



**Determinants of Short Term Initial Public Offering (IPO) Underpricing:  
Empirical Evidence from Colombo Stock Exchange**

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**Abstract**

*The primary motivation of this study was to investigate the Short Term IPO Underpricing in Sri Lankan post war period from June 2009 to June 2014, using a data cluster of 34 new share IPOs that are publicly available at Colombo Stock Exchange (CSE). On average, IPOs are underpriced by 29.3%. However, it is recognized that the level of short term IPO underpricing was higher in the immediate post war period than it was in the later post war period. There have been a number of research studies done in the lights of IPO underpricing but no studies have justified the determinants of IPO underpricing in Sri Lankan context. Secondly, the study determines the underpinned factors that determine the short term IPO underpricing and thereby evaluates the relationship of those factors to the dependent variable. The independent variables are further classified in to market related variables and IPO related variables and analyzed using a regression and correlation analysis with short term IPO underpricing. The research study has found that both markets related and IPO related variables influence the short term IPO underpricing. As a market related variable, higher the investor participation (i.e. Quantified by number of trades during the first day of trading) higher the underpricing is. As an IPO related variable, short term IPO underpricing is higher when the IPO offer price is small in value. One rupee decrease in IPO price results in 2.4% increase in IPO underpricing. Smaller the total number of indexed shares, the short term IPO underpricing is higher.*

**Key words:** CSE, Investor participation, IPO related variables, IPO underpricing, Market related variables, Post war period

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## **1: Introduction**

The act of going public marks a salient milestone in the life span of a growing company. Initial Public Offering usually called as an IPO, provides an entry to public equity capital and so could lower the cost of funding the company's operations and investments. Also it provides a platform for trading the company's shares and enables its existing stockholders to diversify their investments and to shape up their capital gains from backing the company. The incident of going public for equity funds, itself stand out a spotlight on the company. At the very same time, the company get hold of new set of obligations in the form of transparency and disclosure requirements, hence becomes accountable and responsible to a larger population of unknown who will tend to vote impliedly (i.e. by selling, holding or buying the shares). IPO underpricing is an interesting observable fact to study in the area of finance. Especially, in the spear of finance and economics all most all the theories are practically taken a more scientific stance which can be proven with numbers. This Positive return arises from the aftermarket activity accrues to the investors rather than its issuers of the IPO. The IPOs which made a positive return for investors at the end of the first day are said to be "Underpriced". Thus, IPO underpricing is considered as a short term investment gain by the investors since it is calculated only based on the first day return of listing.

## **2: Statement of the Problem**

Problem statement for the research study is, whether there is a short term underpricing in IPOs based on the Sri Lankan stock market; and if there is, how much is it; And to find the factors that underpinned the IPO underpricing and their affect with the relationship with IPO underpricing. It is understandable that the underpricing of a stock can be underpinned by certain other factors. This research report discusses about variables that could influence and support the underpricing of a stock on its initial day of listing/ trading which are categorized as "Market Related Variables" and "IPO Related Variables".

## **3: Objectives of the study**

The first motivation of this research paper was to examine the Short Term IPO underpricing in Sri Lankan stock exchange in the post war period. It is to assign a numerical value, on average how much is the IPO underpricing in Sri Lankan stock market? Secondly, the relationship of Short Term IPO underpricing between, market related variables and IPO related variables.

It is notable that, this report does not include all factors which can influence the first day return. Initial return of an IPO may be influenced by certain other factors, such as; number of newspaper articles published during the period, publicity given to the IPO, goodwill that the IPO company has, number of shares locked-in under Section 28 (A) of the SEC Act<sup>5</sup>, Board of Directors of the Company and the experience of those, whether

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<sup>5</sup>Shares acquired by way of a transfer by Non Public Shareholders or Public Shareholders during the period of twelve (12) months prior to the date of the Initial Listing Application shall be locked

issue is a privatization or not, number of trades during the first day of listing, total no of shares indexed of the listed share, trade share volume as a percentage of total indexed shares, pre IPO share issues of the company, pre IPO share splits of the company, IPO size, IPO offer price, cumulative average return that reflect the market sentiment, number of times oversubscribed, etc. However, researchers did not consider all mentioned variables to this research study which is a limitation to the study.

#### 4: Review of Literature

##### 4.1. Short Term IPO Underpricing

Short term IPO underpricing can be measured when the returns are measured as the variance in the first day closing price of trading and the offer price of the IPO (Ibbotson, 1975; Ritter, 1984).

