Risk and Return Performance of IPOs : An Analysis

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Abstract

Initial public offering (IPO) refers to the sale of new shares in the primary market for the first time to the general public. This study collected IPOs that are listed on the National Stock Exchange. This study focused on the IPO price performance, whether it was overpriced or underpriced. The IPO price performance was calculated by IPOs' post listing data. The IPOs recorded positive returns or negative returns during the study period from January 1, 2014 to November 4, 2015. This study evaluated the IPO risks and return performance by using three different measures, that is, Sharpe's, Treynor's, and Jensen's alpha measures. It also tried to keep an eye on the market index performance during the study period. In this study, it was found that the IPOs were underpriced and the three models also showed superior return performance of IPOs than the market index performance. The investors earned profits from their rational IPO investment decisions. Due to the over-performance of IPOs and risk return analysis, it was concluded that the investments in IPOs was less risky than the benchmark index's performance in the study period.

Keywords : **initial public offerings, fixed price method, book building method, risk analysis, investment decisions, portfolio, under-pricing, overpricing**

JEL Classification : G1, G110, G170, O16

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Initial public offering (IPO) refers to the selling of new shares in the primary market to the general public. The primary market was controlled by the Controller of Capital Issues before 1992. The share prices were also controlled by the CCI and fixed price method was used. But after 1992, SEBI controlled shares prices and IPO issues were freely priced. Two different methods are used to price the IPO shares in the market, that is, fixed price method and book building method. Fixed price refers to the price at which IPO shares are issued at fixed price to the investors, and this IPO price is known in advance by the investors. On the other side, the book-building method refers to the price at which IPO shares are issued at free price to the investors, and this IPO price is not known in advance, only the indicative price band is known by the investors. The issuing company comes out with the prospectus which contains all the information about company shares. This information is submitted to SEBI within 21 days before filing the price band decision into the stock exchange.

In this method, bids are invited (on the basis of indicative price band) for IPO shares from the investors. The investors bid for new shares as they are willing to pay for a share and how many shares they want to buy at a particular price. On the basis of bids of investors, the issuing companies decide the actual issue price of the IPO shares before coming up in the market. The issuing companies appoint mediators as underwriters to evaluate the demand of investors and collect investor bids on new shares before fixing the issue price by the companies. The bidding for investors is open for five days and after five days, IPO share prices are fixed when the book is closed for the investors. Bhanu Murthy and Singh (2008) described the book-building process and described four types of investors who bid for IPO shares as retail individual investors (RII), high networth individual (HNI), non

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institutional investors, and qualified institutional bidders (QIB). The issue price has been decided after the collection of opinion of investors. In this process, the IPO is issued at a premium; this happens when demand is more than the supply of new shares.

IPO investment is very risky because it is tough to predict IPO price on its listing day and also in the near future as short run or long run. Two anomalies are used to price the IPOs as underpriced and overpriced. Many previous research studies have supported the IPO under-pricing concept. Under-pricing refers to the price in which issue price is less than the listing day price. New companies always want to underprice their shares to encourage investors to invest more in IPOs and more issuing companies come up in the market to go public. The over-pricing of IPO refers to the price when issue price is more than the listing day price. In this case, the issuing companies lose their money due to investors' low interest in getting more shares. Jindal and Chander (2015) described in their study that the IPOs are often underpriced or overpriced due to investors' behavioral contours while making investment decisions like whether to invest or not in IPO shares for making profits.

Research Justification

In recent times, higher incidence of market volatility has been found in India and is more attributed to investor switching behavior. This necessitates deeper understanding of this kind in relation with the IPO investment by investors. Very few studies have been done on IPOs in India, and hardly any study has been done on IPO pricing regarding investor behavior. In view of the above, the study of understanding investor behavior in case of IPO pricing is urgently called for justifying the study of consistency.

Review of Literature

This study extensively reviewed previous research studies which were based on IPO performances in the short run and long run, and their impact on investor behavior. Various studies have been found on the concept of under-pricing phenomena of IPOs.

Studies mentioned in this section have shown both IPO under-pricing and over-pricing phenomena. Adams, Thornton, and Hall (2008) said that IPO share prices were underpriced by 10% - 15 % consistently after public. If IPOs are underpriced, the issuing companies of IPOs lose money on the table. The mean of IPO returns was lower than the median of IPO returns. When an IPO is underpriced, the investors demand more shares. Thus, IPOs were heavily subscribed.

