increasingly large stakes in many public companies and have emerged as close monitors and dedicated stewards of their portfolio companies (Fairfax 2011, pp. 115-116, 2-123; Mallow & Sethi 2016, pp. 392-400; Hamdani & Hannes 2019, pp. 983-992). Second, the unprecedented rise of multi-class stock structures among newly public companies (Aggarwal, Eldar, Hochberg & Litov 2022) shields owner-managers from public shareholders (Bebchuk & Kastiel 2017), rendering the Brennan & Franks model less applicable. Perplexingly, a recent study finds that IPO underpricing for multi-class stock is almost twice as large as for that of single-class companies’ stock (Tallarita 2018, p. 7), with multi-class issuers accounting for the vast majority of the most underpriced IPOs in history (Ritter 2022, p. 2). Finally, Brennan and Franks’ model applies to IPO mechanisms involving fixed prices and pro-rata allocation (Lionquisent 2007, pp. 411-412). The argument does not apply in a book-building regime, since issuers can discriminate against conservative investors and omit them from allocations, without having to underprice the offering.

An opposing model to the that of Brennan and Franks’ suggests that an owner-managers may try to limit their ability to obtain private benefits if agency costs cause IPO proceeds and stock market value to decline (Stoughton & Zechner 1998). By optimally rationing the allotment of shares to small investors, owner-managers can capture the benefits associated with better monitoring by large institutional shareholders. However, because monitoring is difficult to observe, a free-rider problem exists and large monitoring shareholders would require compensation in the form of underpricing and favorable allocation treatment (Stoughton & Zechner 1998; Linquisent 2007, p. 411). Although Stoughton and Zechner theory is better configured with the current capital market structure, the view that ownership of large blocks is detrimental to institutional shareholders thus requiring compensation is questionable, as giant institutional investors now hold significant equity stakes in many public companies (Bebchuk & Hirst 2019, p. 13).

1. Signaling theories

In the literature on IPO underpricing, signaling theory plays a role in explaining the degree of underpricing. According to Ibboston, issuers aim to “leave a good taste” in the mouths of investors by deliberately underpricing the issue (Ibbotson 1975, p. 264). Signaling, although costly, serves as a signal to investors and enhances the likelihood of successful future equity offerings on more favorable terms.

The signaling theory has been extended and empirically tested over the years, while also accounting for hot issue period (Allen & Faulhaber 1989), projected cash flows (Grinblatt & Hwang 1989), and future seasoned equity offering (Welch 1989). However, given the shift in the regulatory landscape and the development of information technology, which make information distribution much faster and more accessible, many of the factual assumptions underlying the signaling theories have been somewhat eased (Katti & Phani 2016, p. 40). Moreover, issuers now have a wider array of tools at their disposal to signal their true quality and avoid the need for underpricing (Ljungqvist 2007, pp. 400-401). A noteworthy mechanism that has become relevant nowadays is the use of sophisticated pre-IPO shareholders, such as venture capital (VC) funds to perform a certification-of-quality role (Megginson & Weiss 1991; Lee & Wahal 2004)). The number of VC-backed companies that go public has seen a dramatic increase over the years. Between 2002-2022, 52% of all IPOs, and 70% of tech companies going public, had VC backing (Ritter 2023, p. 3).

1. Behavioral theories

While most of the explanations for IPO underpricing are located within the rational actor framework, some scholars have explored this phenomenon from the perspective of irrational behavior. One prominent explanation within this domain is the information cascade model (Welch 1992). According to the model, investors make investment decisions sequentially: the bids of some investors are made only after observing the bids of earlier investors, disregarding their own information about the investment. This sequential decision-making leads to an informational cascade, wherein early investors gain market power and can demand underpricing as a benefit for committing to the IPO and initiating a positive cascade (Ljungqvist 2007, p. 413). Recent research on institutional investors’ voting behavior provides empirical documentation of the underlying mechanisms behind these cascades, including but not limited to information channel, peer effects, hedging or a combination of the three (Nugerman et al. 2014, Dressler 2020; Dressler & Mugerman 2023).