Primarily, this research paper will be based on the Sri Lankan stock market which is known as CSE, and Sri Lanka is one of the emerging markets in the region. According to the previous studies done by researchers, followings results are been witnessed. However, these studies reflect that short term underpricing is a general situation in the stock markets around the world although there is variability in underpricing results. Since, researchers of this research paper examine the underpricing in Sri Lankan stock market post war period, the most recent and relevant study would be the research paper done by Samarakoon(2008), which has depicted a result of 34% short term underpricing in Sri Lankan IPOs between the periods of 1987 to 2008. It was during the period which the war of the country at its highest. Accordingly, Samarakoon(2008) used the same equation to estimate IPO underpricing whereby researchers used in this research paper.

$$\text{Initial Return} = \left( \frac{\text{First-Day Closing price} - \text{IPO Issue price}}{\text{IPO Issue price}} \right) * 100$$

Also, Samarakoon in 2008 has investigated that small IPO issues are more underpriced than the large IPO issues whereby privatization issues are more underpriced (c. 49%) than the conventional issues. Thereby, Small privatization issues are more underpriced (c. 47%) than large privatization issues. Also, the researchers have documented a positive relationship between investor sentiment and short term underpricing. As per the study done by Daniel J. Bradley, John W. Cooney Jr., Steven D. Dolvin and Bradford D. Jordan in 2006, it has been found that penny stock IPOs have higher initial returns than ordinary IPOs, but significantly worse long-run underperformance.

Small issues are more underpriced than large issues (Ritter, 1984; Beatty and Ritter, 1986), Investor sentiment is positively related with underpricing (Ritter, 1984), privatization IPOs are more underpriced than conventional IPOs (Jones et al, 1999; Perotti and Guney, 1998), and the larger underpricing of small issues is interpreted as supporting the ex-ante uncertainty hypothesis (Ritter, 1984; Beatty and Ritter, 1986).

Apart from the above study, researchers have documented following results on short term underpricing relating to the different parts of the world. It was found that the IPO

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in for a minimum period of six (6) months from the Date of Listing the shares of the Entity or twelve (12) months from the date of acquisition of such shares, whichever is longer.

underpricing was 116% in Bangladesh (Islam, 1999), 145% in China (Chen et al, 2004) and 94% in India (Marisetty and Subramanyam, 2005). Further, Boulton et al in 2007 reports short term underpricing of 41% in Indonesia, 41% in Malaysia, 44% in South Korea, 13% in Taiwan and 26% Thailand. Moreover, it is revealed 23% in Philippines (Sullivan et al., 1999). Furthermore, an exceptional attention has been made on the long-run differences between the IPOs that are underpriced and those are not (Miller and Reilly, 1987).

#### 4.2. IPO Underpricing and other factors affecting the short term IPO underpricing

There are various other factors which affect the short term IPO underpricing according to the previous research papers which have been summarized in the below paragraphs.

Few of the previous researchers have considered Trading Volume of the relevant stock, during the first day of listing to their studies related with IPO underpricing. Moreover, some researchers have included Trading Volume whilst focusing their attention on elsewhere. One of the findings of the research paper done by Miller and Reilly in 1987, was that the IPOs with a positive initial return (i.e. underpricing) have a higher trading volume (scaled by Shares Issued) for each of its first five days of trading. Schultz and Zaman in 1994 confirmed the same finding by reporting a higher trading volume (scaled by Shares Issued) for underpriced IPOs during the first day of trading. Miller and Reilly, further extended their thoughts as, underpriced Issue are underpriced because the investors are uncertain of their true value in return. Greater Trading Volume recorded is a resultant of the same uncertainty (i.e. the uncertainty of stocks true value), additionally added.

According to the study done by William A. Reese Jr. in 1998, under the topic IPO Underpricing, Trading Volume, and Investor Interest he has found following finding and conclusions. He has used number of newspaper articles to reference a company as a proxy for the Investor Interest in that company. Also, in the previous studies, Klubanoff, Lamont and Wizman in 1998 and Andreassen and Kraus in 1990 have linked newspaper articles to investor behavior.

It is recognized that the significance of IPO underpricing is also influenced by the Firm Characteristics, i.e. Business organization's background, past performance, existing shareholding pattern, present performance, age of the company, experience of the management team, etc. Making the hypothesis an acceptable fact, Reside et al in 1994 investigated that the evidence for negative correlation between firm's age and level of IPO underpricing, which is attributed to availability of more information of the older firm. In the study based on the Indian market, which was done by Shelly and Singh in 2008, it is documented that the increase in firm's age is positively correlated with the oversubscription due to higher confidence in firm prospects that ultimately result in higher IPO underpricing.

