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An Historical Analysis of IPO Underpricing in India

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Abstract

This study examines the initial returns of different types of industries in an emerging economy, India, and it investigates the determinants of underpricing. The analysis focuses on companies listed on the Bombay Stock Exchange (BSE) from January 2002 through to November 2013. Key trends in initial returns are highlighted on an annual and industry-specific basis. Out of 427 Indian IPO companies, 273 (63.93%) are underpriced, 134 (31.38%) overpriced and 20 (4.68%) equally priced. The highest number of companies that went public, between January 2002 and November 2013, are those for the manufacturing industry. The highest underpriced IPO occurred in the services industry and the highest overpriced IPO in the manufacturing industry. The average IPO initial return is 23,58%. Multiple linear regressions are used to distinguish the relationship between various independent variables with the dependent variable, i.e. degree of underpricing. It is found that each two-digit SIC industry has its own significant variables. In overall, the ex ante uncertainty concerning the value of IPOs has the highest impact on the degree of underpricing. Regression analysis shows that ex ante uncertainty is significant positively related to the degree of underpricing. The offer price and the size of an issue are found to be significant negatively related to the underpricing phenomenon. However, the age and size of a company, listing delay and the number of bookrunners have no significant influence on the degree of underpricing.

Key words: IPOs, initial returns, determinants of underpricing, asymmetric information, underpricing, overpricing.

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1.   Introduction

Initial public offerings (IPOs) have generated an enormous amount of public interest. Numerous Indian firms have gone public by undertaking IPOs[1]. India has the second highest number of listed companies after the USA. The decision to go public is one of the most important and most studied questions in corporate finance. The conventional wisdom is that going public is simply a stage in the growth of a company.

There are several theories to explain the decision of firms to go public. Traditionally, most researchers suggest that firms go public primarily to raise equity capital required for financing their growth. The main reasons, according to Eriksson and Geijer (2006), are achieving share liquidity and rising status and publicity, which increases the credibility of the company. Initial public offerings are not particularly about financing future investments and growth, it is a choice companies make. Pagano et al. (1998) argue that going public enables companies to borrow more cheaply and that the probability of an IPO is positively affected by the stock market valuation of firms in the same industry.

In a perfect market, the offer price of an IPO would be equal to the closing price on first trading day. However, investment bankers usually price IPOs at levels that differ from the intrinsic value. IPOs can be either underpriced or overpriced. Underpricing of IPOs has been considered as a prevalent phenomenon across the world, both in advanced markets in Western countries and in emerging markets such as India. Ibbotson (1975) and Ritter (1984) provide convincing evidence that IPOs are most of the time underpriced. Underpricing of IPOs is an indirect cost of going public that is borne by the issuing firm. Reasons behind underpricing might be liquidity problems and uncertainty about the level at which the stock will trade. In order to compensate investors for the risk they are taking, the IPOs will be underpriced. The less liquid and less predictable the shares are, the higher the risk. This will lead to more underpricing. An important reason to underprice the IPOs is encouraging investors to participate in the IPO.

Bansal and Khanna (2012) found that the extent of underpricing or overpricing of Indian IPOs depends significantly from the type of price mechanism. In particular, differences in the magnitude of underpricing and overpricing are observed when bookbuilding or fixed price offering mechanisms are employed. There are multiple ways to price an IPO. Beside auction mechanism and fixed price offering, bookbuilding is becoming increasingly popular outside of the United States and typically costs twice as much as a fixed-price offer. Underwriters determine at what price to offer an IPO based on demand from investors. Sherman (2004) and Ljungqvist et al. (2003) observed that bookbuilding is increasingly popular and that auctions are rarely used in IPO markets. Pandey (2004) investigated 84 Indian IPOs and found that the fixed price offerings are used by issuers offering a large proportion of their capital by raising a small amount of money. In contrast, bookbuilding is chosen by issuers offering small proportion of their stocks and a larger amount of money.

The most prominent explanation for underpricing is information asymmetry. Information asymmetry assumes that pricing of an IPO is a product of information disparities. Uninformed investors bid without regard to the quality of the IPO, while informed investors bid only on the offerings they think will gain superior returns. According to Allen and Faulhaber (1989), underpricing is a signaling device used by high-quality firms which intend to make subsequent equity issues to distinguish themselves from other firms.

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[1]See Appendix I, graph 1 for the total listed domestic companies in India.

Underpricing of IPOs can lead to significant gains for investors who have been allocated shares of the IPO at the offering price. However, IPO underpricing results in "money left on the table" for the IPO company. Lost capital could have been raised for the company when the stock had been offered at a higher price. The money left on the table is the difference between the closing price on the first trade day and the offer price, multiplied by the number of shares sold. In other words, this is the first-day profit received by investors who were allocated shares at the offer price. It represents a wealth transfer from the shareholders of the issuing firm to these investors.

Empirical evidence suggests that underpricing of new issues occurs at certain times in particular industries. In light of this tenet, this study seeks firstly to analyze the initial returns for different types of industries in the Indian IPO market, and secondly to investigate the determinants of underpricing.

In order to fulfill the above aims, this study focuses on the initial returns[2] of IPOs. When the offer price is lower than the closing price on the first trade day, the stock is underpriced. This is usually a temporary phenomenon, because the laws of supply and demand will eventually drive newly issued shares towards their intrinsic value. Attempts are made to examine the reasons for the initial returns observed on new issues. Ordinary least squares (OLS) regressions are employed in order to identify the factors explaining underpricing of IPOs in India. The degree of underpricing is used as the dependent variable. The independent variables chosen for this investigation are the age of a company, size of the issuing firm, timing of offer, offer price, issue size, number of bookrunners and ex ante uncertainty.

A sample of 427 Indian IPO companies, listed on the Bombay Stock Exchange (BSE), is used to search for factors that drive the IPO initial returns. Regression analysis shows that ex ante uncertainty has the highest impact on the degree of underpricing. Ex ante uncertainty is positively significant related with the level of underpricing. The offer price and the issue size are found to be negatively related to the degree of underpricing. However, the age and size of the companies, listing delay and the number of bookrunners have no significant influence on the degree of underpricing. The companies that went public, between January 2002 and November 2013, are classified by both 2-digit Standard Industrial Classification (SIC) codes and 3 or 4-digit SIC codes. The average initial return is 23.58%.

The remainder of this thesis proceeds as follows. Section 2 provides a literature review. Section 3 overviews the IPO process and decisions to go public. Section 4 describes the data and methodology and section 5 the findings. Section 6 discusses the empirical results and finally, section 7 concludes.

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[2]As discussed in more detail later, the initial returns are measured as the difference between the first day closing price and the issue or offer price.

2.   Literature Review

IPO underpricing appears to be a universal phenomenon. Studies examining IPOs, have documented the existence of underpricing on various stock exchanges. When going public, the offer price of a stock is on average lower than the closing price of first trade. Underpricing is simply pricing an IPO under its market value. If the new shares are priced at their expected value, investors crowd out the others when good issues are offered and they withdraw from the market when bad issues are offered. Therefore, the offering firm must price the shares at a discount in order to guarantee that the uninformed investors purchase the issue. It is believed that IPOs are often underpriced to attract investors to participate in the IPO, because of concerns relating liquidity and uncertainty about the level at which the stock will trade. If the shares are less liquid and less predictable, they will be more underpriced to compensate the high risk that investors are undertaking. Overpricing is exactly the other way around.

Going public is a choice companies make. When making this choice, a company needs to consider the benefits to the company's overall health. Going public can help your company raise funding and improve your brand and visibility. If the main motivation is raising funding, alternative funds such as loans or seeking out investors should be considered. If a company wants to increase the number of locations for example, but does not have sufficient funds to do so, it may consider undertaking an IPO. If the firm does not want to take more debt, shares of the business can be sold to public in order to fund the expansion plans. Then, the firm can go to an investment bank to set up an IPO. The investment bank will value the company and decides to split it into shares. The company receives money from investors which they can invest. If the company's profit increases, the value of the investors' shares will also increase.

There are several motives behind an IPO. A reason to go public may have to do with qualitative elements like revenue projections and financials. Gaining more credibility and prestige is a known reason to go public. Going public can grant a company access to capital, instead of debit through selling shares. In private financing, angel investors providing money in exchange for ownership equity or convertible debt. The same idea works with a Venture Capital. Most of the time investors want some degree of control of the business, or at least a voting chair.

After going public, a company's debt-to-equity ratio can improve, which tends to result in more favorable financing arrangements. This makes the access to capital greater. The company is also able to raise capital at a lower cost. Public companies can offer stocks as an incentive, bonus or as part of an employment contract. Equity can be used to acquire other businesses, merger and acquisitions.

Pagano et al. (1998) studied Italian IPOs and found that going public enables companies to borrow more cheaply. Around the IPO date, the interest rate on the short-term credit falls and the number of banks willing to lend money rises. According to them, reducing debt is one of the reasons to go public. This point is contrary to the evidence shown by Albornoz and Pope (2004) for UK firms. They found that leverage is negatively related to the probability of going public. They provided several advantages of going public such as cheaper share trading, overcoming borrowing constraints or the windows of opportunity hypothesis.

Other advantages of going public are stock value appreciation, maintaining control, liquid equity, media spotlight and the control of risk. When an investor expects the shares will drop in price, the investor should go by selling the shares. Publicly traded shares are more liquid than privately held ones. Investors in public companies are more able to go short or long because of the higher liquidity. Attracting and retaining high quality employees is most of the time also a result of IPOs. Going public can also increase the net worth of the founder of a company. The company's stock becomes liquid net worth. In order to make a portfolio more diversified, the equities can now be readily cashed out. In short, a well-functioning IPO provides a company rewards in many ways and it opens many opportunities. Nevertheless, a number of disadvantages also exist.

Public companies have to deal with shareholders. These companies need consistently inform shareholders of what is happening in the company. The financial reporting requirements will be higher than in private companies. Because of the higher reporting requirements, the pace of decision-making can slow down. An important disadvantage of going public is the initial and subsequent costs associated with the IPO process. First of all, an underwriter must be hired. Next, the registration needs to be completed. After this, the road show will begin and the firm must make the IPO of the company's stock on the stock market at the end of the road show. The IPO process is complex. If a company is not familiar with the registration process, attempts to do this on your own should be avoided. Some of the direct costs of going public are underwriter, external auditor, legal and reporting advisor fees, travel and printing costs. Next to this, the costs to institute incentive plans for executives and employees and longer-term costs such as external reporting, investor relations and human resource functions need to be taken into account. Unfortunately, only a part of the IPO costs is disclosed publicly, which makes tracking and understanding the IPO costs of other companies that have recently become public difficult.

By going public, the company increases the reporting and disclosure formalities. In India, a firm must be willing to remain compliant with clause 49. Clause 49, part of the listing agreement to the Indian Stock Exchange, came into effect from 31 December 2005 and improves the corporate governance in all listed companies. Remaining compliant is associated with costs. Therefore, it is prudent to weigh the willingness to comply with these rules.

According to Albornoz and Pope (2004), one of the reasons to stay private is adverse selection. Insiders can be assumed to know more than outsiders about the true value of the firm. Private companies can keep their information private. When providing innovative and proprietary information as a public company, the competitors can benefit from this and use it for themselves. It can also create difficulties with vendors.

Another disadvantage of going public is stock manipulation. Stock manipulation affects the short-term stock price. The long-term stock price is influenced by the growth of the profits the company generates. On Wall Street, a less-publicized and more-sinister version of short selling can occur. This is called short and distort (S&D). S&D traders can manipulate the stock prices with smear campaign. After going public, the stock prices are sensitive to trading activities. Investors and traders can abuse this sensitivity. If they do, they affect the performance of the stocks without even purchasing the stocks. For example, if you expect a devaluation of the stock price, a purchaser could pick up more stock for the same amount of money. Fortunately, many institutions provide methods to identify and prevent short and distort.

Multiple studies try to explain the IPO excess returns by the underpricing theory. Underpricing of IPOs can be influenced by many factors such as information asymmetry, principal-agent problems and signaling, timing of IPO, price mechanisms, type of industry or market sentiment. A situation in which one party possesses more or superior information compared to the other party is called information asymmetry. Joh and Kim (2011) argue that underwriters leave out private information, especially positive private information. It is not always the case that the seller of an IPO knows more than the buyer. Because of information asymmetry, one party can take advantage of the lack of knowledge of the other party. A company can take advantage of information asymmetry before or after a transaction. Taking advantage of information asymmetry before a transaction is called adverse selection. Adverse selection refers to a market process in which undesired results occur when buyers and sellers have asymmetric information. The "bad" products or services are more likely to be selected. Taking advantage of information asymmetry after a transaction is called moral hazard. Moral hazard is a situation where one party has the tendency to take risks because the costs that could result will not be assumed by the party taking the risk. It occurs when the party with more information about its actions or intentions has a tendency or incentive to behave inappropriately from the perspective of the party with less information.

According to Lowry et al. (2010), the volatility of initial returns is higher for firms that are more difficult to value. This is because of higher information asymmetry. It should be more difficult to estimate precisely the value of a company that is characterized by high information asymmetry. The extent of the IPO-underpricing could be measured by the initial return of the shares. It is found that hot IPO markets are not only characterized by high initial returns but also by high volatility over time. Beatty and Ritter (1986) demonstrated that there is a monotone relation between the expected underpricing of IPOs and the ex ante uncertainty of investors about its value. It is not necessary that other parties be perfectly informed, it is sufficient that aggregate demand be more informative than an investor's personal observation.

Most theories use the model of Rock (1986) to explain the underpricing phenomenon. Rock argues that underpricing is a result of the risk assumed by uninformed investors because of the informational advantage of informed investors. Due to the participation of informed investors, uninformed investors subscribing to good or more profitable IPOs receive smaller allocations on average. The winner's curse hypothesis of Rock claims that uninformed investors need to be compensated for the informational disadvantage they have.

The winner's curse is a phenomenon that may occur in common value auctions with incomplete information. Uninformed investors tend to overpay which makes them winners. They pay more than the actual intrinsic value of shares. They need to be rewarded in order to attract them to participate in IPOs. Underpricing can be seen as a compensation for the information asymmetry. According to Rock (1986), shares must be offered at a discount to hold uninformed investors in the market because none of the investors group has enough money to absorb the initial public offering. Carter and Manaster (1990) extended Rock's model and showed that if the risk of an issue increases, informed demand will increase which aggravates the adverse selection problem and the required underpricing.

Signaling is the idea that one party conveys some information about itself to the other party. One party can be seen as the agent and the other party as the principal. Insiders have information not available to the market. The moves of insiders can signal information to outsiders and change the stock price. Ljunqvist and Wilhelm (2003) argue that underpricing may arise partly due to principal agent problems. Principal-agent theory is about the difficulties in motivating the agent to act in the best interests of the principal rather than in his own interests. In the context of IPOs, a principal-agent model focuses on asymmetric information between underwriters and issuers.