The cascade theory of IPO underpricing is one of the very few that considers the potential interaction between bidders and its impact on the offer price, an important aspect often overlooked in the literature which we intend to thoroughly explore. However, there are several reasons why this theory may be less relevant in most regimes, including the United States. First, it is less applicable in book-building regimes, where underwriters can maintain secrecy over the development of demand in the book (Ljungqvist 2007, p. 413). Moreover, cascades are less likely to form when investors can freely communicate with each other to learn about the entire distribution of signals (Linquistet 2007, p. 413; Welch 1992, pp. 699-702). Given the regulatory freedom and practical ease with which investors in the United States can communicate with each other during price discovery (Chaim 2023, pp. 56-57) and the growing evidence on their tendency to communicate about their investment decisions (Hong, Kubik & Stein 2005; Pool, Stoffman & Yonker 2015; Chemmanur, Huang, Xie & Zhu 2022), the informational cascade explanation is less probable. In fact, we believe that the likelihood of communication between institutional bidders during price discovery is now greater than ever. Many institutional investors are repeat players who interact with each other in numerous offerings (Brown & Kovbasyuk 2016). Some of these investors have recently taken similar stances on a variety of corporate issues (Opler & Sokobin 1995, p. 4; Chaim 2023, pp. 11-14), including those related to IPO companies (Sharfman 2018, pp. 1-6). Moreover, given the relaxed incentives of several prominent institutional investors to compete with each other (Bebchuk, Cohen & Hirst 2017, pp. 97-100), the cross-ownership of certain institutions in each other (Morenoff 2022), and the business relationships among them (Chaim 2023, p. 38), many investors now have strategic reasons to coordinate with each other in order to force lower offer prices. These crucial accounts, which we intent to carefully examine, are virtually absent from the theoretical and empirical literature on IPO underpricing currently available.

**II. Objectives and Expected Significance**

Objectives:

The proposed project will introduce a novel theory of IPO underpricing that addresses recent shifts in the capital market landscape. This theory identifies the escalating market power of several major institutional investors as a primary driver of IPO underpricing. We aim to conduct theoretical and empirical analyses to illuminate how the participation of these dominant market actors in IPOs exacerbates underpricing and pinpoint key junctures in the IPO process where strategic actions by institutional investors are likely to occur. This research endeavor promises to make substantial contribution by enhancing our understanding of the underpricing phenomenon and exposing shortcomings in the current regulatory and economic climate. This, in turn, would enable us to offer normative recommendations aimed at fostering a more transparent and competitive IPO process in an era dominated by powerful financial giants. By shedding light on the pivotal role of institutional investors in IPO underpricing, we further aim to draw attention to an overlooked, troubling consequence of the increasing concentration of power in the hand of a core group of large institutional investors.

Significance:

Our proposed project carries significant contributions to legal scholarship. First, our theory aims to fill a notable missing piece in the IPO underpricing puzzle. Despite the well-documented and persistent nature of IPO underpricing, there remains a gap in the contemporary understanding of this phenomenon (Katti & Phani 2016, p. 35; Ljungqvist & Wilhelm 2003, p. 723). The crux of the issue lies in the failure of the current theories to account for the meteoric rise of institutional investors (Goshen & Hannes 2019, pp. 304-308) and the growing participation of these investors in the primary market (Michel, Oded & Shaked 2018, p. 1303), some of whom are repeat buyers in IPOs (Michel, Oded & Shaked 2018, p. 1303). We seek to add to the current literature by addressing these important market factors and shifting the spotlight to giant institutional investors with significant market clout.