IPO underpricing is also influenced by regulations prevailing in the respected country, or time which is also supported in empirical studies. With time and location, there is shift in the rules and regulations of the market by regulatory bodies to attract investors and improve the efficiency of the market, which have an effect on the degree of underpricing. When comparing the two different studies that based on the Indian primary market, Shah in 1995, for the period of 1991 to 1995 whilst the study done by A. Pande

and R. Vaidyanathan in 2009, for the period of 2004 to 2006, it is observed that average IPO underpricing has significantly decreased from 105.6% to 22.62%, which is attributed to the change in regulation of discontinuing the allocation to informed individuals.

According to the study conducted by Kenneth S. Choie(2015) under the topic of Factors of IPO Underpricing, it has been investigated that both the issuing firm and its underwriter tend to set the IPO price below the mean of the probability distribution of initial market price; the magnitude of IPO underpricing depends positively on the uncertainty of the initial market price and the marginal cost of making aftermarket, and negatively on the size of underwriter's spread. The researcher has also found that the IPO underpricing in Korea is much greater than in United States of America.

As per the results on the study done by L.X. Liu, A. E. Sherman and Y. Zhang under the topic, Media coverage and IPO underpricing, documented the following conclusions; Media coverage before an IPO significantly relates to IPO underpricing. The relationship is asymmetrical, with positive media coverage associated with more underpricing whilst no such relation exists for negative media coverage. The relationship is both statistically and economically significant.

The research paper done by Igor Filatotchev and Kate Bishop (2002) examined interlinks between executive and non-executive characteristics, share ownership, and short-term performance measured in terms of share offer 'underpricing.' It argues that executives' power and previous experience directly affect ex ante choice of nonexecutive directors and their ownership interests in the firm. These endogenously developed governance factors may be used by IPO teams strategically to reduce the extent of underpricing. However, there is a selective response of investors to different board characteristics and share ownership structure.

Findings under the research study done by N. Ranjan and T. P. Madhusoodanan(2004) under the topic of IPO underpricing, Issue Mechanisms and Issue size based on Indian stock market are as follows; Small size Issues are more likely to be underpriced than large Issues. Also investigated that the IPO Issues are underpriced whether the mechanism is fixed price or book building.

As per the study done by Sarra Ben SlamaZouari, Abdelkader Boudriga and NeilaTaktakBoulila has found an average market adjusted initial return for the first three trading days of about 17.8 percent. The factors significantly related to the underpricing are retained capital, underwriter's price support, oversubscription, listing delay and the offer price. Age of the firm, its size and the size of the offer do not seem to reduce the amount of money left on the table by issuers. It appears also that underpricing is driven by irrational investors (ipoers) seeking for short-run capital gains. These results remain unchanged after controlling for the presence of institutional investors, price discount and the existence of liquidity contract. Overall, the results show that investors rely mainly on side information to value IPOs.

The phenomenon of IPO underpricing is studied across the industries by many researchers to examine the implication of industry classification. The most important difference between the industries is considered as difference of financial industry versus non-financial industry by researchers namely, Cagle and Porter in 1996 and Tinic in 1988. Since financial institutions are controlled by regulatory bodies, there is less initial

uncertainty about the firm value compared to non-regulated industrial firms when they try to launch their IPOs. Even due to higher restriction, there is less information asymmetry<sup>6</sup> in the market.

Ritter in 1984 investigated the significant difference between underpricing level of offerings of natural resource firm and non-natural resources firms using the data during 1977 to 1982 in the United States. Cagle and Porter in 1996 also have supported the lower underpricing (4.8% less) of financial institutions (thrifts, commercial banks, utilities, and insurance companies as financial institutions) compared to others industrial institutions, but no significant difference is found between the underpricing of commercial banks and other financial institutions. They also examined the difference between underpricing level of these financial institutions individually and other industrial firm. He has documented IPO underpricing in the following industries, 4.2 % in Thrifts, 5.8% in commercial banks, 8.4% in insurance companies and 2.7% in utilities. Contrary to the above findings, Tinic in 1988 found that the underpricing of regulated financial institutions is higher than those of non-regulated firms because underwriters and issuers would tend to underprice the IPOs to steer clear of future legal liabilities for misrepresenting the firms' true value.

The term listing delay refers to the number of days between the closing day of IPO and listing day. Number of days between the IPO closure date and the listing date differ from country to country and stock exchange to stock exchange. Number of days may be influenced by regulations criterion, market efficiency, etc. Accordingly, the study done by Shah in 1995, delay of listing of the stock slabs the investors' funds for a time period and leads to illiquidity of investors, and risk of rationing, hence investors ask for the higher premium on the listing day. Shah (1995) studied the relationship between listing delay and level of underpricing based on the data of Bombay Stock Exchange (BSE), whereby the listing delay of three weeks is observed. Due to listing delay different opinions are formed among investors based on the information added during the period, which influences the level of underpricing of the IPO.

