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Who benefits from IPO underpricing? Evidence from hybrid bookbuilding offerings

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EUROPEAN CENTRAL BANK

WORKING PAPER SERIES

NO. 428 / JANUARY 2005

**ECB-CFS RESEARCH NETWORK ON
CAPITAL MARKETS AND FINANCIAL
INTEGRATION IN EUROPE**

**WHO BENEFITS FROM
IPO UNDERPRICING?**

**EVIDENCE
FROM HYBRID
BOOKBUILDING
OFFERINGS**

by Vicente Pons-Sanz



EUROPEAN CENTRAL BANK



In 2005 all ECB publications will feature a motif taken from the €50 banknote.



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WHO BENEFITS FROM IPO UNDERPRICING?

EVIDENCE FORM HYBRID BOOKBUILDING OFFERINGS ¹

by Vicente Pons-Sanz ²

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Abstract

This paper uses a unique sample of 175 Spanish equity offerings from 1985 to 2002 to test who benefits from IPO underpricing and why. Institutions receive nearly 75% of the profits in underpriced issues, while they have to bear only 56% of the losses in overpriced offerings. Superior information regarding first day underpricing cannot completely explain the institutional abnormal profits. Underwriters are better informed about the companies they take public, and use that information to favor their long term clients. The preferential treatment of institutional investors, however, does not come at the expense of retail investors. Retail investors earn positive profits from participating in the new issues market. The driving factor behind the relative retail large allocation in overpriced issues when compared to underpriced offerings is not the underwriter allocation bias in favor of institutional investors. Retail investors subscribe more heavily to underpriced issues, consistent with individuals being partially informed.

JEL classification: G32, G24.

Keywords: Initial Public Offerings, Allocations, Retail Investors, Winner's Curse.

Non-technical summary

Initial public offerings are generally underpriced. While this puzzle has been extensively documented, there is little evidence about who benefits from IPO underpricing and why. Do institutions receive larger allocations than retail investors? Do institutions concentrate on the most underpriced offerings because they are better informed than retail investors or because underwriters use their superior knowledge to intentionally favour their long-term clients? If, on the other hand, allocations to institutional investors are unrelated to first day returns, is it because institutions lack superior ability or because allocations of coveted underpriced shares carry the obligation of participating in cold, overpriced issues?

Recent scandals in the allocation of heavily underpriced offerings make the above questions particularly relevant. The Securities and Exchange Commission, the National Association of Securities Dealers, and the Manhattan U.S. Attorney's Office have found evidence that competition for shares of hundreds of firms that went public since 1999 has been artificially manipulated by the Wall Street investment banks that managed those stock offerings. The lawsuits center on two sets of charges: the securities fraud of unfair IPO allocations; and another set of antitrust charges alleging that several major Wall Street underwriters colluded in determining the allocations. Investment banks demanded kickbacks in the form of higher commissions or increased trading activity in exchange for coveted IPO shares. Banks fueled the Internet bubble by pressuring some large investors who got IPO shares to buy more at higher prices after the stock began trading (a practice known as "laddering"). In either case, these could be considered illegal "tie-ins", since securities laws prohibit quid-pro-quo commission deals.

To analyze the beneficiaries of IPO underpricing, we need data on the allocation of new issues to different investor groups. To differentiate whether any preferential treatment is due to the informational advantage of certain investors or to the discriminatory actions of the underwriter, we need data on investors demand. Understandably, due to the discretionary nature of the US bookbuilding process, underwriters are unwilling to supply information regarding IPO allocations. Given the data limitations on the allocation of U.S. offerings, we attempt to answer the questions regarding who profits from equity offering underpricing and the reason for this preferred status using data on the allocation of Spanish equity offerings. The unique institutional framework of the Spanish new issues provide an unparalleled setting to carry clear cut tests of the questions previously posed. The most important feature of the Spanish IPO market for our purpose is that the distribution of the IPO between retail, local

institutional investors and foreign institutions is stated in the offering prospectus, filed before any investor is allowed to submit his formal application for IPO shares.

Using a sample of all 175 equity offerings, 137 IPOs and 38 secondary equity offerings, that took place in Spain from 1985 to 2002, we document that institutions dominate initial equity offerings allocations in Spanish issues, accounting for an average (median) of 64.74% (58.5%) of the shares offered. The bias in favor of institutional investors is clear once we weight initial allocations by the profit in participating in the equity offerings. While institutional investors receive nearly 75% of the profits in underpriced issues, they have to bear only 56% of the losses. Foreign institutions account for the whole institutional - retail differential.

The preferential treatment of institutional investors is partially due to their informational advantage and by the underwriter bias to favour its long term clients. All investors, however, (retail, local institutions and foreign institutions) subscribe more heavily to underpriced than to overpriced issues, and more to IPOs than to SEOs. This type of behavior is consistent with institutional investors being informed about the future profitability of the issues. The results, however, do not support the idea that retail investors behave as noise traders, subscribing randomly to equity offerings.

One key issue, though, is whether the preferential treatment of institutions comes at the expense of retail investors. We observe that, even though institutions capture the "lion's share" of the money left on the table, retail investors earn, on aggregate, positive profits. The driving factor behind the relative large allocation in overpriced issues when compared to underpriced offerings is not the underwriter allocation bias in favor of institutional investors. Retail investors subscribe more heavily those issues that they believe are marketed at below their expected value; for a fixed retail tranche size, retail behavior results in the allocation pattern described.

Initial public offerings are generally underpriced. While this puzzle has been extensively documented¹, little do we know about who benefits from IPO underpricing and why. Do institutions receive larger allocations than retail investors? Are institutional investors able to "skim the cream" (i.e. avoid overpriced issues)? Do they impose a winner's curse on retail investors? Is the "smart money" really smart, that is, do institutions concentrate on the most underpriced offerings because they are better informed than retail investors or because underwriters use their superior knowledge to intentionally favour their long-term clients? If, on the other hand, allocations to institutional investors are unrelated to first day returns, is it because institutions lack superior ability or because allocations of coveted underpriced shares carry the obligation of participating in cold, overpriced issues? How is information distributed among different investors in the new issues market? Do cascades in IPO demand form? Do retail investors herd on the supposedly superior information of institutions?

Recent scandals in the allocation of heavily underpriced offerings make the above questions particularly relevant. The Securities and Exchange Commission, the National Association of Securities Dealers, and the Manhattan U.S. Attorney's Office have found evidence that competition for shares of hundreds of firms that went public since 1999 has been artificially manipulated by the Wall Street investment banks that managed those stock offerings. The lawsuits center on two sets of charges: the securities fraud of unfair IPO allocations; and another set of antitrust charges alleging that several major Wall Street underwriters colluded in determining the allocations. Investment banks demanded kickbacks in the form of higher commissions or increased trading activity in exchange for coveted IPO shares. Banks fueled the Internet bubble by pressuring some large investors who got IPO shares to buy more at higher prices after the stock began trading (a practice known as "laddering"). In either case, these could be considered illegal "tie-ins", since securities laws prohibit quid-pro-quo commission deals.

To analyze the beneficiaries of IPO underpricing, we need data on the allocation of new issues to different investor groups. To differentiate whether any preferential treatment is due to the informational advantage of certain investors or to the discriminatory actions of the underwriter,

¹Ibbotson (1975), using data on US equity offerings, documents that the first day closing price of new equity issues is on average higher than the price at which the new shares are offered. This finding holds for most time periods and countries analyzed [Loughran et al. (1994)].

we need data on investors demand. Understandably, due to the discretionary nature of the US bookbuilding process, underwriters are unwilling to supply information regarding IPO allocations. Given the data limitations on the allocation of U.S. offerings, we attempt to answer the questions regarding who profits from equity offering underpricing and the reason for this preferred status using data on the allocation of Spanish equity offerings. The unique institutional framework of the Spanish new issues provide an unparalleled setting to carry clear cut tests of the questions previously posed. The most important feature of the Spanish IPO market for our purpose is that the distribution of the IPO between retail, local institutional investors and foreign institutions is stated in the offering prospectus, filed before any investor is allowed to submit his formal application for IPO shares. Given that the underwriter assigns the issue before he can gauge the investors demand, the Spanish IPO market is the ideal setting to test underpricing theories that rest on the underwriter's inferior information [Benveniste and Spindt (1989), Benveniste and Wilhelm (1990)] and allocation bias [Biais et al. (2002)].

Using a sample of all 175 equity offerings, 137 IPOs and 38 secondary equity offerings, that took place in Spain from 1985 to 2002, we document that institutions dominate initial equity offerings allocations in Spanish issues, accounting for an average (median) of 64.74% (58.5%) of the shares offered. The bias in favor of institutional investors is clear once we weight initial allocations by the profit in participating in the equity offerings. While institutional investors receive nearly 75% of the profits in underpriced issues, they have to bear only 56% of the losses. Foreign institutions account for the whole institutional - retail differential.

The preferential treatment of institutional investors is partially due to their informational advantage and by the underwriter bias to favour its long term clients. All investors, however, (retail, local institutions and foreign institutions) subscribe more heavily to underpriced than to overpriced issues, and more to IPOs than to SEOs. This type of behavior is consistent with institutional investors being informed about the future profitability of the issues. The results, however, do not support the idea that retail investors behave as noise traders, subscribing randomly to equity offerings. Retail investors partially herd on the information contained in the demand of institutions. The positive coefficient relationship between retail demand and underpricing is in part driven by the fact that individual investors increase their demand when they observe that institutional demand is high.

One key issue, though, is whether the preferential treatment of institutions comes at the expense of retail investors. We observe that, even though institutions capture the "lion's share" of the money left on the table, retail investors earn, on aggregate, positive profits. The driving factor behind the relative large allocation in overpriced issues when compared to underpriced offerings is not the underwriter allocation bias in favor of institutional investors. Retail investors subscribe more heavily those issues that they believe are marketed at below their expected value; for a fixed retail tranche size, retail behavior results in the allocation pattern described. Retail investors do not seem to behave as the uninformed investors in Rock's (1986) winner's curse model.

The rest of this paper is organized as follows. Section I reviews the asymmetric information based models of IPO underpricing, and shows how this paper contributes to the existing literature on the topic. We discuss the similarities and differences between the institutional characteristics of the Spanish and the more studied U.S. new issues markets in Section II. Section III describes our data. Equity allocations are discussed in Section IV, where we document the excess allocation of underpriced offerings to institutional investors. Section V shows that the preferential treatment of institutions does not come at the expense of retail investors. Information in the new issues markets is discussed in Section VI. Section VII summarizes the main results of the paper.

1 Related Literature.

A thorough review of the different models that attempt to explain the IPO underpricing puzzle is beyond the scope of this paper.² We will focus here on information asymmetry models, that is, models that relate IPO underpricing to the allocation of the offering between differently informed investors.³ Benveniste and Spindt (1989) show that investment banks use the declarations of interest from their client investors to determine the price and allocation of new issues. Underpricing is necessary to induce investors to reveal positive information. However, underwriters can reduce

²For this purpose, see the excellent analysis in Ibbotson and Ritter (1995), Jenkinson and Ljungqvist (2001), and Ritter and Welch (2002).

³A branch of the information asymmetry literature assumes that the issuing firm is better informed about its present value and risk of its future cash flows than investors or the underwriter. The signalling models of Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989) focus on the actions, such as the owners' retention rate and the level of underpricing, that the issuing firm can use to signal its quality. These models are not the focus of this paper.

underpricing by allocating shares repeatedly to a group of regular clients. Given that IPOs are normally underpriced, participating in an allocation normally results in a positive profit. The investment bank can threaten investors that are unwilling to subscribe to badly received IPOs that they will be withdrawn from future offerings. Benveniste and Wilhelm (1990) prove that investment banks can use a combination of price and allocation discrimination to maximize proceeds. The authors analyze the impact that uniform-price restrictions and "evenhanded" allocations of oversubscribed issues have on the cost of soliciting information from regular investors. Without price discrimination, the underwriter is forced to underprice to all investors to place the issue, when only informed investors need to be compensated. To reduce underpricing, the underwriter can bundle IPO allocations with other investment-banking services supplied to regular investors. Sherman (2000), on the other hand, argues that the investment bank's ability to lower underpricing requires favoring regular uninformed, rather than informed, investors. Given that the open offer system limits the underwriter's ability to discriminate between retail investors, the hybrid book building-open offer IPO method should lead to higher underpricing than straight book building.

If issuing firms value pricing accuracy [Sherman and Titman (2002)], in the previous models the underwriter acts in the best interest of the issuer. In both Benveniste and Spindt (1989) and Benveniste and Wilhelm (1990), the preferential allocation of underpriced issues to institutional investors is justified by their superior information. The underwriter, however, can also try to maximize his own utility, at the expense of the issuer. That is, the finding that institutions concentrate on the most underpriced offerings is also consistent with underwriters using their superior knowledge to favour their long-term clients. Biais et al. (2002) analyze the optimal (IPO) mechanism with adverse selection, where institutional investors have private information about the market valuation of the shares, the intermediary has private information about the demand, and the institutional investors and intermediary collude.

If institutions are favored in the allocation of underpriced IPOs, whether it is because they provide the underwriter with helpful information to price the issue or because of the underwriter bias in favor of institutions, then why do individual investors subscribe to equity offerings? Rock (1986) argues that uninformed investors abstain from participating in the new issues market unless the issuing firm prices the shares at a discount. Uninformed investors are not allocated any underpriced issues given the rationing imposed by informed demand, but receive all the overpriced offerings.

The rich development of the allocation-based models of underpricing contrasts with the limited number of papers that empirically test the predictions of these theoretical models. Not surprisingly, given the underwriters' reserve to provide allocation data to researchers, we are aware of only two papers that analyze the allocation of initial public offerings in the United States. Hanley and Wilhelm (1995) gather distribution data for a sample of 38 IPOs managed (or co-managed) by a single underwriter during the period 1983-1988. The authors find that around 70% of shares in both underpriced and overpriced issues are allocated to institutional investors. Institutions are allocated a large proportion of oversubscribed issues, however, they receive a similar share of issues in which pre-offer interest is weak. The authors interpret this finding as evidence against Rock (1986) argument that informed investors impose a winner's curse on uninformed investors by demanding larger allocations of hot offerings and smaller allocations of those issues identified as overpriced. In a more recent study, Aggarwal et al. (2002) find that institutions dominate IPO allocations, accounting for a median of about three-quarters of shares offered. Using a sample of 164 companies going public between May 1997 and June 1998, the authors document that institutions earn greater profits on their IPO investments than retail investors. Part of the institutional-retail differential can indeed be attributed to favorable allocation patterns followed by underwriters. Book building cannot explain completely the entire institutional-retail differential. Institutional allocation also contains private information that predicts IPOs day one returns. Consistent with the Rock (1986) theory of IPO underpricing, institutional investors seem to be able to avoid most overpriced offerings. In a similar study, Ljunqvist and Wilhelm (2002) find that, for 1,032 IPOs in 37 countries and between 1990 and 2000, share allocations to institutional investors are virtually double those received by retail investors.

This paper contributes to the existing literature on IPO allocations along three important lines. First, Hanley and Wilhelm's (1995) result that institutions receive the same proportion of overpriced and underpriced issues is consistent with institutional investors lacking superior information about first day returns. This conclusion, however, implicitly assumes that it is costless for informed investors to abstain from participating in less-attractive offerings. In the U.S., however, an investor's ability to skim the cream from the pool of IPOs is limited by the threat of being excluded from future offerings [Benveniste and Spindt (1989)]. The finding that institutional investors concentrate on the most underpriced offerings [Aggarwal et al. (2002), Ljunqvist and Wilhelm (2002)] has also



two different interpretations. Institutions may be better informed about the offerings true value; or underwriters may have superior information about the companies they take public, and use that information to favor their long term institutional clients. The only way to determine the reasons behind the preferential treatment of institutions is to analyze how information is distributed in the new issues market. Superior information regarding first day underpricing cannot completely explain institutional abnormal profits. Underwriters are better informed about the companies they take public, and use that information to favor institutions.