Baron (1982) argues that underwriters are better informed about demand conditions than issuers, which leads to a principal-agent problem. Karlis (2000) also used Baron's assumption, that insiders know more about issuing firm value than others, for his game theory approach. Leland and Pyle (1977) analyzed the role of signals within the IPO process. They showed that 'good' companies, companies with good future perspectives and higher possibilities of success, should always send clear signals to the market when going public. The signals must be too costly to be imitated by 'bad' companies. If no signal is sent to the market, information asymmetry will result in adverse selection in the IPO market.

Michaely and Shaw (1994) showed that IPOs, underwritten by reputable investment banks, are significantly less underpriced and perform significantly better in the long run. Hiring a prestigious underwriter or a reputable auditor is seen as a specific way to reduce ex ante uncertainty. In certain circumstances, companies with the most favorable prospects find it optimal to signal their type by underpricing their initial issue of shares. Investors know that only the best can recoup the cost of signal from subsequent issues. Companies signal their 'high' quality by using underpricing. High quality firms are able to bear the costs of underpricing. Low quality firms cannot bear the costs of underpricing. Therefore, underpricing is a signal that the firm is good.

The timing of an IPO may also influence the level of underpricing. Companies successfully time their offerings for periods when valuations are high, with investors receiving low returns in the long-run. Loughran and Ritter (2004) showed that IPO underpricing changed over time. They took 4 sample periods in which the average first-day return on IPOs was the highest during the internet bubble years of 1999-2000. The timing of IPOs is related with the market demand. For example, the companies that went through IPOs at the peak receiving higher valuations than companies that went through a point where the demand was lower.

It is important to consider the timing of an IPO, as this may influence not only the price of the shares but also their initial returns. During crises, the prices of IPOs are on average lower than times when there is no crisis. Because of pessimistic behavior, the willingness of investors to invest in stocks will be lower. The firm is not able to get a good price for its IPO. A firm must keep in mind the general sentiments in the investor market in order to make an appropriate decision regarding the timing of an IPO. When the market demand is low, investment bankers will wait with offering their shares. They will wait until the demand is favorable. When there is a favorable demand, the prices of IPOs are high which increases the risk of underperformance. This does not necessarily mean the company is more valuable. The IPOs will exceed their fundamentals.

A situation in which the IPO demand exceeds the deal size or issue size is called oversubscription. An IPO is oversubscribed when there are more buyers than issued shares. It is generally expressed in terms of a multiple. Kenourgios and Papathanasiou (2007) showed that oversubscription significantly affect the degree of underpricing for Greek IPOs. Also Abu Bakar and Uzaki (2013) showed that the time of oversubscription has a significant effect on the level of IPO underpricing for shariah-compliant companies. The late 1990s saw one of the hottest IPO markets ever. The market demand for internet stocks was so high, that nearly all of the stocks were oversubscribed. A hot IPO appeals to many investors and has a great market demand. The excess demand will result in higher IPO prices. Derrien, F. (2005) showed that IPOs can be overpriced and still exhibit positive initial returns. If noise traders are optimistic, they are ready to pay high prices for IPO shares. IPO prices reflect the private information collected in the IPO process, and partially the public information known at the time of offering. Therefore, IPOs are overpriced (i.e. priced over their long-run intrinsic value) on average, but exhibit positive initial returns. The market demand of individual investors is positively related to market conditions and the common market demand leads to high IPO prices, high level of initial returns and a long-run underperformance.

Price mechanisms also affect the IPO initial returns. The most frequently used price mechanism is bookbuilding. Despite the high costs, it is becoming very popular in many countries. Other wellkown price mechanisms are the fixed-price method and auction method. The auction method is a price mechanism for IPOs in which the auctioneer begins with a high asking price which is lowered until investors are willing to accept the price, or a predetermined reserve price is reached. Under the fixed-price method, the issuing price is determined on the basis of the company's fundamentals. The shares are priced without first looking at the investors demand. The main advantage of fixed-price offerings are low costs and the relative ease of executing the offer.

Book building is the process by which an underwriter tries to determine the offer price of an IPO based on investors demand. Fund managers desire a number of shares at a certain price. Based on that, the underwriter builds a book by accepting the orders from fund managers. Joh and Kim (2011) studied how public and private information, revealed during bookbuilding, is differently reflected in price revisions and how it affects IPO underpricing. They explained the initial returns by asymmetric partial adjustments in price revisions. Bansal and Khanna (2012) analyzed the Indian evidence on price mechanisms of IPOs. They found the significant difference between magnitude of level of underpricing and overpricing that are priced through bookbuilding and fixed-price offering. Until 2000, only the fixed-price offering method was available for Indian IPO companies. In 2000, the bookbuilding method was permitted.

The bookbuilding method is increasingly popular, mainly because the underwriter has total discretion in allocating shares. The discretion is limited in obvious ways. It is forbidden, as an underwriter, to allocate shares to your own employees or close relatives. It is also forbidden to keep shares and sell them at a higher price on the aftermarket. Cornelli and Goldreich (2001) found that the investment banker awards more shares to bidders who provide information in their bids, which can be used to set the issue price, and that they also favor large bids and domestic investors. Investment bankers often have superior information about demand in capital markets. Large bids indicate an apparent lack of concern with liquidity and control issues. Bidders from the issuer's country receive a favorable allocation.

According to Kutsuna and Smith (2004), bookbuilding enables more accurate valuation of firms. It also reduces the total issue costs for large issuers and result in a higher aftermarket value. Bookbuilding is a more efficient way to provide information to investors, which result in less underpricing. Because of this, information costs will lower and the investors will accept lower initial returns.

The type of industry is related with the level of underpricing. If a company considers to do an IPO and the company is in a field that already has comparable publicly traded companies, the valuation of the IPO will be linked to the valuation multiples of the competitors. Investors will be willing to pay a similar amount for comparable publicly traded companies. Corwin and Harris (2001) find that IPOs are more likely to list on the exchange where their industry peers are listed. Allen and Faulhaber (1989) showed that underpricing takes place at certain times in particular industries. The levels of initial returns vary from industry to industry. The changing risk composition hypothesis, introduced by Ritter (1984), assumes that riskier IPOs will be underpriced by more than less-risky IPOs. The initial returns of risky firms will be higher than less risky firms. Riskier firms often set a lower offer price to attract investors to participate in the IPO. That's why the underpricing and initial returns will be higher. Lowry et al. (2010) found that the variability of IPO initial return is considerably higher when the fraction of difficult-to-value companies that go public is higher. With difficult-to-value companies, they refer to young, small, and technology companies.

In the study of Islam et al. (2010), the highest level of underpricing was in the manufacturing sector. The second highest level of underpricing was registered in the food and allied products sector and the lowest level of underpricing was in the paper and printing sector. Many researchers used the type of industry as a proxy to explain the level of underpricing (Islam, 2010; Wang, 2012; Abu Baker and Uzaki, 2013).

Evidence has shown that market sentiment is directly related with IPO pricing. Underwriters take advantage of market sentiment by setting an offer price above its intrinsic value. Market sentiment is the overall attitude of investors toward a particular security or larger financial market. Rising prices might indicate a bullish market sentiment, while falling prices indicate a bearish market sentiment. There are several ways to measure market sentiment. A widely used measure of market sentiment is the performance of stock market index prior to the offering. This is not the only information that matters in measuring market sentiment. The degree of optimism or pessimism of investors is also important to take into account in IPO pricing. This can be measured by the Index of Consumer Sentiment (ICS) or the Consumer Confidence Index (CCI). Baker and Wurgler (2007) showed that it is quite possible to measure market sentiment. According to them, investor sentiment is a belief about future cash flows and investment risks that is not justified by the facts at hand. They constructed a sentiment index based on six proxies for market sentiment. They used the following proxies: trading volume, dividend premium, closed-end fund discount, number of IPOs, first-day return on IPOs and equity share in new issues. A few variables should be used to capture market sentiment. Therefore, this proxy is excluded in this study. Jiang and Li (2013) found that underwriters only partially adjust offer prices to reflect pre-market sentiment and money left on the table is positively related to the deterioration of market sentiment in the aftermarket period.

In this study, multiple regression analysis is used to distinguish the relationship between various independent variables with the dependent variable, i.e. level of underpricing. To study the determinants of underpricing in India, various explanations, proposed by previous research, are examined. The independent variables in this study include the age and size of the issuing firm, timing of offer, offer price, offer size, number of bookrunners and ex ante uncertainty.

Bansal and Khanna (2012) studied Indian IPOs listed at Bombay Stock Exchange (BSE) from April 2000 to December 2011. The outcomes of their multiple regressions reveal that the age of the firm, listing delay, book building mechanism, ownership structure, issue size and market capitalization explained 44% of the variation in issuer underpricing. They found that the issue size is negatively significant related with underpricing. Ghosh (2005) studied 1842 Indian companies that got listed at the BSE from January 1993 to March 2001 and found that uncertainty played a role in underpricing in the Indian primary market. He found a negative relationship between the issue size and underpricing. Industry classification had no significance in explaining underpricing.

Mishra (2010) studied 235 IPO companies, listed between April 1997 and March 2008, on Indian stock exchanges and found that the type of price mechanism (bookbuild or fixed price offering) does not affect the degree of underpricing. The 'hot issue' market of IPOs was in 2007. Mishra found a positive initial return of 14.45%, while 60% of the IPOs were initially overpriced. Pandey (2004) examined 84 Indian IPO companies from the period 1999 to 2002. They found that fixed price offering is used by issuers offering large proportion of their capital by raising a small amount of money. In contrast, book build offering is used by issuers offering small proportion of their stocks and mobilizing larger sums of money.

Pande and Vaidyanathan (2009) studied the determinants of underpricing in the National Stock Exchange (NSE) of India and found that the listing delay is positively related with the degree of underpricing. The sample period is from March 2004 to October 2006 and the number of collected IPO companies is 55. They found an average initial return of 22.62%. Loughran et al. (2013) analyzed differences in average initial returns between 50 countries and indicated for India an average initial return of 88.5% from the period 1990 to 2011. The related number of IPO companies is 2964. Sharma and Seraphim (2010) studied the link between the reputation of underwriters and the underpricing of the issue. Underwriters with a high reputation were found to underprice less as compared to their lower ranked counterparts. They used a sample of 43 IPO companies out of 102 public issues during the period of February 2001 to May 2005. They found an average initial return of 46.63%.

One of the possible determinants of the degree of underpricing is the age of the firm. According to Jovanovic and Rousseau (2001), the average age of a firm going public in the United States during the 1990's was the lowest the market has witnessed since World War I. They argued that the electricity-era and the information-technology-era firms came in younger, because the technologies that they brought in were too productive to be kept out very long. The age of the IPO firm signals the level of maturity of the company and it is measured by the difference between the offer date and the year of incorporation. According to Bansal and Khanna (2012), the age of the firm has no significant impact on the level of underpricing in India. However, many other studies (Carter et al.,1998; Downes and Heinkel, 1984; Megginson and Weiss, 1991; Heeley et al, 2007) argue that the age of a company has a negative impact on the level of underpricing.

A second possible determinant is company size. Company size is measured by the net assets of the company prior to the IPO. Ritter (1984) argued that larger firms are easier to value because of ease of forecasting cash flows. According to Teker and Ekit (2003), companies with a larger amount of assets may have less uncertainty concerning future performance, and so the likelihood of IPO underpricing for such firms would be lower. Several studies argue that the size of a company is negatively related with the degree of underpricing (Teker and Ekit, 2003; Tian, 2011; Megginson and Weiss, 1991; Ibbotson et al., 1994), while Islam et al. (2010) support the inverse relation.

The third determinant investigated is the timing of offer. This is the difference between the date of listing and the offer date. According to Islam et al. (2010) and Bansal and Khanna (2012), the time gap between offering and listing has no significant influence on the degree of underpricing. However, according to Chowdhry and Sherman (1996), listing time affects the degree of underpricing. More specifically, the longer the listing delay, the higher the uncertainty. Essentially, when a firm takes too long to be listed, the market may revise its expectations about the future value of the firm, which will have an impact on the subsequent level of underpricing. Chan et al. (2001), Mok and Hui (1998) and Su and Fleischer (1999) find a positive relationship between the listing delay and the degree of underpricing.

Early studies document a negative relation between the offer price and the underpricing phenomenon (Ibbotson et al., 1988; Ben Slama Zouari et al., 2011). The aim of the offer price is to encourage investors to participate in the IPO. Fernando et al. (1999) argue that IPOs with high offer prices attract relatively a large institutional investment. Firms could choose a low offer price and discourage institutional investment, which may systematically lead to higher underpricing. They also found that institutional ownership and underwriter reputation are greater at higher price levels, and that post-IPO turnover is lower for IPOs with high offer prices. They found that long-run performance increases with offer prices. They showed that the offer price of an IPO is related to the quality of the firm, at least when quality is measured by mortality. Firms choosing a higher stock price level experience lower mortality rates. Therefore, higher priced IPOs are better firms.

The size of an issue is expected to be negatively related with the degree of underpricing. The offer size indicates uncertainty about IPO companies. Well-known companies with running years and better records, usually offer larger IPOs. This reduces the uncertainty and the level of underpricing. Several studies report evidence for the negative relationship between the offer size and the degree of underpricing (Kooli and Suret, 2002; Bansal and Khanna, 2012; Islam et al., 2010). Also the number of bookrunners may affect the level of underpricing. Hu and Ritter (2007) observe an increasing frequency of multiple bookrunners in the last decade. The primary benefit to an issuer is the bargaining power with regard to the offer price, which leads to a higher offer price and lower underpricing.

Information about future investments is very important for investors. The future performance of shares is afflicted with uncertainty. If an issuer reveals less information, the costs of getting information about the issuer for the future investors will increase. According to Beatty and Ritter (1986), underpricing serves as a compensation for the procurement costs of future investors. Schertler (2002) found a positive significant relation between the degree of underpricing and the ex ante uncertainty for French and German IPOs. Adjasi et al. (2011) analyzed IPO underpricing on the Nigerian Stock Exchange and found the presence of ex ante uncertainty, which is measured by daily returns volatility. Ritter (1984) used the standard deviation of the first four weeks daily aftermarket returns to measure ex ante uncertainty. Issuers with greater ex ante uncertainty, offer lower prices for the issue. Therefore, this uncertainty about future perspectives increases the level of IPO underpricing.

3.   Going public in India

India has one of the largest and fastest growing economies in the world. The economy of India maintained one of the highest growth rates. The number of listed domestic companies in India is still growing, while the average of the world is declining[1]. An IPO marks the start of a company's publicly traded live. The securities are traded on a securities exchange. The Securities and Exchange Board of India (SEBI) is the regulator for securities in India, which is established in 1988 and given statutory powers on 12 April 1992 through the SEBI Act. After an IPO, private companies transform into public companies.