Peng (2008) described the long run IPO performance, and the Shanghai Stock Exchange Index was used as a benchmark. This study analyzed the aftermarket performance by using the cumulative abnormal returns (CAR) and buy and hold abnormal returns (BHAR). It showed IPO over-performance in six months after listing day and recorded underperformance after six months of listing.

Chatzinas, Markopoulou, and Papadopoulos (2009) studied IPO performance, whether it was underpriced and overpriced during the 4-year study period from 2002 to 2005. This study showed a positive performance of only 14 IPOs out of 32 IPOs and the remaining 18 IPOs performed negatively during the study period. Sohail and Raheman (2010) analyzed the short run IPO performances in the study period from 2000 to 2009 which were listed on the Karachi Stock Exchange and analyzed the IPO return performance and market adjusted performance in the short run. This study concluded the positive average market adjusted returns in the short run period. The investors earned returns on sale of new shares in the short run.

Mauskar and Sivasubramaniam (2011) investigated IPO return performance by using the *t*-test method. It concluded that the hot IPOs and IPO issue price listed at higher price band were more underpriced than the cold IPOs and IPO issue price listed at lower price band. It was observed that the investors were more reluctant to enter the market in underpriced situations. Sadaqat, Akhtar, and Ali (2011) studied three different states of economy as

normal, boom, and recession. The investors got reward on the sale of IPO shares in the boom state of the economy. When the IPO market was in the recession stage, the investors failed to sell their shares on the listing day and behaved pessimistically.

Zouari, Boudriga, and Taktak (2011) studied the short run (1st, 2nd, and 3rd day) IPO performances and explored various factors which affected IPO returns by using multiple linear regression models. Various variables such as retained capital, underwriter's price support, oversubscription, listing delay, and offer price showed underprice performance. Joshi, Sabhaya, and Pandya (2013) analyzed IPO price performance by using cumulative abnormal rate of return and wealth relatives. This study found that 107 IPOs were overpriced, that is, showed underperformance and only 43 IPOs were overpriced from listing day to a year after listing day, that is, positive returns were recorded due to investors' increased demand for IPOs and speculative behavior of the investors.

Jindal (2015) analyzed investors' rationality on market momentum and on IPO performance by using tools such as meta analysis. The study found that the investors were irrational in making IPO investment decisions. The investors behaved exuberantly on the over-performance of the IPOs and behaved over-pessimistically on the overpriced IPOs. The IPOs are often underpriced or overpriced due to investors' behavioral contours while making investing decisions like whether to invest or not in IPO shares for making profits.

Pande and Vaidyanathan (2015) described the IPOs which were issued at lower and higher end of the price band. The IPOs which were issued at the higher end of the price band were referred to as more underpriced and the IPOs which were recorded at the lower end of price band were considered as overpriced. The higher end IPOs meant more investor demand for that IPO. When low investors demand was noted for the IPO issue, then the issuing companies decided to fix the issue price at the lower side of the price range.

Research Objective and Hypothesis

This research paper attempts to investigate the price performance of IPOs - whether they are underpriced or overpriced.

On the basis of the aforesaid objective of this study, the hypothesis is formulated as : The IPOs are fairly priced - neither they are underpriced nor overpriced.

Research Methodology

The listed IPOs' share price data were collected from the National Stock Exchange during the study period from January 1, 2014 to November 4, 2015. In this study period, 26 IPOs which were issued at NSE were recorded. This study considered only those IPOs which satisfied the following criteria: a) The IPOs must be listed on the NSE, b) The IPOs must have recorded the issue price, listing date, issue date, price range, issue size, listing day price, and last traded price. The listing price and post listing IPO price data was collected from multiple online databases such as : http://www.nseindia.com and http://www.moneycontrol.com. Six IPOs were excluded from the sample size due to non availability of the listing date of the IPOs. After exclusion, out of these 26 IPOs, 20 IPOs were used for this study and IPO price performance was measured by using different time spans as listing day return, a week later, a month later, a quarter later, six months later, and a year later of listing day during the study period.