Secondly, our analysis explains why retail investors participate in the new issues market. The preferential treatment of institutional investors does not come at the expense of retail investors. Retail investors earn positive profits from subscribing to new equity offerings. These positive profits ensure that the retail tranche is normally oversubscribed. Benveniste and Spindt (1989) suggests, investment banks reduce underpricing by threatening investors that are unwilling to subscribe to badly received IPOs that they will be withdrawn from future offerings. Retail oversubscription increases the credibility of the underwriters message. These results present new evidence regarding the optimality of price discrimination in the new issues market [Benveniste and Wilhelm (1990), Mello and Parson (1998), and Stoughton and Zechner (1998)]. Price discrimination in favour of individual investors may be optimal since stimulates retail demand.

2 Sample Description.

2.1 Institutional Characteristics of the Spanish IPO and SEO Markets.

The Spanish IPO and SEO markets differ substantially from the extensively studied US equity offerings market in the way shares are allocated, the information available during the bookbuilding period regarding investors' demand, and trading restrictions in the aftermarket. The institutional features of the Spanish IPO market provide a unique framework to test asymmetric information based models of IPO underpricing.

The way companies issue equity and the transparency of the going public process has dramatically changed in the last decade. Prior to 1992, companies go public using three different methods: listing, private placement and public offer. Right issues are the only mechanism for already listed companies to raise new capital. In a listing, the company lists its existing shares; no new shares

are issued. Listings are rare after 1992, with only 4 cases between 1992 and 2002. Private placement issues are allocated at the discretion of the underwriter; the general public cannot apply for shares. There is evidence in the prospectuses consulted, though, that private placements are not only targeted to institutional investors, but few retail investors are also invited to apply for shares. Similarly, many placements involve a large number of investors⁴. Public offerings can be subscribed by both retail and institutional investors. Unlike private placements, any interested investor can apply for the shares. Allocation to institutional investors is at the discretion of the underwriter; shares are allocated to retail investors by the chronological ordering of their applications or pro rata. Unlike in the later hybrid offerings, there is normally no indication regarding the relative size of the retail and institutional tranches in the early years of our sample. Auctions are used to place new issues in Spain in only two cases. Both issues involve an auction tranche and a private placement tranche. Regardless of the method used, all issues are offered at a fixed price. The underwriter does not use the information contained in the investors demand to price the shares; the issue price is set before the offering begins and is contained in the offer prospectus.

Published on March 27, 1992, Royal Decree 291/1992 about equity offerings brings a sharp change in the way Spanish companies raise capital. The offering prospectus must contain much more detailed information regarding the issuing company's financials, underwriter and offer characteristics. In particular, the offer period and trading date, the group of potential investors, and the allocation method have to be perfectly defined. The greater transparency requirement resulted in equity offerings being sold via hybrid book building, from 1992 onwards.⁵ Right issues continue to be used, but listed companies also resort to new investors by selling new shares via secondary equity offerings, also using the hybrid book building method.

Hybrid book building: In hybrid offerings, book building is used to set the price and to allocate shares to institutional investors; a public offer tranche is reserved for local retail investors who do not participate in the price-setting process [Sherman (2000, 2002)]. In the book building tranche, the investment bank first decides which investors will be invited to evaluate and perhaps

⁴Although the number of investors that receive shares in early offerings is not normally available, one particular placement is said to have been distributed among 2000 investors.

⁵Sherman (2002) argues that the methods used for initial public offerings have changed dramatically for much of the world in the last decade. In the 1980s, book building was rare outside North America, but it is now the standard method in most countries.

buy the issue. Investors then analyze the offering and provide the investment bank with preliminary indications of their demand for the new shares. Finally, the investment bank prices the issue and allocates shares to investors, generally allocating more shares to investors who indicate higher levels of demand [Titman and Sherman (2001)]. The key characteristic of the book building method is that the underwriter has total discretion in allocating shares, allowing allocations to be based on a long term relationship between the underwriter and investors. This allows the underwriter to "average" returns over time, requiring investors to participate in the current offering in order to remain part of the group that will participate in future offerings. Retail investors normally pay the price determined in the bookbuilding tranche, although in many offerings the retail price is lower than the institutional price, to stimulate retail demand.

Initial allocations: The most important feature of the Spanish IPO market for our purpose is that the distribution of the IPO between retail, local institutional investors and foreign institutions is stated in the preliminary prospectus. The allocation is decided before any investor is allowed to submit his formal application for IPO shares. Given that the underwriter assigns the issue before he can gauge the investors demand, the Spanish IPO market is the ideal setting to test whether underpricing is due to the underwriter's inferior information [Benveniste and Spindt (1989), Benveniste and Wilhelm (1990)] or to the underwriter bias in favor on institutional investors [Biais et al. (2002)]. The preliminary prospectus normally contains claw back clauses. These clauses establish that, depending on investors' demand during the offer period, the underwriter can re-assign a small percentage of shares from one tranche to another. Claw back clauses, though, normally prevent the underwriter from reducing the retail tranche in favour of institutional investors when the retail tranche is oversubscribed. Institutional demand thus cannot crowd out retail demand in issues expected to be underpriced. Although the distribution of the offer between retail, local and foreign institutions is decided before the offer begins, the distribution of the shares within the institutional tranches is only decided after the underwriter collects investors' demand and is at the discretion of the underwriter.

Retail allocations: The main difference between the U.S. book building and the hybrid book building method used in Spain lies in how shares are allocated to retail investors and the restrictions placed on their trading behavior in the aftermarket. In the U.S., retail investors are drawn mainly from the firm's existing retail brokerage accounts. Once allocated to an individual

broker, distribution of the IPO shares among retail investors is at the discretion of the broker, although IPO shares are rarely allocated to new accounts [Hanley and Wilhelm (1995)]. Allocation to retail investors normally depends on the customer's account size and trading frequency. Even investors able to get shares in an IPO will be penalized for selling those shares right after the stock starts trading, a process called flipping. Most U.S. underwriters punish those who sell their IPO shares in the first 30 or 60 days by restricting allocations in the future. Allocation to retail investors in Spain is done pro rata, and is based only on order size. All retail investors that apply for a given number of shares receive the same allocation, regardless of their past relationship with the issue's underwriter. Retail investors are similarly free to sell their shares immediately in the aftermarket, without being penalized in future allocations.

Information: During the book building period, investors normally receive periodical information regarding aggregate demand for different investor types. We are then able to test whether there is herding in the demand for IPO shares and cascades appear [Welch(1992)]. More important, we can test whether institutional investors are better informed than individuals. We are thus able to discriminate between alternative explanations of the institutional abnormal profits. Finally, information regarding allocation data to individual investors given their application size is publicly available. It is then possible to test whether the assumed preferential treatment in the allocation of underpriced shares to institutions imposes a winner's curse on retail investors [Rock's (1986)].

2.2 Data.

Our sample comprises all 175 equity offerings, 137 IPOs and 38 SEOs, that took place in Spain from 1985 to 2002. We gather data on issue characteristics, such as the offer method, number of shares offered, preliminary price range, proportion of the issuing firm sold, offer date, duration of the offer period, underwriters, firm age, and existing shareholders from the offering prospectus. We collect data on each issue final price and distribution from the Madrid Stock Exchange press releases. First-day closing prices are from Datastream. We fill the small gaps in our data set using the archive news service in Expansion, the leading Spanish economic newspaper, and Lexis/Nexis. Data on IPO demand, oversubscription and pro-rata allocation among individual investors comes from the filings of the issuing companies with the Comision Nacional del Mercado de Valores and the Madrid Stock Exchange press releases. Given that the focus of our paper is the allocation

between retail and institutional investors of new shares, and as allocation decisions are influenced by the common practice of the issuing company's country of origin, rather than on the country where shares are listed, we do not consider equity offerings by foreign companies listing in Spain (8 cases). For the same reason, except in the preliminary analysis, we exclude the 28 listing in our sample, since no new shares are offered. For 46 issues, the preliminary prospectus does not include initial allocation data. The Spanish equity offering process is much more transparent from 1992. We have allocation data for all the companies that went public after that date.

Table I presents summary statistics for our sample. The average company in our sample sells 637 million euros worth of shares (214 million median)⁶, which represents 30.91% (25% median) of the existing company shares. The average market capitalization of the issuing company is 4.3 billion euros (0.49 billion). Initial public offerings are larger and from bigger companies, but the original owners sell a smaller fraction of the company (31.35% average, 29.53% median). For the sample as a whole, average underpricing is 8.88% (0.81%). As expected, though, there are significant differences in the underpricing of IPOs and SEOs. Underpricing is larger for IPOs (average 14.48%, median 4.34%) than for SEOs (average -0.17%, median 0.18%). Privatized companies are less underpriced than private offerings, consistent with privatized companies being larger, more mature companies. For our IPO sample, the initial returns are skewed to the right and have excess kurtosis; Jarque and Bera (1980) normality test indicates that the null hypothesis about the normality of the initial return distribution can be rejected at the 5% level of confidence. Issuing activity is not stable over time but rather presents "cycles". Two periods, 1987-89 and 1997-200, comprise nearly 75% of the offerings in our sample. These "hot markets" [Ritter (1984)] are characterized by high market returns and above normal levels of underpricing.

3 Allocation to Retail and Institutional Investors.

We analyze the allocation of equity offerings among different investor types to identify which investors benefit the most from IPO and SEO underpricing. The unique characteristics of the Spanish IPO allow us to study the initial allocations in the preliminary prospectus, before the underwriter

⁶All monetary variables in the paper are expressed in 2001 purchasing power euros. We use the January 26, 2003 exchange rate between the dollar and the euro of 0.9223 dollars per euro.

is allowed to gauge investor demand. Using the final offering allocation, we test who benefits from equity underpricing and how the underwriter uses the information contained in different investors' demand to price and re-allocate the issue.

3.1 Initial Allocations.

We gather data on the distribution of equity offerings across three investor classes: retail investors, Spanish institutional investors and foreign institutions. Detailed allocation data is available for the 101 offerings for which we have allocation data. In Table II, we see that institutions dominate initial equity offerings allocations in Spanish issues, accounting for an average of 64.74% (62.5%) of the shares offered. Foreign institutions dominate initial institutional allocations. Allocation to foreign institutional investors account for an average (median) of 60.89% (64.10%) of the shares offered to institutional investors. Thirty four offers set aside a special tranche for employees of the issuing company. In these offers, the average employee tranche represents an average of 4.62% (3.88%) of the shares offered. Across offering types, we cannot reject that the IPO and SEO mean allocation distributions are significantly different from each other. Retail, local and foreign institutions receive an average 32.39% (33.45%), 33.10% (25.89%) and 41.04% (39.29%) of the shares offered in IPOs, respectively. For SEOs, the proportion is 35.90% (40.29%), 20.88% (15.83%), and 41.23% (37.42%). There is no difference either between offerings from private companies and privatizations. Local investors (i.e. employees, retail investors and local institutions) receive around 60% of the shares. Curiously, allocation to local investors is larger in offerings from private companies than in privatizations, both for the overall, IPO and SEO sample.

Twenty-two issues in our sample are allocated to institutional investors exclusively. These issues, though, are different from US private placements in that they are not allocated to a small group of institutions. For those issues for which we have detailed institutional allocation data, offerings to institutional investors are allocated on average to over 2000 institutions. In the offerings targeted exclusively to institutional investors, foreign institutions receive 58.51% of all shares. If we exclude these institutional offerings, the average (median) allocation to retail investors rises from 33.71% (36.09%) to 43.10% (41.96%).

The large allocation of new issues that institutions receive does not necessarily imply that these investors enjoy a preferred status. Larger allocations may not lead to abnormal profits if institutions

receive a disproportionate amount of overpriced issues. Hanley and Wilhelm (1995), Ljungqvist and Wilhelm (2001) and Aggarwal et al. (2002) all find that institutions are allocated the largest fraction of the new shares. Hanley and Wilhelm (1995), on the other hand, find that institutions are allocated a large proportion of oversubscribed issues; but they receive a similar share of issues in which pre-offer interest is weak. Ljungqvist and Wilhelm (2001) and Aggarwal et al. (2002), on the other hand, show that underwriters tend to allocate more shares to institutions in IPOs priced at the upper end of the filing range, which are ex-ante expected to appreciate more in the aftermarket. Conversely, institutional allocation is significantly lower in lower-end issues, less likely to appreciate in the aftermarket. Table III relates the allocation among different investor types and initial underpricing. When looking at the fraction of shares allocated in underpriced and overpriced issues, the initial allocation contained in the prospectus does not show an allocation bias in favor of institutional investors. Institutions are allocated approximately two thirds of both underpriced and overpriced issues. This pattern reflects the allocation in underpriced and overpriced IPOs, where institutional allocations are 69.02% and 68.91%, respectively. Institutional allocation in overpriced SEOs is significantly higher than for underpriced SEO (66.05% and 57.37%). This last result, however, has to be interpreted with caution, given the small number of overpriced SEOs.

To study more rigorously the relationship between initial allocation and first day returns, we estimate the following equation for the different investor types in our sample

$$Underpricing_i = \alpha + \beta * Init_Alloc_{ij} + \varepsilon_{ij} \quad (1)$$

where $Allocation_{ij}$ is the initial allocation to investor type j in issue i , $j \in \{retail, local\ institutional, foreign\ institutional\}$. Table IV confirms our previous results. Initial allocation is unrelated to first day returns for different investor types and for different types of offerings. The coefficient on investor allocation is insignificantly different from zero at the 0.1 level for all investor types, regardless of whether we consider the whole sample, IPOs or SEOs.

From Tables III and IV, we cannot reject the hypothesis that there is no allocation bias in initial allocations. This results is consistent with the underwriter being uninformed about first day returns prior to gauging investors demand or, alternatively, the underwriter not using his superior information to favour its long term clients. The analysis so far, though, fails to account for the fact that offerings widely differ in size. The underwriter can favor institutional investors by initially allocating them a larger fraction of underpriced shares in larger issues. To account for

this possibility we focus on the relationship between initial allocations and money left on the table, rather than underpricing. We calculate allocations weighted by the offering relative level of money left on the table, assuming that the offer size does not change. That is, we compute

$$PW_Init_All_{ij} = Init_Alloc_{ij} * \frac{(CPrice_i - Price_i) * OfferSize_i}{\sum_i (CPrice_i - Price_i) * OfferSize_i} \quad (2)$$

where $PW_Init_All_{ij}$ is the profit weighted allocation to investor type j in offering i ; $CPrice_i$ is the first day closing price; and $OfferSize_i$ is the offer size (i.e. the number of shares offered times the offer price). Panel A in Table V reports profit weighted allocations. The bias in favor of institutional investors is clear once we weight initial allocations by the profit in participating in the equity offerings. While institutional investors receive nearly 75% of the profits in underpriced issues, they have to bear only 56% of the losses. Foreign institutions account for the whole institutional - retail differential; allocation to Spanish institutions are independent of offering profits, at 20%. Retail participation is significantly larger in SEOs than in IPOs. Underpricing in SEOs is significantly smaller than in IPOs. SEOs, however, are significantly larger, mainly due to some very large privatizations. The money left on the table, though, is larger in IPOs than in SEOs.

3.2 Final Allocations.

We look at the equity offerings final allocation in Table VI. Panel A shows that, consistent with Ljungqvist and Wilhelm (2001) and Aggarwal et al. (2002) institutional investors concentrate on the more underpriced issues. Institutional allocation is 70.71% (69.46%) in underpriced offerings and 52.74% (53.04%) for overpriced issues. Among institutions, foreign institutional investors are the main beneficiaries of equity offerings underpricing. Allocation to foreign institutions is 44.88% (47.92%) of all shares. Panel B reports the change in the allocation from the initial allocation contained in the preliminary prospectus to the actual, final allocation. Retail investor participation in underpriced issues declines, while it increases in overpriced offerings. We estimate the following following two regressions to confirm the relationship between final and change in allocation and underpricing.

$$Underpricing_i = \alpha + \beta_1 Fin_Alloc_{ij} + \epsilon_{ij} \quad (3)$$

$$Underpricing_i = \alpha + \beta_1 Change_Alloc_{ij} + \epsilon_{ij} \quad (4)$$

where Fin_Alloc_{ij} is the final allocation of investor type j in issue i , j , and $Change_Alloc_{ij} = Init_Alloc_{ij} - Fin_Alloc_{ij}$. Tables VII and VIII report the OLS estimates of equations 3 (Table VII) and 4 (Table VIII). Underpricing is positively related to institutional allocations for IPOs. Similarly, the coefficient on the change in allocation is significantly positive at the ten percent level for initial public offerings. Among institutions, foreign institutional investors allocation is related to equity offering underpricing, although both types of investor benefit from the change in allocation.