3.1 History of India

In 1985, India started having balance of payments problems. By the end of 1990, India was in a serious economic crisis. The crisis damaged the credit worthiness of India and the government was close to default. The central bank had refused new credit and foreign exchange rates had been reduced enormously. In 1991, India had to pledge 47 tonnes of gold to Bank of England and 20 tonnes of gold to Union Bank of Switzerland as part of a bailout with the International Monetary Fund (IMF). India went to a more capitalist system and has emerged as one of the fastest growing large economies of the world. In 1999, investment banks were allowed to use bookbuilding as a price mechanism for the Indian capital market. A second method that was introduced is the fixed-price method. In 1999, when pricing flexibility was coupled with discretion in allocation, the process of IPO liberalization took a major step forward. After 1999, issuers could still choose for fixed price offerings in which investment banks allocated shares on a pro rata basis. On the other hand, they could choose for book building in which a quota of shares is reserved for discretionary allocation to qualified institutional buyers (QIBs). After the 1991 economic crisis, the central government launched economic liberalization. The economic reforms started on 24 July 1991. After 2000, India's productivity grew enormously, which might also explain the services growth of India. According to Das et al. (2011), the services sector accounted for around 88% of the growth rate in real gross domestic product in 2008-2009. It was found that the main driver of growth in India's services sector is growth in the domestic demand for services and not growth to the export of services.

As it stands now, India is one of the poorest countries in the world. The main reason is the very large Indian population. There has been strong growth in recent years. The Indian government has made an effort to improve the economic strength. Because of the large high tech sector and the large percentage of the population that is still engaged in traditional small-scale farming, the improvement of economic strength has still a long way to go. Some facts about India in 2013 are as follows. The economic freedom score is 55.2. The economic freedom denotes the ability of the population to undertake economic directions and actions. From 2012 to 2013, India made improvement in the management of public finance and monetary freedom compensating a continuing decline in freedom from corruption. In 2013, India's overall score is below the world average. India has a population of 1.27 billion people, a gross domestic product at purchasing power parity of 4.5 trillion dollar, an unemployment rate of 9.8%, inflation rate based on the consumer price index of 8.6%, foreign direct investment inflow of 31.6 billion dollar and a growth rate of 7.2%[3].

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[1] See Appendix I: graph 1

[3] Source: Heritage foundation: 2013 index of economic freedom, India.

3.2 IPO Process

The IPO process in India is a complex process and consists multi stages. The IPO process will be briefly described. First, the company needs to make an appointment with a merchant banker and other intermediaries such as registrars, banks or brokers. A merchant banker is known as a book running lead manager (BRLM). The BRLM leads a company's team of advisers and coordinates their roles to ensure a company successfully completes the listing IPO process. A merchant banker is a financial institution that provides capital to companies in the form of share ownership instead of loans. It manages and underwrites the IPO and it is responsible for ensuring market making for a period of three years from the IPO. The merchant banker must have a valid SEBI registration. Without holding a certificate of registration granted by the SEBI, no person can act as a merchant banker in India. In addition to the BRLM, the company needs to make an appointment with other intermediaries such as registrars. The role of a registrar is to make sure that the amount of outstanding shares matches the amount of shares authorized by the company. An important task of a registrar is to update and maintain the official register of members or shareholders of the company.

After the appointment with a merchant banker and other intermediaries, the company needs to access the registration of the Offering Document. By accessing the Offering Document, the company agrees to follow the terms and conditions, including any modifications to them from time to time. After doing this, the company need to invest in the issue's marketing. This can vary from campaign advertising, retail distribution or reservation of the issue. At least the post-issue activities must be done by the lead manager. The post issue activities include management of blocked accounts, coordinate non-institutional allocation, intimation of allocation and dispatch of refunds to bidders. The IPO process is complex and the timeframe to go public varies from country to country. According to Sharma (2013), an IPO process takes about 15 to 20 weeks, depending on market conditions such as the scope and complexity of the deal.

4.   Data and Methodology

This study makes use of data from 427 Indian companies, listed at the Bombay Stock Exchange (BSE), including small and medium scale enterprises (SME). The sample period is from January 2002 to November 2013. Data is collected from Thomson One Banker, Worldscope and Datastream. Missing data is collected from Yahoo! Finance and The Economic Times. Both International Securities Identification Number (ISIN) and Stock Exchange Daily Official List (SEDOL) codes are used for the first day closing prices. The prospectuses are obtained from SEBI's website. Some information, concerning the offer price or first day closing price, is still missing. From January 2002 to November 2013, the total number of IPO companies is 960. The number of companies without available data is 419. The first day closing prices are missing from 86 companies and 28 companies have no available offer prices. The prices are given in Indian Rupees (Rs). The underpricing phenomenon is tested by calculating the initial returns.

4.1 Initial return

Investment bankers usually price IPOs at levels that differ from intrinsic value. Many researchers try to explain this initial excess return. Underpricing refers to the price run up of the IPO on the first day of trading. It is also known as the initial return or first-day return. The price of an IPO on the first trading day represents what the investors are willing to pay for the shares of the firm. If the offer or issue price is lower than the first day closing price, the IPO is said to be underpriced. If the offer or issue price is higher than the first day closing price, the IPO is overpriced. The absolute initial return is defined as the difference between the first day closing price and the issue price as shown below:

$$AIR_{I,T} = P_{I,T} - E_I$$

Where $AIR_{I,T}$ measures the Absolute Initial Return (AIR) of share (I) in period (T), $P_{I,T}$ is the closing price (P) of share (I) at its first trading day and E_i is the issue price (E) of share (I). To make the absolute initial return comparable to the initial return of other shares, they are determined as a percentage of the issue price as shown in the following formula:

$$IR_{I,T} = (P_{I,T} - E_I) / E_I$$

Where $IR_{I,T}$ measures the initial return (IR) of share (I) in period (T).

4.2 Determinants of underpricing

In table 1, the list of explanatory variables is given. The determinants of underpricing include the age and size of the firm, listing delay, offer price, offer size, number of bookrunners and ex ante uncertainty.

Table 1: List of explanatory variables.

Variables	Proxies	Measure
Firm age	AGE	The natural logarithm of the number of years between the year of incorporation and the year of IPO.
Firm size	SIZE	The natural logarithm of net assets at the end of the year preceding the IPO of the issuing firm.
Timing of offer	TIME	The natural logarithm of number of days taken from the date of listing to the offer date.
Offer price	OFFPRICE	The natural logarithm of the price of offered shares.
Offer size	OFFSIZE	The natural logarithm of the number of offered shares times the offer price (gross proceeds).
Bookrunners	BOOKR	The number of bookrunners.
Ex ante uncertainty	EAU	The standard deviation of the first four weeks daily aftermarket trading returns.

Underpricing is used as the dependent variable. Based on the literature review, the following hypotheses are proposed:

(1) H0: There is no relationship between the age of the firm and the degree of underpricing.
Ha: There is a negative relationship between the age of the firm and the degree of underpricing.

(2) H0: There is no relationship between the size of the firm and the degree of underpricing.
Ha: There is a negative relationship between the size of the firm and the degree of underpricing.

(3) H0: There is no relationship between offer timing and the degree of underpricing.
Ha: There is a positive relationship between offer timing and the degree of underpricing.

(4) H0: There is no relationship between the offer price and the degree of underpricing.
Ha: There is a negative relationship between the offer price and the degree of underpricing.

(5) H0: There is no relationship between the offer size and the degree of underpricing.
Ha: There is a negative relationship between the offer size and the degree of underpricing.

(6) H0: There is no relationship between the number of bookrunners and the degree of underpricing.
Ha: There is a negative relationship between the number of bookrunners and the degree of underpricing.

(7) H0: There is no relationship between ex ante uncertainty and the degree of underpricing.
Ha: There is a positive relationship between ex ante uncertainty and the degree of underpricing.

4.3 Multivariate regression model

A multivariate regression is employed to find out which variables significantly affect the underpricing phenomenon in India. The model is described below:

$$UP = \alpha + \beta 1 \log(AGE) + \beta 2 \log(SIZE) + \beta 3 \log(TIME) + \beta 4 \log(OFFPRICE) + \beta 5 \log(OFFSIZE) + \beta 6 (BOOKR) + \beta 7 (EAU) + \varepsilon$$

Where,

UP = Underpricing or overpricing, AGE = Age of the firm, SIZE = Size of the firm, TIME = Timing of offer, OFFPRICE = Offerprice, OFFSIZE = Offer size, BOOKR = Number of bookrunners and EAU = Ex ante uncertainty.

Further,

α is the intercept. It reflects the constant of the equation.

β_I is the sensitive coefficient of each independent variable (i = 1, … , 9).

ε is the error term.

5.   Findings

The sample data consists of 427 companies that are listed at the BSE between the periods of January 2002 to November 2013. These companies are divided over 9 two-digit SIC industries and 180 three or four-digit primary SIC industries and. See Appendix II for the list of companies with the related SIC code descriptions.

5.1 IPOs on a yearly basis

Table 2 shows the IPO underpricing and overpricing on a yearly basis. The highest number of companies were listed in 2007. There were 93 companies listed during this year. Bansal and Khanna (2012) studied Indian IPOs from April 2000 to December 2011 and found a total number of listed companies of 619, from which 550 listed at the BSE. Corresponding to this study, they found that the highest number of listed companies was in 2007 and the lowest number of listed companies in 2002.

Mishra (2010) studied 235 IPO companies, listed between April 1997 and March 2008, on Indian stock exchanges and also found that the highest number of IPOs occurred in 2007. For this year, the number of listed companies was 91, from which 81 offered through bookbuilding and 10 through fixed price offering. In this study, 257 listed companies were collected from January 2002 to March 2008 and Mishra collected 218 companies for this period. For the year 2002, Mishra collected 2 IPO companies and Pandey (2004) 6 IPO companies.

In this study, out of 427 Indian IPO companies, 356 (83.37%) companies used the book building method and 71 (16.63%) companies the fixed price offering method. Mishra (2010) found for his sample period that 79.57% of the IPOs were offered through bookbuilding and 20,43% through fixed price offering. In the study of Bansal and Khanna (2012), 74.64% of the IPOs were offered through bookbuilding and 25.36% through a fixed price offering.

Table 2: IPO underpricing and overpricing on a yearly basis.

Year	Number of IPO companies	Underpricing	Overpricing	Equal
2002	2	1	0	1
2003	4	4	0	0
2004	24	20	3	1
2005	51	42	6	3
2006	67	43	20	4
2007	93	57	35	1
2008	30	14	15	1
2009	21	13	7	1
2010	62	40	21	1
2011	36	18	18	0
2012	23	13	4	6
2013	14	8	5	1
Total	**427**	**273**	**134**	**20**

Graph 2: Number of IPO companies from January 2002 to November 2013.
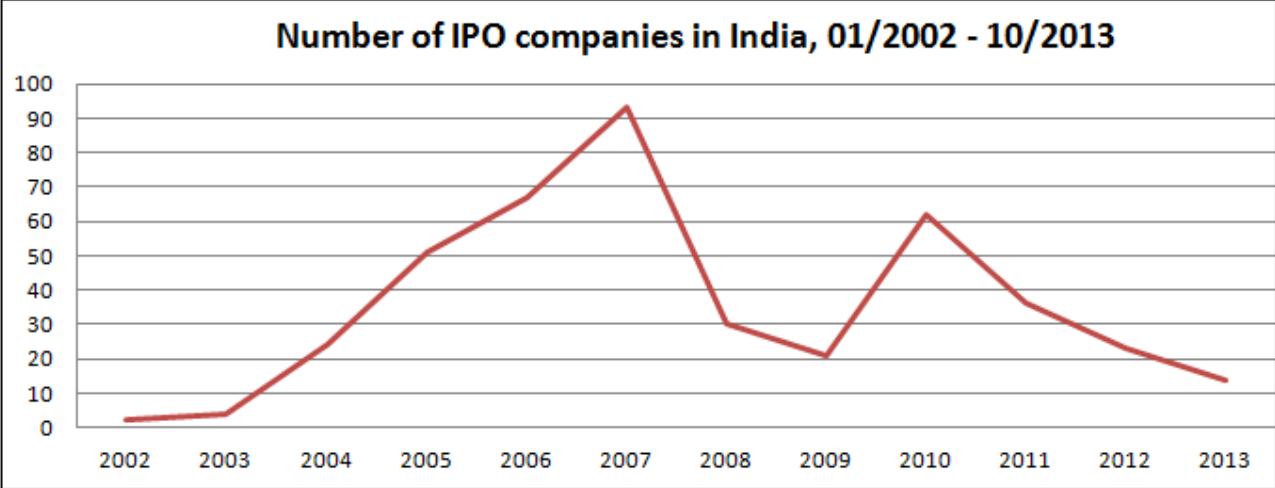
Graph 2 is a line chart of Table 1. The next highest listing was in 2006 with 67 listed companies. The lowest number of listed companies was in 2002. For this year, only 2 IPO companies were collected, from which one underpriced and one equally priced. In 2004, the number of IPO companies was 24, from which 20 (83.33%) IPOs were underpriced and 3 (12.50%) overpriced. Except 2003, this is the year with the highest ratio. For all the other years, the ratios are more close to each other.

5.2 Levels of underpricing and overpricing

Out of the 427 companies, 273 (63.93%) are underpriced, 134 (31.38%) overpriced and 20 (4.68%) are equally priced. Equally priced means that the closing price on first trading day is equal to the issue price. In Table 3, the overall levels of IPO initial returns are given. The average initial return is 23.58% and the standard deviation is 50.55%. A positive initial return indicates underpricing. Therefore, the IPOs are on average more underpriced. The standard deviation indicates that the data points are spread out over a large range of values. According to Lowry et al. (2010), a high volatility of initial returns indicates that the companies have high information asymmetry and therefore they are more difficult to value.

The maximum refers to the largest underpriced IPO. This maximum belongs to Saksoft Limited. The positive difference between the offer price and first day closing price, as a percentage of the offer price, is the highest. Saksoft Limited is incorporated on November 24, 1999. The related primary four digit SIC industry is the computer related services, not elsewhere classified (nec) industry. This industry is part of the services industry. The company is a leading provider of Information Management Solutions to successful companies around the world. Saksoft Limited offered 2,500,000 equity shares of 30 Rs each. Their offer price is three times the face value of their share. The issue is being made through a fixed price offering. The closing price on first trading day was 127 Rs. After 420 days, the share price dropped to 30 Rs per share.

The minimum refers to the largest overpriced IPO. The minimum belongs to Tijaria Polypipes Ltd. The negative initial return, which indicates overpricing, is -70%. Tijaria Polypipes is incorporated on July 17, 2000. The related primary SIC industry is the plastics products, nec industry. This industry is part of the manufacturing industry. Tijaria Polypipes is engaged in the business of plastic pipes. The company produces a big product range in the field of plastics, HDPE sprinkler, drip irrigation, micro irrigation, telecommunications etc. Tijaria Polypipes offered 10,000,000 equity shares at a issue price of 60 Rs per share. The issue is being made through a fixed price offering. The first day closing price was 18 Rs per share. After the issue, the closing prices have been decreasing. On 17 November 2013, the share price is the lowest, i.e. 3,2 Rs per share.

Table 3: Overall levels of initial returns and the distribution by method of listing.

