Group Affiliation and the Performance of Initial Public Offerings in the Indian Stock Market[1]

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ABSTRACT

We document the effects of group affiliation on the initial performance of the 2,713 Initial Public Offerings (IPOs) made in India under three different regulatory regimes during the period 1990-2004. We distinguish between two competing hypotheses regarding the effect of group affiliation on a firm's initial performance in the stock market: the certification hypothesis according to which group membership is a *positive* signal of firm quality, and the "tunneling" hypothesis, under which group membership affords more opportunities for the controlling shareholders to misappropriate the firm's resources, and is thus, a *negative* signal of firm quality. Our results show that the average underpricing of group companies is *higher* than that of stand-alone companies. In particular, the underpricing is high for companies affiliated to private foreign and private Indian groups. The evidence in support of the certification hypothesis is reinforced when we test the *ex post* performance of all IPOs: we find that, over time, group-affiliated companies have a higher probability of survival and success than their stand-alone counterparts. Groups appear to support their affiliates to maintain their reputation in the eyes of investors. However, the long-term stock market performance of firms in all categories is negative or insignificantly different from zero. Further, the long-term performance of group companies is somewhat worse than their stand-alone counterparts. We conclude that the higher underpricing of IPOs of group-affiliated companies is due to investor overreaction, and may be the result of strategic behavior on the part of the groups to eliminate competition from lower quality issues.

1   Introduction

The decision to go public through an Initial Public Offering (IPO) is one of the most critical decisions in the life cycle of a firm. Due to its presumed importance, it has become one of the most widely researched topics in the finance literature. The research evidence, so far, suggests a clear tradeoff between costs and benefits in the IPO decision, both in terms of timing and the issue price. The main considerations in the decision to make an IPO, that have been highlighted by researchers, include the direct underwriting and related transaction costs (see Ritter (1987), as well as indirect effects such as agency costs (see Jensen and Meckling (1976)), and the costs of evaluation by outsiders (see Chemmanur and Fulghieri (1999)). The benefits from an IPO include increased liquidity (see Hölmstrom and Tirole (1993) and Pham, Petko and Stein (2003)), diversification benefits, visibility benefits and dilution of ownership structure (see Zingales (1995) and Pham, Petko and Stein (2003)). There is a vast literature on this topic that examines the evidence in particular markets, and, in relation to specific causal variables.[4]

To alleviate the costs associated with the IPO decision, firms often build their reputation by obtaining different types of quality certifications to signal their true quality to the market. Some popular certification devices include employing a reputed auditor (see Beatty, 1989), associating with a venture capitalist with an established track record (see Barry, Muscarella, Peavey and Vetsuypens (1990)), hiring a well-known underwriter (see Carter, Dark and Singh (1997)), attracting strong institutional affiliation (see Hamao, Packer and Ritter (2000)), and recruiting a qualified management team (see Chemmanur and Paeglis (2004)). The general argument in this literature is that firms try to reduce the investors' uncertainty regarding their value at the time of the IPO by resorting to various types of reputation-enhancing exercises. Analyzing the effect of certification on the firm's initial market performance helps address the efficacy of a particular certification mechanism and assess the validity of the signaling hypothesis that underlies many of the theories based on such certification devices.

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[4] See Ritter (1998) for a survey of IPO studies prior to the late nineties. There have been several papers that have been published since then. Due to the sheer volume of the literature, our focus in this paper remains on the certification hypothesis in relation to IPO performance, rather than IPOs in general.

In this paper, we aim to address three main issues related to group affiliation and firm performance in the Indian context:

1. Does affiliation to a private business group, domestic Indian or foreign, act as a form of certification at the time of the IPO?

2. Does the long run survival/success probability of such group-affiliated companies differ from that of stand-alone companies?

3. How do IPOs for firms that are affiliated to business groups, both Indian and foreign, perform in the long run, in terms of returns to investors?

These questions arise in the context of the family business structure which dominates a vast proportion of enterprises in India. Ownership and control by families is common for many companies in the emerging market countries in Asia and Latin America, as well as in some industrialized countries in Europe. A specific instance of this broad picture is in India, where large family-owned business groups control several firms through complex cross-holdings. On the one hand, group affiliation can be considered to be a *positive* signal by investors as the company is perceived to be backed by established promoters with a track record of good performance. This argument is in line with the certification hypothesis mentioned earlier, on the assumption that investors face less uncertainty regarding a firm's value, due to its affiliation with a group, thus leading to *less* underpricing of the IPO. On the other hand, however, the recent literature on family-owned business groups, particularly in the Asian context, reveals that many of the controlling owners of family-owned business groups may "tunnel" the cash flows from companies where they have low cash flow rights to companies where they have high cash flow rights, relative to their control rights.[5] This evidence suggests that group affiliation may act as a *negative* signal regarding a firm's value. Thus, the complexity associated with cross-holdings between group companies increases the outside investors' uncertainty, leading to *greater* underpricing. Therefore, there are two competing hypotheses regarding the effect of group certification on the firm's initial performance: the "certification" hypothesis, which predicts lower underpricing for group-affiliated companies and the "tunneling" hypothesis, which predicts the opposite.

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[5] See Claessens, Djankov, Fan and Lang (1999), for example.

We aim to bring greater clarity to our understanding of the evolution of pyramidal groups, in which companies are connected by a hierarchical structure of ownership relationships, by studying the effect of group affiliation on firm performance. The existing literature on pyramidal organizations does not attempt to disentangle the web of pyramidal organizations. Rather, so far, most of the papers focus on the effect of group affiliation on firm performance (based on accounting and market variables) on an *ex post* basis. In contrast, we attempt to address part of the pyramidal organizations' evolutionary process, by examining whether the market recognizes group affiliation as a positive or a negative signal *ex ante*, right at the point where public investors are considering acquiring ownership. In this context, we also address the endogeneity problem that is associated with most of the studies related to ownership structure and firm performance (see Demsetz and Lehn (1985)). The observed relationship of ownership structure and firm value at a given point of time can be the outcome of market forces, which react to the ownership structure. Thus, any significant relationship, based on *ex post* performance, may be spurious. However, if the relationship is measured at the time of a firm's initial entry into the stock market, the endogeneity problem will not affect the causal relationship between ownership structure and firm value.

To our knowledge, this is the second paper that addresses the *ex-ante* effects of group affiliation and the market's perception of firm value. In an earlier paper, Dewenter, Novaes and Pettway (2001) (DNP) address the effects of group affiliation and firm initial performance for the IPOs of Japanese firms affiliated to business groups. They conclude that group-affiliated companies pay higher costs in the form of higher IPO underpricing, due to the additional costs incurred by investors to analyze the complexity associated with group affiliated companies. Our study differs from DNP at least in three respects. First, the institutional features, economic environment and the group structure vary significantly between India and Japan.[6] Second, their sample includes only 159 IPOs that were made in Japan between 1981 and 1994. Our study uses a more recent time period (1990-2004) and is based on a much larger sample size (2,713 IPOs). Apart from the IPOs of companies affiliated to domestic groups (as in the DNP study), we also study those of companies

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[6] See Khanna and Palepu (1997) for details regarding the differences in the institutional features between India and Japanese markets.

affiliated to private foreign groups and the government. We are also able to investigate the effect of structural changes in the market and the regulatory framework, since the period of our study spans three different regulatory regimes in India. During this period, the Indian economy emerged from a highly regulated, state-controlled structure to a relatively liberalized, open one. Third, we examine the *ex-post* performance of companies, after the IPO. Our analysis casts some light on the subsequent evaluation of group affiliation, well after the IPO, and presents a more complete picture of market perceptions over time.

Our overall conclusion is that, similar to DNP, group-affiliated companies experienced greater underpricing than their stand-alone counterparts in their IPOs. However, we cannot conclude that underpricing occurs to offset the cost of the complexity associated with group companies. The reason is that we find IPOs of foreign group-affiliated companies also exhibit higher underpricing than domestic group affiliated companies. If we use DNP's argument, private foreign groups should be more complex with numerous chains of cross holdings. However, most of the (parent) private foreign groups in our sample are large multinational companies based in the United States and the United Kingdom. These groups do not generally have complex cross holdings and are presumed to abide by more stringent disclosure norms.[7] Thus, we attribute the higher underpricing of the IPOs companies affiliated to groups to investor overreaction to reputation. This, in turn, may be the result of strategic action by the management to use underpricing as a tool to eliminate competition from the IPOs of lower quality firms. We find that companies controlled by the government are the least underpriced. On an *ex-post* basis, group-affiliated companies survived better in the stock market than stand-alone companies; however, their long run stock market performance is worse than that of stand-alone companies that survived.