Various tools were used to analyze IPO returns post IPO listing day like market benchmark, aftermarket IPO performance, and three models - Sharpe's, Treynor's, and Jensen's alpha were used to evaluate the risk and return performance of IPOs.

(i) IPO Listing Day Returns : IPO listing day return is measured by differentiating the issue price of the IPO with the listing day closing price of the IPO and dividing it by the issue price of the IPO. This calculated amount is

considered as the listing day return. The formula as given below :

$$R_i = \left(\frac{P_1 - P_0}{P_0}\right) * 100 \qquad (1)$$

where,
R_i = IPO listing day return,
P_1 = closing price on the listing day,
P_0 = the issue price.

This IPO listing day return may be positive or negative. If this calculated value is recorded in positive, it is considered as underpriced IPO, but if the measured return is in negative, then it is perceived that the IPO is overpriced.

(ii) Market Benchmark Return : This study uses the CNX Nifty index as the market benchmark. This is calculated by differentiating the closing price of market benchmark on the IPO's listing day with closing price of market benchmark on the closing day of issue and dividing it by the closing price of market benchmark on the closing day of issue. This calculated value is referred to as the market benchmark return and the formula is shown below :

$$R_m = \left(\frac{M_1 - M_0}{M_0}\right) * 100 \qquad (2)$$

where,

R_m = market benchmark return,
M_1 = closing price of market benchmark on the IPO's listing day,
M_0 = closing price of market benchmark on the closing day of issue.

This market index return may be positive or negative. If this calculated value is recorded in positive, it is considered that the market on the whole has moved up, but if the measured return is negative, then it is perceived that the whole market has declined. If it is recorded as zero, it means that the market remains unchanged.

(iii) Market Adjusted Excess Return : Bansal and Khanna (2012) described the calculation of market adjusted return on stock. The market adjusted excess return is calculated by differentiating the IPO's return with the market benchmark return. If the market adjusted excess return is recorded positive, then it is underpriced. If market excess return records negative value, it is considered as overpriced, and if market excess return shows zero value, then it indicates fair price.

$$MAER_i = \left(\frac{P_1 - P_0}{P_0} - \frac{M_1 - M_0}{M_0}\right) * 100 \qquad (3)$$

$$MAER_i = R_i - R_m$$

The analysis of post listing IPO price performance for a week later, a month later, a quarter later, six months later, and a year later is measured by differentiating the particular day closing price with the issue price of the IPO and dividing it by issue price of the IPO. Sadaqat et al. (2011) showed in their study the return calculation on the end of each trading day. The formulas for IPO return, market benchmark return, and excess return on different time spans are given below:

$$R_{it} = \left(\frac{P_{t1} - P_0}{P_0} \right) * 100 \qquad (4)$$

$$R_{mt} = \left(\frac{M_{t1} - M_0}{M_0} \right) * 100 \qquad (5)$$

$$MAER_{it} = \left(\frac{P_{t1} - P_0}{P_0} - \frac{M_{t1} - M_0}{M_0} \right) * 100 \qquad (6)$$

(iv) Sharpe's Measure : Sharpe's measure was developed in 1960s. It is calculated by differentiating the IPO return with risk free rate and dividing it by total risk of the IPOs which is measured by standard deviation. Sharpe's measure is also called as the variability ratio. It derives from the formula as given below :

$$S_i = \frac{R_i - R_f}{\sigma_i} \qquad (7)$$

where,

S_i = Sharpe's measure,
R_i = average of the IPOs return,
R_f = risk free rate of return,
σi = standard deviation of the IPOs (total risk).

This Sharpe's value is recorded in positive or in negative. The positive value of Sharpe's measure is considered as favorable performance of IPOs. If the Sharpe's measure records negative value, then it is referred to as inferior or underperformance of IPOs as compared to market index return.

(v) Treynor's Measure : The Treynor's measure was developed in 1965 by Jack L. Treynor. It is similar to Sharpe's measure except the total risk. In Treynor's measure, the systematic risk is involved. It is measured by differentiating the IPO's return from the risk free rate and dividing it by the beta value of the IPO. This Treynor's measure is also called as volatility ratio. It is derived as given below :

$$T_i = \frac{R_i - R_f}{\beta} \qquad (8)$$

where,
T_i = Treynor's measure,
R_i = average of IPO return,
R_f = risk free rate of return,
β = beta of the IPOs return.