Year	#IPO companies	Mean	Median	Min	Max	Stdev	#BB	#FP	BB	FP
2002	2	9.68%	-	0.00%	19.35%	13.69%	2	0	9.68%	-
2003	4	67.94%	55.26%	13.33%	147.92%	63.74%	4	0	67.94%	-
2004	24	64.27%	43.30%	-44.44%	258.00%	78.28%	14	10	54.61%	80.36%
2005	51	42.40%	35.49%	-15.09%	323.33%	53.30%	38	13	34.36%	71.65%
2006	67	24.80%	13.51%	-35.00%	230.77%	43.55%	56	11	23.67%	29.52%
2007	93	27.44%	12.22%	-62.67%	283.33%	58.68%	85	8	23.87%	65.35%
2008	30	7.81%	-1.00%	-68.75%	160.00%	40.61%	26	4	11.97%	-19.24%
2009	21	9.53%	2.78%	-29.33%	130.00%	31.64%	21	0	9.53%	-
2010	62	15.36%	9.25%	-37.31%	103.87%	29.82%	59	3	13.62%	49.67%
2011	36	3.94%	-1.64%	-70.00%	150.00%	53.35%	35	1	6.05%	-70.00%
2012	23	10.10%	1.82%	-13.18%	145.00%	30.77%	13	10	3.74%	18.37%
2013	14	6.90%	2.68%	-6.67%	56.25%	16.32%	3	11	2.17%	8.20%
Total	427	23.58%	10%	-70.00%	323.33%	50.55%	356	71	22.91%	37.11%

In Table 3, the average initial returns on a yearly basis and the distribution by method of listing are given. The average initial return though bookbuilding is 22.91% and the average initial return through fixed price offering is 37.11%. The bookbuilding process of IPOs is associated with lower initial return. The absolute difference between the offer price and first day closing price of underpriced IPOs is on average larger than those of overpriced IPOs. In 2004, the average initial return through fixed price offering is the highest, i.e. 80.36%. The highest average initial return through bookbuilding was in 2003. In the years 2002, 2003 and 2009 there were no shares offered through a fixed price offering method.

In 2003, the average initial return is the highest and in 2011 the average initial return is the lowest. Pande and Vaidyanathan (2009) investigated Indian IPOs at the NSE and found an average initial return of 22.62%. Their sample period is from March 2004 to October 2006 and the number of collected IPO companies is 55. In this study, the average initial return from March 2004 to October 2006 is 35.95% and the number of IPO companies is 125.

Khurshed et al. (2010) investigated a dissection of Indian bookbuilt IPOs and found an average initial return of 24.15%. Their sample period is from April 2003 to March 2008 and the number of collected IPO companies is 218. They found a maximum initial return of 307.41% and a minimum initial return of -43.44%. Corresponding to this study, they found that the highest average initial return occurred in 2003. For this year, they collected data from 5 listed companies and found an average initial return of 89.69%.

Nearly one third of the total number of IPOs is overpriced. The negative initial returns are much lower than the positive ones. See Table 4 for the maximum levels of underpricing and overpricing for all 427 companies. This table shows the enormous difference between maximum values of underpricing and overpricing. Only the top ten companies are given below.

Table 4: Maximum levels of initial returns.

Issuer	Underpricing	Issuer	Overpricing
Saksoft Ltd	323.33%	Tijaria Polypipes Ltd	-70.00%
Burnpur Cement Ltd	283.33%	Indo Thai Securities Ltd	-68.92%
FCS Software Solutions Ltd	258.00%	Chemcel Bio-tech Ltd	-68.75%
Everonn Systems India Ltd	241.43%	RDB Rasayans Ltd	-65.82%
Nissan Copper Ltd	230.77%	Vaswani Industries Ltd	-63.27%
Allied Computers Intl Ltd	216.67%	Taksheel Solutions Ltd	-62.67%
Vivimed Labs Ltd	211.43%	Bharatiya Global Infomedia Ltd	-62.20%
Dishman Pharm & Chem Ltd	209.71%	Omkar Speciality Chemicals Ltd	-53.06%
Religare Enterprises Ltd	182.16%	Vishal Exports Overseas Ltd	-44.44%
Power Trading Corporation	181.25%	Broadcast Initiatives Ltd	-42.50%
Average	233.81%		-60.16%

5.3 IPOs on a industry basis

In Table 5, the top ten industries with the highest number of listed companies between January 2002 through November 2013 are given. The total number of two-digit SIC industries is 9. This study focuses on these nine industries and the related determinants of underpricing.

Table 5: two-digit SIC industry and specification of initial return.

2-digit SIC industry	Number of IPO companies	Underpricing	Overpricing	Equal
Agriculture, Forestry and Fishing	5	5	0	0
Mining	7	3	3	1
Construction	29	18	9	2
Manufacturing	193	114	69	10
Transportation and Public Utilities	40	27	12	1
Wholesale Trade	12	6	5	1
Retail Trade	9	6	3	0
Finance, Insurance and Real Estate	58	40	15	3
Services	74	54	18	2
Total	427	273	134	20

The highest number of listed companies is from the manufacturing industry. This is the industry with the highest overpriced IPO. There are 193 companies listed during the sample period. See Appendix II for a list of companies with the related 2-digit SIC- and 3/4-digit SIC industry. The manufacturing industry is connected with engineering and industrial design. Manufacturing is the process of converting raw materials, components or parts into finished goods. In this sector, 114 (59.07%) companies have underpriced IPOs and 69 (35.75%) companies overpriced IPOs. This is also the sector with the highest number of equally priced IPOs. The average intitial return of these 193 IPOs is 23.23%. In this industry, IPOs are more underpriced than overpriced. The manufacturing industry is vital for the economic progress of India. Its contribution to the GDP is 16%, with the potential to grow more[4]. The rapidly growing economy of India gives domestic entrepreneurs and international companies great opportunities to invest and grow. The rising demand in the country and the aspirations of multinational companies to establish low-cost plants, are seen as reasons for the growth of this industry.

The next highest number of listed companies is from the services industry. This is the industry with the highest underpriced IPO. Companies in this industry provide services to businesses and final consumers. According to the India Brand Equity Foundation (IBEF, 2013), the services industry contributes to about 60% of India's GDP, 35% of employment, 25% of total trade, and more than 50% of the foreign investment inflows. India's services industry is one of the largest and fastest growing industries in the global market. The total number of IPO companies is 74, from which 54 (72.97%) companies with underpriced IPOs, 18 (24.32%) with overpriced IPOs and only 2 with equally priced IPOs. The average initial return is 34.65%.

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[4]Source: India in Business, Ministry of External Affairs (2013).

The third highest number of listed companies is from the finance, insurance and real estate (FIRE) industry. The companies in this industry provide financial services to commercial and retail customers. This industry includes insurance companies, securities and investment firms, real estate interests and commercial banks. In the FIRE industry, 58 companies were listed from which 40 (68.97%) with underpriced IPOs, 15 (25.86%) with overpriced IPOs and 3 company with equally priced IPOs. The average initial return of this industry is 15.86%. In this industry, IPOs are also more underpriced than overpriced. In India, the progress of this sector is driven by factors such as rapid urbanization, positive demographics, rural-urban migration, higher income levels and housing demand.

The lowest number of listed companies is from the agriculture, forest and fishing industry. Involved companies are primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals. In this industry, a low number of firms went from private to public. The number of listed companies is 5. The IPOs of all companies were underpriced. The average initial return in this industry is 32.42%. India is principally an agricultural country. This industry is the largest livelihood provider. In chapter 3.1, history of India, the change of India's globalization and liberalization is mentioned. The transformation in the past two decades had opened new avenues for agricultural modernization.

By comparing the services industry with the FIRE industry, it is notable that the difference between the average initial returns is large. See Table 6 for an overview of the overall levels of initial returns for 9 industries.

Table 6: Overall levels of underpricing and overpricing per industry.

2-DIGIT SIC Industry	Number of companies	Mean	Min	Max	Stdev
Agriculture, Forestry and Fishing	5	32.42	8.00	63.33	20.35
Mining	7	-0.39	-39.58	39.59	27.37
Construction	29	17.85	-30.07	82.86	29.17
Manufacturing	193	23.23	-70.00	283.33	51.85
Transportation and Public Utilities	40	24.09	-42.50	181.25	44.00
Wholesale Trade	12	27.39	-37.31	216.67	66.91
Retail Trade	9	14.46	-44.44	57.93	33.40
Finance, Insurance and Real Estate	58	15.86	-68.92	182.16	37.83
Services	74	34.65	-62.67	323.33	65.01
Total	427	21.06	-43.05	158.94	41.77

As can be observed from Table 6, the average of the largest negative initial returns is lower than the average of the largest positive initial returns. The difference between the offer price and first day closing price of underpriced IPOs is on average larger than those of overpriced IPOs. The standard deviation is almost twice as much as the mean. For all the industries, except the mining industry, the initial returns are positive. This means that in these industries the IPOs are on average more underpriced than overpriced. There are no big differences between the average initial returns of industries. Also the volatilities do not differ a lot from each other.

The industry with the highest average initial return is the services industry. This industry has the second highest volatility. For this industry, the largest positive initial return belongs to Saksoft Ltd and the largest negative initial return belongs to Taksheel Solutions Ltd. Taksheel Solutions Ltd, part of the computer facilities management services industry, offered 5,500,000 equity shares at a issue price of 150 Rs per share. The closing price on first trading day was 56 Rs per share. The issue is being made through a bookbuilding process.

The mining industry is the industry with the lowest average initial return. This industry is a major economic activity which contributes significantly to the economy of India. The average initial return is -0.39%. Only 7 IPO companies are included, from which 3 companies with underpriced IPOs and 3 companies with overpriced IPOs. The IPOs are on average more overpriced than underpriced. In this industry, the largest overpriced IPO belongs to Oriental Trimex Ltd, part of dimension stone industry. This company is engaged in the business of trading of building material, marble and granite. Their offering was made through the bookbuilding process at an issue price of 48 Rs per share and the first day closing price was 29 Rs per share. In this industry, the company with the largest underpriced IPO is from Coal India Ltd, part of bituminous coal and lignite surface mining industry. The shares were offered through bookbuilding at an offer price of 245 Rs per share and the first day closing price was 342 Rs per share. Coal India is the largest coal producer company in the world and contributes around 81% of the coal production in India[5]. India's largest public offer ever was from this company. The government holds 90% stake in Coal India Limited and the finance ministry expects to raise 150 billion Indian Rupees.

The industry with the highest volatility is the wholesale trade industry. In this industry, only 12 IPO companies are included. The company with the sixth highest underpriced IPO is part of this industry. This industry maximum has ensured that the volatility increased. Wholesale is the sale of goods or merchandise to retailers. In general, it is the sale of goods to anyone other than the standard consumer. In this industry, the company with the highest underpriced IPO is Allied Computers International Limited, part of computers and peripheral equipment and software industry. The offer price was 12 Rs per share and the closing price on first trading day was 38 Rs per share. Shree Ganesh Jewellery House is part of the jewelry, watches, and precious stones and metals industry. This company has the lowest initial return in the mining industry. The issue price was 260 Rs per share and the first day closing price 163 Rs per share.

In short, we can conclude that the IPOs in almost every industry are more underpriced than overpriced. It is interesting to analyze the factors that cause these levels of initial returns. OLS regression analysis is used to test the relationship between the underpricing phenomenon and the independent variables. In the last part, regressions on an industry-specific basis are made for the top five industries.

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[5]Source: Arch Coal, Inc. 19 March 2013, Top ten global coal producers.

5.4 Effect of each determinant individually

Multiple regression analysis is used to find out whether the independent variables have any significant effect on the dependent variable, i.e. degree of underpricing. The independent variables are the age and size of the firm, timing of offer, offer price, offer size, number of bookrunners and ex ante uncertainty.

First, the effect of each proxy on the degree of underpricing is provided, which is used for a preliminary hypothesis model. Second, the result of the multiple regression model is given. At least, this study specifies on each 2-digit SIC industry. The following regressions are made with the use of the HAC Newey-West estimator. This estimator is used to try to overcome autocorrelation or correlation and heteroskedasticity in the error terms in the models. Also adjustment for degrees of freedom is included. The results of one-variable regressions are given in Table 7.

Table 7: Output of one-variable regressions.

Proxy	Coëfficient	t-Statistic	Probability
AGE	-8.12E-07	-0.2923	0.7702
SIZE	-7.30E-12	-1.0258	0.3057
TIME	6.15E-05	0.3399	0.7342
OFFPRICE	-7.20E-10	-0.9091	0.3638
OFFSIZE	-1.04E-10	-1.3669	0.1725
BOOKR	-0.0260	-1.2155	0.2261
EAU	2.3703	3.1782	0.0018

Preliminary hypotheses results:

(1) H0: *There is no relationship between the age of the company and the degree of underpricing.*
Ha: *There is a positive relationship between the age of the company and the degree of underpricing.*

The age of the company is found to have no significant relation with the degree of underpricing. Therefore, the null hypothesis is accepted. The probability level is 0.77%.

(2) H0: *There is no relationship between the size of the firm and the degree of underpricing.*
Ha: *There is a positive relationship between the size of the firm and the degree of underpricing.*

The size of the company is found to have no significant relation with the degree of underpricing. Therefore, the null hypothesis is accepted. The probability level is 0.31%.

(3) H0: *There is no relationship between offer timing and the degree of underpricing.*
Ha: *There is a positive relationship between offer timing and the degree of underpricing.*

The time of offering is found to have no significant relation with the degree of underpricing. Therefore, the null hypothesis is accepted. The probability level is 0.73%.

(4) H0: *There is no relationship between the offer price and the degree of underpricing.*
Ha: *There is a negative relationship between the offer price and the degree of underpricing.*

The offer price is found to have no significant relation with the degree of underpricing. Therefore, the null hypothesis is accepted. The probability level is 0.36%.

(5) H0: *There is no relationship between the offer size and the degree of underpricing*
Ha: *There is a negative relationship between the offer size and the degree of underpricing.*

The size of an offer is found to have no significant relation with the degree of underpricing. Therefore, the null hypothesis is accepted. The probability level is 0.17%.

(6) H0: *There is no relationship between the number of bookrunners and the degree of underpricing.*
Ha: *There is a negative relationship between the number of bookrunners and the degree of underpricing.*

The number of bookrunners is found to have no significant relation with the degree of underpricing. Therefore, the null hypothesis is accepted. The probability level is 0.23%.

(7) H0: *There is no relationship between ex ante uncertainty and the degree of underpricing.*
Ha: *There is a positive relationship between ex ante uncertainty and the degree of underpricing.*

Ex ante uncertainty is found to have a significant positive relation with the degree of underpricing. Therefore, the null hypothesis is rejected. The probability level is 0.002%.

A constant term is used in the one-variable regressions. None of the independent variables, except the ex ante uncertainty, have a significant relation with the underpricing phenomenon. The highest significance level is from the proxy ex ante uncertainty and the independent variable with the lowest significance level is the age of a company. The Durbin-Watson statistics are for all the proxies, except for proxy size, above 2. This indicates that the successive error terms are, on average, much different in value from one another, i.e. negatively correlated. For the size of the firm, there is positive autocorrelation. The ex ante uncertainty is the only variable with a high beta coefficient. The other variables have very low influence on the degree of underpricing. These results are preliminary, because the degree of underpricing is not just a function of a single explanatory variable but a combination of several explanatory variables.