It is the understanding of the researchers that short term IPO underpricing is a resultant of many hidden variables. Having methodically analyzing the previous literature above and considering the availability of information relating to the analysis, researchers found following variables to be used as independent variables in determination of Short Term IPO Underpricing. They are; number of trades during the first day of listing, cumulative average return of ASPI (one month), total indexed shares, IPO offer price, oversubscription of IPO, pre-share Issues to IPO, pre-share splits to IPO and traded

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<sup>6</sup>A situation in which one party in a transaction has more or superior information compared to another. This often happens in transactions where the seller knows more than the buyer, although the reverse can happen as well. Potentially, this could be a harmful situation because one party can take advantage of the other party's lack of knowledge

shares as percentage of total indexed shares. Study was conducted purely based on Sri Lankan stock exchange, CSE.

### 4.3. Conceptual Framework

After identifying the previous literature, the researchers have constructed following conceptual framework (Figure 1)

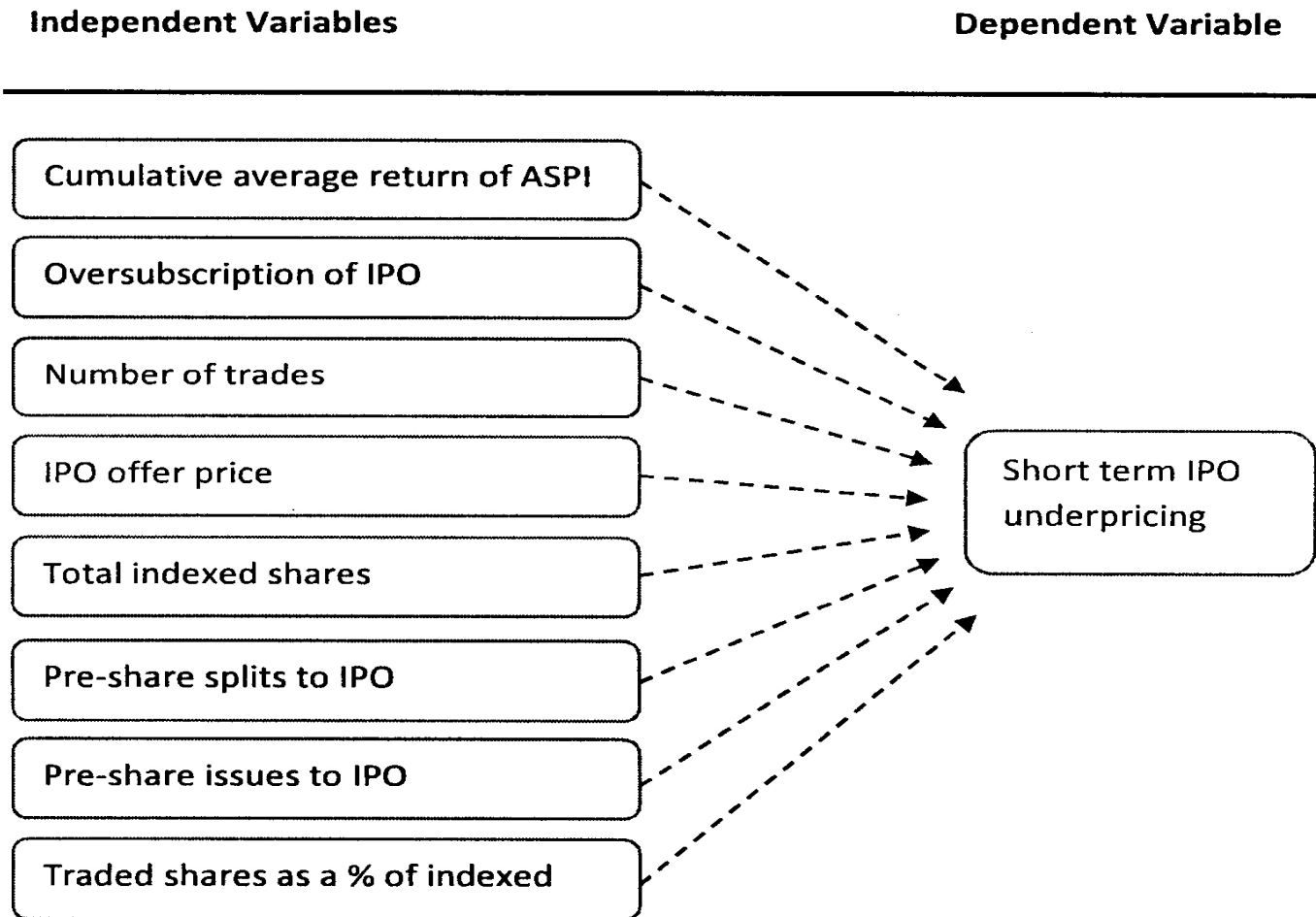


Figure 1: Conceptual Framework

## 5: Research Methodology

### 5.1. Data and Data Collection

After walking through the literature review it is identified that most of the obtained data for the previous researches are from respective county's stock exchange. The data related to this research paper are taken from Colombo Stock Exchange, either from the website which is published under data library or data are purchased the CSE data library on a compact disk. The data that researchers could not find from data library are

gathered via a request email to [info@cse.lk](mailto:info@cse.lk). Researchers have taken the data that is publically available at CSE. The data comprise of name of the IPO stock's Issue size, offer price, IPO opening date, number of times oversubscribed, total number of shares indexed, first-day closing price, number of trades, trading volume and turnover, date of listing and sector listed. Data comprise of all share IPOs that took place in the post war period that comprised of both panel data and cross sectional data. The researchers have not issue any questionnaires or has not done any pilot studies regarding the available information at CSE. It is assumed that the data available at CSE are true and subjected to no changes.

## 5.2. Research Design

The research study will conduct as a hypothesis testing to examine the relationship between IPO underpricing and market related variables and IPO related variables. The following multiple hypotheses were formulated; (See Table 1)

Table 1: Hypothesis Definitions

Variable	Measure	Null Hypothesis (H0)	Alternative Hypothesis (H1)
Number of trades during the first day of listing	Absolute number of trades during the first day of listing	There is no positive relationship between IPO underpricing and No of trades during the first day of listing	There is a positive relationship between IPO underpricing and No of trades during the first day of listing