Second, our theory underscores the importance of the institutional framework within which IPOs are conducted and demonstrates that its bearing on the capital raising process largely depends on the equity market structure. Specifically, we call into question the efficiency of the traditional book-building method in the modern U.S. capital markets. The process was originally devised to accomplish price discovery in a cost-effective way by enabling issuers and underwriters to incorporate into the final offer price collective market information from sophisticated institutional investors (Benveniste & Spindt 1989, pp. 343-362), aligning it more closely with the intrinsic value of the stock (Biais & Faugeron-Crouzet 2002). We intend to show that this process fails to serve its purpose when many of the key participants in the process are concentrated, interconnected institutional investors who possess collective market power over issuers and underwriters.

Third, the proposed project adds a significant dimension to the case law and literature analyzing the intersection between capital markets and antitrust law (Rock 1992; Piraino 2008; Waller 2011; Chaim 2023). Traditionally, policymakers and courts have either neglected or been reluctant to apply competition law principles to capital markets, upholding a somewhat incongruous separation between these two legal fields (Crane 2008). By demonstrating how anticompetitive conduct by powerful bidders in IPOs threatens fundamental objectives of both antitrust law and securities regulations, we will provide economic and legal justifications for antitrust jurisprudence of capital markets to ensure competitive processes in these markets.

Fourth, our account aims to uncover a major peril associated with the growing power and concentration of institutional investors, complementing the expending literature that explores the market distortions and suboptimal economic outcomes caused by these capital market shifts (Gilson & Gordon 2013; Bebchuk, Cohen & Hirst 2017; Azar, Tecu & Schmeltz 2018; Schmeltz 2018; Bebchuk & Hirst 2019; Christie 2021; Azar, Marinescu & Steinbaum 2022; Goshen & Levit 2022; Brav, Malenko & Malenko 2023; Chaim 2023; Chaim 2023; Coates 2023). The potential capacity of dominant institutional investors to disrupt competition in the primary market, which we intend to empirically substantiate, suggests that the current focus of antitrust scholarship in the context of institutional ownership should extend beyond product (Elhauge 2016; Azar, Tecu & Schmeltz 2018; Elhauge 2020; Rock & Bluminfeld 2020) and labor (Azar, Marinescu & Steinbaum 2022; Goshen & Levit 2022) markets, to encompass capital markets as well.

Finally, once we establish the explanatory power of our theory in deriving IPO underpricing, we will be able to use it to formulate necessary policy recommendations. We will advocate for a reform of the U.S. book-building process to make it less susceptible to the potential abuse of market power by dominant institutional investors. Within this context, the institution of devices in the process that can impede strategic, coordinated behavior during price discovery, is imperative.

Our theoretical predictions and empirical findings on underpricing in book-built IPOs are expected to have bearing to equity markets worldwide. In recent decades, the book-building method has gained popularity in many countries, whereas sealed-bid IPO auctions have been abandoned (Sherman 2005, p. 615; Jovanovic & Szentes 2007, p. 1; Jagannathan & Sherman 2015, pp. 285-291; Kati & Phani 2016, p. 41). Policymakers tend to focus mainly on the advantages of registries but fail to explore its potential vulnerability to strategic behavior by large institutional investors. Hence, our proposed project should serve as a clarion call to policymakers outside the United States, inspiring them to evaluate the utility of this method in their respective regions.

## III. Detailed Description of the Proposed Research

### A. Working Hypothesis

Our working hypothesis is the following: Large, dominant institutional investors utilize their aggregated market power to pressure issuers to sell shares in IPOs at a price lower than their intrinsic value, holding explanatory power for the unprecedent levels of IPO underpricing documented in the last two decades.