In many studies, natural logarithms are used for the proxies (Bansal and Khanna, 2012; Tian, 2011; Zouari et al., 2011). An advantage of using natural logarithms is avoiding heteroskedasticity. Like all logarithms, the natural logarithm also maps multiplication. In Table 8, the logarithms of certain proxies are given.

Table 8: Logarithms of proxies.

Proxy	P-value	LN Proxy	P-value
AGE	0.7702	LN AGE	0.8145
SIZE	0.3057	LN SIZE	0.0114
TIME	0.7342	LN TIME	0.2766
OFFPRICE	0.3638	LN OFFPRICE	0.0956
OFFSIZE	0.1725	LN OFFSIZE	0.0431

As can be observed from Table 8, most of the p-values improved by taking the natural logarithm of the independent variable.

5.5 All proxies together

In Table 9, the results of the multiple regression analysis is given. By using all the proxies in the multiple regression analysis, we see that the ex ante uncertainty is still significant. The proxy offprice changes from insignificant to significant and the proxy offsize becomes plausible. Combining these proxies with each other has ensured that the probability levels improved.

Table 9: effect of all proxies on the degree of underpricing (no logarithms).

Variables	Coefficient	St. Error	T-Ratio	Prob.
C	-0.0503	0.0723	-0.6953	0.4875
AGE	2.87E-06	3.27E-06	0.8760	0.3818
SIZE	-2.01E-12	1.12E-11	-1.2098	0.2273
TIME	5.45E-04	0.0001	0.2769	0.7822
OFFPRICE	-1.32E-04	1.81E-04	-2.0112	0.0461**
OFFSIZE	-2.08E-11	6.21E-09	-1.6132	0.1088
BOOKR	0.0108	0.0152	1.0949	0.2753
EAU	3.5682	0.5422	3.8130	0.0002***

R squared = 0.1366   Durbin-Watson = 1.6122

Adjusted R squared= 0.1127   F=5.1105; Sig F= 0.0001

*, **, *** denote significance at 10%, 5%, and 1% level, respectively.

An interesting result is that the ex ante uncertainty has still the highest impact on the degree of underpricing. The probability level changed from 0.0018% to 0.0002% and the t-value is now 3.81. This means that there is a significant positive relationship at a 1% significance level. The higher the ex ante uncertainty, the higher the level of underpricing. Bansal and Khanna (2013) used a probit regression approach to test the relationship between ex ante uncertainty and short-run underpricing in India for the period of 2008 to 2011. The degree of underpricing is expressed in terms of new firm's age. They dealt with firms as new firms, which have been started their business since last 1 to 5 years. They found that the ex ante uncertainty has a significant positive impact on the initial returns. Gulati (2011) studied Indian IPOs from 2005 to 2009 and found that ex ante uncertainty significantly influence the degree of underpricing. They found that ex ante uncertainty is statistically significant at 1% level with a p-value of 0.003%. In line with theory and empirics, the ex ante uncertainty is also significant negative related with the size of the company at a 5% significance level. The probability level is 0.041% and the t-value is -2.06. Therefore, the lower the size of a company, the higher the ex ante uncertainty of shares.

The independent variable with the second highest impact on the degree of underpricing is the offer price. The probability level is 0.046% and the t-value is -2.01. This indicates a significant negative relationship. Fernando et al. (1999) investigated IPOs from the United States during the period 1981 to 1998 and found a negative significant relationship between the offer price and the degree of underpricing at 1% significance level. Ben Slama Zouari (2011) studied Tunisian IPOs from 1992 to 2008 and found a negative significant relation between the offer price and underpricing at 5% significance level. The relationship between the offer size and the degree of underpricing is plausible. The p-value is just above the 10% significance level. The variable with the lowest impact on the level of underpricing is listing delay. The time lag from IPO date to listing date has no effect on the level of underpricing.

The R-squared always increases when adding a new variable. Therefore, the focus is on the adjusted R-squared, which is 11.3%. This R-squared adjusts for number of explanatory terms relative to the number of data points. There are other factors that may explain 88.7% variations of the degree of underpricing. The Durbin-Watson statistic is used to detect the presence of autocorrelation in the residuals. The value is lower than 2, which indicate positive autocorrelation. This differs from the results in chapter 5.4, in which 6 individual proxies had negative autocorrelation.

In Table 10, the logarithms of certain variables is taken, which improved the model. By taking natural logarithms, the proxies offerprice, offersize and ex ante uncertainty have a significant effect on the degree of underpricing. The offer size is now significant at a 10% level. The p-value is 0.08%. Bansal and Khanna (2012) studied Indian IPOs from April 2000 to December 2011 and found a negative significant relationship between the size of an offer and the degree of underpricing at 5% significance level. Ghosh (2005) studied Indian IPOs from 1993 to 2001 and found a negative relationship between the offer size and the level of underpricing at 1% significance level. The adjusted R-squared improved from 11.27% to 27.18%. In addition, the t-value of the offer price is now lower than -2. This means the confidence in this coefficient as a predictor is higher. The analysis of variance (ANOVA), which is reported as the f-statistic, increased from 5.11 to 16.71. This indicates a strong increase in the overall significance of the regression model. The prob(f-statistic) lowered from 0.0001 to 0.0000. This means that there is no chance that all of the parameters are zero and that the equation has high validity in fitting the data.

Table 10: effect of all proxies on the degree of underpricing (including logarithms).

Variables	Coefficient	St. Error	T-Ratio	Prob.
C	3.9361	0.5432	1.9928	0.0481
LN_AGE	0.0381	0.0411	1.0863	0.2791
LN_SIZE	-0.0411	0.0008	-1.6234	0.1066
LN_TIME	-0.0052	0.0201	-0.0978	0.9222
LN_OFFPRICE	-0.3284	0.2009	-2.3553	0.0198**
LN_OFFSIZE	-0.0301	0.0191	-1.7550	0.0813*
BOOKR	0.0051	3.98E-07	1.5071	0.1339
EAU	2.0313	0.4322	2.6545	0.0088***

R squared = 0.2831		Durbin-Watson = 1.6263	
Adjusted R squared= 0.2718		F=16.7127; Sig F= 0.0000	

*, **, *** denote significance at 10%, 5%, and 1% level, respectively.

Table 11: correlation matrix for the independent variables.

	LN_AGE	LN_OFFPRICE	LN_SIZE	LN_TIME	LN_OFFSIZE	BOOKR	EAU
LN_AGE	1	0.26	0.42	-0.18	0.26	-0.12	0.14
LN_OFFPRICE	0.26	1	0.35	-0.22	0.48	0.16	-0.10
LN_SIZE	0.42	0.35	1	-0.21	0.61	0.47	-0.27
LN_TIME	-0.18	-0.22	-0.21	1	-0.30	-0.02	0.05
LN_OFFSIZE	0.26	0.48	0.61	-0.30	1	0.55	-0.13
BOOKR	-0.12	0.16	0.47	-0.02	0.55	1	-0.15
EAU	0.14	-0.10	-0.27**	0.05	-0.13	-0.15	1

*, **, *** denote significance at 10%, 5%, and 1% level, respectively.

In Table 11, the correlation matrix for all variables is given. This matrix reveals the direction and extent of significant bivariate associations between various independent variables. The ex ante uncertainty is negative significant correlated with the size of a company. This corresponds to the literature, in which is stated that the larger the size of a company, the lower the uncertainty about the IPO. There is no multicollinearity between the independent variables. Multicollinearity exists if two or more predictor variables are highly correlated, meaning that one can be linearly predicted from the others.

Based on the output of the multiple regression analysis, including logarithms, the following hypothesis model is given in Table 12.

Table 12: Hypothesis model.

Null hypotheses	Expected sign Ha	Results
H1: AGE	-	Accepted
H2: SIZE	-	Accepted
H3: TIME	+	Accepted
H4: OFFPRICE	-	Rejected
H5: OFFSIZE	-	Rejected
H6: BOOKR	-	Accepted
H7: EAU	+	Rejected

Null hypotheses 4 and 5 are rejected by using logarithms. An important independent variable is the offer price. As you can see in graph 3, both the average offer prices and first day closing prices, on a yearly basis, have quite similar patterns. It is important to note that every year the IPOs are on average more underpriced than overpriced. We see an increasing line in average prices from 2002 to 2007. After 2007, this line decreases. After 2010, both lines converge. The graph demonstrates that the degree of underpricing in the Indian stock markets has reduced over the years. The bottom line stands for the average offer prices. This line is always lower than the upper line, which stands for the average first day closing prices. In 2004, the difference between the average offer price and first day closing price is the highest.

Graph 3: Timeline of average offer prices and first day closing prices from 2002 to 2013.
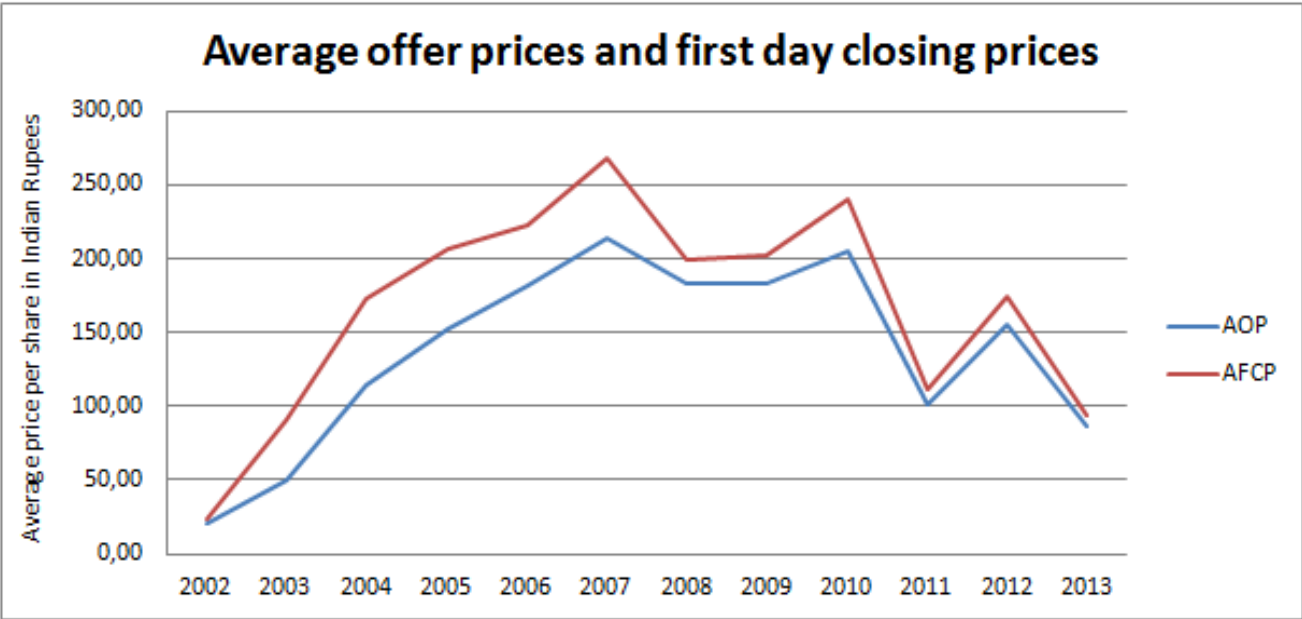
* AOP = average offer price.
** AFCP = average first closing price.

Gauss-Markov-Theorem

The Gauss-Markov theorem states under certain condition, ordinary least squares (OLS) estimators are best linear unbiased estimators (BLUE). 'Best' means giving minimum variance of the estimate in the class of unbiased linear estimators. This study focuses on the following Gauss-Markov conditions: heteroskedasticity, autocorrelation and normality.

The following Gauss-Markov conditions are assumed:

(1) $E(\varepsilon_i) = 0$

(2) X and ε are independent

(3) $V(\varepsilon_i) = \sigma^2 < \infty$

(4) $\text{cov}(\varepsilon_i, \varepsilon_j) = 0, \forall i \neq j$

(5) $\epsilon_i \sim N(0, \sigma_\epsilon^2)$

Misspecification is tested with Ramsey's regression specification error test (RESET). It detects omitted variables and tests whether non-linear combinations of the fitted values help explain the response variable.

The Breusch–Pagan test is used to test heteroskedasticity. It tests whether the variance of the residuals are dependent on the values of the independent variables. This test is also used for autocorrelation. Another name for this test is the Breush-Godfrey serial correlation LM test. LM stands for LaGrange multiplier and indicates that the test is equivalent to one based on LaGrange multiplier testing. To test normality, the popular Jarque–Bera test is used. This test is a goodness-of-fit test of whether sample data have the skewness and kurtosis matching a normal distribution. For all test statistics, a 5% significance level is maintained.

Hypotheses:

H0: No misspecification
Ha: misspecification

The probability level is 0.11%. One fitted term is included. A high number of fitted terms may report a near singular matrix error message, since the powers of fitted values are likely to be highly collinear. The p-value give no evidence to reject the null hypothesis of no misspecification.

H0: homoskedasticity
Ha: heteroskedasticity

The probability level is 0.054%. This value is above the 5% significance level. Therefore, the null hypothesis is accepted. The model has no heteroskedasticity.

H0: No autocorrelation
Ha: autocorrelation

The probability level is 0.29%. Two lags are included. H0 is accepted, because the p-value is above 5%. In the model, there is no autocorrelation.

H0: normality
Ha: non normality

The probability level is 0.00%. This value is below the 5% significance level. Therefore, H0 is rejected. The model is non normal. Under the condition that all the assumptions are valid, except the one for normality, one can assume that the OLS regression is an efficient and unbiased method for estimating the model paramaters[6].

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[6]Source: Heij et al. (2004). *Econometric methods with applications in Business and Economics*. New York, NY: Oxford University Press, 125-127.

5.6 Determinants based on industry

This chapter is about the relationship of proxies with the degree of underpricing, on a industry to industry basis. Before the regressions for each industry will be provided, it seems interesting to me to compare the top 3 biggest industries together with the results given in Table 10. This first part is just an extra topic to analyze the output differences between the top 3 biggest industries, which account for 76.11%, and the whole sample of 9 industries. After this, the most important part will be tested, i.e. the regressions per industry.

Table 13: Top 3 industries, results of 325 IPO companies.

Variables	Coefficient	St. Error	T-Ratio	Prob.
C	2.3188	0.2151	1.2864	0.2003
LN_AGE	0.0512	0.0522	0.7116	0.4778
LN_SIZE	-0.0591	0.0466	-1.1939	0.2344
LN_TIME	0.0090	0.0316	0.2822	0.7782
LN_OFFPRICE	-0.1295	0.0934	-1.8724	0.0631*
LN_OFFSIZE	-0.0701	0.0612	-1.2055	0.2299
BOOKR	0.1457	0.0854	1.0763	0.2835
EAU	3.1653	0.4893	3.3878	0.0009***

R squared = 0.2519   Durbin-Watson = 1.3922

Adjusted R squared= 0.2312   F=12.2983;   Sig F= 0.0000

*, **, *** denote significance at 10%, 5%, and 1% level, respectively.