The results in Tables VII and VIII confirm that institutions, specially foreign institutional investors, are the main beneficiaries of Spanish equity offerings underpricing. One key issue, though, is whether the preferential treatment of institutions comes at the expense of retail investors. To clarify this issue, we report in Table IX the final money left on the table for the 82 equity offerings in our sample for which we have detailed final allocation data. We observe that, even though institutions capture the "lion's share" of the money left on the table, retail investors earn, on aggregate, positive profits. In particular, retail investors earn significantly positive profits, casting doubts on Rock (1986) prediction that retail investor break even on average. These results are similar to that findings by Hanley and Wilhelm (1995) for U.S. offerings.

Panel B shows that actual profits are actually higher than the profits that investors would have obtained if the offer had taken place as stated in the preliminary prospectus. This improvement holds for all investor types. This last result is apparently in contradiction with the result in Table VI, where we show that the change in allocation benefits institutions at the expense of retail investors. The explanation lies in the expansion and contraction of offer size based on investors' demand. When investors demand is high, the underwriter can increase the offer size in two ways: increase the number of shares offered, and exercise the green shoe option. When investors demand is low, the underwriter can reduce the offer size. In Rock (1986) winner's curse model, demand expansion by institutional investors crowds out retail demand. This mechanism does not entirely take place in Spain. Offering prospectuses normally include claw back clauses that allow the underwriter to modify the initial allocation tranches based on investors' demand during the offering period. These clauses, though, normally establish that the retail tranche cannot be reduced when it is oversubscribed. In underpriced issues, underwriters normally exercise the green shoe option and allocate the extra shares to institutions. Institutional investors account then for a larger fraction of

the final allocation, even though retail profits are not cut. Retail investors get the same number of shares, albeit of a larger offer; this results in a proportional decrease of the retail allocation. Retail investors can also be allocated a portion of the extra shares. In overpriced offerings, underwriters may reduce the offer size and in some cases re-allocate shares from institutions to retail investors, if the retail tranche is oversubscribed. Demand expansion in underpriced offerings, and the fact that equity offerings are normally underpriced, more than compensates demand expansion in overpriced issues. Retail investors earn, on average, positive profits.

4 Information in the Equity Offerings Market.

The institutional characteristics of the Spanish equity offerings market, as well as the availability on investors demand data, provide an unparalleled setting to test how information is distributed and dissipates among market participants. In this section, we focus on three different issues. We first analyze whether the preferential treatment of institutional investors is due to their informational advantage or the preferential treatment by the underwriter. We start by analyzing whether a subset of investors have superior information regarding first day returns. We then focus on the use the underwriter makes of the information contained in investors' demand. Finally, since data on different investors' demand are available during the book building process, we test whether there is herding in the Spanish equity issues market.

4.1 The Informational Advantage of Institutional Investors.

In Table X, we see that the average (median) oversubscription is 13.01 (6.32). The oversubscription series presents a high degree of cross-sectional variation. Oversubscription ranges from 108.72 times to 0.67. Only two offers are under subscribed. Initial public offerings are much more oversubscribed than SEOs for all investor groups. Underpriced issues are significantly more oversubscribed than overpriced issues. Average (median) oversubscription is 22.26 (16.26) for underpriced IPOs and 6.66 (5) for SEOs; for overpriced issues, IPOs are 7.80 (6.15) times oversubscribed and SEOs 3.96 (2.52).

By investor groups, the retail tranche is more oversubscribed in median than the institutional tranche (7.84 vs. 5.27 times); although there is not a significant difference on average (14.52 vs. 14.43

times). The difference between demand in underpriced and overpriced issues is larger for institutions than for retail investors. Average institutional oversubscription in underpriced offerings is 17.66 (6.58); for overpriced issues it drops to 3.62 (3.40). Retail investors oversubscription rate, on the other, is similar in underpriced offerings 17.71 (8.40), but is much higher than the institutional oversubscription rate in overpriced issues 7.29 (5.36).

All investors, however, (retail, local institutions and foreign institutions) subscribe more heavily to underpriced than to overpriced issues, and more to IPOs than to SEOs. This type of behavior is consistent with institutional investors being informed about the future profitability of the issues. The results, however, do not support the idea that retail investors behave as noise traders, subscribing randomly to equity offerings. To confirm these hypotheses, we estimate for each investor type:

$$Demand_{ij} = \alpha + \beta_1 Underpricing_i + \epsilon_i \quad (5)$$

where $Demand_{ij}$ is the oversubscription in offering i for investor type j . The results in Table XI confirm the positive relationship between investors' demand and equity offering underpricing. For all investor types, the coefficient on underpricing is significantly positive at the five percent level, when we consider all offerings. This last result is driven by the initial public offerings sample. In SEOs, the coefficient on underpricing remains significant for institutional investors, but it is insignificantly different from zero for retail investors.

We turn now to the question of the relative information of different investor types. Are institutional investors better informed than individual? Do retail investors herd on the information contained in the demand of institutions? If this is the case, the positive coefficient in equation 5 for individual investors may simply reflect that they invest when institutional demand is high. If this is the case, since institutional investors seem to possess ability to predict first day returns, herding by individuals would result in individuals appearing to be well informed as well. As a first indication that retail demand is not simply a proxy for institutional demand, for the 57 offerings for which we have detailed retail and institutional demand, the correlation between them is 0.43. To compute the relative information of different investors, we calculate the percentage of times they are "right" in their demand. To do so, we carry the following non-parametric test: we compute the percentage of times the demand for each investor group is above its median demand for issues whose underpricing is above the median level of underpricing; or its demand is below its median

demand for issues whose underpricing is below the median level of underpricing. Table XII reports the results for the various investor groups. We observe that overall institutional investors are better informed about first day returns than individual investors. Among institutions, foreign institutions exhibit superior performance than local institutional investors.

4.2 The Underwriter Response to Investors Demand.

In the traditional book building model, the underwriter initially sets a price range for the offering. After it collects indications of interest from investors, it uses the information contained in investors demand to set the offer price and distribute the offering. If the underwriter expects the offering to be underpriced and the final price to be in the top half of the file price range, then there should be a positive relationship between revisions in the offer price and the allocation of those investors favored by the underwriter. To test whether this is the case, we estimate the following regression using initial allocation data.

$$Update_i = \alpha + \beta_1 Demand_{ij} + \varepsilon_{ij} \quad (6)$$

where $Update_i = \frac{Price_i - Plow_i}{Phigh_i - Plow_i}$, and $Phigh$ and $Plow$ are the upper and lower bounds of the indicative price range in the preliminary prospectus. We can estimate the previous equation for the 45 offerings for which we have preliminary price range data. Note that for many SEOs there is no price range filed. The offer price for SEOs is normally set as the average price few days before the offer date. Out of the 45 offerings, 3 are priced below the range, 4 are price above the filed range and 20 are priced at the upper indicative price range. Table XIII reports the estimates of equation 6. Underwriters use the information contained in the investors demand to set the final offer price. There is an important difference, though, between institutional and retail demand. The coefficient for institutional demand is significantly positive at the one percent level; the coefficient for retail demand is insignificantly different from zero at the ten percent level.

4.3 Herding in the IPO and SEO Market.

In Welch (1992), potential investors can learn from the existing demand of other investors if shares are sold sequentially. In this setting, cascades form when investors imitate the behavior of earlier

investors, not using their own private information. This results in offerings being largely oversubscribed or under subscribed, with few cases in between. To test whether this is the case in our sample, for each offer we calculate, for each investor group, the monetary value of its demand as

$$Mon_Demand_{ij} = Fraction_{ij} * Size_i * Price_i * Demand_{ij} \quad (7)$$

Figure I reports a histogram for overall, retail and institutional investors monetary demand. We observe that, for both investor types, demand is extremely large or low, with few cases in between. We confirm herding in the Spanish equity offerings market for both institutions and individuals. While Figure I shows that individual investors do herd, it is more important to analyze the interaction between retail and institutional investors. Do individuals herd on the supposedly superior information of institutions?. Retail unconditional demand may be high when institutional demand is high, simply because institutions and individuals have common information. To analyze whether one group of investors herds on the information of the other, we rank institutional demand and calculate the average and median retail demand for each institutional demand quartile. We analyze institutional demand conditional on retail demand in the same way. Table XIV shows that retail and institutional demand move together, consistent with all investors sharing common information. When we compare Panels A and B, we show that there is less variation in institutional demand conditioned on retail demand than vice versa, consistent with individuals herding on institutional investor's demand.

Overall, this section shows that there is herding both among individuals and institutions in the Spanish equity market. Analyzing the interaction between retail and institutional investors, we observe both types share common information. Retail investors, though, seem to herd on the information contained in institutional investors demand.

5 Retail Investors Profits.

5.1 The winner's curse model of IPO underpricing.

In Rock's (1986) winner's curse model, IPO underpricing arises as a consequence of asymmetric information and rationing. The value of the new shares offered is uncertain. A group of investors,

the informed, have perfect knowledge about the realized value of the offering. All other investors, including the issuing firm and the underwriter, are uninformed; they can only form an expectation about the distribution of the issue's value. In this setting, new shares cannot be priced at their expected value. Informed investors crowd out the uninformed when the offering price is set below its true value; similarly, the informed withdraw from the market when the issue is overpriced. Uninformed investors are not allocated any underpriced issues given the rationing imposed by informed demand, but receive all the overpriced offerings. The uninformed then abstain from participating in the new issues market unless the issuing firm prices the shares at a discount.

Rock's (1986) model yields several testable implications. Underpricing in the model is necessary because informed demand expands in underpriced issues, crowding out retail investors. Individuals are allocated only those offerings in which the underwriter does not collect positive indications of interest. Secondly, while it seems appropriate to assume that institutional investors have an informational advantage over retail investors, there is no reason a priori to assume that there is asymmetry of information among institutional investors. If Rock's model is correct, issues targeted exclusively to institutional investors should not be underpriced.

The crucial test of the model involves observing the degree to which shares are rationed on the offer date. The mere existence of rationing does not necessarily induce the uninformed to withdraw from the market. Rationing is not sufficient to explain the discount. What is required is that rationing occurs more often for overpriced shares than in underpriced IPOs. We feel, however, that this test is inconclusive. If we abstain from the oversimplifying assumption that retail investors act as simple noise traders, applying for shares randomly, the result that rationing occurs more often for overpriced shares than in underpriced IPOs may occur naturally, with no need of an allocation bias. This is the case when retail investors subscribe more heavily to those issues that they believe that are being marketed at below their true price, resulting in larger oversubscription and smaller allocation in underpriced issues for a given retail tranche size. Finally, Rock predicts that weighting the returns by the probabilities of obtaining an allocation should leave the uninformed investor earning the riskless rate.

In the next section, we then test these four predictions regarding the winner's curse model ability to explain Spanish equity offerings underpricing:

Hypothesis 1: In a setting where the fraction of shares allocated to each investor class is decided

before bids are submitted, there should be no underpricing.

Hypothesis 2: IPOs targeted exclusively to institutional investors should not be underpriced.

Hypothesis 3: Rationing occurs more often for overpriced shares than in underpriced IPOs.

Hypothesis 4: Uninformed investors earn the riskless rate.

Rock's model cannot be properly tested in the United States for two reasons. First, information on the rationing process is not available. More important, in the United States allocation to retail investors is at the discretion of the underwriter. It is impossible then to generate the return of an uninformed investor that subscribes randomly to all offerings. Given these data restrictions, researchers have tested Rock's model in countries where retail allocations are unbiased, in the sense that all investors that apply for the same number of shares receive the same allocation; and where the allocation method is publicly disclosed. Koh and Walter (1989), Levis (1990), Keloharju (1993) and Amihud et al. (2002) gather data from IPOs in Singapore, the United Kingdom, Finland and Israel, respectively, to document that equally-weighted average initial returns are significantly positive. Uninformed investors in these countries, however, could not have realized those returns because of their disproportionately large purchases of overpriced shares. When individual returns are weighted by the respective allocations, the average initial return falls to zero.

5.2 Methodology and Empirical Results

We proceed now to test the four hypothesis posed in Section 5.1. Given the evidence in Section 4 that equity offering allocations favor institutional investors, and Rock's prediction that retail investors earn zero profits, a logic question is why retail investors participate in the equity offerings market. Tests of hypothesis three and four provide an answer to this question.

Hypothesis 1: In a setting where the fraction of shares allocated to each investor class is decided before bids are submitted, there should be no underpricing.

We have seen in Section 3 that this prediction does not hold for our sample. In Spain, initial allocation are included in the offering prospectus, filed before the underwriter collects indications of interest from investors. Thus, institutional demand expansion cannot crowd out retail investors.

Yet, as we have seen in Table I, Spanish equity offerings are on average underpriced by 8.72%. Average (median) IPO underpricing is 14.39% (4.69%); only for SEOs underpricing is indifferent from zero (-0.17% average, 0.17% median). These results are largely inconsistent with the winner's curse model prediction.

In many offerings, the prospectus includes claw back clauses that allow the underwriter to modify the initial retail and institutional tranche size depending on investors demand during the offer period. Underpricing for our equity offerings sample is only consistent with Rock winner's curse model if underwriters use the claw back provision to reduce retail allocations in heavily oversubscribed issues, or decide to increase the retail tranche in poorly received offerings. This is unlikely to be the case, though. Offering prospectuses normally include a clause that prevents the underwriter to reduce the retail allocation when the retail tranche is oversubscribed. As we argued in Section 4, the retail allocations are not decreased when the retail tranche is oversubscribed. When comparing the final allocation with the allocation included in the offering prospectus, we observe that retail investors are not harmed by the reallocation carried out by the underwriter.

Hypothesis 2: IPOs targeted exclusively to institutional investors should not be underpriced.

We do not find empirical support for Hypothesis 2 either. In Table II, we observe that IPOs targeted to institutional investors are underpriced on average (median) by 9.39% (6.10%). This result inconsistent with the winner's curse model. While it is commonly accepted that institutional investors have an informational advantage over individuals, it is more difficult to justify this information asymmetry within institutions. With no asymmetry of information, the winner's curse model predicts that there should be no underpricing. This result is consistent, however, with the underwriter using the allocation of underpriced shares to induce institutional investors to reveal positive information [Benveniste and Spindt (1989)]. Alternatively, the underwriter may use its superior information regarding the issuing company to intentionally allocate underpriced shares to its long term preferred clients.

Hypothesis 3: Rationing occurs more often for overpriced shares than in underpriced offerings.

To test Hypothesis 3 we gather retail allocation data for all equity offerings from 1993 onwards. Prior to that year, even though offering prospectuses contain the size of the retail tranche, there

is no reliable data on the pro rata allocation among individual investors, or shares were allocated by chronological arrival. Of the 85 equity offerings that took place in Spain from 1993 to 2002, 24 were allocated to institutional investors exclusively, with no retail tranche. We also exclude another 8 offerings for which, although they had a retail tranche, we do not have data on the pro rata allocation among individual investors. Our working sample then contains 53 equity offerings, 30 IPOs and 23 SEOs for which data on retail allocations is publicly available.