This paper is organized into five sections. The introduction in section 1 is followed by a brief review of IPOs and business groups related literature in section 2. A brief description of the Indian primary market is also discussed in this section. To keep the paper more focused, our discussion of the IPO literature is mainly restricted to papers that are related to the certification hypothesis. The description of the data used for this study

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[7] However, as we point out in our detailed analysis in later sections, private foreign groups do have a conflict of interest between the Indian affiliate and the overseas parent, due to royalties and other transfer payments paid to the parent, which may partly explain our results.

and the related statistics are presented in section 3. Section 4 discusses our empirical results. Concluding remarks are presented in Section 5.

2   Literature Review

2.1   *Group affiliation and firm performance*

The relationship between group affiliation and firm performance has been well documented in the finance, strategy and industrial organization literatures. The broad consensus is that the specific institutional context of the economy plays an important role in determining the merits and demerits of group affiliation. The evidence, so far, suggests that in an environment with a relatively strong institutional infrastructure, enterprises engaged in multiple businesses under-perform relative to those that are focused on specific industries (excluding leveraged bought out (LBO) Deals).[8] This "conglomerate discount," interpreted in the context of business groups, would suggest that there are diseconomies associated with group affiliation.

In contrast, in an environment with a relatively weak institutional infrastructure, group-affiliated companies that belong to large, highly diversified groups tend to out-perform stand-alone companies (see, for example, Khanna and Palepu (2000)). Khanna and Palepu (2000) relate these differences in the performance of companies to the "substitution" mechanism provided by groups. Firms in markets with a poor institutional infrastructure incur higher costs to acquire finance, technology and managerial talent. Group-affiliation reduces these costs due to economies of scope and scale, and results in better performance than stand-alone companies. On the other hand, if these necessary inputs for the growth of firms are easily available in the marketplace, the positive group effect may disappear. In such cases, group affiliation could be expensive, due to a lack of focus in one particular activity, resulting in under-performance of group-affiliated companies compared to their stand-alone counterparts. This would be in line with the "conglomerate discount" hypothesis in the industrialized countries, primarily in the United States. A recent empirical study by Gopalan, Nanda and Seru (2005) on Indian business

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[8] See, for example, Comment and Jarrell (1995), Berger and Ofek (1995) and Shin and Stulz (1998).

groups supports the former conjecture. They found that in the event of financial distress, group companies support each other, through intra-group loans, to reduce the negative spillover effects of group reputation. However, this support for group firms may come at the cost of overall financial performance of group companies. These two effects need to be disentangled, in order to come to a clear-cut conclusion regarding the effects of group affiliation on firm performance.

Interest in the relationship between group affiliation and firm performance has increased with the growing importance of corporate governance issues, both in policy-making and in the academic literature. Many academic papers report that group affiliation is detrimental to firm performance, due to the possible expropriation of funds by the controlling group. The argument is that group companies are prone to poor internal governance, especially when there is excessive control by the family that owns a significant stake. This happens especially when the control rights of the ultimate owners are out of line with their cash flow rights in a group-affiliated firm. In this context, several papers report evidence of such "tunneling" activities - uni-directional, often undisclosed, flows of funds, within a group, from firms where the ultimate owner has low cash flow rights (compared to control rights) to firms where the ultimate owner has high cash flow rights.[9]

Thus, the issue of group affiliation and firm performance is not a straightforward one. This debate is very pertinent in the Indian context, mainly due to the seemingly conflicting results from the Khanna and Palepu (2000) and Bertrand, Mehta and Mullainathan (2002) papers. After comparing the accounting and market-based performance of group-affiliated Indian companies with similar stand-alone companies, Khanna and Palepu (2000) conclude that group affiliation is a positive signal. However, they also point out that the positive relationship holds only for well-diversified and relatively large business groups. Without distinguishing firms based on the extent of diversification, Bertrand, Mehta and Mullainathan (2002) argue that firms affiliated to

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[9] Several authors document such evidence including Classens, Djankov, Fan and Lang (1999), Classens, Djankov, Lang (2000a), Claessens, Djankov, and Lang (2000b), Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000), Johnson, and Friedman (2000), Nam (2001), Obata, (2001) and Bertrand, Mehta, Mullainathan (2002).

groups are prone to "tunneling," thus causing a reduction in firm value; consequently, group affiliation could be a negative signal.

However, both these papers, along with similar ones in other countries, examine the *ex post* performance of firms that are affiliated to groups compared to their stand-alone counterparts. If firm group affiliation is regarded as positive or negative, this ought to be reflected in the pricing of the firm's shares when they are offered for sale to outside investors in the first place. In line with this argument, our study aims to examine the *ex-ante* perceptions of investors, through the underpricing of IPOs, thus throwing light on the seemingly contradictory prior studies in the context of Indian business groups.

2.2   *Performance of certification-backed IPOs*

Certification-backed IPOs are those that are perceived to be of better quality due to the reputation of the certifier or the certification device in question. This certification can come in many forms, including a good track record of the company before the IPO, the use of a reputed underwriter, venture capital backing, group affiliation, institutional backing, analysts' following, among others. However, the previous theoretical literature suggests that the pricing of certification-backed IPOs can go either way. Chemmanur and Fulghieri (1999) suggest that investors incur lower cost of information accumulation, if an IPO has some backing that signals better quality. However, Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Welch (1989), and Chemmanur (1993) suggest that underpricing should be more for higher quality IPOs, as they use underpricing as a signaling cost to drive low quality issuers out of the market.

Appendix 1 summarizes the findings of existing empirical studies on the certification hypothesis. Barry, Muscarella and Vetsuypens (1990) and Megginson and Weiss (1991) find that underpricing is *lower* for IPOs of firms with a strong venture capital participation compared to those without such investors. These results are consistent with the investors' cost of information accumulation hypothesis. In contradiction to these findings, a recent paper by Lee and Wahal (2004), based on a large sample, over a longer time period, uses a more robust statistical methodology to find *higher* underpricing in venture-backed IPOs. These authors explain that the contradiction between the two conclusions could be the result of incentives received by venture capitalists from

investment bankers to leave more money on the table. This may happen in exchange for preferential allocation by investment bankers in other underpriced IPOs to the venture capitalists. Loughran and Ritter (2002) also reach a similar conclusion.

There is a general consensus about underwriter reputation and its effect on IPO performance. Logue (1973), Beatty and Ritter (1986), Titman and Trueman (1986), Masksimovic and Unal (1993) and Carter, Dark and Singh (1998) find that the under pricing of IPOs brought to the market by reputable underwriters is lower compared to those of non-reputable underwriters. The evidence holds both on a short term and a long-term basis. Rajan and Servaes (1997) find that, in the long run, IPOs have better stock performance, when analysts predict low growth potential rather than high growth potential before the offering. Chemmanur and Paeglis (2004) test the certification hypotheses by using management quality as a proxy for certification. They find that good management quality is negatively related to the extent of underpricing.

DNP is the only published study, to date, on group affiliation and IPO performance. This paper examines the potential for conflicts of interest in Japanese *Keiretsu* business groups. They argue that the underpricing of the IPOs of group-affiliated companies reflects the complexity of the group structure, resulting in information acquisition costs to the investor. Hence, there is a trade-off between visibility and complexity. Visibility leads to costs for unscrupulous business groups - which prefer to be opaque - as investors can detect their opportunistic actions. On the other hand, complexity is a penalty imposed by investors on the business groups, as they incur more costs of information accumulation. If the benefits of being complex outweigh the penalty costs imposed by the investors, then, business groups may accept the underpricing of their IPOs. In the event, DNP find that the underpricing of group-affiliated *Keiretsu* companies is higher than that of stand-alone companies in their sample.

Thus, the empirical results, so far, suggest a) that the certification may not always reduce the costs associated with *ex-ante* uncertainty of firm value, and b) that firm performance varies with the nature of certification. Generally speaking, underwriting seems to work better than the other forms of certification. However, in general, it is difficult to comment on the optimality of the nature of certification based on these studies.

2.3   *The Indian primary market*

The primary market for equity in India gained momentum after the liberalization initiative taken by the government in the early 1990s. Following the improvement in the growth rate of the economy at that time, there have been a large number of IPOs during the period 1990-2004.[10] Unlike the US market, which is the basis for many IPO studies, the Indian IPO market has been dominated by retail investors (see Agarwal (2000)). The dominance of retail investors is also observed in the secondary market. During the last fifteen years, the Indian IPO market has undergone many changes that are widely seen to have improved its transparency and efficiency over the past fifteen years. In particular, the initial years of liberalization, after 1990-91, witnessed a boom in the Indian IPO market. With fewer regulations during this period, many entrepreneurs used the primary market as the main vehicle to raise capital. A majority of the IPOs in our sample were made in the first five years of liberalization (1990-95). The new spurt in the popular equity culture also witnessed several instances of "fly-by-night" entrepreneurs who eroded investors' wealth.[11] During 1995-96, the new securities regulator, the Securities and Exchange Board of India (SEBI), introduced more regulations on IPO pricing and enforced other restrictions on promoters, such as the lock-in period for insider promoters. This resulted in a slump in the IPO market, immediately following this period.