By focusing on these 325 (76.11%) IPO companies, we see in Table 13 that the probabilities of listing delay and ex ante uncertainty improved. The probabilities of other variables are deteriorated. The adjusted R squared and F-statistic also deteriorated. Graph 4 is a circle diagram of all 2-digit SIC industries. The size of an offer is not significant when only focusing on the top 3 industries with the highest number of IPO companies. There is no plausible relationship between the size of a company and the degree of underpricing. The offer price and ex ante uncertainty are still significant. Combining these 3 industries with the rest of the sample (23.89%), ensured that the significance levels improved. Next, regressions for each industry will be provided.

Graph 4: Two-digit SIC industries.
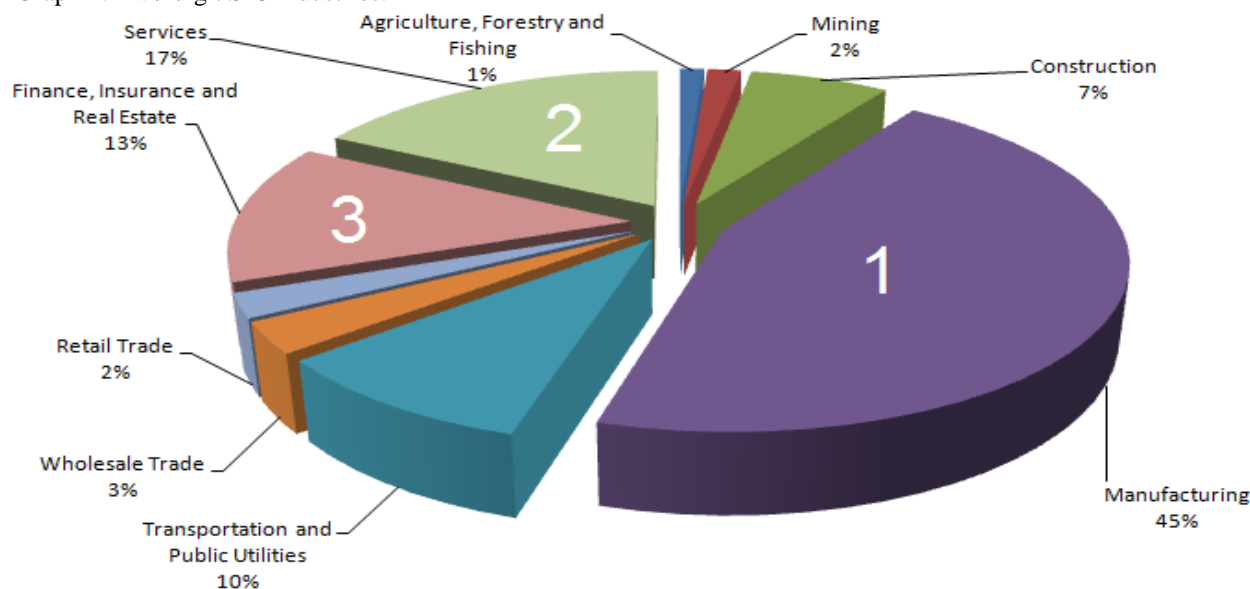
Table 14: Effect of proxies on the degree of underpricing for each industry.

Variables	Manufacturing	Services	FIRE	Transportation and public utilities	Construction	Other[7]
Number of IPO companies	193	74	58	40	29	33
C	0.2931	0.2126	0.0929	0.0011	0.0178	0.0069
LN_AGE	0.7891	0.3893	0.4632	0.4036	0.7330	0.2682
LN_SIZE	0.3006	0.0261**	0.1199	0.1133	0.2093	0.1831
LN_TIME	0.4822	0.0923*	0.3308	0.0031***	0.5139	0.6152
LN_OFFPRICE	0.1169	0.3162	0.0461**	0.0242**	0.0901*	0.0188**
LN_OFFSIZE	0.0492**	0.3866	0.1088	0.0912*	0.0428**	0.0721*
BOOKR	0.2110	0.1477	0.3687	0.1316	0.3240	0.0280**
EAU	0.0006***	0.0466**	0.0030***	0.0182**	0.2857	0.0016***
R squared	0.3962	0.2566	0.3991	0.5996	0.6617	0.6223
Adjusted R squared	0.3122	0.1211	0.2655	0.4830	0.4281	0.4411
Durbin-Watson	1.7811	0.6368	2.5441	2.8342	0.8182	2.1353
F	11.0271	2.0094	2.9816	5.0412	1.9733	1.7771
Sig F	0.0000	0.0778	0.0152	0.0011	0.0838	0.1223

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[7]The group 'other' consists of industries mining (2%), agriculture, forestry and fishing (1%), wholesale (3%) and retail trade (2%). They are grouped, because of insufficient number of observations per industry.
*significant at the 10% level, ** at 5% level, and *** at 1% level.

Regressions are made for the top 5 biggest IPO industries. The other industries with insufficient number of observations are grouped. In Table 14, the probabilities for the industries in India are given. The transportation and public utilities industry has the highest adjusted R squared. This means that in this industry, the independent variables have the best relationship with the degree of underpricing. The explanatory power is the highest. In this industry, four variables are significant. Quite striking is that the variable listing delay is positive significant related to the degree of underpricing at a 1% significance level. In this industry, the average listing delay is 19 days and the average of all 427 companies is 15 days. In general, there is no ex post information about how long it will take an IPO to be listed. The longer the difference between the offer date and first trade date, the higher the uncertainty on the offer. Also, the longer the listing delay, the higher the chance that the market revise its expectations about the future value of the company. Investors might be discouraged to trade actively in the market.

The industry with the lowest adjusted R squared is the services industry. The listing delay is negative significant at a 10% significance level. Interesting is that this is the only industry where the size of a company is significantly related to the underpricing phenomenon. The larger the size of a firm, the lower the uncertainty around the offering. This will lead to less underpricing. The manufacturing industry has the highest number of IPO companies. For this industry, also the f-value is the highest. The independent variables highly influence the level of underpricing. The probability of ex ante uncertainty is the lowest. The average volatility of the first four weeks daily aftermarket trading returns is 4.36%. This is very close to the average of all companies, i.e. 4.96%.

Important to notice is that each industry has his own significant variables. In the manufacturing industry, the issue size and ex ante uncertainty are significantly related with the degree of underpricing. In the services industry, the company size, listing delay and ex ante uncertainty have a significant impact on the level of underpricing. In the FIRE industry, the offer price and ex ante uncertainty are significant related with the dependent variable. In the transportation and public utilities industry, all variables, except the age, size and the number of bookrunners, significantly influence the level of underpricing. In the construction industry, the offer price and offer size significantly influence underpricing. In the 'other' group of industries, every variable, except the size, age and listing delay, has a significant relationship with the degree of underpricing.

The results in Table 14 are quite similar to the output of the multiple regression analysis. The proxy ex ante uncertainty has on average the lowest probability levels, i.e. 5.93%. The proxy with the second highest impact on the level of underpricing is the offer price with an average of 10.21%. The proxy offer size is in third place, with an average probability of 12.51%. In contrast, the variable listing delay has the second lowest impact on the degree of underpricing, while based on Table 10 it has the lowest impact on the degree of underpricing.

6.   Results and discussions

The sample used in this report comprises 427 Indian IPOs out of 960 public issues during the period January 2002 and November 2013. This study is based on companies listed at the Bombay Stock Exchange (BSE), including small and medium scale enterprises (SME). Out of 427 Indian IPO companies, 273 (63.93%) are underpriced, 134 (31.38%) overpriced and 20 (4.68%) equally priced. The average initial return is 23.58% and the standard deviation is 50.55%. This positive initial return indicates underpricing. The total number of IPO companies that offered their shares through bookbuilding is 356 (83.37%) and 71 (16.63%) IPO companies used a fixed price offering method.

The results are largely consistent with those of Mishra (2010) and Bansal and Khanna (2012). A quite striking difference is that in the sample of Mishra, 60% of the IPOs were initially overpriced. In the sample of Bansal and Khanna, around 40% of the IPOs was overpriced. In this study, nearly a third of the initial returns are negative. The highest number of listed companies was in 2007 and the lowest number of listed companies in 2002. In this study, the largest average initial return was in 2003. This is consistent with the findings of Khurshed et al. (2010). Noteworthy is that each year the IPOs are on average more underpriced than underpriced.

The highest number of IPOs occurred in the manufacturing industry and the lowest number of IPOs in the agriculture, forestry and fishing industry. The largest positive and negative initial returns are not close to each other. The largest positive initial return is 323.33%. This maximum refers to Saksoft Limited. The largest negative initial return is from Tijaria Polypipes Limited. Their first-day return was -70%. The industry with the highest average initial return is the services industry. The related initial return is 34.65%. The industry with lowest average initial return is the mining industry. In this industry, the initial return is -0.39%.

The ex ante uncertainty, offer price and offer size are found to have a significant effect on the degree of underpricing. The size of a firm is found to have a plausible relationship with the level of underpricing. However, the age of a firm, listing delay and the number of bookrunners do not have a significant relation with the underpricing phenomenon.

Ex ante uncertainty has the strongest impact on the level of underpricing. It is significant with a positive beta at 5% significance level. The probability level is 0.88% and the t-value is 2.65. Investments are about future prospects and achieving certain goals. It is important for investors to obtain information about their future investment. The future performance of an IPO is always uncertain. The ex ante uncertainty is defined as the uncertainty about the value of the offering once it starts trading, i.e. uncertainty about its aftermarket price. It is measured as the standard deviation of the first four weeks daily aftermarket trading returns. This ex ante uncertainty is related with the underpricing phenomenon. The results are consistent with those of several other studies. Bansal and Khanna (2013) tested the relationship between ex ante uncertainty and short-run underpricing in India for the period of 2008 to 2011 and found that the ex ante uncertainty has a significant positive impact on the initial returns. Clarkson and Merkley (1994) used Canadian IPOs to test the prediction that the underpricing of IPOs increases with ex ante uncertainty and found a positive significant relation between these two. Beatty and Ritter (1986) also argued that there is a positive significant relation between the ex ante uncertainty about an IPO value and its expected underpricing.

The results also indicate that there is a negative significant relationship between the ex ante uncertainty and the size of a company. The related probability level is 4.1%. The ex ante uncertainty of the issue is the greatest for small firms. The size of the firm is measured as the net assets in the year of IPO. Lowry et al. (2010) found that the variability of IPO initial return is considerably higher when the fraction of difficult-to-value IPO companies, such as young or small firms, is higher. Small or young firms often have high risk and high uncertainty about future developments. These companies attract investors to participate in the IPO by compensating the higher risk. They do this by setting low offer prices, which simultaneously gives high underpricing results.

The offer price has the second strongest impact on the level of underpricing. The probability level is 1.98%. Multiple regression analysis showed that the offer price is found to be significant with a negative beta at 5% significance level. The beta is -0.33. This means that if the offer price increases by one, the degree of underpricing decreases by 0.33. According to Fernando et al. (1999), firms do no decide the offer price arbitrarily. The price level in an IPO is related to other choices the company makes. According to them, companies select their offer prices to target a desired ownership structure, which will also affect the degree of underpricing and post-IPO performance. The results in this report are consistent with the findings of Ibbotson et al. (1988). They found that offer prices have high significant impact on the degree of underpricing in which low offer prices usually record high levels of underpricing.

The size of an offer also has a negative significant relation with the degree of underpricing. The gross proceeds in the year of the IPO, measured by the number of offered shares times the price of the issue, negatively affect the level of underpricing. The probability level is 8.13% and the t-value is -1.75. This finding is consistent with those of Bansal and Khanna (2012). They studied the determinants of underpricing for Indian IPOs from 2000 to 2011 and found that the issue size is negatively related with the degree of underpricing at a 5% significance level. The offer size indicates the uncertainty about IPO companies. Large firms usually offer large IPOs.

The company size is plausible related with the degree of underpricing. The probability level is 10.66%. Larger firms are usually associated with lower risk. This reduces the uncertainty around the IPO of large firms. Small or young companies often set low offer prices to attract investors and to compensate the higher risk. The larger the company size, the lower the ex ante uncertainty around the IPO. This ex ante uncertainty is positively related with the underpricing phenomenon and therefore the initial return will be lower.

Further, in contrast with previous studies, the significant relation between underpricing and either the age or size of the company nor the listing delay or number of bookrunners is not found. However, in the services industry and the transportation and public utilities industry, the listing delay do have a significant relationship with the degree of underpricing. In the services industry, also the company size is significant related with the level of underpricing. The age is not significant in any of the 2-digit industries. The number of bookrunners is only significant in the 'other' group, consisting of 4 industries with low number of observations.

7. Conclusions and further research

The underpricing phenomenon appears to be a universal phenomenon (Loughran et al, 1994). Differences between the IPO offering price and the first day closing price often occur and can be explained by different theories. This study examines the initial returns of different types of industries in the Indian IPO market, and it investigates the determinants of underpricing. Companies listed at the Bombay Stock Exchange (BSE), from January 2002 to November 2013, are included.

The average initial return in India is 23.58% and nearly one third of the initial returns is negative. Varying levels of initial returns across the years are highlighted. It is found that the degree of underpricing in the Indian IPO markets has reduced over the years. The average initial return is the highest in 2003 and the lowest in 2011. Out of 427 Indian IPO companies, 273 (63.93%) are underpriced, 134 (31.38%) overpriced and 20 (4.68%) equally priced. The highest number of listed companies was in 2007. The number of IPO companies that offered their shares through bookbuilding and fixed price offering is 356 (83.37%) and 71 (16.63%), respectively. The bookbuilding process of IPOs is associated with lower initial return.

A significant difference between IPOs in different industries is found. The services industry is the industry with the largest positive initial return. In this industry, the listing delay and size of a company are significant related with the degree of underpricing. Both the largest negative initial return and the highest number of IPOs was from the manufacturing industry. In this industry, the offer size and ex ante uncertainty are significant related with the degree of underpricing.

Underpricing of IPOs is influenced by information asymmetry, principal-agent problems, timing of an IPO, price mechanisms, type of industry and market sentiment. Beside these factors, various proxies are used for an OLS regression. The most notable finding is that the underpricing of Indian IPOs strongly increases with ex ante uncertainty. The positive significant relation between underpricing and ex ante uncertainty is consistent with those of many other papers (Clarkson and Merkley, 1994; Beatty and Ritter, 1986; Falconieri et al., 2009). The higher the volatility of daily aftermarket trading returns of IPOs, the higher the uncertainty about the future performance of the shares.