This calculated value is recorded in positive or negative. The positive value of Treynor's measure refers to higher or superior IPO performance and negative value of Treynor's measure means inferior performance of IPOs.

(vi) Jensen's Alpha Measure : The Jensen measure was developed in 1968 by Michael C. Jensen. Jensen's alpha is measured by differentiating IPO return with the expected return of the IPOs. The expected return of the IPOs is measured by risk free rate of IPOs, beta of IPOs, and risk premium of the IPOs. The computation is used for Jensen's alpha measure as shown below :

$$\alpha_j = R_i - (R_f + \beta * (R_m - R_f)) \quad (9)$$

$$\alpha_j = R_i - R_e$$

where,
α_j = alpha that measures forecasting ability,
R_i = average of IPO return,
R_e = expected return of the IPOs,
R_f = risk free rate of return,
R_m = average of the market index.
β = measure of the systematic risk.

The calculated Jensen's alpha value is positive, negative, or zero. The positive Jensen's alpha value is referred to as the over-performance of the IPOs and issuing companies' ability to provide more return to investors than they had expected from their investments. If Jensen's alpha is recorded as negative, then the IPOs are considered as underperforming and issuers have low ability to provide more return to the investors.

Analysis and Results

The IPO performance has been analyzed by the IPOs' post listing return, market benchmark return, and excess return of IPOs during the study period. If the IPOs are positively recorded, then it is considered that the IPOs are underpriced. If the IPOs are negatively recorded, then it is considered that the IPOs are overpriced. In this study, IPO performance was analyzed in different ways as calculation of IPO return, market index return, and excess return in different time frames. The positive and negative IPO return calculation and three different models' performance in relation to IPOs returns are also examined.

(i) Performance of IPOs' Return, Market Index Return, and Excess Return of the IPOs : This study describes IPOs' prices and their performance from listing day to a year after listing day during the study period from January 2014 to November 2015. The Table 1 describes the IPOs' average return, market benchmark return, and average excess return performance in percentage covering the sample of 20 IPOs during the study period. For this study, the time period used is return on listing day, a week later, a month later, a quarter later, six months later, and a year after listing day. IPO average return increased from listing day to a year later.

As can be inferred from the Table 1, on the listing day, the positive average return is recorded as 8.53% ; a week after, IPO return jumps by 11.88% ; a month after, IPOs' average return rises by 11.92% ; a quarter after, IPOs' return increases by 24.32% ; after six months, IPOs' average return sees a continuous upside by 31.12% ; and a

Table 1. Performance of IPOs' Return, Market Benchmark Return, and Excess Return of IPOs During the Study Period

Time Period	IPOs' Average Return (%)	Market Benchmark Average Return (%)	Average Excess Return (%)
Listing day	8.53	-0.81	9.33
A week later	11.88	-0.07	11.96
A month later	11.92	-0.07	12.00
A quarter later	24.32	0.05	24.26
Six month later	31.12	-0.004	31.13
A year later	86.64	-2.27	88.91

year after, only three IPOs' average return increases by 86.64%. All the positive values show that the IPOs are underpriced or over-performed at all time periods. The market benchmark average return shows negative values in the different time spans during the study period. For the market benchmark return calculation, the CNX Nifty index was taken into consideration as a benchmark for the different time spans.

On the listing day, the benchmark return records a figure of - 0.81%, which means decline in the market ; in a week after listing day, it recovers, but negatively records a value of -0.07% ; in a month after, -0.07% records benchmark return ; in a quarter after, the average market return has recovered and increased by 0.05% ; in six months after, the benchmark average return again drops by -0.004% ; and in a year after, the market index return declines by -2.27%. The negative market benchmark return in Table 1 means the overall market has declined more than the average return of IPOs in this study period. The average excess return is measured by subtracting the average IPOs return with the average of market benchmark return. The excess return is recorded positive in all the different time frames. This positive average return of the IPOs is referred to as under-pricing of the IPOs during the study period.