Allocation of equity offerings among retail investors is done pro rata. All investors that apply for the same number of shares receive the same allocation, regardless of their past relationship with the underwriter. This allows us to simulate the return that an informed investor may obtain from subscribing to equity offerings. We assume that the investor is uninformed in that he subscribes to all offerings. For each offering, the prospectus establishes the minimum and maximum retail application size. Applications are normally allowed to vary between 200,000 pesetas (\$1303 approximately) and 10,000,000 pesetas (\$65.163), although a minimum application size of 50.000 pesetas (\$326) is not uncommon in early offerings. We observe these restrictions to make sure that our uninformed strategy is perfectly implementable

To study the initial return that an uninformed investor could obtain, we assume that the investor subscribes to all offerings. Retail investors are normally allocated a fixed number of shares, regardless of application size, and a fixed fraction of their unsatisfied demand. This scheme results in allocations that are a decreasing function of application size. We study allocation patterns for applications between 50,000 and 10,000,000 pesetas in 50,000 (\$326) increments. For each offer, we define

$$Fraction_{ij} = \frac{Allocation_i * Price_i + Perc_i * [Size_j - Allocation_i * Price_i]}{Size_j} \quad (8)$$

where $Fraction_{ij}$ is the fraction allocated in offer i to an investor that applies for j Spanish pesetas worth of shares, where $j \in [50,000; 10,000,000]$; that is, $Fraction_{ij}$ is the ratio between the value of the shares allocated to an investor in offer i and the size of his demand $Size_j$; $Shares_i$ is the number of shares all investors get in offer i , regardless of their application size. Obviously, if $Size_j < Allocation_i * Price_i$, then the investor is allocated $Size_j$ and $Fraction_{ij}$ equals 1. There are four issues that were so heavily oversubscribed that allocations were decided by lottery. If all investors had received an allocation, the number of shares allocated would have been so

small that transaction costs would have likely rendered any trading decision unprofitable. For these issues, we multiply the final investor allocation by the probability of being chosen in the lottery. $Price_i$ and $Perc_i$ are the offer price and percentage allocated of unsatisfied demand, $App_Size_j - Allocation_i * Price_i$. For each application size j , we compute the average allocation fraction for application size j across offerings as follows

$$Fraction_J = \frac{\sum_i Fraction_{ij}}{N_J} \quad (9)$$

where N_J is the number of offerings for which $Size_j$ is feasible.

Figures II, III and IV display the proportional allocations for each application size, ranging for 50,000 to 10,000,000 pesetas, for the whole sample (Figure II), IPOs (Figure III), and SEOs (Figure IV). Curves A, U and O, represent the proportional allocation for the whole sample, underpriced and overpriced offerings, respectively. Allocations are a decreasing function of order size. The average allocation drops to 0.3072, 0.2063 and 0.1897 for an application size of one, five and ten million pesetas, respectively (\$6,516; \$32,581 and \$65.163). This same result holds for our IPO and SEO sample in Panels B and C. Average allocation is 0.8993, 0.2459, 0.1438, 0.1241 for fifty thousand, one, five and ten million peseta applications in the IPO sample; and 0.9591, 0.3871, 0.2878, 0.2754 for the SEO sample.

Consistent with prior studies [Amihud et al. (2002), Keloharju (1993), Koh and Walter (1989), Levis (1990)], uninformed investors obtain large allocations in overpriced IPOs and small allocations in underpriced offerings. For the smallest application size, 50.000 pesetas (\$326), the average allocation across all offerings is 0.9252; allocation in overpriced issues rises to 0.9381, whereas the allocation in underpriced issues drops to 0.9186 and to 0.8098 for those issues that are underpriced by more than 10%. Average allocation is 0.8732, 0.2240, 0.1202, 0.0973 for fifty thousand, one, five and ten million pesetas in the IPO underpriced sample; and 0.9404, 0.3033, 0.2098, 0.1981 for overpriced IPOs. In the SEO sample, average allocations are 0.9868, 0.3187, 0.2284, 0.2172 for underpriced offerings and 0.9055, 0.4482, 0.3216, 0.3058 for overpriced issues.

While these results are consistent with Rock's model main assumption, the fact that retail allocations are larger for underpriced than for overpriced offerings does not necessarily imply that underwriters allocation decisions are biased against retail investors. If not completely uninformed, retail investors will subscribe more heavily to those issues they believe are being marketed at

below their true value. For a given retail tranche size, greater oversubscription of underpriced offerings with respect to overpriced issues, results in allocations being inversely related to offering initial returns, with no need of an allocation bias. We find support for this hypothesis in our sample. Retail oversubscription in the two most underpriced IPOs in our sample, Terra and Adolfo Dominguez (with a retail underpricing of 213.29% and 97.87%) was 90 and 182 times the size of the retail tranche. Excluding these two offerings, average (median) retail oversubscription is 9.98 (7.14). Average oversubscription is 17.33 for underpriced offerings and 6.33 overpriced issues.

To study the relationship between underpricing and retail participation more rigorously, we estimate the following two equations:

$$Demand_{ir} = \alpha + \beta Underpricing_i + \epsilon_i \quad (10)$$

$$Ret_Numb_i = \alpha + \beta Underpricing_i + \epsilon_i \quad (11)$$

where $Demand_{ir}$ is the oversubscription in the retail tranche (i.e. the ratio between retail investor's demand and the size of the retail tranche), and Ret_Numb_i is the number of retail investors that apply for shares in equity offering i . Panel A in Table XV reports equation 7 estimates. There is a significantly positive relationship between underpricing and the level of retail demand. The coefficient on underpricing is positive at the 1% level for our whole and IPO samples. Panel B shows that results do not change when we use the number of retail investors that subscribe to each offering, as an indication of retail demand.

Overall, we document that uninformed investors obtain larger allocations in overpriced issues than in underpriced offerings. This result is consistent with Rock's model main assumption. We present evidence, however, that the driving factor behind the relative large allocation in overpriced issues when compared to underpriced offerings is not the underwriter allocation bias in favor of institutional investors. Retail investors subscribe more heavily those issues that they believe are marketed at below their expected value; for a fixed retail tranche size, retail behavior results in the allocation pattern described. Retail investors do not seem to behave as the uninformed investors in Rock's model. The crucial test of the winner's curse theory will then be whether, as predicted by the model, retail investors earn zero profits from participating in equity offerings.

Hypothesis 4: Uninformed investors earn the riskless rate.

We have seen in Section 4 that out of the 101 offerings for which we have retail/institutional allocation data, retail investors participate in 80 issues. Retail investors' make aggregate abnormal profits from participating in these offerings. These aggregate profits, although certainly large, do not guarantee that an individual informed investor is able to obtain abnormal profits from participating in all offerings. We know that retail investors subscribe more heavily to those issues marketed at below their market value, and consequently allocations are larger in overpriced issues than in underpriced offerings. To calculate the allocation-weighted return an uninformed investor may obtain from subscribing to all issues, define

$$Profit_{ij} = Fraction_{ij} * Size_j * Underpricing_i \quad (12)$$

$$Profit_J = \sum_i Fraction_{ij} * Size_j * Underpricing_i \quad (13)$$

where $Profit_{ij}$ is the monetary gain of an investor that applies for j Spanish pesetas worth of shares in offer i , and $Profit_J$ is the aggregate return for an investor that applies for j Spanish pesetas worth of shares in all equity offerings in which a $Size_j$ application is permitted. Using our monetary gain measure, we can devise two return measures: the return on application (ROA) measures the ratio between the monetary gain and the application size; given that allocations are normally a small, declining fraction of the application, the return on investment (ROI) measures the ratio between the monetary gain and the amount actually invested.

$$ROA_{ij} = \frac{Profit_{ij}}{Size_j} = Fraction_{ij} * Underpricing_i \quad (14)$$

$$ROA_J = \sum_i \frac{Fraction_{ij} * Underpricing_i}{N_j} \quad (15)$$

$$ROI_{ij} = \frac{Profit_{ij}}{Size_j * Fraction_{ij}} \quad (16)$$

$$ROI_J = \frac{\sum_i Size_j * Fraction_{ij} * Underpricing_i}{\sum_i Size_j * Fraction_{ij}} \quad (17)$$

Since allocations are a monotonically declining function of applications, we expect returns on application to be significantly lower than returns on investment. Whether the return on application

or the return on investment is the appropriate return measure depends on the provision of funds retail investors have to make when submitting their application. In Spain, retail investors do not have to pay in full when submitting their applications. Soon after the book building period starts, brokers have a rough estimate of how heavily subscribed the issue is going to be and, consequently, of the allocation for each application size. Investors are normally required to have enough funds to cover their expected allocation. Investors do not necessarily need to provide their broker with new funds at the time of the application; mutual funds, stocks or bonds that an investor may have with his broker account serve as collateral until final allocations are decided. Some investors, depending on their trading relationship with their broker, do not need to provide funds at all, as long as they sell their allocation in the first trading day. In this case, the investor's account is credited (debited) with his first day trading profit (loss).

Chowdhry and Shermann (1996) and Levis (1990) emphasize interest rate costs in the calculation of investment returns. In Spain, the book building period starts on average (median) 16 (15) days before shares start trading and lasts for 11 (10) days. The offer price and final pro rata retail allocation are decided the day before shares start trading. Given the fund provision characteristics of the Spanish offering market and the short time elapsed from application to actual trading, interest rate costs in Spain are insignificant. We thus attempt to provide empirical support to or refute Rock's claim that retail investors earn zero profits from participating in equity offerings, and abstain from interest rate cost considerations.

For the 53 offerings for which detailed pro rata retail allocation data are available, average underpricing is 13.21%, 21.69% and 2.15% for the overall, IPO and SEO sample. We see on Table XVI that the return on application, on the other hand, ranges from 9.21% to 0.77% for the overall sample, from 14.67% to 1.21% for the IPO sample, and from 2.08% to 0.19% for the SEO sample. Unconditional underpricing is significantly higher than allocation-weighted returns. The return on application for the maximum application size is only larger than 1% for the IPO sample. We think however, that it is inappropriate to conclude from these results that retail investors earn zero abnormal profits from participating in equity offerings. First, as we have mentioned, the return on investment is a superior measure of investor's return. The return on investment is significantly higher than the return on application. In particular ROI rises to 4.06%, 9.78%, and 0.71% for the overall, IPO and SEO sample. Furthermore, most offerings allow investors to submit more than

one application. Individual investors are normally allowed to submit one application individually and up to two more joint applications, providing the individual ten million pesetas limit is not exceeded. Since allocations are a monotonically decreasing function of application size, a splitting order strategy that consists of submitting three relatively small applications rather than a large one, results in a higher allocation. We compute the returns for two such strategies: one that involves three equal applications of 3.333.333 pesetas (Strategy A), and a second strategy that splits the ten million application limit in a five million and two 2.5 million applications (Strategy B). The return on investment for this last strategy is 4.57%, 9.79% and 0.85%, for the overall, IPO and SEO sample. Even more compelling, the average individual profit from participating in all offerings when Strategy B is used is 100,226, 157,934, 24,955 pesetas (\$653, \$1,029, \$163) for the overall, IPO and SEO sample. Retail investors earn positive abnormal profits from participating in equity offerings.

Retail investors, though, can earn even higher profits if they condition on information publicly available by the time the subscription period closes. Loughran and Ritter (2002) claim that underpricing is predictable based on lagged market returns because offer prices only adjust partially to public information. Since the subscription period for retail investor opens on average 16 days before the offer date, t , and lasts for about 11 days, we first assume that retail investors only subscribe to those offerings for which the market return, as measured by the return for the Ibex-35 index, is positive between $t - 16$ and $t - 5$. Secondly, we have observed in Section 4. that the underwriter uses its superior information to intentionally favor its long-term clients. We then assume that retail investors only subscribe to those offerings for which the profit-weighted institutional size tranche is larger than average (and that, of course, have a retail tranche). Finally, if we assume that institutional investors have an informational advantage of retail investors, we calculate the return from participating in offerings for which institutional demand oversubscription is larger than average. Table XVII shows the results for the conditional retail profits. Conditioning on publicly available information, retail investors can increase their profits by about 16%.

6 Conclusion.

In the Spanish IPO market, the distribution of the IPO between retail, local institutional investors and foreign institutions is stated in the preliminary prospectus. The allocation is decided before any investor is allowed to submit his formal application for IPO shares. Given that the underwriter assigns the issue before he can gauge the investors demand, the Spanish IPO market is the ideal setting to test underpricing theories that rest on the underwriter's allocation bias.

Using a sample of all 175 equity offerings, 137 IPOs and 38 secondary equity offerings, that took place in Spain from 1985 to 2002, we document that institutions receive nearly 75% of the profits in underpriced issues, they have to bear only 56% of the losses. Foreign institutions account for the whole institutional - retail differential; allocation to Spanish institutions are independent of offering profits, at 20%. The preferential treatment of institutional investors is partially due to their informational advantage and by the underwriter bias to favour its long term clients.

Even though institutions capture the "lion's share" of the money left on the table, retail investors earn, on aggregate, positive profits. We simulate the return that an informed investor may obtain from subscribing to equity offerings. Uninformed investors obtain large allocations in overpriced IPOs and small allocations in underpriced offerings. The driving factor behind the relative large allocation in overpriced issues when compared to underpriced offerings is not the underwriter allocation bias in favor of institutional investors. Retail investors subscribe more heavily those issues that they believe are marketed at below their expected value. The average individual profit from participating in all offerings. Retail investors earn positive abnormal profits from participating in equity offerings. Retail investors, though, can earn even higher profits if they condition on information publicly available by the time the subscription period closes.

References

- [1] Aggarwal, Reena, 2002, Allocation of initial public offerings and flipping activity, *Journal of Financial Economics*, forthcoming.
- [2] Aggarwal, Reena, N. Prabhala, and Manju Puri, 2002, Institutional allocation in initial public offerings: Empirical evidence, *Journal of Finance* 57, forthcoming.
- [3] Amihud, Yakov, Shmuel Hauser and Amir Kirsh. 2001 Allocations, adverse selection and cascades in IPOs: Evidence from Israel, working paper.
- [4] Baron, David P., 1982, A model of the demand for investment banking advising and distribution services for new issues, *Journal of Finance* 37, 955-976.
- [5] Beatty, Randolph P. and Jay R. Ritter, 1986, Investment banking, reputation, and the underpricing of initial public offerings, *Journal of Financial Economics* 15, 213-232.
- [6] Benveniste, Lawrence M., and Walid Y. Busaba, 1997, Bookbuilding vs. fixed price: An analysis of competing strategies for marketing IPOs, *Journal of Financial and Quantitative Analysis* 32, 383-403.
- [7] Benveniste, Lawrence M., Walid Y. Busaba and William J. Wilhelm, Jr., 1996, Price stabilization as a bonding mechanism in new equity issues, *Journal of Financial Economics* 42, 223-256.
- [8] Benveniste, Lawrence M. and Paul A. Spindt, 1989, How investment bankers determine the offer price and allocation of new issues, *Journal of Financial Economics* 24, 343-362.
- [9] Benveniste, Lawrence M. and William J. Wilhelm, 1990, A comparative analysis of IPO proceeds under alternative regulatory environments, *Journal of Financial Economics* 28, 173- 208.
- [10] Benveniste, Lawrence M., Sina M. Erdal, and William J. Wilhelm, Jr., 1998, Who benefits from secondary market price stabilization of IPOs, *Journal of Banking and Finance* 22, 741-767.
- [11] Booth, James R. and Lena Chua, 1996, Ownership dispersion, costly information, and IPO underpricing, *Journal of Financial Economics* 41, 291-310.