The results of multiple regressions reveal that the age and size of the firm, listing delay, offer price, offer size, number of bookrunners and ex ante uncertainty explain 27.18% of the variation in issuer underpricing. Ex ante uncertainty is found to have a positive significant effect on the degree of underpricing. The price of offered shares and the size of the issue are found to be negatively related with the degree of underpricing. The size of the company is plausible related with the level of underpricing. Conversely, the results show that there is no significant relationship with other explanatory variables such as the age of the firm, listing delay or the number of bookrunners. The variable with the strongest impact on the degree of underpricing is measured as the standard deviation of the first four weeks daily aftermarket trading returns. This could be extended by using different proxies for ex ante uncertainty. It is also interesting to take a longer aftermarket horizon.

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Appendices

Appendix I: Number of listed companies in the world and in India

Graph 1: Total listed domestic companies in the World and in India between 2004-2012.
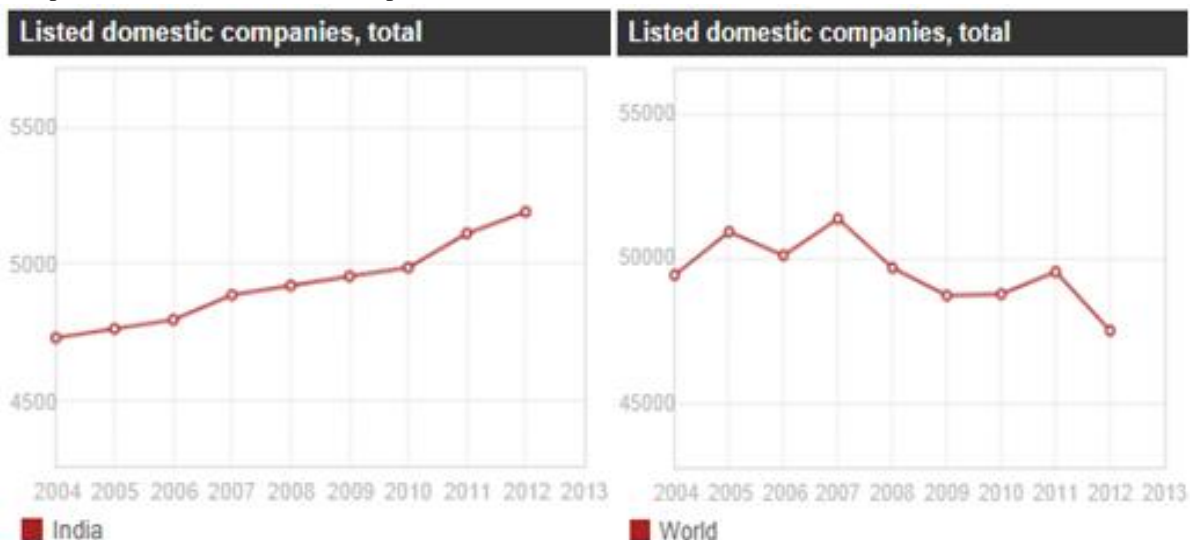
Source: The World Bank, Working for a World Free of Poverty

Appendix II: 427 IPO companies and 2 and 3/4-digit SIC code description

2-digit SIC industry	3/4-digit SIC industry	Company
Agriculture, Forestry and Fishing	Ornamental floriculture and nursery products	Advanta India Ltd
	Wheat	Esteem Bio Organic Food
	Crop preparation services for market	Kaveri Seed Co Ltd
	Ornamental floriculture and nursery products	Pochiraju Industries Ltd
	Sugarcane and sugar beets	Uttam Sugar Mills Ltd
Construction	Residential construction, nec	ARSS Infrastructure Projects
	Industrial buildings and warehouses	Ashoka Buildcon Ltd
	Residential construction, nec	Atlanta Ltd
	Residential construction, nec	B.L.Kashyap & Sons Ltd
	Residential construction, nec	Consolidated Construction
	Residential construction, nec	DLF Ltd
	Bridge, tunnel, and elevated highway construction	Gammon Infrastructure Projects
	Residential construction, nec	Gayatri Projects Ltd
	Highway and street construction	GMR Infrastructure Ltd
	Highway and street construction	IL&FS Transp Networks Ltd
	Residential construction, nec	J Kumar Infraprojects Ltd
	Residential construction, nec	Kaushalya Infrastructure
	Highway and street construction	KNR Constructions Ltd
	Residential construction, nec	Man Infraconstruction Ltd
	Residential construction, nec	MBL Infrastructures Ltd
	Residential construction, nec	MSK Projects(India)Ltd

	Water, sewer, pipeline & utility line construction	Niraj Cement Structurals Ltd
	Residential construction, nec	PBA Infrastructure Ltd
	Residential construction, nec	Pratibha Industries Ltd
	Residential construction, nec	Ramky Infrastructure Ltd
	Residential construction, nec	Roman Tarmat Ltd
	Water, sewer, pipeline & utility line construction	RPP Infra Projects Ltd
	Residential construction, nec	Simplex Projects Ltd
	Heavy construction, nec	Sunil Hitech Engineers Ltd
	Residential construction, nec	Supreme Infrastructure India
	Residential construction, nec	Unity Infraprojects Ltd
	Residential construction, nec	Vascon Engineers Ltd
	Nonresidential building construction, nec	VKJ Infradevelopers Ltd
	Heavy construction, nec	VKS Projects Ltd
Finance, Insurance and Real Estate	Land subdividers and developers, except cemeteries	Akruti Nirman Ltd
	Banks	Allahabad Bank Ltd
	Banks	Bank of Maharashtra
	Personal credit institutions	BCB Finance Ltd
	Land subdividers and developers, except cemeteries	Brigade Enterprises Ltd
	Land subdividers and developers, except cemeteries	Bronze Infra-Tech Ltd
	Banks	Central Bank of India
	Commodity contracts brokers and dealers	Comfort Commotrade Ltd
	Land subdividers and developers, except cemeteries	DB Realty Ltd
	Banks	Development Credit Bank Ltd
	Investment advice	Edelweiss Capital Ltd
	Security brokers, dealers, and flotation companies	Emkay Share & Stock Brokers
	Investment advice	Future Capital Holdings Ltd
	Land subdividers and developers, except cemeteries	Godrej Properties Ltd
	Land subdividers and developers, except cemeteries	Housing Dvlp & Infrastructure
	Personal credit institutions	IDFC
	Security brokers, dealers, and flotation companies	India Infoline Ltd
	Banks	Indian Bank
	Security brokers, dealers, and flotation companies	Indo Thai Securities Ltd
	Security brokers, dealers, and flotation companies	Inventure Growth & Sec Ltd
	Land subdividers and developers, except cemeteries	IRB Infrastructure Developers
	Land subdividers and developers, except cemeteries	IVR Prime Urban Developers Ltd
	Security brokers, dealers, and flotation companies	JRG Securities Ltd
	Land subdividers and developers, except cemeteries	Kolte-Patil Developers Ltd
	Security and commodity services, nec	L&T Finance Holdings Ltd
	Personal credit institutions	Mahindra & Mahindra Financial
	Security and commodity services, nec	Microsec Finl Services Ltd
	Security and commodity services, nec	Motilal Oswal Finl Svcs Ltd
	Commodity contracts brokers and dealers	Multi Commodity Exchange
	Personal credit institutions	Muthoot Finance Ltd
	Land subdividers and developers, except	Natl Buildings Constr Corp Ltd

	cemeteries	
	Land subdividers and developers, except cemeteries	Nitesh Estates Ltd
	Land subdividers and developers, except cemeteries	Oberoi Realty Ltd
	Land subdividers and developers, except cemeteries	Omaxe Ltd
	Security brokers, dealers, and flotation companies	Onelife Capital Advisors Ltd
	Land subdividers and developers, except cemeteries	Orbit Corp Ltd
	Land subdividers and developers, except cemeteries	Parsvnath Developers Ltd
	Short-term business credit institutions	Power Finance Corp Ltd
	Land subdividers and developers, except cemeteries	Prestige Estates Projects Ltd
	Banks	PSB
	Investment advice	PTC India Finl Svcs Ltd
	Banks	Punjab National Bank
	Land subdividers and developers, except cemeteries	Puravankara Projects Ltd
	Offices of holding companies, nec	RDB Rasayans Ltd
	Security and commodity services, nec	Religare Enterprises Ltd
	Personal credit institutions	Repco Home Finance Ltd
	Personal credit institutions	Rural Electrification Corp Ltd
	Land subdividers and developers, except cemeteries	Samruddhi Realty Ltd
	Land subdividers and developers, except cemeteries	Silverpoint Infratech Ltd
	Personal credit institutions	SKS Microfinance Ltd
	Land subdividers and developers, except cemeteries	Sobha Developers Ltd
	Personal credit institutions	SRG Housing Finance Ltd
	Personal credit institutions	Stellar Capital Services Ltd
	Land subdividers and developers, except cemeteries	Sunstar Realty Development Ltd
	Security brokers, dealers, and flotation companies	Transwarranty Finance Ltd
	Banks	Union Bank of India
	Banks	United Bank of India
	Banks	Yes Bank Ltd
Manufacturing	Pharmaceutical preparations	Aanjaneya Lifecare Ltd
	Ship building and repairing	ABG Shipyard Ltd
	Textile goods, nec	Abhishek Mills Ltd
	Construction machinery and equipment	Action Constr Equip Ltd
	Steel works, blast furnaces, and rolling mills	Adhunik Metaliks Ltd
	Abrasive products	AIA Engineering Ltd
	Instruments to measure electricity	Aishwarya Telecom Ltd
	Alkalies and chlorine	Alkali Metals Ltd
	Pharmaceutical preparations	Alpa Laboratories Ltd
	Pharmaceutical preparations	Amar Remedies Ltd
	Packaging machinery	AMD Metplast Ltd
	Primary metal products, nec	Ankit Metal & Power Ltd
	Biological products, except diagnostic substances	Anu's Laboratories Ltd
	Softwood veneer and plywood	Archidply Industries Limited
	Phosphatic fertilizers	Aries Agro Ltd
	Inorganic pigments	Asahi Songwon Colors Ltd

Ceramic wall and floor tile	Asian Granito India Ltd
Pharmaceutical preparations	Astec LifeSciences Ltd
Industrial inorganic chemicals, nec	Aster Silicates Ltd
Valves and pipe fittings	Astral Poly Technik Ltd
Motor vehicle parts and accessories	Autoline Industries Ltd
Scales and balances, except laboratory	Avon Weighing Systems Ltd
Pharmaceutical preparations	Bafna Pharmaceuticals Ltd
Perfumes, cosmetics, and other toilet preparations	Bajaj Corp Ltd
Men's and boys' clothing, nec	Bang Overseas Ltd
Yarn spinning mills	Bannari Amman Spinning Mills
Computer peripheral equipment, nec	Bartronics India Ltd
Steel works, blast furnaces, and rolling mills	Bedmutha Industries Ltd
Turbines and turbine generator sets	BGR Energy Systems Ltd
Ship building and repairing	Bharati Shipyard Ltd
Cement, hydraulic	Binani Cement Ltd
Biological products, except diagnostic substances	Biocon Ltd
Manufacturing industries, nec	Birla Pacific Medspa Ltd
Stationery, tablets, and related products	Blue Bird (India) Ltd
Broadwoven fabric mills, cotton	Bombay Rayon Fashions Ltd
Pharmaceutical preparations	Brooks Laboratories Ltd
Cement, hydraulic	Burnpur Cement Ltd
Jewelry, precious metal	C Mahendra Exports Ltd
Men's and boys' clothing, nec	Celebrity Fashions Ltd
Chemicals and chemical preparations, nec	Chemcel Bio-tech Ltd
Printed circuit boards	Circuit Systems(India)Ltd
Pharmaceutical preparations	Claris Lifesciences Ltd
Truck and bus bodies	Coml Engineers & Body Builders
Leather tanning and finishing	Crew BOS Products Ltd
Books: publishing, or publishing & printing	DB Corp Ltd
Newspapers: publishing, or publishing & printing	Deccan Chronicle Holdings Ltd
Ceramic wall and floor tile	Decolight Ceramics Ltd
Pharmaceutical preparations	Dishman Pharm & Chem Ltd
Cane sugar, except refining	Dwarikesh Sugar Industries Ltd
Chemicals and chemical preparations, nec	Dynemic Products Ltd
Steel pipe and tubes	Electrosteel Steels Ltd
Uncoated paper and multiwall bags	Emmbi Polyarns Ltd
Malt beverages	Empee Distilleries Ltd
Plastics, foil and coated paper bags	Ess Dee Aluminium Ltd
Ceramic wall and floor tile	Euro Ceramics Ltd
Magnetic and optical recording media	Euro Multivision Ltd
Fabricated plate work (boiler shops)	Everest Kanto Cylinder Ltd
Textile goods, nec	Evinix Accessories Ltd
Vehicular lighting equipment	Fiem Industries Ltd
Chemicals and chemical preparations, nec	Fineotex Chemical Ltd
Textile goods, nec	First Winner Industries Ltd
Plastics foam products	Flexituff International Ltd
Steel works, blast furnaces, and rolling mills	Gallantt Ispat Ltd
Steel works, blast furnaces, and rolling mills	Gallantt Metal Ltd
Jewelry, precious metal	Gitanjali Gems Ltd
Malt beverages	Globus Spirits Ltd
Packaging paper & plastics film,coated & laminated	Glory Polyfilms Ltd
Steel works, blast furnaces, and rolling mills	Godawari Power & Ispat Ltd
Jewelry, precious metal	Goenka Diamond & Jewels Ltd
Men's and boys' clothing, nec	Gokaldas Exports Ltd
Vegetable oil mills, nec	Gokul Refoils & Solvent Ltd