(ii) IPO Price Performance : The Table 2 shows the pricing performance of the IPOs - whether they are overpriced or underpriced in the study period. The IPOs' return is distributed into different positive and negative return levels as below 10%, below 20%, below 50%, and more than 50% in different time frames as on the listing day, a week later, a month later, a quarter later, six months later, and a year later from the listing day. On the listing day, a total of 20 IPOs are recorded and out of these, 11 IPOs are recorded as positive IPO returns and only nine IPOs perform negatively, and on an average, 8.53% return is recorded.

As it is seen in the Table 2, the sample IPOs perform positively in all the time spans from listing day to a year after the listing day. In a week after listing, the IPOs show positive return performance and record, on an average, 11.88% return. As the time span increases, the IPOs' return also increases. In case of 19 IPOs a month later, the IPOs' return is recorded as 11.92%. In a quarter after, on an average, 12 IPOs record, on an average, 24.32% return. Three IPOs - Sharda Cropchem (61.15% return), Snowman Logistics (116.28% return) issued in 2014 and VRL Logistics (84.41% return) issued in 2015 record above 50% positive return level in a quarter after the listing day.

Six months later, eight IPOs record 31.12% return, and out of these, six IPOs note positive return and the remaining two IPOs show negative return performance. A year later, only three IPOs record positive return, and on average, 86.64% return level is recorded by Shemaroo Entertainment (63.32% return), Sharda Cropchem (83.62% return), and Snowman Logistics (112.98% return) . Out of 20 IPOs, seven IPOs record positive returns from the listing day to a year after the listing day. The seven IPOs are Sharda Cropchem, Snowman Logistics both issued in 2014, IPOs issued in 2015 are Navkar Corporation, Syngene International, Manpasand Beverages, VRL Logistics, and Inox Wind.

Only six IPOs (Monte Carlo Fashions, Coffee Day, Pennar Engineered Building Systems, Power Mech

Table 2. IPOs' Performance (Underpriced and Overpriced) in the Study Period

IPO Return (%)	Number of IPOs																	
	Listing Day			A week later			A month later			A quarter later			Six month later			A year later		
	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg
Below ± 10	06	06	-0.83	04	08	-2.05	03	04	0.26	-	03	-3.01	01	-	8.32	-	-	-
Below ± 20	-	03	-13.32	-	02	-16.55	01	03	-2.29	-	02	-12.64	02	-	12.95	-	-	-
Below ± 50	04	-	37.65	03	-	36.10	04	02	16.75	03	01	16.07	-	02	-29.02	-	-	-
Above ± 50	01	-	69.79	02	-	87.58	02	-	70.64	03	-	87.28	03	-	90.94	03	-	86.64
Avg. of total IPOs	11	09	8.53	09	10	11.88	10	09	11.92	06	06	24.32	06	02	31.12	03	-	86.64

Projects, UFO Moviez India, MEP Infrastructure Developers) show negative performance in the whole time frames. The remaining IPOs show volatility after market performance. However, overall, it is recorded that the IPOs over-performed in all time frames during the study period and the investors earned gains while trading in these IPOs. The IPO - Snowman Logistics recorded highest performance.

(iii) IPOs' Price Performance Analysis in Relation to Three Measures as Sharpe's, Treynor's and Jensen's Alphas : Sharpe's measure refers to the calculation of excess IPO return over to the total risk of the IPOs. The positive value of Sharpe's measure has been considered as good investor investment decision after taking additional risk on shares. The negative value of Sharpe's measure has been considered as the poor investors' investment decision or low return earned due to the high market index value. Treynor's measure refers to the measurement of IPO return over systematic risk. The positive value of Treynor's measure is considered as gains earned on IPOs and negative value of Treynor's measure is considered as low return earned on IPOs' investment by investors.

The Jensen's alpha measure refers to the forecasting of IPOs return over to the expected return of the IPOs by investors. The positive Jensen's alpha has been considered as better forecasting ability of IPO issuers, and investors earn more return than the expected return on IPOs. The negative Jensen's alpha is considered inferior forecasting ability of the issuers of IPOs and these earned less return on IPOs than the expected return from the IPOs.