Our initial focus would be on BlackRock, Vanguard, and Fidelity, who are currently the three largest institutional investors in terms of AUM (Lund & Robertson 2023, p. 2). In that context, it should be noted that until recently, the three largest asset management institutions were BlackRock, Vanguard, and State Street (Bebchuk & Hirst 2022; Fichtner, Heemskerk & Garcia-Bernardo 2017, pp. 288-299). Yet, as Lund & Robertson (2023) have noted, in the last few years Fidelity has surpassed State Street Global Investors in assets under management (AUM), reaching $4.5 trillion compared to State Street’s $4.1 trillion. More importantly, with respect to our project of assessing institutional investors’ impact on IPO, the importance of Fidelity is greater than that of State Street. First, in terms of equity under management (EUM), the gap between fidelity and State Street is starker: Fidelity has over $2.5 trillion of EUM compared to State Street’s $955 million (Lund & Robertson 2023. P. 14). Even the gap between Fidelity and the largest institutional shareholder, BlackRock, is not significant when comparing equity holdings: BlackRock holds $3.2 trillion of EUM compared to Fidelity’s $2.5 trillion (Lund & Robertson 2023, p. 14). Furthermore, when comparing the magnitude of actively managed mutual funds, which are more relevant to the IPO market—index funds typically do not invest in IPOs as issuers new to the public market are not automatically added to market indices—the prominence of Fidelity is even more pronounced. Fidelity has $4.18 trillion in actively managed mutual funds, widening the gap from State Street, which manages only $1.23 trillion, and narrowing the gap from BlackRock, which has $5.7 trillion (Lund & Robertson 2023, p. 14). The dominance of Fidelity, especially with respect to its potential impact on the IPO market, leads us to focus on BlackRock, Vanguard and Fidelity and their joint impact on the underpricing of IPOs.

Our hypothesis of collusion between a group of powerful institutional investors leans on two previous scholarly findings in the field of corporate law and capital markets. First, several recent empirical studies have shown that a core group of large institutional investors exploit their collective power and influence over corporate America to promote anticompetitive behavior by their portfolio companies in markets in which the companies compete (Azar, Tecu & Schmaltz 2018; Azar, Raina & Schmaltz 2019). Our hypothesis extends the existing literature, demonstrating that these large investors may also use their collective power to promote anticompetitive behavior in markets in which they compete with each other. Second, recent literature identifies signs of coordination among large institutional investors, who tend to vote in lockstep and synchronize their positions on a variety of environmental, social, and governance issues related to their portfolio companies (Rock & Rubinfeld 2022, p. 202; Bebchuk & Hirst 2022, p. 1565; Cook 2022; Chaim 2023, pp. 1-3).

The observation that influential investors coordinate their positions as shareholders in the primary market invites an investigation into whether coordination occurs in other contexts, including the primary market. In fact, there are reasons to think that collaboration in the primary market is more probable. While in the secondary market there are regulatory limitations on communication between shareholders that may trigger disclosure requirements, there are no equivalent restrictions in the primary market. The absence of such restrictions on communications between bidders during price discovery makes this process a fertile ground for collusion. Historically, the enablement of communication between participants at this stage were aimed at promoting a more accurate pricing of an offering. However, in modern capital markets it raises anticompetitive concerns. When many of the bidders in IPOs are large, powerful institutional investors—many of whom share ownership links or maintain business relationships—that interact with each other in multiple offerings, the freedom to communicate may facilitate a collusive behavior.

### B. Research Design and Methods

Our research will be comprised of three stages. The first and central stage of our research is to examine the relationship between the joint participation of several dominant institutional investor, namely the three largest institutional investors (BlackRock, Vanguard, and Fidelity) in U.S. IPOs and the degree of underpricing. A positive correlation between the joint participation of these three financial giants, will provide empirical support to the existence of collusion between these institutional investors, giving rise to a cartel of bidders in the primary market that depress offering prices.

In the second stage, we will examine whether additional market actors participate in this bidders’ cartel. Although many scholars tend to focus on the power of BlackRock, Vanguard, Fidelity and State Street (Fichtner, Heemskerk & Garcia-Bernardo 2017, pp. 288-299; Strine 2020; Bebchuk & Hirst 2022), some have also looked into the market power of other dominant institutional investors. For instance, Kahan & Rock (2019, pp. 939-940) have emphasized the power of the twenty-five largest institutional investors, something we also intend to explore in the context of IPO underpricing.