Cumulative average return (one month)*	Average of the return in percentages values	There is no positive relationship between IPO underpricing and No of trades during the first day of listing	There is a positive relationship between IPO underpricing and No of trades during the first day of listing
Total indexed shares	Absolute number of shares indexed	There is no negative relationship between IPO underpricing and No of trades during the first day of listing	There is a negative relationship between IPO underpricing and No of trades during the first day of listing
IPO offer price	Offer price in LKR	There is no negative relationship between IPO underpricing and No of trades during the first day of listing	There is a negative relationship between IPO underpricing and No of trades during the first day of listing
Oversubscription of IPO	No of times the IPO is	There is no positive relationship between	There is a positive relationship between



	oversubscribed (Eg: 1.2 times)	IPO underpricing and No of trades during the first day of listing	IPO underpricing and No of trades during the first day of listing
Pre-share Issues to IPO	If YES (1), if NO (0)	There is no positive relationship between IPO underpricing and No of trades during the first day of listing	There is a positive relationship between IPO underpricing and No of trades during the first day of listing
Pre-share splits to IPO	If YES (1), if NO (0)	There is no positive relationship between IPO underpricing and No of trades during the first day of listing	There is a positive relationship between IPO underpricing and No of trades during the first day of listing
Traded shares as % of total indexed shares	Traded shares on the first day of listing as a percentage of the listed shares (percentage)	There is no positive relationship between IPO underpricing and No of trades during the first day of listing	There is a positive relationship between IPO underpricing and No of trades during the first day of listing

### 5.3. Data Analysis

The data and variables is analyzed by running a regression and correlation analysis between the above identified variables and short term IPO underpricing. Initially, all the above mentioned variables will be run together with the values of short term IPO underpricing. Step by Step, based on the incompatibility of the variable to the regression model the variables are excluded from the regression model. In other words, depending on the incompatibility of independent variables to the model, they are excluded from the model one by one.

The initial regression equation can be written as follows;

$$\text{Unprice}_{it} = \beta_0 + \beta_1 \text{trades}_1 + \beta_2 \text{cum}_2 + \beta_3 \text{indexed}_3 + \beta_4 \text{offer}_4 - \beta_5 \text{over}_5 + \beta_6 \text{issues}_6 + \beta_7 \text{splits}_7 + \beta_8 \text{tradedvolume}_8$$

Whereby, IPO underpricing is a function of number of trades during the first day of listing, cumulative average return of ASPI (one month), total indexed shares, IPO offer price, oversubscription of IPO, pre-share Issues to IPO, pre-share splits to IPO and traded shares as percentage of total indexed shares. Classification of Market related variables and the IPO related variables are represented in the Table 2.