To encourage equity participation after the slump (1995-98), SEBI tried to shore up investor confidence by tightening its norms for public issues of equity between 1999 and 2000. Some of the main changes are related to:

(1) Financial reporting norms. (For example, the eligibility criterion for making a public offer was changed from "actual dividend payout" to "distributable profit," the resulting emphasis on profitability ensured that only companies with a track record of financial performance entered the IPO market.)

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[10] Source: Securities Exchange Board of India (SEBI) Public Issue Guidelines.
[11] The weakness of then-prevailing regulations attracted SEBI's attention after a major primary market scandal related to an infamous IPO by MS Shoes Ltd in 1995. In the same year, SEBI took some initiatives by appointing the Malegam Committee to recommend appropriate regulations for closer scrutiny of proposed offerings. See Shah and Thomas (2001) and Rao (2002) for more details.

(2) Allotment norms. (For example, the minimum allotment to Qualified Institutional Buyers (QIBs) was reduced from 60 per cent to 50 per cent, giving greater scope for retail investor participation. Moreover, a minimum allotment of 25 per cent was reserved for the retail public (investors with an investment below Rs 50,000).)

(3) Cost/efficiency norms. (For example, the secondary market infrastructure of the stock exchanges was used for the primary market too; the number of collection centers for investor applications for new issues was reduced to cut issue costs.)

(4) Transparent book building procedures. (Bids were invited from investors to aid price discovery.)

Thus, there have been three distinct regimes in the Indian primary market, namely, (1) the immediate post-liberalization regime (1990-1995), (2) the initial regulated regime (1996-2000), and (3) the reformed regulated regime (2001-2004).

3   Data and Descriptive Statistics

Our definition of group affiliation in our sample is based on the classification of the Center for Monitoring Indian Economy (CMIE). The CMIE classifies a company as affiliated to a group based on an analysis of company announcements and a qualitative assessment of the behavior of the firm in relation to the rest of the group.[12] For all companies with group affiliations, where appropriate, CMIE assigns each company to a unique ownership group, based on the group most closely associated with that company. In our research, we use the CMIE group classification to allocate all companies in our sample into four categories: stand-alone companies, companies affiliated to private Indian groups, those affiliated to private foreign groups (typically multinational companies) and government companies. Incidentally, previous studies of group ownership in India such as Khanna and Palepu (2000), Bertrand, Mehta and Mullainathan (2002) and Gopalan, Nanda and Seru (2005) use the same classification.

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[12] See the Prowess Users' Manual, Version 2, p.4, for details.

The data-set we assembled consists of attributes on all IPOs recorded in the CMIE database on Indian capital markets, between the years 1990 and 2004. Table 1 presents the summary statistics of our sample. We also divide our sample period into three regimes, and present a regime-wise classification of our data in the table. As discussed in Section 1, Regime 1 (1990-95) was the relatively unregulated IPO period in the immediate aftermath of the economic liberalization program launched in 1990-1991. During this time, there were few pricing restrictions and most of the IPOs were by firms that attempted to profit from the opening up of the Indian economy. Regime 2 (1996-2000) was the initial period after the newly constituted securities regulator, SEBI, began exercising strict regulatory oversight over the Indian securities market. At the beginning of this period, SEBI introduced price and promoter lock-in restrictions and closely scrutinized the IPO market. Regime 3 (2001-2004) is the period after the introduction of the book-building process to the IPO market, which may have changed the process of price discovery, and hence the underpricing in the IPO market. This characterization of the different regimes in the IPO market is designed to control for the effect of structural changes in the Indian market on the results from our study. Regime 1 witnessed the highest number of IPOs, while regime 3 had the lowest. Thus, Regime 1 and Regime 3 have been "hot" and "cold" issue periods respectively, for the Indian market using the terminology of Ritter (1984). However, unlike in the US market, where the hot issue period was driven by a boom in specific industrial sectors (e.g. the resources sector), in the Indian market, it was due to structural changes in the political economy, primarily through liberalization.

There are 2,713 IPOs over the fifteen-year period of our study in our data-set. During this period, a majority of the IPOs (2,147 or 79 percent) were made by stand-alone firms. The IPOs of private Indian group-affiliated firms represent 484 or 18 percent of the total sample. The remaining 82 or 3 percent of the IPOs are shared between firms affiliated to the government (33 or a little more than 1%) and those affiliated to foreign companies (49 or a little less than 2%). As shown in Table 1, there has been considerable variation in the number of IPOs in each year, during our sample period. Most of the IPOs in each category were made in the first half of the 1990s (Regime 1). However, the issue size per IPO, in Regimes 2 and 3 (post-1996) is substantially higher compared to the pre-1996 period (Regime 1). While part of the increase can be attributed to inflation, this broad

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trend indicates that the IPO market in India became more mature after SEBI's regulations were introduced or tightened during 1995-96, even as the size of the retail investor base was growing, due to emergence of a sizeable middle class. As a result, most of the issues made in the post-1996 period were by larger companies, which could pass the close scrutiny of the regulator. However, the number of issues in Regime 3 reduced to a trickle compared to prior years, except for government companies, mainly due to the slump in the world capital markets, following the dot-com collapse in 2000. In the case of government companies, the continued volume of IPOs was due to the privatization program of the government. The average issue size increased for all firm categories over time, indicating the growing maturity of the Indian primary market.

On average, underpricing is evident across almost all the years in our sample period and across the different categories. Typically, the extent of underpricing is low for firms affiliated to the government. Government-affiliated companies experienced *overpricing*, on average, for several years in the total study period. In the case of firms affiliated to Indian group companies, underpricing on average was as high as 394% in 1999 and came down substantially in 2001 and 2002, and was as low as 17.4% in 2002. In 2001, there was only one IPO and it was overpriced. On average, stand-alone companies experienced underpricing across all years in the study period. The extent of underpricing, on average, was the highest in 1999 (689%) and the lowest in 2003 (37.5%). Firms affiliated to private foreign groups experienced record underpricing with the highest recorded in 1991 (1,392%) and the lowest in 1995 (24%). There was a wider variation in other years, but those were typically due to an individual outlier in either direction. Table 1 also reports the average 30-day standard deviation of daily returns in the post-listing period. As shown in the table, the size of the standard deviation amount is not large enough to explain the extent of underpricing. For instance, the average underpricing for private Indian groups is around 140%; however, the average 30-day standard deviation of return after the listing is only 5.7%. This shows that uncertainty in firm valuation in the eyes of the investor cannot fully explain the extent of underpricing. Thus, underpricing is likely to be more due to investor overreaction, than any post-listing risk to investors.[13]

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[13] Another explanation for higher underpricing is provided by Chowdhry and Sherman (1996), who argue that in many Asian markets, the offer price is set *prior* to the public issue. A low issue price would lead to

.   Table 2 summarizes the pooled cross-sectional statistics relating to IPOs during the whole period, 1990-2004. This table summarizes the average values of the key variables based on the nature of firm affiliation. Along with average initial return and standard deviation, this table contains the average values for other control variables used in this study. This table also shows that the highest underpricing, on average, across the fifteen year period of our study is for firms affiliated to private foreign groups. Private Indian group-affiliated companies, stand-alone companies and government-affiliated companies follow in hierarchical order. It is interesting to note that the 30-day standard deviation of returns, after listing, also follows the same order. However, the sizes of the average underpricing are vastly greater than the sizes of the respective standard deviation of returns. This suggests that IPO performance, post-listing, was more due to investor over-reaction than the (fundamental) uncertainty of the firm value before IPO. Firms that are affiliated to large groups attracted more investors and the overreaction led to the high listing prices.

The average asset size of the firms varies based on the nature of the affiliation. Firms with government affiliation are relatively large in size at the time of the IPO. The IPOs from government-affiliated companies are mostly the result of the government's disinvestment plan. Throughout our sample period, the central and state governments in India divested their stakes in some of the large public sector companies through IPOs. The underpricing of government-affiliated companies is consistent with the hypothesis that reputation (in this case, the backing of the state) should decrease the extent of underpricing. These firms also exhibit the lowest standard deviation of returns in the post-listing period. However, it is surprising to see that the asset sizes of group-affiliated firms (both domestic and foreign) are smaller than those of stand-alone firms. It is generally expected that a venture from an established group should be of greater size than a similar venture from a stand-alone firm. The descriptive statistics also indicate that the IPOs of smaller firms are underpriced to a greater extent. Thus, asset size is an important control variable in our study.

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over subscription, while a high issue price may result in a failure of the issue. To avoid failure, a risk-averse issuer may underprice the issue.