- [12] Brav, Alon and Paul A. Gompers, 1997, Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies, *Journal of Finance* 52, 1791-1821.
- [13] Brennan, Michael J. and J. Franks, 1997, Underpricing, ownership and control in initial public offerings of equity securities in the UK, *Journal of Financial Economics* 45, 391-413.
- [14] Carter, Richard B., Frederick H. Dark and Alan K. Singh, 1998, Underwriter reputation, initial returns, and the long-run performance of IPO stocks, *Journal of Finance* 53, 285-311.
- [15] Carter, Richard and Steven Manaster, 1990, Initial public offerings and underwriter reputation, *Journal of Finance* 45, 1045-1067.
- [16] Chemmanur, Thomas J., 1993, The pricing of initial public offers: A dynamic model with information production, *Journal of Finance* 48, 285-304.
- [17] Chemmanur, Thomas J. and Paolo Fulghieri, 1999, A theory of the going-public decision, *Review of Financial Studies* 12, 249-279.
- [18] Cornelli, Francesca, and David Goldreich, 2001, Bookbuilding and strategic allocation, *Journal of Finance*, 2337-2369.
- [19] Cornelli, Francesca, and David Goldreich, 2002, Bookbuilding: How informative is the order book? Unpublished London Business School working paper.
- [20] Derrien, Francois, and Kent L. Womack, 2002, Auctions vs. bookbuilding and the control of underpricing in hot IPO markets, *Review of Financial Studies*, forthcoming.
- [21] Ellis, Katrina, Roni Michaely, and Maureen O'Hara, 2000, When the underwriter is the market maker: An examination of trading in the IPO aftermarket, *Journal of Finance* 55, 1039-1074.
- [22] Habib, Michel, and Alexander Ljungqvist, 2001, Underpricing and entrepreneurial wealth losses in IPOs: theory and evidence, *Review of Financial Studies* 14, 433-458.
- [23] Hanley, Kathleen Weiss, 1993, The underpricing of initial public offerings and the partial adjustment phenomenon, *Journal of Financial Economics* 34, 231-250.

- [24] Hanley, Kathleen Weiss and William J. Wilhelm, Jr., 1995, Evidence on the strategic allocation of initial public offerings, *Journal of Financial Economics* 37, 239-257.
- [25] Ibbotson, R. G., 1975, Price performance of common stock new issues, *Journal of Financial Economics* 2, 235-272.
- [26] Jenkinson, Tim and Alexander Ljungqvist, 2001, *Going Public: The Theory and Evidence on How Companies Raise Equity Finance* (2nd edition), Oxford University Press.
- [27] Keloharju, Matti, 1993, The winner's curse, legal liability, and the long-run price performance of initial public offerings in Finland, *Journal of Financial Economics* 34, 251-277.
- [28] Kim, Moonchul and Jay R. Ritter, 1999, Valuing IPOs, *Journal of Financial Economics* 53, 409- 437.
- [29] Koh, Francis and Terry Walter, 1989, A direct test of Rock's model of the pricing of unseasoned issues, *Journal of Financial Economics* 23, 251-272.
- [30] Krigman, L., W. Shaw, and K. Womack, 1999, The persistence of IPO mispricing and the predictive power of flipping, *Journal of Finance* 54, 1015-1044.
- [31] Krigman, L., W. Shaw, and K. Womack, 2001, Why do firms switch underwriters? *Journal of Financial Economics* 60, 245-284.
- [32] La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1997, Legal determinants of external finance, *Journal of Finance* 52, 1131-1150.
- [33] Lee, Philip J., Stephen L. Taylor and Terry S. Walter, 1999, IPO underpricing explanations: Implications from investor application and allocation schedules, *Journal of Financial and Quantitative Analysis* 34, 425-444.
- [34] Ljungqvist, Alexander, and William Wilhelm, 2002a, IPO allocations: Discriminatory or discretionary?, *Journal of Financial Economics*, forthcoming.
- [35] Ljungqvist, Alexander, and William Wilhelm, 2002b, IPO pricing in the dot-com bubble: Complacency or incentives? unpublished NYU working paper.

- [36] Ljungqvist, Alexander, Vikram Nanda, and Raj Singh, 2001, Hot markets, investor sentiment, and IPO pricing, unpublished NYU working paper.
- [37] Loughran, Tim, and Jay R. Ritter, 2002, Why don't issuers get upset about leaving money on the table in IPOs? *Review of Financial Studies* 15, 413-443.
- [38] Loughran, Tim, Jay R. Ritter and Kristian Rydqvist, 1994, Initial public offerings: International insights, *Pacific-Basin Finance Journal* 2, 165-199.
- [39] Lowry, Michelle, 2002, Why does IPO volume fluctuate? *Journal of Financial Economics*, forthcoming.
- [40] Lowry, Michelle, and G. William Schwert, 2002, IPO market cycles: Bubbles or sequential learning? *Journal of Finance* 57, forthcoming.
- [41] Muscarella, Chris J. and Michael R. Vetsuypens, 1989, A simple test of Baron's model of IPO underpricing, *Journal of Financial Economics* 24, 125-136.
- [42] Rock, Kevin, 1986, Why new issues are underpriced, *Journal of Financial Economics* 15, 187-212.
- [43] Sherman, Ann, 2000, IPOs and long-term relationships: An advantage of bookbuilding, *Review of Financial Studies* 13, 697-714.
- [44] Sherman, Ann, 2001, Global trends in IPO methods: Book building versus auctions, unpublished University of Notre Dame working paper.
- [45] Sherman, Ann, and Sheridan Titman, 2002, Building the IPO order book: Underpricing and participation limits with costly information, *Journal of Financial Economics*, forthcoming.
- [46] Teoh, Siew Hong, Ivo Welch and T. J. Wong, 1998, Earnings management and the long-run market performance of initial public offerings, *Journal of Finance* 53, 1935-1974.
- [47] Welch, Ivo, 1989, Seasoned offerings, imitation costs, and the underpricing of initial public offerings, *Journal of Finance* 44, 421-450.
- [48] Welch, Ivo, 1992, Sequential sales, learning, and cascades, *Journal of Finance* 47, 695-732.

	Sample	IPOs	SEOs
Issue Size	637,316,600 (214,746,193)	737,774,784 (214,284,772)	422,049,063 (214,746,193)
Issue Size (inc. Green Shoe)	700,744,206 (225,894,967)	802,310,443 (223,767,539)	483,102,270 (225,894,967)
Fraction Sold	30.91% (27.00%)	31.35% (29.53%)	30.04% (23.75%)
Market Capitalization	4,308,785,582 (489,762,959)	5,005,529,414 (624,995,183)	2,965,065,335 (256,570,100)
Price	21.14 (15.00)	20.63 (15.67)	22.25 (13.79)
Underpricing	8.88% (0.81%)	14.48% (4.34%)	-0.17% (0.18%)
Money "Left on the Table"	24,119,959 (2,697,602)	45,734,118 (3,079,307)	-4,526,539 (1,311,662)
Number	100	65	35

Table I: Summary Statistics

This table reports summary statistics for 100 equity offerings in Spain from 1985 to 2002. We report the average (median) issue size, both including and excluding the green shoe option, the fraction of the company sold, the market capitalization of the issuing company, price, underpricing, and money left on the table. All monetary variables are in euros.

Panel A: All Offerings								
		N	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
All	All	101	1.56%	33.71%	25.32%	39.42%	64.74%	60.59%
			(0.00%)	(36.09%)	(21.00%)	(37.50%)	(62.50%)	(62.50%)
	Private	72	0.74%	33.98%	27.11%	38.18%	65.29%	61.09%
			(0.00%)	(33.39%)	(25.00%)	(35.00%)	(65.00%)	(62.16%)
	Public	29	3.58%	33.07%	20.86%	42.50%	63.35%	53.92%
			(1.94%)	(38.13%)	(15.00%)	(39.29%)	(55.00%)	(54.00%)
IPO	All	63	1.30%	32.39%	27.99%	38.33%	66.32%	61.69%
			(0.00%)	(33.45%)	(25.00%)	(37.50%)	(65.00%)	(62.50%)
	Private	54	0.99%	31.97%	29.15%	37.91%	67.06%	62.11%
			(0.00%)	(33.32%)	(26.69%)	(37.68%)	(65.83%)	(62.32%)
	Public	9	3.16%	34.94%	21.07%	40.83%	61.91%	59.17%
			(0.70%)	(37.50%)	(20.00%)	(37.50%)	(60.00%)	(62.50%)
SEO	All	38	1.98%	35.90%	20.88%	41.23%	61.73%	58.76%
			(0.00%)	(40.29%)	(15.83%)	(37.42%)	(54.50%)	(62.58%)
	Private	18	0.00%	39.99%	21.01%	39.00%	60.01%	61.00%
			(0.00%)	(45.49%)	(19.43%)	(29.71%)	(54.51%)	(70.29%)
	Public	20	3.77%	32.23%	20.76%	43.24%	64.00%	56.75%
			(2.97%)	(39.35%)	(10.83%)	(41.00%)	(54.50%)	(59.00%)

Panel B: Offerings with a Retail Tranche								
		N	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
All		79	1.96%	43.10%	21.13%	33.82%	54.95%	66.19%
			(0.00%)	(41.96%)	(20.00%)	(33.91%)	(55.00%)	(66.62%)
IPO		57	1.55%	40.02%	24.03%	34.41%	58.45%	65.60%
			(0.00%)	(37.50%)	(25.00%)	(35.00%)	(61.00%)	(65.00%)
SEO		22	2.69%	48.73%	15.84%	32.74%	48.58%	67.26%
			(0.25%)	(48.49%)	(15.00%)	(30.42%)	(46.32%)	(69.58%)

Panel C: Offerings with Institutional Tranche Only				
		N	Local Inst	Foreign Inst
All		22	41.37%	58.51%
			(49.20%)	(50.00%)
IPO		12	46.70%	53.08%
			(49.20%)	(50.00%)
SEO		10	39.97%	60.03%
			(50.00%)	(50.00%)

Table II: Unconditional Initial Allocation.

This table reports the initial allocation for 101 equity offerings in Spain from 1985 to 2002. The initial allocation is the allocation specified in the prospectus filed with the Comisión Nacional del Mercado de Valores before the offer begins. We present the average (median) allocation for both IPOs and SEOs, and for offers by privately owned companies, as well as issues in which the government has a stake in the company. In Panel A, we consider all offerings. In Panel B, we report statistics only for those offerings that have a retail tranche. Finally, in Panel C, we show the distribution between foreign and domestic institutions in those offerings targeted exclusively to institutional investors. Data on initial allocations are from the offering prospectuses.

Intuition: Institutional investors receive the largest fraction of the shares offered. Foreign institutions dominate institutional allocations.

	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
All	82	1.56% (0.00%)	33.71% (36.09%)	25.32% (21.00%)	39.42% (37.50%)	64.74% (62.50%)	60.59% (62.50%)
Underpriced	55	2.22% (0.00%)	33.42% (35.75%)	24.14% (20.00%)	40.22% (39.64%)	64.36% (60.71%)	59.78% (60.36%)
Overpriced	22	0.95% (0.00%)	33.17% (35.90%)	26.14% (24.99%)	39.74% (36.25%)	65.88% (63.75%)	60.00% (60.26%)
IPO	63	1.30% (0.00%)	32.39% (33.45%)	27.99% (25.00%)	38.33% (37.50%)	66.32% (65.00%)	61.69% (62.50%)
Underpriced	34	1.67% (0.00%)	29.32% (27.50%)	27.48% (25.00%)	41.54% (40.00%)	69.02% (67.50%)	58.46% (60.00%)
Overpriced	10	1.31% (0.32%)	29.78% (31.82%)	28.33% (25.00%)	40.58% (38.75%)	68.91% (65.83%)	59.42% (61.25%)
SEO	38	1.98% (0.00%)	35.90% (40.29%)	20.88% (15.83%)	41.23% (37.42%)	61.73% (54.50%)	58.76% (62.58%)
Underpriced	24	3.05% (0.71%)	39.57% (41.27%)	19.12% (12.08%)	38.25% (37.42%)	57.37% (50.31%)	61.74% (62.58%)
Overpriced	6	0.94% (0.16%)	32.90% (33.06%)	26.20% (25.00%)	39.73% (38.12%)	66.05% (65.42%)	60.27% (61.88%)

Table III: Initial Allocation and Underpricing.

This table reports the initial allocation for 82 equity offerings in Spain from 1985 to 2002, conditional on first day returns. The initial allocation is the allocation specified in the prospectus filed with the Comisión Nacional del Mercado de Valores before the offer begins. We present the average (median) allocation for both IPOs and SEOs, and for offers by privately owned companies, as well as issues in which the government has a stake in the company. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansion. Intuition: There is not a bias in favour of institutional investors when we conditional initial allocations by the degree of underpricing.

Panel A: Sample					
	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
Intercept	0.1258 **	0.0799	0.0194	0.0156	0.1994 **
	(0.0135)	(0.1395)	(0.7709)	(0.8430)	(0.0457)
Coefficient	-0.1049	0.0389	0.1800	0.1163	-0.1800
	(0.3731)	(0.8321)	(0.2452)	(0.3159)	(0.2452)
F	0.80	0.05	1.37	1.02	1.37
R-Squared	0.0103	0.0006	0.0175	0.0131	0.0175
N	79	79	79	79	79

Panel B: Initial Public Offerings					
	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
Intercept	0.1601 **	0.1806 **	0.0361	0.0954	0.3044 *
	(0.0348)	(0.0482)	(0.7577)	(0.4927)	(0.0729)
Coefficient	-0.0536	-0.1310	0.2683	0.0711	-0.2683
	(0.7814)	(0.6344)	(0.3202)	(0.7114)	(0.3202)
F	0.08	0.23	1.01	0.14	1.01
R-Squared	0.0017	0.0049	0.0210	0.0029	0.0210
N	49	49	49	49	49

Panel C: Secondary Equity Offerings					
	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
Intercept	0.0136	-0.0031	-0.0108	-0.0146	0.0204
	(0.2720)	(0.7847)	(0.3929)	(0.3413)	(0.3045)
Coefficient	-0.0310	0.0201	0.0312	0.0274	-0.0312
	(0.2254)	(0.6864)	(0.2951)	(0.2750)	(0.2949)
F	1.54	0.17	1.14	1.24	1.14
R-Squared	0.0520	0.0059	0.0391	0.0424	0.0391
N	30	30	30	30	30

Table IV: Underpricing and Initial Allocations.

This table reports the ordinary least squares estimates of the coefficients in a cross-sectional regression of underpricing on initial allocations to different investor types in 79 equity offerings in Spain from 1985 to 2002. Initial allocation is the allocation specified in the prospectus filed with the Comisión Nacional del Mercado de Valores before the offer begins.

$$\text{Underpricing}_i = \alpha + \beta \text{Init_Alloc}_{ij} + \varepsilon_i$$

Intuition: Initial allocations are independent of underpricing, when allocations are not profit-weighted.

*, **, *** imply significance at the 0.1, 0.05, 0.01 levels

Panel A: Money Left on the Table Weighted Allocations

	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local
All	81	1.71%	28.24%	19.66%	50.39%	70.05%	49.61%
Underpriced	55	1.95%	23.81%	19.46%	54.78%	74.24%	45.22%
Overpriced	21	0.93%	43.01%	20.32%	35.74%	56.06%	64.26%
IPO	49	1.52%	26.18%	19.83%	52.47%	72.30%	47.53%
Underpriced	36	1.50%	26.55%	20.05%	51.90%	71.95%	48.10%
Overpriced	10	0.96%	35.17%	25.19%	38.68%	63.87%	61.32%
SEO	32	1.64%	43.95%	19.28%	35.13%	54.41%	64.87%
Underpriced	19	0.93%	44.56%	19.36%	35.16%	54.52%	64.84%
Overpriced	11	3.84%	45.24%	15.73%	35.19%	50.92%	64.81%

Panel B: Money Left on the Table

	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total
All	81	469,272	5,743,451	4,693,954	13,213,285	17,907,239	10,906,677	24,119,959
		(0)	(10,375)	(360,607)	(670,397)	(1,107,932)	(1,427,731)	(2,697,602)
Underpriced	55	800,055	13,196,558	9,187,753	23,550,401	32,738,153	23,184,366	46,734,762
Overpriced	21	-251,030	-11,583,988	-5,473,736	-9,626,484	-15,100,220	-17,308,754	-26,935,239
		(0)	(-1,761,880)	(-1,511,716)	(-2,442,964)	(-3,980,261)	(-4,100,195)	(-6,820,000)
IPO	49	697,286	11,971,594	9,066,836	23,998,627	33,065,463	21,735,716	45,734,118
		(0)	(207,916)	(820,382)	(926,640)	(1,847,584)	(1,803,036)	(3,079,307)
Underpriced	36	975,163	17,248,184	13,024,086	33,713,479	46,737,565	31,247,433	64,960,605
Overpriced	10	-93,883	-3,432,653	-2,459,214	-3,775,251	-6,234,465	-5,985,750	-9,761,001
		(-21,524)	(-2,236,744)	(-1,511,716)	(-2,327,382)	(-3,904,453)	(-4,100,195)	(-6,543,159)
SEO	32	-416,712	-3,613,910	268,801	-764,718	-495,916	-3,210,318	-4,526,539
		(0)	(0)	(216,004)	(97,820)	(479,623)	(703,527)	(1,311,662)
Underpriced	19	468,271	5,519,794	1,918,910	4,294,041	6,212,951	7,906,974	12,201,585
Overpriced	11	-416,712	-20,047,382	-2,532,514	-9,641,613	-12,174,127	-22,996,609	-32,638,222
		(0)	(-1,487,505)	(-1,333,600)	(-3,872,692)	(-4,840,865)	(-3,308,916)	(-6,693,797)

Table V: Initial Allocation and Money Left on the Table.