Table 2: Market related variables and IPO related variables

Market related variables	IPO related variables
Number of trades during the first day of listing (tradedvolumes <sub>8</sub> )	Total indexed shares (trades <sub>1</sub> )
Cumulative average return (one month)* (Cum <sub>2</sub> )	IPO offer price (offer <sub>4</sub> )
	Oversubscription of IPO (over <sub>5</sub> )
	Pre-share Issues to IPO (issues <sub>6</sub> )
	Pre-share splits to IPO (splits <sub>7</sub> )
	Traded shares as % of total indexed shares (indexed <sub>3</sub> )

\* Cumulative average return (one month) shows the cumulative average return of ASPI only 20 market days that resembles a one month.

#### 5.4. Population and Sample

This study investigated the short term IPO underpricing, relationship of short term IPO underpricing to market centered variables and to the IPO related variables. To be timelier in conducting this research paper, researchers have selected the population as all the Initial Public Offerings of new shares (that may be Voting shares or Non-voting shares) in CSE in the post war era, which can be illustrated as the period of June 2009 to June 2014 (approximately 5 years). 30 years of war came to an end on 18 May 2009 and liberalized the country to wide range of investors around the world. However, there were 35 IPOs during the period. Out of all the IPOs only 34 IPOs were of issuance of new shares whilst 01 IPO was for listing of units in spite of new shares. IPOs of preferred stocks and units are excluded. Since, the research paper discusses about the IPOs of issuing fresh shares, the population includes only 34 new share issuing IPOs. Moreover, the whole population is considered as the sample which includes all 34 IPOs consisting of both offer for subscription and offer for sale issues. Researchers have evaluated the whole population, as the population size is small, manageable and to be conservative. More importantly, the evaluation of the whole population gives meaningful set of outcomes in spite of evaluating a small sample separately. Also, one of the strength of this research report is taking whole population into consideration which will make the research report free from sampling errors.

#### 5.5. Underpricing

Simply, underpricing of an IPO means the issue price of the IPO below its market determined value. It can be calculated as difference between the offer price of a new share and the first day closing price on the secondary market. A stock is generally underpriced for a temporary time period, and law of demand and supply will eventually drive it towards the intrinsic value. However, the first-day return of IPO can be calculated as the difference between IPO Issue price and the first-day closing and as a percentage of the IPO Issue price.

$$\text{Initial Return} = \left( \frac{\text{First-Day Closing price} - \text{IPO Issue price}}{\text{IPO Issue price}} \right) * 100$$

### 5.6. Factors affecting short term IPO underpricing

Market related variables are the variables that prevail in the stock market even in the absence of IPO transaction. Examples for market related variables are; (1) Market sentiment, is a qualitative variable which can be measured in terms of cumulative average return in the market. If the cumulative average return is higher in the range of positive, it is defined as the market sentiment is positive. (2) Investor participation also refers to a qualitative factor that may differ from investor to investor. To make the factor, Investor participation a numerical value, researchers have used an applicable proxy. As the proxy for the Investor participation researchers have used the number of trades that had taken place during the first day of listing. It is considered that higher number of trades results in higher investor participation. IPO related variables are variables that might affect the IPO underpricing that is attached to the IPO Issue. Hence, those variables can be either qualitative or quantitative. These IPO related variables can be named as direct variables that affect the IPO underpricing. Examples for quantitative variables are Issue offer price, number of offered shares, Issue size, number of indexed shares, number of shares traded on the IPO stock on the first day of listing, etc.

## 6: Results and Discussion

### 6.1. Regression and Correlation Analysis

It was researchers' initial observation that all the independent variables in the regression model are not compatible with each other variables. The overall model was significant even we included all the above mentioned independent variables. However, only independent variable, number of trades during the first day of listing is significant at 5% significant level and only other variable significant at 10% significant level is IPO price. Then, depending on the incompatibility of independent variables to the model, they are excluded from the model one by one. The basic criterion for exclusion of independent variables from the regression model is the significant level of the variable. If the significant level is higher than 0.05, that variable is supposed to be insignificant and thereby excluded from the model. Out of all the independent variables, first variable to eliminate from the original regression model was oversubscription of the IPO, since it had a significant value of 0.840 which was above the expected significant value and it is described in the Table 3. At that point, the Variance Inflation Factor (VIF) of number of trades occurred during the first day of listing has shown as marginally auto correlated. Also, most of the t values are below 2 that made the overall model insignificant too.