Another important variable summarized in the table is the share premium. The share premium represents the difference between the par value of the share and the issue price. The prospectuses of all IPOs clearly state the share premium for a given IPO, with the practice continuing even today. Although it is the issue price that matters from an economic perspective, there is casual evidence that the share premium, which is widely quoted in the prospectus and other related public announcements by the company, acts on investor psychology. Firms with a better track record, reputation, and good management are widely believed to charge a higher share premium. Thus, premium is believed to act as a proxy for the issuing firm's reputation. Indeed, in Regimes 1 and 2, the SEBI scrutinized the logic behind the premium calculation, but even so, there is every chance that even low quality projects charged high premium during the IPO market boom.[14] There is anecdotal evidence suggesting that investor resentment by the end of Regime 1 was partly due to this phenomenon. Investors lost their investments by investing in such artificially inflated IPO prices. Table 2 shows that the average premium charged by all affiliated firms is higher than stand-alone firms.

The subscription details for IPOs by type of investor – promoters (insiders), the public, institutions, and others - are also summarized in Table 2. The promoters' participation figures clearly show that most of the government-affiliated companies are part of government disinvestment plans. The average promoters' subscription for government-affiliated firms is only 3.7%. The other affiliated firms (private Indian groups and private foreign groups) have a higher promoter participation compared to stand-alone firms. The public participation in all IPOs is quite similar. However, the institutional participation varies based on the nature of group affiliation. Government-affiliated companies, on average, have the highest participation by institutional investors. (At that time, several large domestic institutional investors were controlled or tightly regulated by the government.) Stand-alone companies come next. It is again surprising to see that institutional participation is quite low in both categories of group-affiliated companies. It is generally presumed that higher (lower) institutional investors' participation signals higher (lower) quality of the firm making the IPO. However, it can also be argued that higher

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[14] SEBI tightened its norms for IPO pricing due to widespread criticism of the lack of oversight of offerings during Regime 1.

institutional participation is not desirable in the case of group-affiliated companies, from the perspective of the controlling group, since higher participation of institutional investors reduces the group's control over the firm and subjects it to institutional scrutiny.[15]

4   Results

4.1   Preliminary results

Following the preliminary insights from Tables 1 and 2, we extend our analysis to investigate the statistical significance of the differences between the key variables across the different categories of firms. Table 3 presents the results of the tests of the mean differences between the key variables. We use analysis of variance (ANOVA) tests to evaluate whether there is any evidence that the means of the different populations differ. However, if we have more than two sub-groups (we have four categories in our analysis) it is inappropriate to compare each pair using a simple *t*-test because of the problem of multiple testing. For this reason, we used the Tukey multiple comparison test, which compares differences between the means with appropriate adjustments for multiple testing (see Tukey (1977) and Bland and Altman (1995)). The Tukey multiple comparison test, like the simple *t*-test and the pair-wise ANOVA, assumes that the data from the different groups come from populations where the observations have a normal distribution and the standard deviation is the same for each group.

Table 3 tests the mean difference of each group with the other groups. For instance, the first row, third column, shows the difference between the means of private Indian group affiliated companies and stand-alone companies for initial return variable. The *p*-values are shown in the parentheses below each mean difference value. The initial returns or the extent of underpricing between group-affiliated companies, both private Indian and foreign, and stand-alone companies is significantly different. The positive mean difference value indicates that the domestic group companies' mean value for initial return is higher

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[15] In many cases, institutional investors obtain a seat on the boards of companies where they have a stake.

than stand-alone companies. Likewise, the mean difference values can be interpreted for other variables, and comparisons between other groups. The initial return of government-affiliated companies is not statistically different from that of other categories. However, the asset size is significantly different from that of other groups. Table 3 shows that, in terms of asset size, the mean difference value between group-affiliated companies and their stand-alone counterparts is not statistically significant. The issue size of domestic group-affiliated companies is larger than for stand-alone companies and smaller than for government affiliated companies. The share premium charged by domestic group-affiliated companies is higher than for stand-alone firms and smaller than for foreign group affiliated companies.

The difference in means between the proportions of promoter participation is not significantly different between group-affiliated and stand-alone companies. However, there is a highly statistically significant difference between group-affiliated companies and government-affiliated companies. The same results hold for public participation. The finding regarding institutional investor participation is also not that surprising, as discussed in Section 3. The only mean difference value that is statistically significant is between private Indian group-affiliated companies and stand-alone companies. The institutional investors' participation for stand-alone companies is higher than domestic group affiliated companies, which is in line with the discussion in the previous section. In summary, the mean-difference test results provide enough evidence that group affiliated firms (both domestic and foreign) are quite different from stand-alone companies and government-affiliated companies on several dimensions.

4.2 Regression results

Table 4 presents regression results of the relationship between the extent of underpricing and firm characteristics. We consider five sets of independent variables. The first set consists of firm characteristics such as issue size and asset size. The second set consists of the group affiliation dummies for three of the four categories we have defined. (We do not have a dummy variable for the government companies, since that is absorbed in the constant term.) The third set of characteristics relates to the industry dummies for

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three of the four industry sectors identified – banking, other financial services, manufacturing, and other services. (The "other services" category of industries does not have a dummy variable attached to it.) The fourth set of variables is the dummies for the three regimes (with Regime 3 being excluded) defined earlier that sub-divide our time series. The last set is the investor dummies for promoter, public and institutional participation. (The "others" category of investor participation is excluded.)

We estimate four regressions for different sets of independent variables, in order to assess the incremental impact of each set of variables on the extent of underpricing. Even though asset size varies significantly across the different categories we have defined, we find no evidence of any significant relationship between asset size and the extent of underpricing. The same holds for the issue size of the IPO: the size of the issue does not influence the extent of underpricing. The domestic group dummy is positive and highly significant in all the four regressions. Thus, after controlling for other factors, we find that being part of a private Indian group influences the extent of underpricing in a positive manner. The same positive relationship for the extent of underpricing holds for firms affiliated to private foreign groups. The coefficients for the industry dummies are all insignificant. Thus, underpricing is seen across all industry categories and it is not industry-specific in terms of its relative importance. Of course, it is possible that our industry classification is too coarse to detect such effects, particularly if they vary over time. We could not examine this issue in greater detail due to paucity of detailed industry classification data, along the lines of data in the industrialized countries.

Our results relating to the variations across regimes are reported in Regressions 3 and 4 in Table 4. The coefficients for Regimes 1 and 2 are negative and significant. This indicates that firms that undertook IPOs in Regimes 1 and 2 were, on average, relatively overpriced compared to the firms that issued equity in Regime 3. Higher underpricing in Regime 3 questions the efficacy of SEBI regulations for making the IPO market more investor-friendly and transparent. It can also be argued that the market conditions during Regime 2 were dull after the pricing of the IPO "bubble" at the end of Regime 1, reflecting investors' disenchantment with the returns on their investments in the previous regime, which led to lower listing prices in the subsequent period. During Regime 3, this trend was reversed as a consequence of SEBI's intervention to attract investors and IPOs

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from large, well-known companies with closer regulatory scrutiny, leading once again to investor overreaction and greater underpricing.

Contrary to our expectations, we find that promoter participation in the IPOs has a marginally significant influence the extent of underpricing. However, public and institutional investor participation reduces the extent of underpricing. This indicates that public and institutional interest signals firm quality and improves the valuation. However, our result on institutional affiliation contradicts the conclusion of Hamao, Packer and Ritter (2000) for the Japanese market: they find a positive relationship between institutional affiliation and the extent of underpricing.

4.3   Post IPO performance

4.3.1 Firm survival analysis

The regression-based results discussed in the above sections are inconclusive with respect to group affiliation and firm performance. The higher underpricing for group-affiliated companies may indicate that the "complexity of groups" argument made by DNP holds even for the Indian market. However, higher underpricing for firms affiliated to private foreign groups, a majority of which are US and UK conglomerates, poses a contradiction to the complexity argument. The private foreign groups used in this study are generally regarded as quite transparent, with most of them being managed by professionals, rather than family members who typically manage companies in the private Indian business groups. It is generally presumed that firms affiliated to foreign groups are better run and less likely to divert firm resources to outsiders than those in the private Indian groups. On the other hand, many of these firms affiliated to private foreign groups are subsidiaries of multinational companies. Since these firms are only partially owned by the parent companies, there is an inherent conflict of interest between the parent and the subsidiary, particularly with regard to brand royalties, technology fees, and other transfer payments. The issue is whether the presumed professionalism of the affiliates of multinational companies is in conflict with their allegiance to their parents.