Rolling, drawing, & extruding of nonferrous metals	Gravita India Ltd
Industrial inorganic chemicals, nec	Gwalior Chemical Inds Ltd
Steel works, blast furnaces, and rolling mills	Gyscoal Alloys Ltd
Games, toys, children's vehicles,exc. dolls, bikes	Hanung Toys & Textiles Ltd
Motor vehicle parts and accessories	Hilton Metal Forging Ltd
Newspapers: publishing, or publishing & printing	Hindustan Media Ventures Ltd
Men's and boys' suits, coats, and overcoats	House of Pearl Fashions Ltd
Electrometallurgical products, except steel	Impex Ferro Tech Ltd
Power, distribution, and specialty transformers	Indo Tech Transformers Ltd
Pharmaceutical preparations	Indoco Remedies Ltd
Semiconductors and related devices	Indosolar Ltd
Turbines and turbine generator sets	Indowind Energy Ltd
Textile goods, nec	Indus Fila Ltd
Mechanical power transmission equipment, nec	Innoventive Industries Ltd
Pesticides and agricultural chemicals, nec	Insecticides(India)Ltd
Textile goods, nec	Jagjanani Textiles Ltd
Books: publishing, or publishing & printing	Jagran Prakashan Ltd
Dental equipment and supplies	JHS Svendgaard Lab Ltd
Yarn spinning mills	Jindal Cotex Ltd
Perfumes, cosmetics, and other toilet preparations	Jyothy Laboratories Ltd
Cane sugar refining	K M Sugar Mills Ltd
Steel works, blast furnaces, and rolling mills	Kamdhenu Ispat Ltd
Textile goods, nec	Kavita Fabrics Ltd
Motor vehicle parts and accessories	Kew Industries Ltd
Men's and boys' clothing, nec	Kewal Kiran Clothing Ltd
Cyclic crudes and intermediates, and organic dyes	Kiri Dyes & Chemicals Ltd
Fabricated textile products, nec	Koutons Retail India Ltd
Textile goods, nec	KPR Mill Ltd
Paper mills	Kushal Tradelink Ltd
Textile goods, nec	Lakhotia Polyester(India)Ltd
Rubber and plastics footwear	Lawreshwar Polymers Ltd
Machinery,except electrical	Lokesh Machines Ltd
Women's, misses', & children's underwear,nightwear	Lovable Lingerie Ltd
Rice milling	LT Overseas Ltd
Motor vehicle parts and accessories	Lumax Auto Technologies Ltd
Power, distribution, and specialty transformers	M & B Switchgears Ltd
Pulp mills	Malu Paper Mills Ltd
Crowns and closures	Manaksia Limited
Textile goods, nec	Mandhana Industries Ltd
Pharmaceutical preparations	Mangalam Drugs & Organics Ltd
Communications equipment, nec	MaxAlert Systems Ltd
Semiconductors and related devices	MIC Electronics Ltd
Hand and edge tools, except machine tools and saws	Midfield Industries Ltd
Medicinal chemicals and botanical products	Monarch Health Services Ltd
Steel works, blast furnaces, and rolling mills	MSP Steel & Power Ltd
Men's and boys' separate trousers and slacks	Mudra Lifestyle Ltd
Broadwoven fabric mills, cotton	Nandan Exim Ltd
Pharmaceutical preparations	Nectar Lifesciences Ltd
Gray and ductile iron foundries	Nelcast Ltd
Copper foundries	Nissan Copper Ltd
Ceramic wall and floor tile	Nitco Tiles Ltd
Manufacturing industries, nec	Nitin Fire Protection Indus
Textile goods, nec	Nitin Spinners Ltd

	Greeting cards	Olympic Cards Ltd
	Chemicals and chemical preparations, nec	Omkar Speciality Chemicals Ltd
	Textile goods, nec	Page Industries Ltd
	Pharmaceutical preparations	Parabolic Drugs Ltd
	Folding paperboard boxes, including sanitary	Paramount Printpackaging Ltd
	Jewelry, precious metal	PC Jeweller Ltd
	Household audio and video equipment	PG Electroplast Ltd
	Ship building and repairing	Pipavav Shipyard Ltd
	Pharmaceutical preparations	Plethico Pharmaceuticals Ltd
	Motor vehicle parts and accessories	Porwal Auto Components Ltd
	Steel pipe and tubes	Prakash Steelage Ltd
	Motor vehicles and passenger car bodies	Precision Pipes & Profiles Co
	Women's, misses', & juniors' blouses and shirts	Provogue(India)Ltd
	Edible fats and oils, nec	Raj Oil Mills Ltd
	Iron and steel forgings	Ramkrishna Forgings Ltd
	Cold-rolled steel sheet, strip and bars	Rathi Bars Ltd
	Malt beverages	Ravi Kumar Distilleries Ltd
	Cookies and crackers	RCL Retail Ltd
	Steel works, blast furnaces, and rolling mills	Readymade Steel India Ltd
	Petroleum refining	Reliance Petroleum Ltd
	Jewelry, precious metal	Renaissance Jewellery Ltd
	Commercial printing	Repro India Ltd
	Textile goods, nec	Richa Knits Ltd
	Drawing and insulating of nonferrous wire	Rishabhdev Technocable Ltd
	Packaging paper & plastics film,coated & laminated	RMCL
	Electrometallurgical products, except steel	Rohit Ferro-Tech Ltd
	Corrugated and solid fiber boxes	Ruchira Papers Ltd
	Laminated plastics plate, sheet and profile shapes	Rushil Decor Ltd
	Lubricating oils and greases	Sah Petroleums Ltd
	Electrometallurgical products, except steel	SAL Steel Ltd
	Machine tools, metal forming types	Sanghvi forging & Eng Ltd
	Flat glass	Sejal Architectural Glass Ltd
	Yarn spinning mills	SEL Manufacturing Co Ltd
	Commercial printing, nec	Servalakshmi Paper Ltd
	Plastics materials and synthetic resins	Shekhawati Poly-Yarn Ltd
	Drawing and insulating of nonferrous wire	Shilpi Cable Technologies Ltd
	Knit outerwear mills	Shivalik Global Ltd
	Iron and steel forgings	Shree Ganesh Forgings Ltd
	Cane sugar refining	Shree Renuka Sugars Ltd
	Cold-rolled steel sheet, strip and bars	Shri Ramrupai Balaji Steel Ltd
	Pharmaceutical preparations	SMS Pharmaceuticals Ltd
	Explosives	Solar Explosives Ltd
	Conveyors and conveying equipment	Somi Conveyor Beltings Ltd
	Textile goods, nec	SPL Industries Ltd
	Paper mills	Sree Sakthi Paper Mills Ltd
	Men's and boys' suits, coats, and overcoats	Sudar Garments Ltd
	Pharmaceutical preparations	Surya Pharmaceuticals Ltd
	Turbines and turbine generator sets	Suzlon Energy Ltd
	Pharmaceutical preparations	Syncom Healthcare Ltd
	Jewelry, precious metal	Tara Jewels Ltd
	Power, distribution, and specialty transformers	Tarapur Transformers Ltd
	Motors and generators	TD Power Systems Ltd
	Metal stampings, nec	Technocraft Industries(India)
	Miscellaneous fabricated wire products	Tecpro Systems Ltd
	Fabricated pipe and pipe fittings	Texmo Pipes & Products Ltd
	Plastics products, nec	Tijaria Polypipes Ltd

	Plastics materials and synthetic resins	Time Technoplast Ltd
	Railroad equipment	Titagarh Wagons Ltd
	Power, distribution, and specialty transformers	Transformers & Rectifiers Ltd
	Fabricated pipe and pipe fittings	Tulsi Extrusions Limited
	Hardwood veneer and plywood	Uniply Industries Ltd
	Food preparations, nec	Usher Agro Ltd
	Steel works, blast furnaces, and rolling mills	Vaswani Industries Ltd
	Steel works, blast furnaces, and rolling mills	Vikash Metal & Power Ltd
	Steel works, blast furnaces, and rolling mills	Visa Steel Ltd
	Pharmaceutical preparations	Vivimed Labs Ltd
	Ship building and repairing	VMS Industries Ltd
	Power, distribution, and specialty transformers	Voltamp Transformers Ltd
	Semiconductors and related devices	XL Telecom Ltd
Mining	Crude petroleum and natural gas	Cairn India Ltd
	Bituminous coal and lignite surface mining	Coal India Ltd
	Crude petroleum and natural gas	Deep Industries Ltd
	Ferroalloy ores, except vanadium	Moil Ltd
	Crude petroleum and natural gas	Oil India Ltd
	Dimension stone	Oriental Trimex Ltd
	Crude petroleum and natural gas	Petronet LNG Ltd
Retail Trade	Retail stores, nec	eDynamics Solutins Ltd
	Eating places	Jubilant FoodWorks Ltd
	Miscellaneous general merchandise stores	Piramyd Retail Ltd
	Retail stores, nec	Shoppers Stop Ltd
	Eating places	Speciality Restaurants Ltd
	Miscellaneous homefurnishings stores	Timbor Home Ltd
	Jewelry stores	Tribhovandas Bhimji Zaveri Ltd
	Family clothing stores	Vishal Retail Ltd
	Variety stores	Vmart Retail Ltd
Services	Computer facilities management services	3i Infotech Ltd
	Facilities support management services	A2Z Maintenance & Engineering
	Computer facilities management services	Accel Frontline Ltd
	Computer facilities management services	Acropetal Technologies Ltd
	Computer facilities management services	Allied Digital Services Ltd
	Business services, nec	Allsec Technologies Ltd
	Computer facilities management services	AurionPro Solutions Ltd
	Motion picture and video tape production	BAG Films Ltd
	Hotels and motels	Bhagwati Banquets & Hotels Ltd
	Prepackaged Software	Bharatiya Global Infomedia Ltd
	Engineering services	C&C Constructions Ltd
	Computer facilities management services	Cambridge Tech Ent Ltd
	Schools and educational services, nec	Career Point Infosystems Ltd
	Prepackaged Software	Compulink Systems Ltd
	Credit reporting services	Credit Analysis & Research Ltd
	Computer related services,nec	Cyber Media India Ltd
	Business services, nec	Datamatics Technologies Ltd
	Motion picture and video tape production	DQ Entertainment Intl Ltd
	Data processing services	eClerx Services Ltd
	Schools and educational services, nec	EdServ Softsystems Ltd
	Schools and educational services, nec	Educomp Solutions Ltd
	Motion picture and video tape production	Eros International Media Ltd
	Data processing schools	Everonn Systems India Ltd
	Business services, nec	Excel Infoways Ltd
	Computer facilities management services	FCS Software Solutions Ltd
	Business services, nec	Firstsource Solutions Ltd
	General medical and surgical hospitals	Fortis Healthcare (India) Ltd
	Computer integrated systems design	Four Soft Ltd
	Heavy construction equipment rental and leasing	Gremach Commerce Pvt Ltd

	Computer facilities management services	GSS America Infotech Ltd
	Business services, nec	HOV Services Ltd
	Credit reporting services	ICRA Ltd
	Computer facilities management services	Infinite Computer Solutions
	Information retrieval services	Info Edge(India)Ltd
	Motion picture theaters, except drive-in	Inox Leisure Ltd
	Business services, nec	Intrasoft Technologies Ltd
	Engineering services	Jaypee Infratech Ltd
	Computer facilities management services	Jointeca Educ Solutions Ltd
	Information retrieval services	Jupiter Infomedia Ltd
	Information retrieval services	Just Dial Ltd
	Computer programming services	Kernex Microsystems
	Engineering services	Lanco Infratech Ltd
	Specialty hospitals, except psychiatric	Lotus Eye Care Hospital Ltd
	Hotels and motels	Mahindra Holidays & Resorts
	Services allied to motion picture production	Midvalley Entertainment Ltd
	Computer facilities management services	MindTree Consulting Ltd
	Elementary and secondary schools	MT Educare Ltd
	Computer facilities management services	Omnitech InfoSolutions Ltd
	Computer facilities management services	Paradyne Infotech Ltd
	Computer programming services	Patni Computer Systems Ltd
	Prepackaged Software	Persistent Systems Ltd
	Motion picture and video tape production	Prime Focus Ltd
	Prepackaged Software	Prithvi Info Solutions Ltd
	Engineering services	Punj Lloyd Ltd
	Motion picture theaters, except drive-in	PVR Ltd
	Motion picture theaters, except drive-in	Pyramid Saimira Theatre Ltd
	Computer facilities management services	R Systems International Ltd
	Hotels and motels	Royal Orchid Hotels Ltd
	Computer related services,nec	Saksoft Ltd
	Motion picture and video tape production	Shree Ashtavinayak Cine Vision
	Motion picture theaters, except drive-in	Shringar Cinemas Ltd
	Engineering services	Shriram EPC Ltd
	Motion picture theaters, except drive-in	SRS Ltd
	Prepackaged Software	Take Solutions Ltd
	Computer facilities management services	Taksheel Solutions Ltd
	Physical fitness facilities	Talwalkars Better Value
	Information retrieval services	Tata Consultancy Services Ltd
	Computer facilities management services	Tech Mahindra Ltd
	Engineering services	Technofab Engineering Ltd
	Engineering services	Thejo Engineering Ltd
	Prepackaged Software	Thinksoft Global Services Ltd
	Schools and educational services, nec	Tree House Education
	Computer integrated systems design	Tulip IT Services Ltd
	Computer facilities management services	Zylog Systems Ltd
Transportation and Public Utilities	Travel agencies	Ace Tours Worldwide Ltd
	Electric services	Adani Power Ltd
	Trucking, except local	Allcargo Global Logistics Ltd
	Trucking, except local	Aqua Logistics Ltd
	Telephone communications, except radiotelephone	Bharti Infratel Ltd
	Television broadcasting stations	Broadcast Initiatives Ltd
	Electric services	BS Transcomm Ltd
	Travel agencies	Cox & Kings(India)Ltd
	Cable and other pay television services	DEN Networks Ltd
	Telephone communications, except radiotelephone	Dhanus Technologies Ltd

	Radio broadcasting stations	Entertainment Network(India)
	Arrangement of transportation of freight and cargo	Gateway Distriparks Ltd
	Air transportation, scheduled	Global Vectra Helicorp Ltd
	Marine cargo handling	Gujarat Pipavav Port Ltd
	Natural gas transmission	Gujarat State Petronet Ltd
	Electric and other services combined	GVK Power & Infrastructure Ltd
	Cable and other pay television services	Hathway Cable & Datacom Pvt
	Radiotelephone communications	Idea Cellular Ltd
	Electric services	Indiabulls Power Ltd
	Natural gas transmission	Indraprastha Gas Ltd
	Cogeneration, alternative energy sources	Jaiprakash Hydro-Power Ltd
	Air transportation, scheduled	Jet Airways(India)Ltd
	Cogeneration, alternative energy sources	JSW Energy Ltd
	Television broadcasting stations	New Delhi Television Ltd
	Cogeneration, alternative energy sources	NHPC Ltd
	Electric services	NTPC
	Radiotelephone communications	OnMobile Global Ltd
	Cogeneration, alternative energy sources	Orient Green Power Co Ltd
	Electric services	Power Grid Corp of India Ltd
	Electric services	Power Trading Corporation
	Television broadcasting stations	Raj Television Network Ltd
	Electric services	Reliance Power Ltd
	Telephone communications, except radiotelephone	Sasken Communication
	Cable and other pay television services	Sea TV Network Ltd
	Cogeneration, alternative energy sources	SJVN Ltd
	Radio broadcasting stations	Sun TV Ltd
	Courier services, except by air	Tiger logistics (India) Ltd
	Television broadcasting stations	TV Today Network Ltd
	Television broadcasting stations	UTV Software Commun Ltd
	Water supply	VA Tech WABAG Ltd
Wholesale Trade	Computers and peripheral equipment and software	Allied Computers Intl Ltd
	Brick, stone, and related construction materials	Barak Valley Cements Ltd
	Men's and boys' clothing and furnishings	Cantabil Retail India Ltd
	Electrical apparatus and equip	Cords Cable Industries Ltd
	Industrial machinery and equipment	Magnum Ventures Ltd
	Piece goods, notions, and other dry goods	Pradip Overseas Ltd
	Computers and peripheral equipment and software	Redington(India)Ltd
	Chemicals and allied products, nec	Refex Refrigerants Ltd
	Jewelry, watches, and precious stones and metals	Shree Ganesh Jewellery House
	Grain and field beans	Sita Shree Food Products Ltd
	Electrical apparatus and equip	Veto Switchgears & Cables Ltd
	Electronic parts and equipment, nec	V-Guard Industries Ltd