Moreover, as we noted above, the size of AUM is not necessarily the only factor that reflects the potential influence of various institutional investors on IPO pricing. There are other relevant factors, such as the AUM invested in equities; the ratio between the institutional investors’ active and passive funds; the degree of geographic concentration of its investments and its general investment strategy (that is, the degree of the funds’ sophistication and its utilization of “outside the box” strategies). Brown & Kovbaynuk (2016) have identified various institutional investors, which are not necessarily large in terms of AUM, as key investors in IPOs that may impact underpricing. Their focus was on those institutional investors with the highest participation in IPOs.

When considering these various characteristics, we may detect other potentially powerful institutional investors that may influence the price of an offer, even if the AUM is significantly lower than that of the three largest institutional investors. For instance, based on Brown & Kovbaynuk (2016), and the features listed above, T. Rowe Price, J.P. Morgan Investment Management, Janus Capital, and PNC Bank can also potentially be part of a powerful cartel of bidders that induces underpricing. We would also like to examine the prospect that large pension funds, such as California Public Employee’ Retirement System (CalPERS), California State Teachers’ Retirement System (CalSTRS), and New York City Employees’ Retirement System (NYCERS)—many of which maintain close business relations with large mutual funds as sponsors—are also participating in the cartel.

We will use a similar strategy to the one used in the first stage to find additional cartel members and their influence on IPO underpricing. A logistical regression will be used to determine whether the participation of a few of these “suspect” institutional investors in concert with other cartel members we have already identified is correlated with an increase in IPO underpricing while controlling for the factors we have noted in the first stage. For the purpose of achieving this goal, we also intend to conduct informal interviews with investment bankers, accountants and especially lawyers that accompany the book-building process in order to identify potential cartel members that we should examine more closely.

The third stage aimed to investigate how, depending on the IPO strategy used, the level of IPO underpricing increases when institutional investors identified as cartel members are participating. We anticipate that the presence of these investors will significantly elevate underpricing levels, particularly in book-built IPOs compared to other methods, due to the susceptibility of book-built IPOs to strategic interactions among bidders. The fourth stage involves a comparative analysis of IPO underpricing across several countries, emphasizing the impact of institutional frameworks on underpricing levels. As part of this analysis, we focus outlier countries with notably high and low levels of underpricing. Specifically, our study will look at four countries, two within Europe and two outside. In Europe, we will examine Greece, which has exceptionally high average underpricing of 50.8% (Ritter 2023) and Austria, which displays a remarkably low underpricing of 5.2% (Ritter 2023). Outside Europe, our analysis will include the United Arab Emirates, exhibiting an average underpricing of 186.4% (Ritter 2023), and Canada, where the average underpricing stands at 6.8% (Ritter 2023). Our primary focus will be on the bidding mechanisms employed, particularly examining whether these countries utilize the book-building method or alternative approaches and what are the specific characteristics of the bidding process in each system. Additionally, we will consider structural differences in their capital markets, including the magnitude and concentration in the asset management industry. Our research will encompass countries that have transitioned from one bidding system to another, investigating how such shifts impact the magnitude of underpricing. For instance, we will draw insights from the Israeli case, where recent regulatory changes enabling widespread book-building in IPOs coincided with a marked increase in underpricing. This phase will culminate in policy recommendations derived from the collective findings of all three research stages. These recommendations will highlight optimal institutional settings that can effectively minimize underpricing while considering associated costs.