We investigate this issue further by examining the post-IPO performance of firms in the various categories described earlier. We estimate the success probability of a given firm based on the category of affiliation by using an ordered probit model. We use the current listing band of a given IPO in the Bombay Stock Exchange in India (BSE) as a proxy for the long-run success of the IPO. The BSE classifies all listed stocks into different quality bands, namely, A, B1, B2, C and Z groups.[16] Shares that are classified in the A band are generally the large, liquid, blue chips of the Indian stock market. B1, B2 and C follow in the quality hierarchy from high to low. The firms that are classified as Z are usually failures. These companies are classified as such, either because they declared bankruptcy, or they violated the listing norms of the BSE, and were, therefore, suspended from trading. Thus, the BSE classification acts as a barometer for a firm's success in the Indian stock market, somewhat akin to a rating from a credit rating agency. The ordered probit model estimates the probability of failure by taking values 1 to 4 for A, B1, B2 and Z categories respectively.[17]

The results are presented in Table 5. We used both private Indian and private foreign group dummies that take the value 1, if the firm is affiliated to a private domestic or foreign group, respectively (and 0 otherwise). The negative and significant coefficients for both the domestic and private foreign group dummy variables indicate that the failure probability for a firm affiliated to either a private domestic or foreign group is lower than for a stand-alone firm. In other words, if a firm is affiliated to either a private domestic or foreign group, the probability of the firm listing in the lower bands is low. The results also indicate that, on average, firms that experienced higher underpricing in their IPOs have a lower probability of survival.[18] The size of the company, measured by assets, and the extent of promoter or institutional participation in the IPO do not affect the probability of firm survival over time. Also, IPOs made in Regime 1 had a greater chance of failure compared to those in the other two regimes. This is consistent with the opportunistic actions of "fly-by-night" entrepreneurs in Regime 1 as described in Section 2.3. This may be due to the fact that very few firms ventured into the capital market during this period,

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[16] We did not include the C band in our analysis as there are very few companies in this band in our sample.
[17] We also ran the probit model with just two classes, A, B1 and B2, in one class with a value, and Z with a value 0. The results are qualitatively similar, although less sharp than the ones reported here.
[18] We did not use issue size as an independent variable, as one would expect its effect to wear off over time.

and those that did so tended to be the robust ones, perhaps due to the closer scrutiny of the regulator and the more demanding market conditions. There are no patterns in the relationship between the nature of industry affiliation and the survival odds, except for the banking industry. All industry affiliations have equal chances of failure relative to the banking sector, which seems to have a lower probability of failure. This finding may be due to the additional requirement of scrutiny by the banking regulator, in addition to the securities regulator.

It should be noted that the chances of more stand-alone getting listed in the A and B1 bands should be higher than group-affiliated firms, based purely on the relative number of issues by stand-alone companies issues compared to domestic private group-affiliated firms. Stand-alone companies represent around 80 percent of IPOs issued in the Indian market, while group-affiliated companies represent only 18 percent of the IPO market. However, these numbers need not be reflected in the *probability* of success of any individual firm. Also, as shown earlier in Tables 1, 2 and 3, the size of domestic group-affiliated companies is not significantly different from that of stand-alone companies. The ordered probit analysis reinforces this conclusion in terms of probability of success: size is not significant for the likelihood of success of firms making the IPO. Thus, after controlling for other variables that might affect their performance, both private domestic and foreign group-affiliated companies survived better in the post-IPO period, compared to stand-alone companies. The reason for better survival odds could be due to the implicit contracts between group firms to help each other, in a weak legal system, in the event of distress, as argued by Bull (1987) and Shleifer and Vishny (1997). In this connection, Gopalan, Nanda and Seru (2005) find supporting evidence that Indian business groups, support each other, through intra-group lending, in case of financial distress.[19] They concluded that these supporting actions are to safeguard the group's reputation in the capital market. Our survival analysis supports this argument. Group firms might survive better, post IPO, perhaps due to this supporting mechanism, which is not available to stand-alone companies.

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[19] There is anecdotal evidence that this happens very often. In a well-publicized episode involving Tata Finance Ltd, the group companies of the Tata group provided financial assistance to bail it out of financial distress in 2003. This happened despite the fact that some of the group companies involved had no obligation to do so, since they were independent legal entities.

4.4 Long run performance of IPOs

We next analyze the long-run return performance of IPOs for firms in the various categories discussed earlier. The results are reported in Tables 6 and 7. Consistent with the IPO literature relating to the evidence in other countries (see, for example, Ritter, 1991), we find that the average long-run return performance of firms, post their IPOs, is significantly negative. This has been consistently true for different horizons - 12, 24 and 36 month windows - indicating the systematic over-optimism of investors regarding the performance of new investment opportunities.[20]

In Table 6, we report the long run return performance statistics for our data-set. We use both the Buy-and-Hold Abnormal Return (BHAR) and the Cumulative Average Abnormal Return (CAAR) measures for our long-run performance analysis. These are the standard metrics used in the IPO literature and represent different ways of defining the post-listing, long-term, return: BHAR is the risk-adjusted return based on buying at the beginning of the period and selling it at the end, taking into account any intervening distributions, while CAAR is the cumulative average return assuming compounding in each period (see, for example, Brav, Geczy, and Gompers (2000)). A more formal representation is as follows:

$$CAAR = 1/n\ CAR_i,$$
$$\text{where } CAR_i = \Sigma_{t=1\ to\ T}\ (R_{it} - R_{mt}).$$
$$BHAR = 1/n\ BHER_i,$$
$$\text{where } BHER_i = \Pi_{t=1\ to\ T}\ (1+R_{it}) - \Pi\ (1+R_{mt})$$

BHER is the Buy-and-Hold Excess Return; R_{it} = the return of firm i and R_{mt} is the market bench mark return (BSE 100 index return) in period t; the horizon date $T = 12$ or 24 or 36 months.

Among the different firm categories we had defined earlier, we find, to our surprise, that the magnitude of negative long-run stock market performance is *greater* for

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[20] See Ritter (1991), Levis (1993) and Agarwal, Leal and Hernandez (1993), for US, UK and Latin American markets respectively.

private foreign groups and private Indian groups compared to stand-alone companies. These are significantly different from zero for both these categories, over all three horizons we define, and also using both measures of return performance.

While this result appears to be in conflict with the findings from the ordered probit analysis, closer examination suggests that this is not the case. One can resolve this seeming contradiction based on three arguments:

1. The criteria for being classified in the better quality groups are not based purely on stock market performance. Other aspects of the stock, such as stock market liquidity, play a role.

2. The better survival odds of group-affiliated companies do not necessarily indicate superior market performance. In fact, low returns and high investments in fixed assets may go together, particularly in the pyramidal structure of family business growth, as argued by Almeida and Wolfenzon (2005).[21]

3. The results in Table 6 may also indicate long term reversals in firm valuation after substantial initial post-listing returns.

The results for government-affiliated IPOs are strikingly different from the rest of our sample. These firms have positive (albeit, statistically insignificant) long run performance. It should be noted that, the government-affiliated IPOs experienced very low underpricing. The results based on the BHAR measure are higher than those based on the CAAR measure. This could be due to the over-estimation issue associated with the BHAR measure, as noted by Brav, Geczy, and Gompers (2000).

Table 7 investigates whether there is any significant variation in the long-run performance across the various categories in our sample. We use the mean differences between the categories with similar methodology used in Table 3. We use the Average Abnormal Return (AAR) as the performance measure[22]. AAR is defined as follows:

$$AAR_i = 1/n \; \Sigma_{t= 1 \; to \; T} \, (R_{it} - R_{mt}),$$

where R_{it} = return of firm i and R_{mt} is the market bench mark return (BSE 100 index return) in period t, and the horizon date T = 12 or 24 or 36 months.

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[21] They argue that this is mainly due to the unique advantages that the controlling family can derive through the ease of expropriation achieved by driving a wedge between cash flow rights and control rights.
[22] We also used BHAR as the measure of performance. The results are qualitatively similar to AAR. For brevity we did not report them in the paper.

We find that there is no significant difference in long-run performance between the four groups. There appear to be no clear differences between the post-IPO return measures that are statistically significant. This confirms the conjecture that long-run underperformance, similar to other markets, is more a general phenomenon across all types of firms.[23] Thus, the negative performance of firms affiliated to domestic and foreign groups is not that significant on a relative basis.

In summary, both short-run and long-run performance supplemented with the survival analysis indicate that firms that are affiliated to both domestic and foreign groups exhibit greater investor over-reaction compared to stand-alone firms and firms affiliated to the government. This cannot be attributed to the "duration effect" proposed by Chowdhry and Sherman (1996), as the duration between opening of the issue and its listing on the exchange is more or less the same for all stocks. This leads us to conclude that group reputation might cause such high overreactions. Higher under-pricing may also be a strategic choice for group-affiliated companies to compete with low quality stand-alone issuers as argued by Allen and Faulhaber (1989) Chemmanur (1989) and Grinblatt and Hwang (1989).