**Table 3: Insignificance of oversubscription**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1							
(Constant)	.512	.244		2.096	.046		
Trades	4.778E-5	.000	.473	2.379	.025	.423	2.363
IPOPrice	-.018	.010	-.276	-1.815	.082	.725	1.379
Cum20	1.088	1.214	.150	.896	.379	.600	1.666
Issues	-.142	.144	-.141	-.986	.333	.813	1.230
Split	-.198	.143	-.200	-1.386	.178	.805	1.243
Oversubscription	.000	.001	.036	.204	.840	.540	1.853
Indexedshares	-2.209E-10	.000	-.240	-1.470	.154	.630	1.588
Indexed	.421	1.041	.074	.405	.689	.507	1.974

a. Dependent Variable: underpricing

Then again the model has run with the remaining independent variables and dependent variable. Secondly, it was the number of traded shares as a percentage of total indexed shares that generated a significant value of 0.707. It is rejected from the model purely based on the significance level (Table 4).

Table 4: Insignificance of traded share volume as a percentage of total indexed shares

		Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.520	.237		2.195	.037		
	Trades	5.030E-5	.000	.498	3.247	.003	.685	1.460
	IPOPrice	-.018	.010	-.278	-1.872	.073	.730	1.371
	Cum20	1.014	1.137	.139	.892	.381	.659	1.517
	Issues	-.140	.141	-.139	-.993	.330	.817	1.224
	Split	-.203	.138	-.205	-1.472	.153	.830	1.204
	Indexedshares	-2.302E-10	.000	-.250	-1.637	.114	.693	1.443
	Indexed	.382	1.004	.067	.380	.707	.525	1.905

a. Dependent Variable: underpricing

After the exclusion of identified insignificant variable from the overall model, it was routed repeatedly until it becomes all the variables significant. According to the Table 5 it was found that the Cumulative average return (One month) of ASPI which showed the market sentiment during the period of listing of IPO shares is insignificant. The significant value has shown as 0.329 that was judged insignificant and removed from the model. At the same time, it is observed that the t values were below the standards.

Table 5: Insignificance of cumulative average return of ASPI (One month)

		Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.569	.195		2.918	.007		
	Trades	5.288E-5	.000	.524	3.856	.001	.846	1.181
	IPOPrice	-.019	.009	-.290	-2.022	.053	.761	1.315
	Cum20	1.093	1.099	.150	.995	.329	.682	1.465
	Issues	-.154	.134	-.153	-1.148	.261	.876	1.142
	Split	-.214	.133	-.216	-1.605	.120	.865	1.156
	Indexedshares	-2.516E-10	.000	-.273	-1.985	.057	.826	1.211

a. Dependent Variable: underpricing

Then it was the independent variable, presence of pre IPO share issues had found insignificant with a significant value of 0.218. This was insignificant. In fact, t values were moving towards 2, regardless of positive or negative which are shown in the below Table 6.

Table 6: Insignificance of presence of pre share issues

		Coefficients <sup>a</sup>						Collinearity Statistics	
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF	
		B	Std. Error	Beta					
1	(Constant)	.662	.171		3.871	.001			
	Trades	5.659E-5	.000	.560	4.290	.000	.914	1.094	
	IPOPrice	-.023	.008	-.351	-2.722	.011	.936	1.068	
	Issues	-.168	.133	-.167	-1.259	.210	.885	1.129	
	Split	-.227	.132	-.229	-1.713	.098	.874	1.145	
	Indexedshares	-2.994E-10	.000	-.325	-2.554	.016	.965	1.037	

a. Dependent Variable: underpricing

Researchers found that the last insignificant independent variable to the model was the occurrence of pre IPO share splits, with a significant value of 0.180. This was higher than 0.05 and the independent variable is eliminated. At the same time, t values have become little more comfortable to fit the model. This little story was appeared in the Table 7.

Table 7: Insignificance of presence of pre share splits

		Coefficients <sup>a</sup>						Collinearity Statistics	
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF	
		B	Std. Error	Beta					
1	(Constant)	.577	.159		3.636	.001			
	Trades	5.860E-5	.000	.580	4.430	.000	.928	1.078	
	IPOPrice	-.024	.008	-.364	-2.805	.009	.942	1.061	
	Split	-.174	.127	-.176	-1.372	.180	.971	1.030	
	Indexedshares	-3.201E-10	.000	-.347	-2.730	.011	.984	1.016	

a. Dependent Variable: underpricing

Table 8 depicts the regression model that had been fitted to determine the relationship between dependent variable and the independent variables. In the regression model used in the research study, researchers have used the IPO underpricing as the dependent variable. Whilst number of trades during the first day of return, IPO offer price and total indexed shares are become significant at some point of classifying as independent variables.