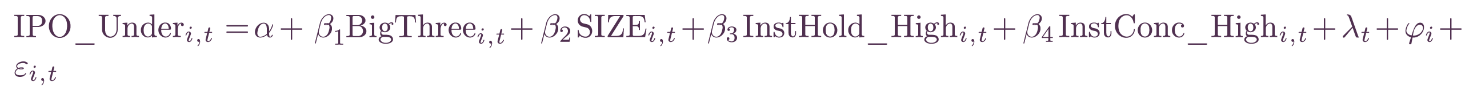
In each stage, our intention is to generate at least one article. Specifically, in the first stage, our goal is to produce two articles—one for a finance journal and one for a general law review. For the subsequent two stages, our primary aim is publication in legal journals, preferably peer-reviewed, although law reviews are also a viable option.

**C. Preliminary Results**

At the current stage of our research, we are conducting an in-depth analysis of IPOs of U.S. enterprises that took place between 2002 and 2022. We have accessed comprehensive data from the Thompson Financial Securities Database Corporation (SDC) and have cross-referenced it with the Audit Analytics Initial Public Offerings (Audit Analytics) databases available on Wharton Research Data Services (WRDS) to obtain the closing stock prices at the end of the first trading day on the stock exchange. We have also incorporated data on individual institutional investor holdings, extracted from 13F filings available through Thomson Reuters. Additionally, we have gathered various firm-specific characteristics and accounting data from Compustat. Our final dataset comprises a total of 2,692 IPOs, encompassing all instances where we successfully gathered data from all relevant sources.

The initiation of our sample period in 2002 is informed by several considerations. Firstly, the last two decades, particularly the most recent one, have witnessed a significant uptick in institutional ownership of public equity (Bebchuk & Hirst, 2019, p. 5). This substantial increase in institutional ownership could confer considerable influence and market power upon these major stakeholders within capital markets, potentially fostering a trend towards cartelistic behavior. Secondly, our reliance on the Audit Analytics databases, which exclusively covers U.S. registered IPOs on major exchanges since 2000, necessitates the commencement of our sample period in 2002. It is noteworthy that we deliberately exclude the dot-com bubble period characterized by exceptionally high first-day returns (Ljungqvist & Wilhelm, 2002). This exclusionary measure is undertaken to ensure the robustness and relevance of our analysis, focusing on a period less susceptible to extraordinary market conditions.

Formally, our primary regression specification, which we are currently estimating, can be represented as follows (Equation 1):



In this context, the dependent variable IPO\_Under (representing IPO underpricing) is formally defined as ((price - ipo\_price) / ipo\_price) \* 100, with “price” denoting the stock price at the end of the first public trading day on the stock exchange. The variable “BigThree” is a binary indicator, taking the value of 1 if all three major institutional investors known as the Big Three (BlackRock, Vanguard, and Fidelity) are involved in the IPO deal (have holdings in the company at the end of the quarter following the IPO); otherwise, it takes the value of 0. Additionally, “SIZE” signifies the natural logarithm of the firm’s IPO market valuation (measured in millions of U.S. dollars), computed as the product of the IPO price and the number of outstanding shares. “InstHold\_High” is a dummy variable, equals to 1 if the total institutional holdings in the company at the end of the quarter following the IPO are greater than or equal to the median institutional holdings for all companies in our sample (above or equal to 24.88%); otherwise, it is assigned the value of 0. Similarly, “InstConc\_High” is a dummy variable, taking the value of 1 if the concentration of institutional holdings in the company, as measured by the Herfindahl-Hirschman Index (HHI), at the end of the quarter following the IPO is greater than or equal to the median HHI for all companies in our sample (above or equal to 16.45%); otherwise, it takes the value of 0. The parameter λ represents calendar year fixed effects, while φ represents industry fixed effects (using the Fama-French 12-industry classification). ε denotes the error term, which is robustly clustered at the industry level. Our primary focus lies in investigating the influence of the presence of all three Big Three institutional investors on IPO\_Under, specifically examining the extent to which IPO underpricing is affected by their participation in the IPO process.