5   Conclusion

We document the results of a comprehensive study of the Indian IPO market focusing on the effect of group affiliation on the initial performance in the post-listing market. We use a relatively large sample of 2,713 IPOs that were issued in India, from 1990 to 2004, to test whether group affiliation affects the extent of underpricing. We consider two competing hypotheses on the relationship between group affiliation and the extent of underpricing. The certification hypothesis suggests that in less developed capital markets, business groups form internal capital markets to help member companies in the case of financial distress. Thus, group affiliation acts as a positive signal, resulting in lower

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[23] There is a long standing debate on mis-measurement issues related to the methodology used to calculate long-run performance. For instance, Brav, Geczy, and Gompers (2000) show that the choice of performance measurement directly determines both size and power of statistical tests. However, we believe that the magnitude as well as the consistency of our results, for different horizons and for both measures of return performance, is striking, notwithstanding this theoretical argument.

underpricing compared to standalone companies. On the other hand, the "tunneling" hypothesis argues that due to excessive control of the family over group companies, the controlling family may expropriate the future cash flows of the affiliated companies, where they have relatively low cash flow rights. Thus, group affiliation acts as a negative signal, resulting in greater underpricing. In our analysis, we find that underpricing is greater for firms affiliated to groups. Our results hold for both private domestic as well as private foreign groups (affiliated to multi-national companies) that are presumed to be more transparent; hence, we cannot attribute underpricing to the tunneling effect or the complexity of group affiliation as argued by DNP.

We extend our analysis beyond DNP's framework to uncover the possible reasons for higher underpricing in both domestic and private foreign groups, by examining the post-IPO success of the firms. Our survival analysis indicates that group affiliated companies survive better than stand-alone firms. We conjecture that this could be due to a better support mechanism for group-affiliated companies compared to their stand-alone counterparts, in the case of financial distress, as argued by Gopalan, Nanda and Seru (2005): business groups try to preserve their market reputation by bailing out member firms that are in financial distress. Thus, group affiliation acts as a positive signal to the market. However, our long-run IPO performance results, measuring the stock market performance of the firm, are consistent with the results in other countries: in the long run, firms that were underpriced in their IPOs experience negative performance.

We also report many other stylized facts of an unexplored emerging primary market. Our overall conclusion is that the higher underpricing in group-affiliated companies is mainly due to the over-reaction of investors, and thus, reflects investor reaction to the reputation of group firms. Groups may also use underpricing as a strategic choice to attract more investors in competition with low-quality issuers from the market.

Our study raises a number of issues for future research. Are business groups the optimal organizational structure in the emerging economies? Do business groups hinder or help entrepreneurial growth in these countries? Will the role of these groups diminish as markets develop in these economies and reliance on group support mechanisms becomes less important? We believe that cross-sectional evidence from other markets will throw light on these questions.

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Appendix 1

Summary of prior research results on the relationship between the nature of certification and the extent of underpricing of IPOs

Author/s	*Nature of Certification*	*Relationship between the Nature of Certification and the Extent of Underpricing*	*Country*	*Study Period*
Beatty (1989)	Auditor Reputation	Negative	US	1975-84
Barry, Muscarella, Peavy, and Vetsuypens (1990)	Venture Capitalist Affiliation	Negative	US	1978-87
James and Weir (1990)	Borrowing relationship with Banks	Negative	US	1980-83
Megginson and Weiss (1991)	Venture Capitalist Affiliation	Negative	US	1983-87
Rajan and Servaes (1997)	Degree of Analysts Coverage	Positive	US	1985-87
Carter, Dark and Singh (1997)	Underwriter Reputation	Negative	US	1979-91
Hamao, Packer and Ritter (2000)	Institutional Affiliation	Positive	Japan	1989-95
Dewenter, Novaes and Pettway (2001)	Business Group Affiliation	Positive	Japan	1975-87
Lee and Wahal (2004)	Venture Capitalist Affiliation	Positive	US	1999-00
Chemmanur and Paeglis (2004)	Management Quality	Negative	US	1993-96

Table 1   Year Wise Summary Statistics for IPOs made in India during 1990-2004

This table summarizes the data on 2,713 Initial Public Offerings (IPOs), made in India during 1990-04, on a yearly basis, for the whole period and for sub-periods (regimes). The data are classified into four groups, based on the nature of the ownership of the firm making the IPO, namely, Private Indian Groups, Stand-alone Companies, Government Companies and Private Foreign Groups. The initial return is calculated as the proportionate change between the issue price and the first listing price on the stock exchange (the Bombay Stock Exchange). The total amount raised is presented in Indian Rupees. A crore is 10 million and the current foreign exchange rate (November 2005) is about 45 Indian Rupees to one US $. The data are also classified into three regimes based on the major structural changes that occurred in the Indian primary market. Regime 1 (Reg 1) (1990-95) is the IPO boom period, soon after the liberalization of the Indian economy, when the regulatory restrictions were mild. In Regime 2 (Reg 2)(1996-00) restrictions were introduced regarding pricing and other aspects of the issue. Regime 3 (Reg 3) (2001-04) is the period after the introduction of a transparent book-building process for price discovery.

Year	1990	1991	1992	1993	1994	1995	Reg 1	1996	1997	1998	1999	2000	Reg 2	2001	2002	2003	2004	Reg 3	Grand Total
Private Indian Groups																			
No. of Issues	7	33	74	100	129	72	415	32	7	-	10	12	61	1	4	1	2	8	484
Total Amount Raised (In Rs. Crores)	147	497.7	1045.7	1334.3	2354.7	4389.1	9768.0	1290.9	1086	-	1111.9	1591.6	5080.4	49.89	1561.5	95	402.1	2108.5	16957
Average Issue Size (In. Rs. Crores)	8.61	15.08	14.12	13.34	17.03	30.12	17.36	14.51	35.28	-	111.19	135.13	57.72	49.89	506.05	95	201.02	253.19	25.55
Average Issue Premium (Issue price/Face value)	1.41	1.5	1.23	4.67	2.14	2.6	3.05	2.6	1.12	-	11.2	2.63	4.29	1	5.25	5	1.1	2.83	4.63
Average Initial Return (%)	85.5	299.5	219.68	141.84	93.61	34.87	145.83	18.08	38.29	-	393.54	41.33	122.81	-32.5	17.4	140	80.03	51.23	140.07
Average 30 day Standard Deviation	3.70	4.49	2.92	7. 80	5.51	5.46	5.4	2.89	3.89	-	24.46	6.98	7.52	1.01	7.17	4.19	5.74	5.61	5.74
Stand-alone Companies																			
No. of Issues	12	40	129	270	535	738	1724	329	16	8	15	42	410	10	-	2	1	13	2147
Total Amount Raised (In Rs. Crores)	130	190.3	788.94	1436.9	3382.5	4432.1	10360	1900.2	189.9	207.3	238.48	814.23	3350.1	304.1	-	32.6	16.95	353.66	14065
Average Issue Size (In. Rs. Crores)	12.9	4.64	6.11	5.32	6.32	6.01	6.01	5.7	11.87	29.62	15.89	19.38	8.20	17.12	-	16.3	16.95	16.97	6.62
Average Issue Premium (Issue price/ Face Value)	1.33	1.01	1.08	1.36	1.58	1.81	1.60	1.26	1	1.24	1.26	1.58	1.28	2.37	-	1	1	1.55	2.14
Average Initial Return (%)	251	241.9	97.76	67.50	86.53	43.94	131.47	80.36	131.0	62.8	688.62	52.24	203.01	70.69	-	37.5	50	52.73	78.78
Average 30 day Standard Deviation	8.38	5.14	2.59	2.86	3.36	3.01	3.13	1.93	3.17	3.23	13.68	2.99	2.68	2.35	-	4.60	3.06	2.91	3.06
Government Companies																			
No. of Issues	1	-	1	1	9	2	14	2	5	-	1	2	10	1	4	1	3	9	33
Total Amount Raised (In Rs. Crores)	-	-	217.36	525	765.29	2478	3985.6	1030	1287.	-	125	205.1	2647.1	150	937.6	240	715.1	2042.7	8675
Average Issue Size (In. Rs. Crores)	120	-	217.36	525	85.03	1239	306.58	515	257.54	-	125	102.54	264.77	150	234.42	240	238.35	226.97	271.13
Average Issue Premium (Issue price/ Face Value)	1	-	1.5	1	3.05	2	2.5	5	1.5	-	1.5	4.75	2.66	4.27	1	1	5.33	2.98	3.5
Average Initial Return (%)	-71	-	370	21.42	55.04	-20.04	106.60	146.98	10.94	-	23	-4.5	44.105	-5	33.58	49.1	52.18	32.46	53.62
Average 30 day Standard Deviation	55.3	-	1.38	4.07	4.38	2.57	7.5	2.78	6.47	-	0.63	0.33	4.92	0.25	1.14	0.38	2.09	1.27	1.27

Private Foreign Groups

No. of Issues	2	9	6	7	8	7	39	3	-	1	1	4	9	-	-	-	1	1	49
Total Amount Raised (In Rs. Crores)	7.73	80.4	99.07	119.73	170.61	70.98	548.52	47.38	-	1.75	55.13	291.04	395.3	-	-	-	365	365	1309
Average Issue Size (In. Rs. Crores)	3.86	8.93	16.51	17.10	21.32	21.32	14.06	10.14	-	1.75	55.13	58.54	37.60	-	-	-	365	365	24.99
Average Issue Premium (Issue price/ Face Value)	5.25	6.83	6.63	4.5	7.42	2.5	5.71	2.41	-	4	4.5	2.37	2.80	-	-	-	7	7	8.76
Average Initial Return (%)	275	1392.	157.5	261.3	92.70	24.28	367.13	44.5	-	1899	152.2	356.54	613.06	-	-	-	26.98	26.98	351.01
Average 30 day Standard Deviation	2.22	9.99	2.88	3.09	2.90	3.01	4.56	1.17	-	8.73	94.4	5.49	14.27	-	-	-	5.49	36.78	7.08