This table reports the initial allocation for 101 equity offerings in Spain from 1985 to 2002, conditional on first day returns. The initial allocation is the allocation specified in the prospectus filed with the Comisión Nacional del Mercado de Valores before the offer begins. We present the average (median) allocation for both IPOs and SEOs, and for offers by privately owned companies, as well as issues in which the government has a stake in the company. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansión.

Intuition: There is not a bias in favour of institutional investors when we conditional initial allocations by the degree of underpricing.

Panel A: Final Allocation and Underpricing						
	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst
All	82	0.87%	29.11%	25.14%	44.88%	70.02%
		(0.00%)	(30.83%)	(21.25%)	(47.92%)	(69.17%)
Underpriced	55	1.43%	27.85%	27.39%	43.32%	70.71%
		(0.00%)	(30.54%)	(23.25%)	(46.20%)	(69.46%)
Overpriced	22	0.79%	46.48%	18.53%	34.21%	52.74%
		(0.00%)	(46.96%)	(20.20%)	(32.83%)	(53.04%)
IPO	63	0.92%	22.95%	29.64%	46.48%	76.13%
		(0.00%)	(25.37%)	(28.59%)	(46.04%)	(74.63%)
Underpriced	34	1.54%	19.16%	30.01%	49.28%	79.29%
		(0.00%)	(17.84%)	(28.15%)	(54.01%)	(82.16%)
Overpriced	10	1.12%	42.92%	25.28%	30.68%	55.96%
		(0.32%)	(42.91%)	(21.62%)	(35.15%)	(56.77%)
SEO	38	1.30%	32.49%	23.21%	43.00%	66.21%
		(0.00%)	(34.78%)	(22.87%)	(42.35%)	(65.22%)
Underpriced	24	1.37%	25.16%	23.52%	49.96%	73.48%
		(0.63%)	(29.24%)	(19.56%)	(50.56%)	(70.12%)
Overpriced	6	0.21%	49.73%	22.54%	27.52%	50.07%
		(0.03%)	(46.89%)	(24.54%)	(28.54%)	(53.08%)

Panel B: Change in Allocation and Underpricing						
	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst
All	82	-0.69%	-4.61%	-0.18%	5.46%	5.28%
		(0.00%)	-(5.26%)	(0.25%)	(10.42%)	(6.67%)
Underpriced	55	-0.79%	-5.57%	3.25%	3.10%	6.36%
		(0.00%)	-(5.21%)	(3.25%)	(6.56%)	(8.75%)
Overpriced	22	-0.16%	13.31%	-7.62%	-5.53%	-13.15%
		(0.00%)	(11.07%)	-(4.79%)	-(3.42%)	-(10.71%)
IPO	63	-0.38%	-9.44%	1.65%	8.16%	9.80%
		(0.00%)	-(8.08%)	(3.59%)	(8.54%)	(9.63%)
Underpriced	34	-0.12%	-10.15%	2.53%	7.75%	10.27%
		(0.00%)	-(9.66%)	(3.15%)	(14.01%)	(14.66%)
Overpriced	10	-0.19%	13.14%	-3.05%	-9.90%	-12.95%
		-(0.01%)	(11.08%)	-(3.38%)	-(3.60%)	-(9.06%)
SEO	38	-0.69%	-3.41%	2.33%	1.77%	4.48%
		(0.00%)	-(5.50%)	(7.04%)	(4.93%)	(10.72%)
Underpriced	24	-1.68%	-14.42%	4.40%	11.71%	16.10%
		-(0.08%)	-(12.03%)	(7.48%)	(13.14%)	(19.82%)
Overpriced	6	-0.73%	16.82%	-3.66%	-12.21%	-15.98%
		-(0.13%)	(13.83%)	-(0.46%)	-(9.58%)	-(12.34%)

Table VI: Final Allocation and Underpricing

Panel A reports the final allocation for 82 equity offerings in Spain from 1985 to 2002, conditional on first day returns. The final allocation is the allocation the underwriter decides after collecting indications of interest from investors. Panel B reports the change in allocation from the initial allocation contained in the preliminary prospectus and the final allocation. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansión.

Intuition: Institutional investors, specially foreign, are the main beneficiaries of Spanish equity offering underpricing.

Panel A: Sample				
	Retail	Local Inst	Foreign Inst	Total Inst
Intercept	0.3527 *** (0.0010)	0.0745 (0.3344)	-0.0580 (0.4834)	-0.2010 * (0.0939)
Coefficient	-0.5436 ** (0.0115)	0.1767 (0.5586)	0.5155 ** (0.0209)	0.5802 *** (0.0068)
F	6.89	0.35	5.70	8.00
R-Squared	0.1233	0.0070	0.1042	0.1403
N	51	51	51	51

Panel B: Initial Public Offerings				
	Retail	Local Inst	Foreign Inst	Total Inst
Intercept	0.4749 *** (0.0097)	0.2179 (0.1252)	-0.0559 (0.7237)	-0.2788 (0.3046)
Coefficient	-0.7436 * (0.0876)	-0.0795 (0.8685)	0.6802 * (0.0810)	0.7710 * (0.0746)
F	3.14	0.03	3.29	3.44
R-Squared	0.1042	0.0010	0.1085	0.1130
N	29	29	29	29

Panel C: Secondary Equity Offerings				
	Retail	Local Inst	Foreign Inst	Total Inst
Intercept	0.0402 * (0.0895)	-0.0232 * (0.0997)	-0.0123 (0.4186)	-0.0394 * (0.0593)
Coefficient	-0.0800 * (0.0558)	0.1249 * (0.0774)	0.0350 (0.4508)	0.0844 * (0.0573)
F	4.12	3.47	0.59	4.07
R-Squared	0.1710	0.1477	0.0287	0.1691
N	22	22	22	22

Table VII: Underpricing and Final Allocations.

This table reports the ordinary least squares estimates of the coefficients in a cross-sectional regression of underpricing on final allocations to different investor types in 79 equity offerings in Spain from 1985 to 2002.

$$\text{Underpricing}_i = \alpha + \beta \text{Fin_Alloc}_{ij} + \varepsilon_i$$

Intuition: Institutional investors, specially foreign, are the main beneficiaries of Spanish equity offering underpricing.

*, **, *** imply significance at the 0.1, 0.05, 0.01 levels

	Sample			
	Retail	Local Inst	Foreign Inst	Total Inst
Intercept	0.5729 *	0.5669 *	0.4875 **	0.4823 **
	(0.0530)	(0.0922)	(0.0199)	(0.0391)
Coefficient	-0.0014 *	0.0024 *	0.0016 *	0.0002 *
	(0.9625)	(0.0818)	(0.0925)	(0.0981)
R-Squared	0.0307	0.0804	0.0766	0.0201
N	35	42	42	42

Table VIII: Allocation Update.

This table reports the ordinary least squares estimates of the coefficients in a cross-sectional regression of the change in allocation on underpricing for different investor types in 42 equity offerings in Spain from 1985 to 2002.

$$\text{Change } _ \text{Alloc}_{ij} = \alpha + \beta \text{Demand}_{ij} + \varepsilon_i$$

Intuition: Institutional investors, specially foreign, are the main beneficiaries of Spanish equity offering underpricing.

*, **, *** imply significance at the 0.1, 0.05, 0.01 levels

Panel A: Actual Money Left on the Table										
	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total	Total Local	Total
All	81	478,487	5,749,162	5,625,808	18,174,575	23,800,383	11,853,457	30,028,032	11,853,457	30,028,032
		(0)	(10,910)	(427,175)	(906,610)	(1,346,175)	(428,134)	(1,382,797)	(428,134)	(1,382,797)
Underpriced	55	819,259	14,446,123	11,175,827	33,726,867	44,902,694	26,441,209	60,168,076	26,441,209	60,168,076
		(0)	(1,714,710)	(1,529,846)	(2,629,883)	(4,065,622)	(3,356,997)	(5,720,660)	(3,356,997)	(5,720,660)
Overpriced	21	-256,616	-12,376,451	-4,611,735	-9,588,879	-14,200,614	-17,244,801	-26,833,681	-17,244,801	-26,833,681
		(0)	(-1,897,578)	(-1,215,862)	(-2,257,836)	(-3,582,244)	(-3,078,977)	(-5,535,801)	(-3,078,977)	(-5,535,801)
IPO	49	710,233	12,235,159	11,335,542	35,463,181	46,798,724	24,280,935	59,744,116	24,280,935	59,744,116
		(0)	(208,437)	(952,613)	(1,262,609)	(2,269,629)	(1,199,169)	(2,223,236)	(1,199,169)	(2,223,236)
Underpriced	36	1,018,860	18,578,296	16,983,907	49,590,810	66,574,717	36,581,062	86,171,872	36,581,062	86,171,872
		(0)	(1,152,928)	(2,624,953)	(3,297,418)	(5,901,822)	(3,533,103)	(6,709,072)	(3,533,103)	(6,709,072)
Overpriced	10	-95,882	-3,623,216	-1,914,305	-3,294,608	-5,208,913	-5,633,403	-8,928,011	-5,633,403	-8,928,011
		(-19,800)	(-2,418,234)	(-1,271,964)	(-2,168,136)	(-3,427,943)	(-3,720,959)	(-5,620,252)	(-3,720,959)	(-5,620,252)
SEO	32	-434,209	-3,781,999	297,075	-982,532	-685,458	-3,919,134	-4,901,666	-3,919,134	-4,901,666
		(0)	(0)	(254,681)	(130,052)	(350,468)	(261,177)	(381,197)	(261,177)	(381,197)
Underpriced	19	482,062	5,603,879	2,300,523	6,025,715	8,326,238	8,386,464	14,412,179	8,386,464	14,412,179
		(94,292)	(2,216,673)	(737,009)	(1,810,539)	(2,549,879)	(2,868,581)	(5,184,188)	(2,868,581)	(5,184,188)
Overpriced	11	-434,254	-21,584,494	-2,232,040	-9,410,048	-11,642,087	-24,250,788	-33,660,836	-24,250,788	-33,660,836
		(0)	(-13,583)	(-13,501)	(-47,426)	(-64,213)	(-26,355)	(-74,418)	(-64,213)	(-74,418)

Panel B: Money Left on the Table, Difference with Initial Allocation										
	Number	Employees	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total	Total Local	Total
All	81	9,214	5,711	931,855	4,961,290	5,893,145	946,780	5,908,073	946,780	5,908,073
		(0)	(535)	(66,567)	(236,213)	(238,243)	(999,598)	(-1,314,805)	(-999,598)	(-1,314,805)
Underpriced	55	19,204	1,249,565	1,988,075	10,176,466	12,164,541	3,256,844	13,433,314	3,256,844	13,433,314
		(0)	(10,841)	(285,120)	(826,847)	(1,160,960)	(375,240)	(720,918)	(375,240)	(720,918)
Overpriced	21	-5,586	-792,463	862,001	37,605	899,606	63,953	101,558	63,953	101,558
		(0)	(-135,697)	(295,854)	(185,128)	(398,017)	(1,021,218)	(1,284,200)	(398,017)	(1,284,200)
IPO	49	12,947	263,566	2,268,706	11,464,554	13,733,260	2,545,219	14,009,998	2,545,219	14,009,998
		(0)	(521)	(132,231)	(335,968)	(422,045)	(603,867)	(-856,071)	(422,045)	(-856,071)
Underpriced	36	43,697	1,330,112	3,959,820	15,877,331	19,837,151	5,333,629	21,211,267	5,333,629	21,211,267
		(0)	(16,926)	(474,160)	(1,028,598)	(74,214)	(423,298)	(-60,923)	(423,298)	(-60,923)
Overpriced	10	-1,999	-190,563	544,909	480,642	1,025,551	352,347	832,990	1,025,551	832,990
		(1,724)	(-181,491)	(239,752)	(159,246)	(476,510)	(379,236)	(922,907)	(476,510)	(922,907)
SEO	32	-17,497	-168,089	28,273	-217,815	-189,541	-708,816	-375,127	-189,541	-375,127
		(0)	(0)	(38,677)	(32,231)	(-129,155)	(-442,350)	(-930,465)	(-129,155)	(-930,465)
Underpriced	19	13,791	84,085	381,613	1,731,673	2,113,287	479,490	2,210,594	2,113,287	2,210,594
		(-6,678)	(94,083)	(129,125)	(565,812)	(85,729)	(103,926)	(315,990)	(85,729)	(315,990)
Overpriced	11	-17,542	-1,537,112	300,474	231,565	532,039	-1,254,180	-1,022,614	532,039	-1,022,614
		(0)	(-71,764)	(236,798)	(351,754)	(-154,127)	(532,940)	(521,367)	(-154,127)	(521,367)

Table IX: Money Left on the Table.

Panel A reports the actual average (median) money left on the table (in euros) for 81 equity offerings in Spain from 1985 to 2002, conditional on first day returns. Panel B reports the change in money left on the table from the initial allocation contained in the preliminary prospectus and the final allocation. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansion.

Intuition: Institutional investors, specially foreign, are the main beneficiaries of Spanish equity offering underpricing.

	Employ	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total
All	1.69	14.52	13.22	14.42	14.43	12.56	13.01
	(1.40)	(7.84)	(5.00)	(5.00)	(5.27)	(7.30)	(6.30)
Underprice	1.31	17.71	15.97	17.80	17.66	14.57	15.55
	(0.75)	(8.40)	(5.70)	(6.05)	(6.58)	(8.47)	(8.37)
Overpriced	2.22	7.29	3.94	3.20	3.62	5.83	4.75
	(2.00)	(5.36)	(3.03)	(3.55)	(3.40)	(4.54)	(3.96)
IPO	1.55	17.40	19.52	21.18	20.97	15.88	17.82
	(1.00)	(10.30)	(9.09)	(8.00)	(8.00)	(10.00)	(9.72)
Underprice	0.89	22.07	24.69	27.62	27.29	18.95	22.26
	(0.74)	(10.65)	(10.00)	(11.86)	(12.40)	(11.33)	(16.26)
Overpriced	2.50	8.45	8.18	6.47	7.06	9.27	7.80
	(2.50)	(10.50)	(6.12)	(4.05)	(5.07)	(8.30)	(6.15)
SEO	1.89	10.00	3.03	4.05	3.86	7.06	5.62
	(1.90)	(7.50)	(2.70)	(2.55)	(2.70)	(4.68)	(4.40)
Underprice	1.86	12.87	3.38	4.88	4.52	8.48	6.66
	(1.90)	(8.00)	(2.80)	(2.55)	(2.60)	(6.82)	(5.00)
Overpriced	1.94	5.91	2.54	2.28	2.54	4.76	3.96
	(1.94)	(4.47)	(2.58)	(1.49)	(2.30)	(3.56)	(2.52)

Table X: Oversubscription.