Several preliminary regression specifications, as outlined in Equation 1, are presented in Table 1. These preliminary findings indicate that when all big three institutional investors participate in an IPO, IPO underpricing experiences a significant increase of 13 percentage points. This result remains robust even after controlling for factors such as IPO size, high institutional holdings, high concentration of institutional holdings, as well as accounting for year and industry fixed effects. Our preliminary results maintain their robustness when subjected to separate analyses for distinct time intervals—specifically, 2002-2012 and 2012-2022. Importantly, our findings display greater strength in the latter period (2012-2022), in accordance with the hypothesis positing a correlation between IPO underpricing and the escalation of institutional market power.

### E. Expected Pitfalls

Our proposed project faces several challenges. First, one of the main challenges is attributed to the hurdles facing the obtainment of information regarding the shares that institutional investors at the IPO stage. The book-building process is secretive and is designed to maintain the confidentiality of investors’ identity (Katti & Phani, 2016). Institutional investor bids in book-built IPOs are “propriety information that investment banks are loathe to reveal” (Jenkinson & Jones, 2004, p. 2309) and there is no public information regarding the actual allocation of shares to the various bidders.

Our intent is to look into the 13F filings of institutional investment managers in the first quarter following the IPO. These filings include a reporting form which are forms in which institutional investors have to disclose their equity holdings in all listed companies. The utilization of the information disclosed on 13F forms as a proxy for IPO allocation is a common practice in empirical studies on public offerings (Reuter 2006; Binay, Gatchev & Prinsky 2007; Brown & Kovbasyuk 2016). However, it may not necessarily reflect the allocation of shares in the IPO. Indeed, there are indications for a systematic gap between shares allocated in IPOs to institutional investors and their holding a short period later (Field & Lowry 2009). Aggrawal (2003), for example, found that institutional investors flip 26% of their allocated shares in the first day of trading. Likewise, Chemmanur & Hu (2007) found heavy selling by institutional investors throughout the first month of trading. Brown & Kovbasyuk (2016, p. 4), on the other hand, found a high correlation (87%) between the disclosure of holdings on 13F forms and the actual allocation in IPO. They also argue that post-IPO trading activity is not biasing the measure of IPO allocation through 13F disclosure.

Despite the limitation associated with using 13F filings, our methodology is less prone to be biased due to the gap between IPO allocation and 13F holdings. This is largely because most studies that have found a systematic gap between the two demonstrate a one-directional gap: institutional investors tended to flip a large percentage of their initial allocation at the beginning of the trading in the market (Field & Lowry 2009; Aggrawal 2003; Chemmanor & Hu 2007). Thus, institutional investors may have held shares at the initial allocation stage which are not reflected in their holding disclosures in the first quarter. The opposite scenario is less probable (Chemmanor & Hu 2007). It should also be noted that the model in our study is based on a dummy variable of whether an institutional investors held any shares at the time of the first quarterly disclosure after the IPO. As noted above, if an investor held shares according to the first quarterly disclosure, it most likely held those shares at the time of the IPO. The main reason we did not choose an alternative model—looking at the correlation between the aggregated magnitude of the holding of the giant institutional investors and underpricing—is the potential gap between shares held in the IPO and those disclosed in the first quarter after the IPO. The latter would have suffered more from a systematic discrepancy between the size of holdings in the first quarter and the size of holdings in the IPO.

Second, in our exploration of the econometric model (Eq. 1), the consideration of additional control variables is viable. Theoretical frameworks suggest that underwriters might use their position in the book-building process to favor certain business associates, especially institutional investors, through strategic stock allocations (referenced works: Ritter 1984; Benveniste & Spindt 1989; Ljungqvist 2003; Ljungqvist & Wilhelm 2003; Loughran & Ritter 2004; Griffin, Harris & Topaloglu 2007). This suggests a possible nuanced relationship between some underwriters and particular institutional investors, potentially influencing IPO dynamics. Currently, our dataset presents certain constraints, particularly regarding detailed information on underwriters involved in the IPOs. This aspect, along with other potential control variables, merits further investigation. The aim of this grant application is to access additional resources, thereby enriching our research database.