Table 2 Comprehensive Descriptive Statistics for IPOs made in India during 1990-2004

This table summarizes the data on 2,713 Initial Public Offerings (IPOs), made in India during 1990-04, in terms of various descriptive statistics. The data are classified into four groups, based on the nature of the ownership of the firm making the IPO, namely, Private Indian Groups, Stand-alone Companies, Government Companies and Private Foreign Groups. The initial return is calculated as the proportionate change between the issue price and the first listing price on the stock exchange (the Bombay Stock Exchange). The average asset size and the issue size are presented in crores of Indian Rupees. A crore is 10 million and the current foreign exchange rate (November 2005) is about 45 Indian Rupee to one US $. The average 30-day standard deviation is calculated by using the stock returns from day 1 to day 30, after the stock was listed in the stock exchange. Each variable's standard deviation is reported in parentheses.

Variables of Interest	Private Indian Groups	Stand-alone Companies	Government Companies	Private Foreign Groups
Average Initial return (%)	140.07	78.78	53.62	351.01
	(349.46)	(285.44)	(100.06)	(855.99)
Average 30 day Standard Deviation (%)	5.74	3.06	1.27	7.08
	(11.29)	(4.77)	(10.14)	(14.14)
Average Asset Size at the time of IPO (In Rs. Crores)	102.83	360.44	17194.92	64.21
	(384.82)	(251.05)	(20963.42)	(133.94)
Average Issue Size (In Rs. Crores)	28.01	12.7	280.15	27.90
	(85.33)	(11.97)	(427.08)	(57.03)
Average Issue Premium (Issue price/Face value)	4.63	2.14	3.5	8.76
	(11.08)	(2.70)	(2.95)	(24.09)
Average Promoters' Subscription (%)	17.34	12.54	3.76	14.82
	(22.92)	(16.64)	(18.90)	(26.91)
Average Public Subscription (%)	68.63	64.38	69.50	75.28
	(27.01)	(20.97)	(27.22)	(28.90)
Average Institutional and Others Subscription (%)	14.03	23.08	26.74	9.90
	(19.10)	(16.25)	(18.32)	(17.21)
Number of observations	484	2147	33	49

Table 3 One-Way ANOVA Multiple Means Comparison Test for IPOs of Private Indian Groups, Stand-alone Companies, Government Companies, and Private Foreign Groups, during 1990-2004

This table is based on data for 2,713 Initial Public Offerings (IPOs), made in India during 1990-04. The data are classified into four groups, based on the nature of the ownership of the firm making the IPO, namely, Private Indian Groups, Stand-alone Companies, Government Companies and Private Foreign Groups. The initial return is calculated as the proportionate change between the issue price and the first listing price in the stock exchange (Bombay Stock Exchange). The asset size and issue size are presented in crores of Indian Rupees. A crore is 10 million and the current foreign exchange rate (November 2005) is about 45 Indian Rupee to one US $. The test statistic presented below relates to the differences between the means in different groups based on the Tukey multiple comparison test. This test allows a comparison of the means simultaneously for multiple samples. For instance, in the case of the initial return variable, the Private Indian Group sample mean is first compared with the other three groups. The Stand-alone Companies sample is also compared in the same manner, but, leaving out the Private Indian Group sample, which was compared in the first set, etc. The * indicates statistical significance at the 1% level. The *p*-values are in parentheses.

	Private Indian Groups	Stand-alone Companies	Government Companies	Private Foreign Groups		Private Indian Groups	Stand-alone Companies	Government Companies	Private Foreign Groups
Initial return					**Premium**				
Private Indian Groups	-	63.26* (0.001)	83.71 (0.427)	-214.26* (0.000)		-	2.68* (0.000)	1.12 (0.797)	-4.12* (0.001)
Stand-alone Companies		-	20.44 (0.981)	-277.53* (0.000)			-	-1.55 (0.564)	-6.18* (0.000)
Government Companies			-	-297.98* (0.000)				-	-5.25* (0.005)
Private Foreign Groups				-					-
Asset Size					**Promoters' Subscription**				
Private Indian Groups	-	68.38 (0.966)	-1792.07* (0.000)	38.61 (1.000)		-	0.11 (1.00)	16.17* (0.000)	-3.65 (0.654)
Stand-alone Companies		-	-1716.45* (0.000)	-29.76 (1.000)			-	16.16* (0.000)	-3.64 (0.626)
Government Companies			-	1713.69* (0.000)				-	-19.83* (0.000)
Private Foreign Groups				-					-
Issue Size					**Public Subscription**				
Private Indian Groups	-	20.95* (0.000)	-252.13* (0.000)	0.113 (1.000)		-	3.15 (1.00)	14.72* (0.003)	0.62 (0.998)
Stand-alone Companies		-	-1.55 (0.564)	-6.81* (0.000)			-	-17.87* (0.000)	-2.53 (0.904)
Government Companies			-	-5.25* (0.005)				-	15.34* (0.029)
Private Foreign Groups				-					-
Institutional Subscription									
Private Indian Groups	-	-3.29* (0.004)	1.73 (0.951)	2.76 (0.776)					
Stand-alone Companies		-	5.02 (0.386)	1.03 (0.995)					
Government Companies			-	1.02 (0.955)					
Private Foreign Groups				-					

Table 4 Regression Results with Initial Return as the Dependent Variable

This table is based on data on 2,713 Initial Public Offerings (IPOs), made in India during 1990-04. The table presents multiple regression results based on the following equations (Note: For brevity, only one regression equation is reported. The other equations are nested in the equation 4 below, but with fewer variables on the right hand side).

Regression 4: Initial return = c + a1 Asset Size + a2 Issue Size+a3 Private Indian Groups dummy + a4 Stand-alone companies dummy + a5 Government companies dummy + a6 Private Foreign Group dummy + a7 Banking companies dummy + a8 Financial services dummy + a9 Manufacturing companies dummy +a10 Other Services companies dummy + a11 Regime1 + a12 Regime2 + a13 Regime3 + a14 Promoters' contribution + a15 Public investors' contribution + a16 Institutional investors' contribution + a17 Other investors' contribution + e

The regressions are aimed to test the relationship between underpricing and variables of interest, namely: asset size, issue size, Private Indian Group dummy, Stand-alone Companies dummy, Government Companies dummy, Private Foreign Group dummy, Banking Companies dummy, Financial Services (ex-banking) Companies dummy, Manufacturing Companies dummy, Other Sectors dummy. Promoter's contribution represents the percentage subscribed by the promoters for the IPO; Public investors' contribution represents the percentage subscribed by the public for the IPO; Institutional investors' contribution represents the percentage subscribed by the institutional investors, while other investors' contribution (omitted here as an independent variable) represents the rest of the participation in the IPO. Apart from these variables, the table also reports the coefficients for the regime dummies. Regime 1 is a dummy variable for regime 1 (1990-1995); Regime 2 is a dummy variable for regime 2 (1996-2000); Regime 3 is a dummy variable for regime 3 (2001-2004. The *, **, *** represent significance at the 10%, 5% and 1% levels, respectively. The *t*-values are in parentheses.