This table reports oversubscription data for 74 Spanish equity offerings from 1985 to 2002. We report average (median) statistics by offering type (IPO and SEO) and level of underpricing. Underpricing data are from the Madrid Stock Exchange and *Expansión*. Oversubscription data are from *Expansión* and the Comisión Nacional del Mercado de Valores.

Intuition: Equity offerings are normally oversubscribed. Institutional demand is more volatile than retail demand.

Panel A: Sample						
	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total
Intercept	0.0057 (0.8622)	0.0663 (0.0820)	0.0202 (0.5604)	0.0299 (0.4020)	0.0169 (0.6334)	-0.0287 (0.3767)
Coefficient	0.0071 *** (<0.0001)	0.0038 *** (0.0047)	0.0065 *** (<0.0001)	0.0061 *** (<0.0001)	0.0080 *** (<0.0001)	0.0111 *** (<0.0001)
F	39.99	8.54	29.65	23.46	27.97	58.06
R-Squared	0.4123	0.1115	0.3037	0.2565	0.2914	0.4606
N	59	70	70	70	70	70

Panel B: Initial Public Offerings						
	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total
Intercept	0.0562 (0.3268)	0.1150 (0.0858)	0.0426 (0.4896)	0.0580 (0.3612)	0.0519 (0.3791)	-0.0217 (0.7007)
Coefficient	0.0081 *** (<0.0001)	0.0032 * (0.0773)	0.0062 *** (0.0005)	0.0057 *** (0.0021)	0.0080 *** (0.0003)	0.0113 *** (<0.0001)
F	26.23	3.29	14.22	10.81	15.64	31.35
R-Squared	0.4355	0.0760	0.2622	0.2128	0.2810	0.4394
N	36	42	42	42	42	42

Panel C: Secondary Equity Offerings						
	Retail	Local Inst	Foreign Inst	Total Inst	Total Local	Total
Intercept	0.0155 (0.1140)	0.0022 (0.8206)	0.0125 (0.1019)	0.0088 (0.2860)	0.0152 (0.0550)	0.0125 (0.1345)
Coefficient	0.0008 (0.2141)	0.0067 ** (0.0145)	0.0025 ** (0.0412)	0.0037 ** (0.0238)	0.0011 (0.1278)	0.0018 * (0.0820)
F	1.64	6.87	4.62	5.77	2.47	3.27
R-Squared	0.0725	0.2090	0.1508	0.1815	0.0869	0.1118
N	23	28	28	28	28	28

Table XI: Underpricing and Investors Demand.

This table reports the ordinary least squares estimates of the coefficients in a cross-sectional regression of underpricing on investors demand for a sample of equity offerings in Spain from 1985 to 2002.

$$\text{Underpricing}_i = \alpha + \beta \text{Demand}_{ir} + \varepsilon_i$$

Intuition: There is a positive relationship between retail investors' demand and underpricing.

*, **, *** imply significance at the 0.1, 0.05, 0.01 levels

Panel A: All Investors			
	Retail	Local Inst	Foreign Inst
All	55.93%	64.29%	68.57%
IPO	44.44%	66.67%	73.81%
SEO	73.91%	60.71%	60.71%

Panel B: Retail vs. Institutional				
	Both	Retail	Inst	None
All	21	9	15	9
IPO	12	2	11	7
SEO	9	7	4	2

Panel C: Foreign vs. Local				
	Both	Local	Foreign	None
All	41	4	7	19
IPO	25	3	6	8
SEO	15	1	1	11

Table XII: Information about first day returns.

This table analyzes the relative information among investor groups about first day returns. We assume an investor group makes the right demand decision in an offering when its demand for that offering is above (below) its median demand for all offerings if that particular offering is underpriced (overpriced). Panel A reports the percentage of times each investor groups makes good demand decisions. In Panel B, we analyze the relative information ability for retail and institutional investors. We classify if each offering depending on whether both retail and institutions make appropriate demand decisions (Both), whether retail investors make the appropriate decision and institutions do not (Retail), vice versa (Inst); or neither investor group makes the appropriate decision (None). In Panel C, we repeat the previous analysis between local and foreign institutions. Oversubscription data are from Expansion and the Comisión Nacional del Mercado de Valores.

Intuition: Institutions, particularly foreign institutional investors, are better informed about first day one returns than individuals.

	Retail	Local Inst	Foreign Inst	Total Inst	Total
Intercept	0.5369 *** (<0.0001)	0.5188 *** (<0.0001)	0.4540 *** (<0.0001)	0.4656 *** (<0.0001)	0.4299 *** (<0.0001)
Coefficient	0.0048 (0.1013)	0.0054 ** (0.0411)	0.0079 *** (0.0029)	0.0076 *** (0.0052)	0.0113 *** (0.0022)
F	2.84	4.46	10.04	8.74	10.73
R-Squared	0.0793	0.1002	0.2006	0.1793	0.2114
N	35	42	42	42	42

Table XIII: Price Revision and Investors Demand.

This table reports the ordinary least squares estimates of the coefficients in a cross-sectional regression of the revision in the offer price on the demand by different investor types in 42 equity offerings in Spain from 1985 to 2002.

$$\text{Update}_i = \alpha + \beta \text{Demand}_{ij} + \varepsilon_i$$

$$\text{Update}_i = \frac{\text{Price}_i - \text{Plow}_i}{\text{Phigh}_i - \text{Plow}_i}$$

Intuition: Underwriters use the information contained in the investors demand to set the final offer price.

*, **, *** imply significance at the 0.1, 0.05, 0.01 levels

Panel A: Retail Demand Conditional on Institutional Demand				
Average	230,904,710	2,857,454,668	7,999,007,180	7,880,086,465
(% increase)		1238%	280%	99%
Median	172,766,824	1,124,976,000	2,867,136,527	5,113,125,000
(% increase)		651%	255%	178%

Panel B: Institutional Demand Conditional on Retail Demand				
Average	169,218,303	1,925,496,747	7,510,016,037	14,142,134,061
(% increase)		1138%	390%	188%
Median	66,562,309	858,238,469	4,825,676,426	5,191,433,726
(% increase)		1289%	562%	108%

Table XIV: Herding on other investors' demand.

This table analyzes whether one group of investors herds on the information of the other. We rank institutional demand and calculate the average and median retail demand for each institutional demand quartile. We analyze institutional demand conditional on retail demand in the same way. On brackets, we report the percentage average and median increase from one quartile to the next. IPO underpricing data are from the Madrid Stock Exchange and *Expansión*. Demand data are in euros. Intuition: Although retail and institutions share common information, retail investors herd on institutional investors' demand.

Panel A: Retail Demand and Underpricing			
	All	IPO	SEO
Intercept	0.05 ** (0.0317)	0.02 * (0.0887)	0.06 ** (0.0471)
Demand	0.05 *** (<0.0001)	0.06 *** (<0.0001)	0.10 (0.1380)
R-Square	0.4895	0.4966	0.0970
Observations	59	36	23

Panel B: Retail Participation and Underpricing			
	All	IPO	SEO
Intercept	0.0538 ** (0.0317)	0.0180 * (0.0887)	0.0613 ** (0.0471)
Demand	0.0544 *** (<0.0001)	0.0578 *** (<0.0001)	0.1018 (0.1380)
R-Square	0.4895	0.4966	0.0970
Observations	59	36	23

Table XV: Underpricing and Retail Investors Demand.

Panel A reports the ordinary least squares estimates of the coefficients in a cross-sectional regression of underpricing on retail investors demand for a sample of equity offerings in Spain from 1985 to 2002. Panel B uses, rather than oversubscription, the number of retail investors (in thousands) that subscribe the offering, as an indication of retail investors demand.

$$\text{Panel A: } \text{Underpricing}_i = \alpha + \beta \text{ Demand}_{ir} + \varepsilon_i$$

$$\text{Panel B: } \text{Underpricing}_i = \alpha + \beta \text{ Ret_Num}_{ir} + \varepsilon_i$$

Intuition: There is a positive relationship between retail investors' demand and underpricing.

*, **, *** imply significance at the 0.1, 0.05, 0.01 levels

Panel A: All Offerings				
Application	Allocation	Profit	ROA	ROI
50,000	0.9252	4,603	9.21%	9.95%
200,000	0.7028	10,056	5.03%	7.15%
500,000	0.4240	13,440	2.69%	6.34%
1,000,000	0.3072	17,052	1.71%	5.55%
2,000,000	0.2488	24,276	1.21%	4.88%
3,000,000	0.2280	31,339	1.04%	4.58%
4,000,000	0.2145	37,918	0.95%	4.42%
5,000,000	0.2063	44,449	0.89%	4.31%
6,000,000	0.2008	50,979	0.85%	4.23%
7,000,000	0.1968	57,510	0.82%	4.17%
8,000,000	0.1939	64,041	0.80%	4.13%
9,000,000	0.1916	70,571	0.78%	4.09%
10,000,000	0.1897	77,102	0.77%	4.06%
Strategy A	0.2228	100,268	1.01%	4.52%
Strategy B	0.2268	100,226	1.04%	4.57%

Panel B: IPOs				
Application	Allocation	Profit	ROA	ROI
50,000	0.8993	7,336	14.67%	16.31%
200,000	0.6521	15,723	7.86%	12.06%
500,000	0.3572	21,002	4.20%	11.76%
1,000,000	0.2459	26,742	2.67%	10.87%
2,000,000	0.1903	38,222	1.91%	10.04%
3,000,000	0.1694	49,417	1.65%	9.72%
4,000,000	0.1536	59,756	1.49%	9.73%
5,000,000	0.1438	70,010	1.40%	9.74%
6,000,000	0.1372	80,265	1.34%	9.75%
7,000,000	0.1325	90,519	1.29%	9.76%
8,000,000	0.1290	100,774	1.26%	9.77%
9,000,000	0.1263	111,028	1.23%	9.77%
10,000,000	0.1241	121,282	1.21%	9.78%
Strategy A	0.1634	158,072	1.59%	9.72%
Strategy B	0.1674	157,934	1.64%	9.79%

Panel C: SEOs				
Application	Allocation	Profit	ROA	ROI
50,000	0.9591	1,038	2.08%	2.16%
200,000	0.7690	2,665	1.33%	1.73%
500,000	0.5112	3,576	0.72%	1.40%
1,000,000	0.3871	4,413	0.44%	1.14%
2,000,000	0.3250	6,087	0.30%	0.94%
3,000,000	0.3043	7,760	0.26%	0.85%
4,000,000	0.2940	9,434	0.24%	0.80%
5,000,000	0.2878	11,108	0.22%	0.77%
6,000,000	0.2837	12,781	0.21%	0.75%
7,000,000	0.2807	14,455	0.21%	0.74%
8,000,000	0.2785	16,128	0.20%	0.72%
9,000,000	0.2768	17,802	0.20%	0.71%
10,000,000	0.2754	19,476	0.19%	0.71%
Strategy A	0.3004	24,871	0.25%	0.83%
Strategy B	0.3043	24,955	0.26%	0.85%

Table XVI: Retail Profits.

This table reports the average allocation, profit per offering, return on allocation and return on investment for a sample of equity offerings in Spain from 1985 to 2002. Return on allocation and return on investment is the ratio between the offering profit and the application size and investment, respectively. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansión.

Panel A: Conditioning on Past Market Returns				
Application	Allocation	Profit	ROA	ROI
50,000	0.8755	4,618	10.07%	11.29%
200,000	0.6904	10,743	5.19%	7.17%
500,000	0.3897	14,347	2.97%	6.83%
1,000,000	0.2765	20,017	2.00%	6.27%
2,000,000	0.2444	26,492	1.38%	5.11%
3,000,000	0.2279	37,159	1.18%	4.82%
4,000,000	0.2015	45,271	1.03%	4.95%
5,000,000	0.2005	44,831	0.89%	4.87%
6,000,000	0.1976	56,305	0.90%	4.39%
7,000,000	0.1921	66,624	0.94%	4.87%
8,000,000	0.1774	76,655	0.89%	4.82%
9,000,000	0.1760	80,396	0.85%	4.80%
10,000,000	0.1754	86,769	0.87%	4.52%
Strategy A	0.2144	120,132	1.11%	5.34%
Strategy B	0.2205	103,380	1.09%	4.64%

Panel B: Conditioning on Initial Institutional Allocations				
Application	Allocation	Profit	ROA	ROI
50,000	0.8696	8,266	14.68%	16.55%
200,000	0.6105	18,509	8.05%	13.50%
500,000	0.3226	21,482	4.61%	11.79%
1,000,000	0.2433	27,773	2.84%	12.36%
2,000,000	0.1813	42,312	2.06%	11.66%
3,000,000	0.1531	54,684	1.96%	10.30%
4,000,000	0.1395	71,510	1.71%	10.26%
5,000,000	0.1333	81,881	1.43%	11.21%
6,000,000	0.1300	87,999	1.38%	11.23%
7,000,000	0.1288	92,718	1.42%	10.76%
8,000,000	0.1252	103,425	1.46%	11.50%
9,000,000	0.1145	115,129	1.40%	10.82%
10,000,000	0.1118	132,770	1.46%	10.23%
Strategy A	0.1534	184,662	1.70%	10.96%
Strategy B	0.1533	184,228	1.94%	11.72%

Panel C: Conditioning on Institutional Demand				
Application	Allocation	Profit	ROA	ROI
50,000	0.9136	1,242	2.48%	2.38%
200,000	0.7051	3,059	1.42%	1.87%
500,000	0.5065	4,031	0.72%	1.61%
1,000,000	0.3749	4,597	0.48%	1.35%
2,000,000	0.3100	6,954	0.34%	1.02%
3,000,000	0.2974	8,181	0.26%	1.00%
4,000,000	0.2729	10,403	0.25%	0.89%
5,000,000	0.2728	12,159	0.24%	0.83%
6,000,000	0.2632	14,253	0.25%	0.88%
7,000,000	0.2624	15,468	0.21%	0.77%
8,000,000	0.2615	17,326	0.21%	0.77%
9,000,000	0.2597	18,482	0.21%	0.74%
10,000,000	0.2579	21,396	0.23%	0.80%
Strategy A	0.2997	29,441	0.29%	0.84%
Strategy B	0.3025	25,394	0.28%	0.91%

Table XVII: Conditional Retail Profits.

This table reports the conditional average allocation, profit per offering, return on allocation and return on investment for a sample of equity offerings in Spain from 1985 to 2002. We assume that retail investors condition their participation in equity offerings based on: past market returns (Panel A); profit weighted institutional allocations (Panel B); and institutional demand (Panel C). Return on allocation and return on investment is the ratio between the offering profit and the application size and investment, respectively. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansión.