The third pitfall we intend to address is the possibility that there are additional market actors that are part of the bidders’ cartel, which induce IPO underpricing. The second stage of our research is designed to mitigate this concern, but it is not as robust as the first stage—we may miss some important institutional players that are also members of the cartel. We believe that by examining other institutions’ features mentioned above, in addition to the AUM test—such as EAM, the institutional investors’ ratio of passive to active funds and geographic concentration, as well as the general correlation between the institutional investors’ participation in an IPO and underpricing—we will be able to reduce the likelihood of overlooking key members of the cartel. Informal interviews with central players in the primary market should also assist us in identifying potential cartel members.

**Preliminary Regression Results**

**Table 1: Financial Giants and IPO Underpricing**

The table presents the results of Ordinary Least Squares (OLS) regression analyses conducted on IPO Underpricing (IPO\_Under). IPO Underpricing is defined as ((price - ipo\_price) / ipo\_price) \* 100, with "price" representing the closing stock price at the conclusion of the first public trading day on the stock exchange. To mitigate potential outliers, we employ winsorizing on the raw IPO Underpricing data at the 1% and 99% levels. Our primary explanatory variable of interest is “BigThree,” which is a binary indicator =1 when all three major institutional investors collectively known as the Big Three are engaged in the IPO deal (holding shares in the company at the end of the quarter following the IPO). Conversely, it takes the value of 0 when they are not involved. Among our control variables, “SIZE” represents the natural logarithm of the firm's IPO market valuation, measured in millions of U.S. dollars. This valuation is computed as the product of the IPO price and the number of outstanding shares. “InstHold\_High” is a dummy variable set to 1 if the total institutional holdings in the company at the end of the quarter following the IPO exceed or equal the median institutional holdings for all companies in our sample (24.88% or more); otherwise, it equals 0. Similarly, “InstConc\_High” is a binary variable with a value of 1 if the concentration of institutional holdings in the company, as quantified by the Herfindahl-Hirschman Index (HHI), at the end of the quarter following the IPO is greater than or equal to the median HHI for all companies in our sample (16.45% or higher); otherwise, it is set to 0. All model specifications incorporate calendar year fixed effects and industry fixed effects based on the Fama-French 12 industry classification. Columns 4 and 5 in the table present results from subsamples, with Column 4 focusing on the years 2002-2011 and Column 5 concentrating on the years 2012-2022. Standard errors are robust and clustered at the industry level, with significance levels indicated by asterisks: \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
| BigThree | 13.60\*\*\* | 12.62\*\*\* | 13.05\*\*\* | 8.37\*\*\* | 16.67\*\*\* |
|  | (1.26) | (0.71) | (1.48) | (0.41) | (0.80) |
| SIZE |  | 0.72 | 0.72 | -0.07 | 1.48\* |
|  |  | (0.41) | (0.59) | (0.33) | (0.79) |
| InstHold\_High |  |  | -3.90 | -0.40 | -8.70\*\*\* |
|  |  |  | (2.47) | (1.22) | (2.28) |
| InstConc\_High |  |  | -4.00\*\*\* | -3.53\*\* | -4.54\*\*\* |
|  |  |  | (0.60) | (1.34) | (0.58) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Industry and year FE | YES | YES | YES | YES | YES |
| Observations | 2,692 | 2,692 | 2,692 | 1,414 | 1,278 |
| *R*2 | 0.0954 | 0.0960 | 0.1002 | 0.0913 | 0.0732 |

1. Yuval Zook, The Prevalent Method for Issuing New Companies on the Tel Aviv Stock Exchange, Talniri (April 2021), <https://www.talniri.co.il/marketnews/article.asp?mp=153&cat=4&id=102229>. [↑](#footnote-ref-1)
2. Understanding the IPO Share Allocation Process, Fidelity, https://www.fidelity.com/learningcenter/trading-investing/trading/ipo-share-allocation-process. [↑](#footnote-ref-2)