Independent Variables	Regression 1	Regression 2	Regression 3	Regression 4
C	74.24	75.38	367.84	621.47
	(9.86)***	(8.64)***	(4.02)***	(3.93)***
Asset Size (at the time of IPO)	-0.00	-0.00	-0.005	-0.005
	(-0.13)	(-0.13)	(-1.49)	(-1.55)
Issue Size	-0.108	-0.115	-0.09	-0.074
	(-1.01)	(-1.08)	(-0.93)	(-0.71)
Private Indian Group dummy	65.54	65.52	63.14	59.05
	(3.95)***	(3.95)***	(3.79)***	(3.64)***
Stand-alone Companies dummy	-	-	-	-
Government Companies dummy	15.06	15.48	3.19	-1.80
	(0.21)	(0.20)	(0.04)	(-0.02)
Private Foreign Group dummy	279.79	277.63	270.13	267.03
	(5.85)***	(5.81)***	(5.66)***	(5.78)***
Banking Companies dummy		2.84	21.95	21.79
		(0.04)	(0.31)	(0.32)
Financial Services Companies dummy		-22.12	-21.14	-22.78
		(-1.20)	(-1.14)	(-1.27)
Manufacturing Companies dummy		-	-	-
Other Services Companies dummy		18.56	16.06	12.35
		(0.94)	(0.82)	(0.64)
Regime 1			-293.30	-270.22
			(-3.21)**	(-3.02)**
Regime 2			-290.85	-266.66
			(-3.16)**	(-2.96)**
Regime 3			-	-
Promoters' contribution				-2.33
				(-1.63)
Public investors' contribution				-2.72
				(-1.93)*
Institutional investors' contribution				-3.42
				(-2.38)**
Other investors' contribution	-	-	-	-
N	1914	1913	1913	1905
Adj R^2	0.0216	0.0260	0.0275	0.0360

Deleted: levels of

36

Table 5 Ordered Probit Model Results

This table is based on data on 2,713 Initial Public Offerings (IPOs), made in India during 1990-04. The table reports IPO post-performance results. We use an ordered probit model to measure the likelihood of success (failure) for a given IPO after listing on the stock exchange. The proxy for success (failure) is the current (as of Dec 2004) listing category on the Bombay Stock Exchange (BSE). The BSE classifies all listed firms into different quality bands. There are four main quality-based bands, namely, A, B1, B2, and Z on the BSE. The A band represents the best quality stocks in terms of size, liquidity and financial performance and the rest follow in hierarchical sequence, with the Z band representing firms that have violated BSE listing norms or have been declared bankrupt. In the ordered probit model, firms takes the values 1 through 4, if the firms' current listing bands are A, B1, B2 and Z respectively. We also use all the control variables that are used in Table 4. The ordered probit model (Model 4) is represented as follows:

Prob(Failure) = c + b1(Size of firm at the time of IPO)+ b2 (Private Indian Group Dummy) + b3 (Standalone companies dummy) + b4 (Government companies dummy) + b5 (Private Foreign Group dummy) + b6 (Banking companies dummy) + b7 (Financial services companies dummy) + b8 (Manufacturing companies dummy) + b9 (Other services dummy) + b10 (Regime 1) + b11 (Regime 2) + b12(Regime 3 dummy) + b13 (Promoters' contribution) + b14 (Public investors' contribution)+ b15 (Institutional investors' contribution) + b16 (Other investors' contribution) + b17 (Extent of underpricing) + e.

Note that models 1, 2 and 3 are variations of model 4, with or without sector dummies, regime dummies, subscription details and subscription details, respectively. Model 5 includes all variables that are presented in the table. Note: z-values are in parentheses. The *, **, and *** represent statistical significance at the 10%, 5% and 1% levels, respectively. The *z*-values are in parentheses.

	Model 1	Model 2	Model 3	Model 4
C	-	-	-	-
Asset Size (at the time of IPO)	-0.000	-0.000	-0.000	-.0000
	(-4.12)***	(-1.28)	(-0.42)	(-0.55)
Private Indian Group dummy	-0.619	-0.642	-0.672	-0.647
	(-9.36)***	(-9.65)***	(-10.01)***	(-9.55)***
Standalone companies dummy	-	-	-	-
Government companies dummy	-1.38	-1.04	-1.008	-0.974
	(-4.73)***	(-3.46)**	(-3.36)**	(-3.24)**
Private Foreign Group dummy	-0.899	-0.928	-0.902	-0.898
	(-4.73)***	(-4.89)***	(-4.73)***	(-4.68)***
Banking companies dummy	-	-1.823	-1.801	-1.749
		(-6.43)***	(-6.34)***	(-6.10)***
Financial Services companies dummy	-	0.095	0.094	0.104
		(1.30)	(1.28)	(1.40)
Manufacturing companies dummy	-	-	-	-
Other Services companies dummy	-	-	-	-
Regime 1	-	-	0.306	0.796
			(4.48)***	(2.18)*
Regime 2	-	-	-0.715	-0.507
			(-1.96)*	(-1.38)
Regime 3	-	-	-	-
Promoters' contribution	-	-	-	0.007
				(1.09)
Public investors' contribution	-	-	-	0.009
				(1.42)
Institutional investors' contribution	-	-	-	0.001
				(0.17)
Other investors' contribution	-	-	-	-
Extent of underpricing	-0.003	-0.003	-0.0002	-0.0003
	(-3.57)**	(-3.58)**	(-3.36)**	(-3.13)**
N	1884	1884	1884	1876
Log Likelihood	-1779.47	-1750.85	-1731.43	-1708.001

Table 6 IPO Long-Run Performance Results

This table is based on data on 2,713 Initial Public Offerings (IPOs), made in India during 1990-04. The table shows the average cumulative abnormal returns of firms (CAAR) on the BSE 100 index, and the average buy and hold returns of firms (BHAR) on BSE 100. The t-values are reported in parentheses. CAAR and BHAR are calculated and reported for different periods, for 12, 24 and 36 months respectively. The number of observations (N) varies based on the time period used to calculate CAAR and BHAR. CAAR is defined as 1/n CAR_i, where $CAR_i = \Sigma_{t=1\ to\ T}$ $(R_{it} - R_{mt})$; T = 12 or 24 or 36 months. BHAR is defined as 1/n $BHER_i$ where $BHER_i = \Pi_{t=1\ to\ T} (1+R_{it}) - \Pi (1+R_{mt})$. T = 12 or 24 or 36 months. R_{it} = return of firm i and R_{mt} is the market bench mark return (BSE 100 index return). The *, **, and *** represent significance at the 10%, 5% and 1% levels, respectively. The t-values are in parentheses.

Ownership Type	N (12 M)	N (24 M)	N (36 M)	CAAR (12 M)	BHAR (12 M)	CAAR (24 M)	BHAR (24 M)	CAAR (36 M)	BHAR (36 M)
Private Indian Groups	92	83	79	-0.265 (3.61)**	-0.614 (-4.34)***	-0.465 (-4.84)***	-0.792 (-6.40)***	-0.606 (-4.76)***	-0.820 (-5.43)***
Stand-alone Companies	426	401	391	-0.065 (-1.46)	-0.307 (-1.42)	-0.201 (-3.67)**	-0.792 (-6.40)***	-0.321 (-4.77)***	-0.820 (-5.44)***
Private Foreign Groups	12	9	9	-0.609 (-2.94)**	-0.943 (-7.20)***	-1.015 (-2.91)**	-1.001 (-6.60)***	-0.995 (-2.44)*	-1.012 (-6.18)***
Government Companies	13	9	6	0.082 (0.81)	-0.106 (-0.27)	0.191 (1.80)	0.219 (0.11)	0.094 (0.33)	0.181 (0.04)
All companies	543	502	485	-0.105 (-2.79)*	-0.366 (-2.48)*	-0.250 (-5.27)***	-0.448 (-3.23)**	-0.373 (-6.39)**	-0.501 (-2.77)*

Deleted: *indicates values are significant at the 1% level.

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Table 7 One-Way ANOVA Multiple Mean Comparison Test for Testing the Significant Difference Between Long Run Performance of Different Groups.

This table is based on data on 2,713 Initial Public Offerings (IPOs), made in India during 1990-04, on a yearly basis. The data are classified into four groups, based on the nature of the ownership of the firm making the IPO, namely, Private Indian Groups, Stand-alone Companies, Government Companies and Private Foreign Groups. AAR is defined as $1/n \Sigma_{t=1 \text{ to } T}$ $(R_{it} - R_{mt})$ for stock i, where R_{it} = return of firm i and R_{mt} is the market bench mark return (BSE 100 index return) and T = 12 or 24 or 36 months. The statistical significance of the differences between groups is based on the Tukey multiple comparison test. This test allows a comparison of the means simultaneously for multiple samples. For instance, in the case of the initial return variable, the Private Indian Group sample mean is compared with the other three groups. The Stand-alone Companies sample is also compared in the same manner, but, leaving out the Private Indian Group sample, which was compared in the first set, etc. The * represents statistical significance at the 1% level. The *p*-values are in parentheses.

Variable (i)	Private Indian Groups	Stand-alone Companies	Government Companies	Private Foreign Groups	Variable (i)	Private Indian Groups	Stand-alone Companies	Government Companies	Private Foreign Groups
AAR (12 MONTHS)					**AAR (24 MONTHS)**				
Private Indian Groups	-	0.0091 (0.972)	0.0283 (0.531)	0.022 (0.719)	Private Indian Groups	-	0.0271 (0.536)	0.0361 (0.279)	0.0114 (0.943)
Stand-alone Companies		-	-0.192 (0.796)	0.311 (0.446)	Stand-alone Companies		-	0.009 (0.970)	0.385 (0.227)
Government Companies			-	0.0504 (0.078)	Government Companies			-	0.0475 (0.088)
Private Foreign Groups				-	Private Foreign Groups				-
AAR (36 months)									
Private Indian Groups	-	0.005 (0.993)	0.025 (0.557)	0.0218 (0.666)					
Stand-alone Companies		-	0.0199 (0.725)	0.0269 (0.495)					
Government Companies			-	0.0468 (0.070)					
Private Foreign Groups				-					