The Table 3 shows IPOs' performance in relation to Sharpe's, Treynor's and Jensen's alpha measures. These three measures were applied on the IPO return performance during the study period. On the listing day, the Sharpe's measure records (0.36%) a positive performance, which means better IPO return earned than the market index performance after adjusting total risk. The Treynor's measure also records (5.40%) positive performance, which means better IPO performance than the market benchmark performance on the listing day. The Jensen's alpha (9.87%) indicates positive performance, which means that IPO issuers had better forecasting ability and provided higher than expected return to investors from their investments on the listing day. A week later, all three measures show positive IPO return performance and negative benchmark value is recorded, which means IPOs are less riskier than the market index.

It is noted that as the time span increases, the positive performance of Sharpe's measure also increases. It means the IPOs are better performing in a year after than on the listing day. Nineteen IPOs are recorded a month later and all three measures show the positive performance of the IPOs and record inferior (-0.07%) market index performance. Only eight IPOs are recorded six months later and all three measures show positive return on IPOs. Six months after the listing day, the highest performance is recorded by Sharpe's and Jensen's alpha measures, but zero market index performance is recorded, which means the market index performance remains unchanged. In this, the Jensen's alpha measure records highest (31.14%) positive performance, which means that the IPO issuers provide higher return on IPOs than what the investors expected from investments and result in good investment decisions for the IPOs.

The two IPOs out of eight IPOs are VRL Logistics issued in 2015 which recorded 98.59% returns and

Table 3. IPOs' Performance in Relation to Sharpe's, Treynor's, and Jensen's Alpha Measures

No. of IPOs	20	19	19	12	08	03
Measures	**Listing Day**	**A Week after**	**A Month after**	**A Quarter after**	**Six month after**	**A Year after**
Sharpe's	0.36	0.37	0.41	0.56	0.59	3.47
Treynor's	5.40	7.89	115.04	-201.97	10.00	15.95
Jensen's Alpha	9.87	11.99	11.93	24.32	31.14	98.99
Benchmark Value	-0.81	-0.07	-0.07	0.05	0.00	-2.27

Snowman Logistics issued in 2014, which recorded 82.87% gain earned as highest performance in six months after the listing day. It shows that these IPOs are highly subscribed, which means the investors are more interested to invest in IPOs of this sector. A year later, only three IPOs are recorded and all three measures show positive performance. The IPO - Snowman Logistics performed best in a year after the listing day. Overall, it is concluded that the IPOs earned excess returns by taking additional risk on investments and the gain on IPOs, which means, the IPOs over-performed. These three measures' outcomes show positive performance of the IPOs during the study period, which are positively related to the models.

Implications, Discussion, and Conclusion

This study shows that the IPOs are underpriced during the study period from January 2014 to November 2015. Through this result, it is clear that the null hypothesis that IPOs are fairly priced, neither underpriced nor overpriced, is rejected. This study shows that the IPOs record positive IPO returns in different time spans and three measures also conclude that the IPOs' over-performed, which means the investors earned more returns from their investments in the study period under low index performance. The IPOs are less risky than the market benchmark recorded in this study. The IPOs excess returns also shows positive returns after adjusting the negative market index performance. The investors can reduce the total risk by diversifying their investments in different sector IPOs to make more returns on IPOs and also minimize the risk by analyzing the market momentum before making an IPO investing decision. When the investors demand more new shares, the IPOs are underpriced and the IPOs are highly subscribed due to investment decisions for the IPOs. In the underpriced situation of the market, more companies want to enter in the market to go public with new shares. Overall, the IPOs record over-performance from listing day to a year after listing day and the investors are rewarded with positive excess returns.

This study is concerned with the price performance of IPOs which are listed under NSE book-building issues during the study period. This study discovered only percentage and trends of returns in the short as well as in the long run period.

(1) This study will be useful for the book building runners, underwriters, and price makers in deciding the issue price of IPOs in boom and slump period.

(2) This study will be helpful in understanding investors' reactions with respect to IPO price implications. The exuberant behavior on the listing day of IPOs earned profits. Sometimes, the investors' disposition affects their investing decisions.

(3) This study will be helpful in understanding IPO issuers and making their decisions to go public. The IPO issuers always try to go public when the market is in the rising phase. Otherwise, they postpone their decision to go public due to fear of failure of an issue.

(4) This research will also be helpful for SEBI while issuing guidelines in the future.

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