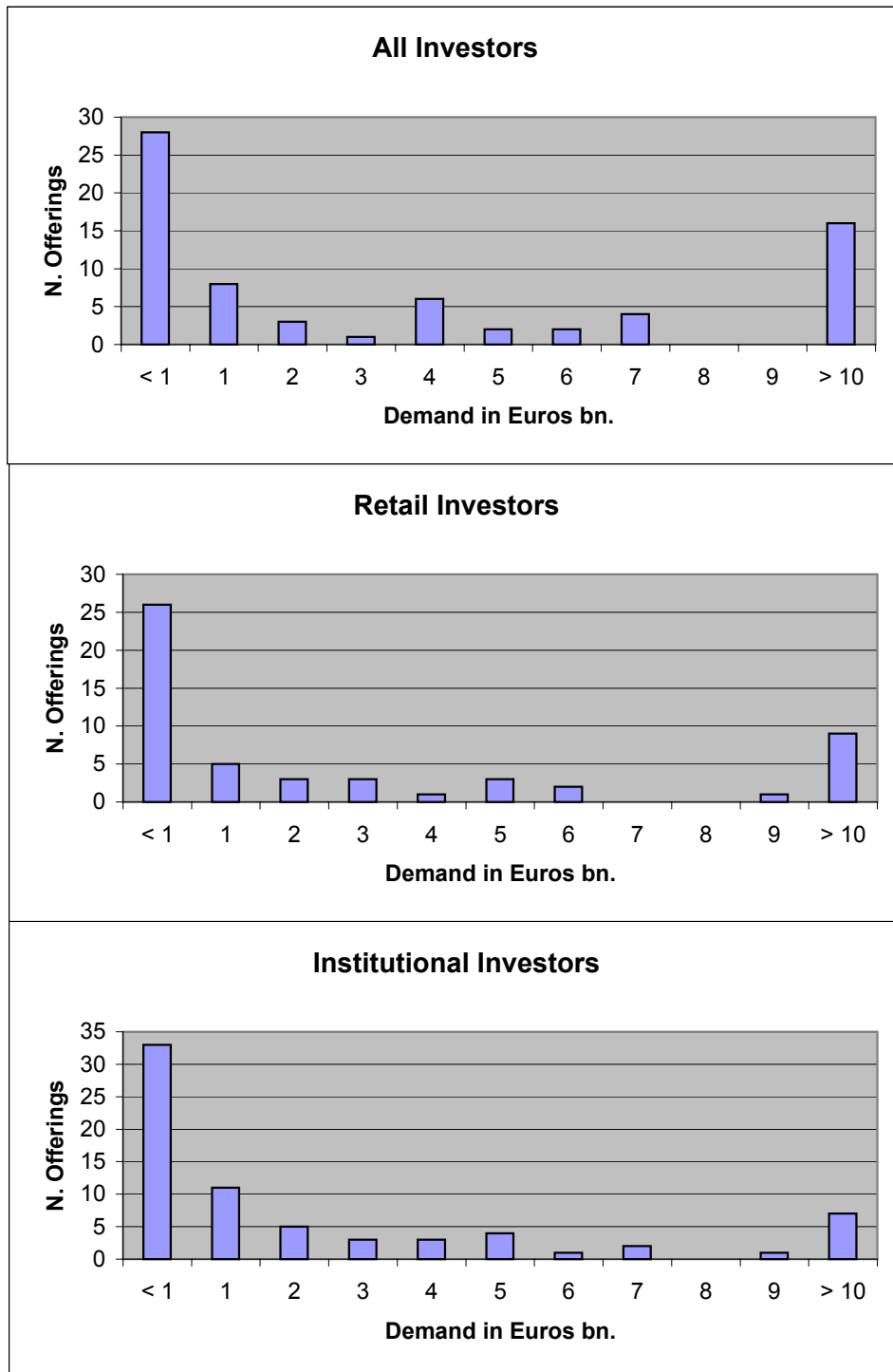


Figure I: Aggregate Monetary Demand.

This figure shows the aggregate monetary demand for both retail and institutional investors. Data on initial allocations are from the offering prospectuses. IPO underpricing data are from the Madrid Stock Exchange and Expansión.

Intuition: There is herding, both among institutions and individual investors in the market for new issues.

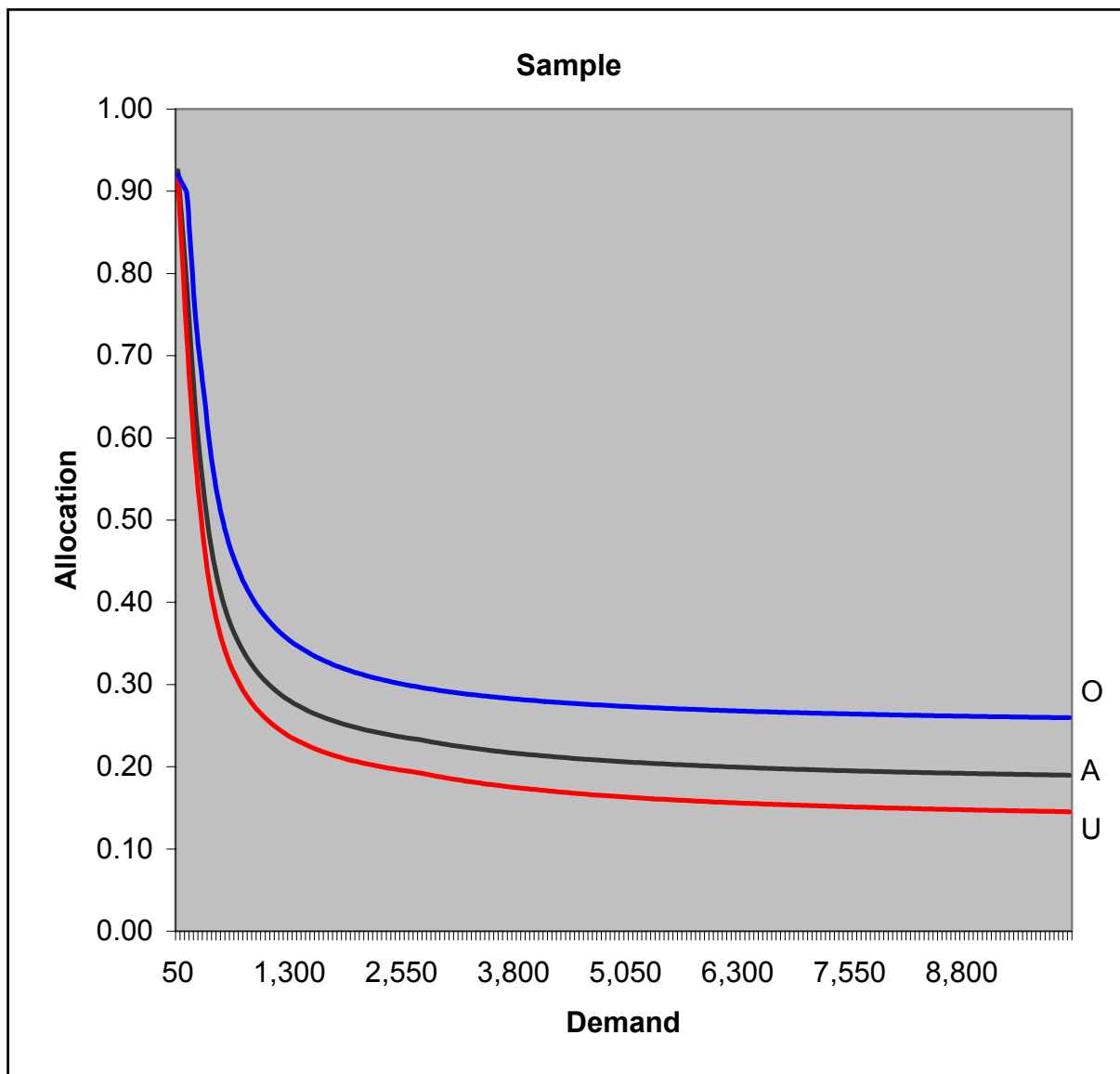


Figure II: Pro-Rata Allocation to Retail Investors (All Offerings)

This figure shows the pro rata allocation to retail investors in all offerings, for different application sizes. Allocation is the fraction between between the monetary allocation to an investor and his application. We differentiate between the whole sample (A), underpriced (U) and overpriced (O) offerings. Underpricing data are from the Madrid Stock Exchange and Expansión. Allocation data are from Expansión and the Comisión Nacional del Mercado de Valores.

Intuition: Allocations in overpriced issues are significantly larger than in underpriced offerings.

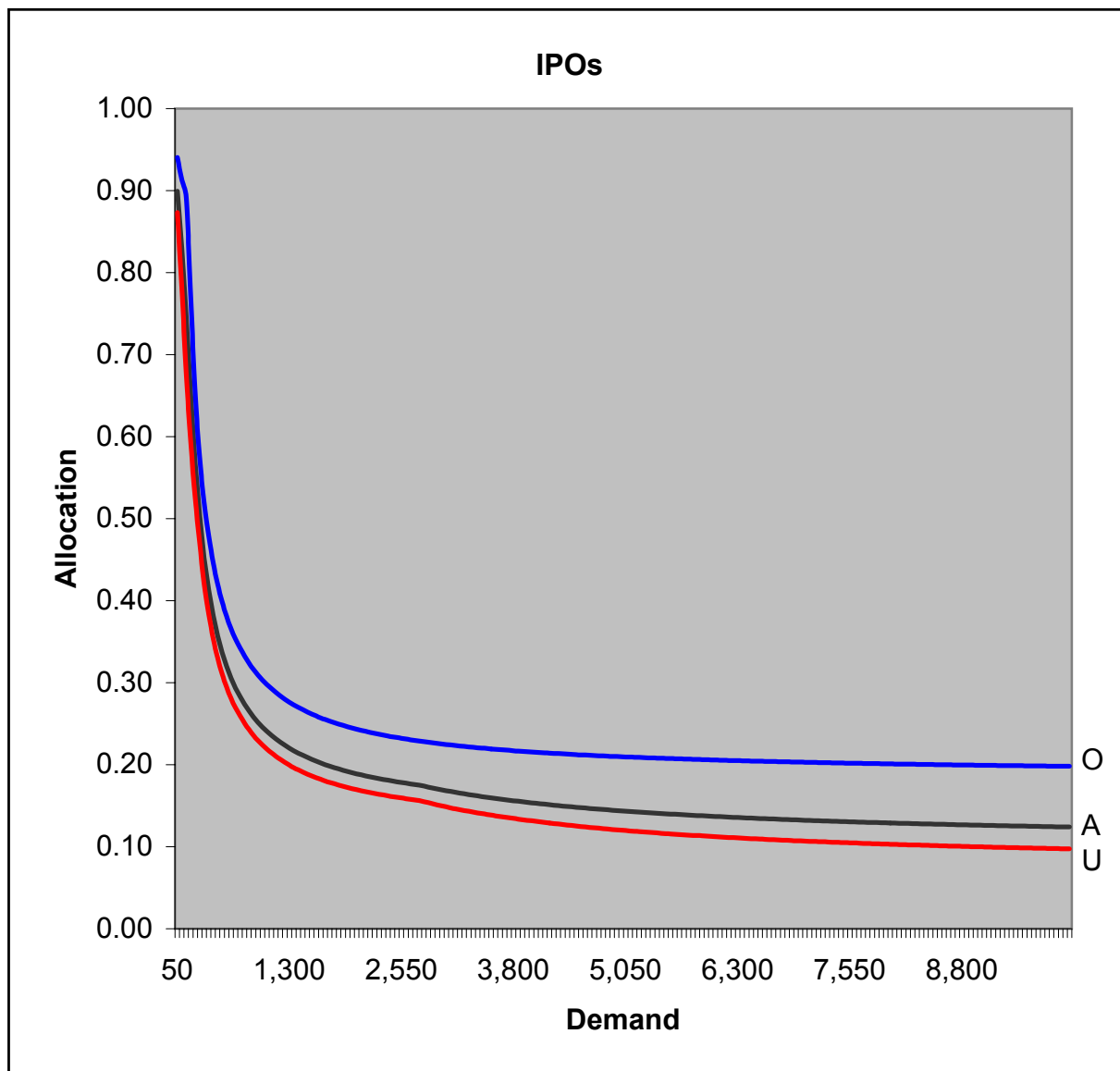


Figure III: Pro-Rata Allocation to Retail Investors (IPOs).

This figure shows the pro rata allocation to retail investors in initial public offerings, for different application sizes. Allocation is the fraction between between the monetary allocation to an investor and his application. We differentiate between the whole sample (A), underpriced (U) and overpriced (O) offerings. Underpricing data are from the Madrid Stock Exchange and *Expansión*. Allocation data are from *Expansión* and the Comisión Nacional del Mercado de Valores.

Intuition: Allocations in overpriced issues are significantly larger than in underpriced offerings.

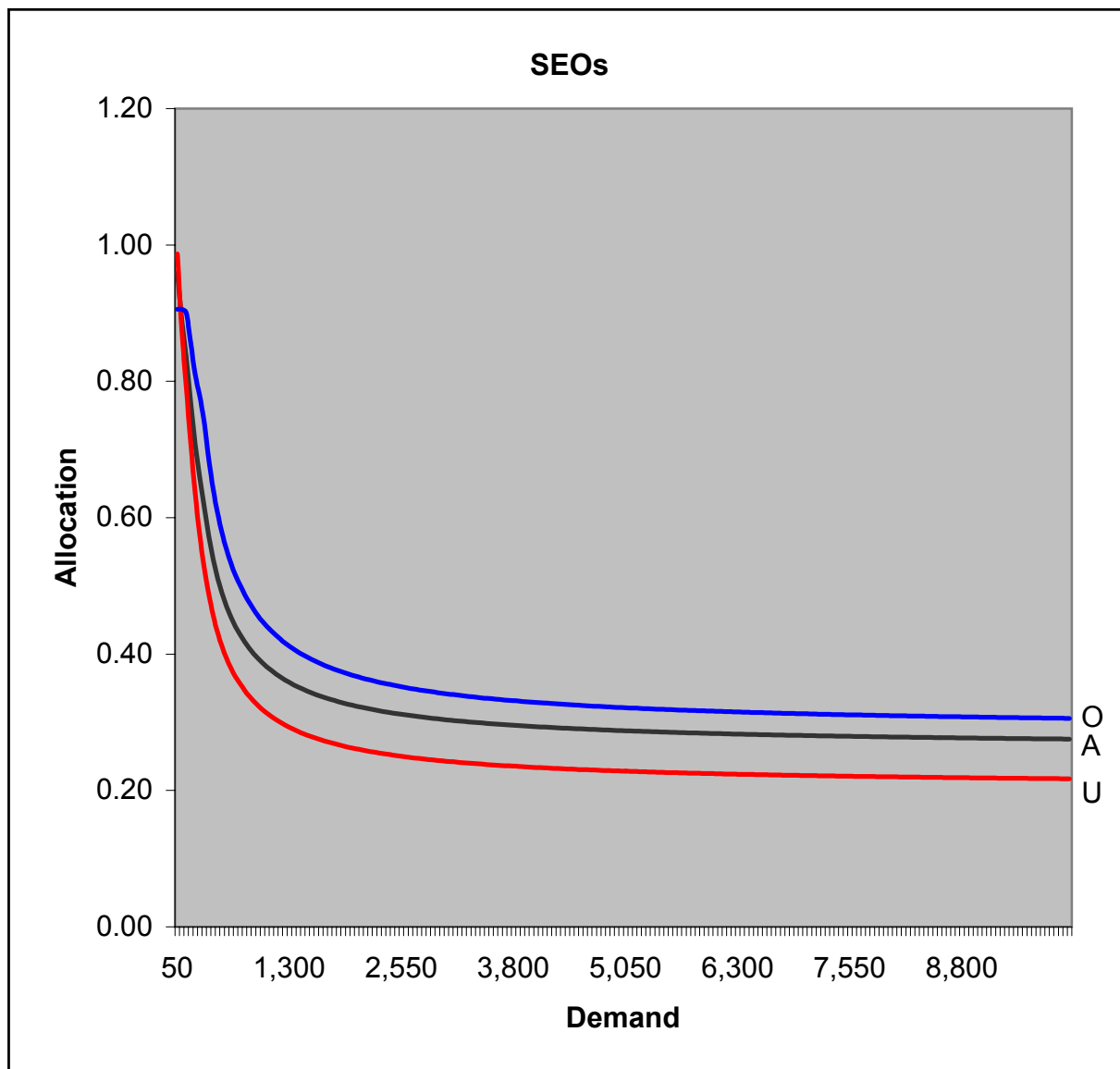


Figure IV: Pro-Rata Allocation to Retail Investors (SEOs).

This figure shows the pro rata allocation to retail investors in secondary equity offerings, for different application sizes. Allocation is the fraction between the monetary allocation to an investor and his application. We differentiate between the whole sample (A), underpriced (U) and overpriced (O) offerings. Underpricing data are from the Madrid Stock Exchange and *Expansión*. Allocation data are from *Expansión* and the Comisión Nacional del Mercado de Valores.

Intuition: Allocations in overpriced issues are significantly larger than in underpriced offerings.

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