Table 8: Final Coefficients table

		Coefficients <sup>a</sup>						Collinearity Statistics	
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF	
		B	Std. Error	Beta					
1	(Constant)	.489	.147		3.320	.002			
	Trades	6.113E-5	.000	.605	4.600	.000	.946	1.057	
	IPOPrice	-.024	.009	-.374	-2.839	.008	.945	1.058	
	Indexedshares	-3.373E-10	.000	-.366	-2.852	.008	.995	1.005	

a. Dependent Variable: underpricing

Finally, it has come to conclusion that there are no insignificant variables in the regression model. Significant values in the column Sig. under Table 8 have shown all values lesser than 0.05. On the other hand, t test is another benchmark for measurement of the significance of variables. T test values also support the same argument of significance displaying values which are higher than numerical value 2, regardless of positive or negative. One of the important OLS assumptions is to check multi co linearity in the variables of the overall regression model. Thereby, the most reasonable measurement criterion is to evaluate the VIF. The rule of thumb to evaluate VIF is; if the VIF values are equal or close to 1, the variables are not multi co lineated, if the VIF value is close to 10, the variables take a multi co linearity stance. Under the column VIF, all the values reflect numerical values very close to zero. That numbers have shown the nonexistence of multi co linearity in the variables. Further, smaller coefficient values in the variables, number of trades during the first day of listing and number indexed shares show the explanatory power to the IPO underpricing. On the other hand, higher coefficient value in the variable IPO price shows the significant explanatory power to IPO underpricing i.e. One rupee decrease in IPO price result in 2.4% increase in IPO underpricing.

Table 9: Regression model summary

**Model Summary<sup>a</sup>**

Mode	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.713 <sup>a</sup>	.509	.459	.36900	2.420

a. Predictors: (Constant), Indexedshares, Trades, IPOPrice

b. Dependent Variable: underpricing

As depicted in the Table 9 Regression model summary, R = 0.713 or 71.3% reflects a very strong positive correlation between the inputs and output. Connecting to the model, there is a very strong positive relationship between IPO underpricing and number of trades, IPO offer price and total indexed shares. R square of the model is 0.509, which means 50.9% of variation in output or IPO underpricing is explained through inputs or number of trades during the first day of listing, IPO offer price and total indexed shares. More than 50% of the change in IPO underpricing is explained by number of trades during the first day of listing, IPO offer price and total indexed shares. Adjusted R square is the explanatory power of the model even after allocating a penalty for adding more parameters. Hence, adjusted R square of the model is 45.9%. Standard error of the estimation is a measure of the accuracy of the predictions. It is numbered as 0.369. Furthermore, more the standard error of estimation closes to zero, higher the accuracy of the model predictions. Another prominent measures in the regression modeling is Durbin-Watson value whereby it measures one of the basic Ordinary Least Square (OLS) assumptions of the existence of auto correlation among the variables. The rule of thumb is to state that there is no auto correlation related with the model, that Durbin-Watson value should be equal to 2 or very close to 2. If Durbin-Watson reflects value, which is not close to 2, that means the model variables are auto correlated. Here, in the

table 3: Durbin-Watson value is 2.420. Hence, the researchers can conclude that there is no auto correlation related with the model since the value is very close to 2.

Table 10: Overall significance of the model

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.226	3	1.409	10.347	.000 <sup>a</sup>
	Residual	4.085	30	.136		
	Total	8.311	33			

a. Predictors: (Constant), Indexedshares, Trades, IPOPrice

b. Dependent Variable: underpricing

Analysis of variance (ANOVA) table (Table 10) is used to interpret the overall significance of the model. In the below given ANOVA table F value indicates the significance of the overall regression model that researchers have exercised. F value in the study amounts to 10.347 with a significant level of (P=000<sup>a</sup>) is almost equal to zero thereby that number is too small to show up in the number decimals. Therefore it can be concluded that the overall regression model is significant.

## 6.2. First Objective: Short Term IPO Underpricing

The primary motivation is to investigate the short term IPO underpricing in Sri Lankan stock exchange in the post war period (approximately from June 2009 to June 2014). It is the return of the fresh stocks that have been listed in the stock exchange. It has been found that, on average IPOs in respect of all new share Issuances in the period of post war except for preferred stock IPOs, have been underpriced by 29.3%. Additionally, IPO underpricing in the post war period in Sri Lankan stock exchange is slightly differ from what Samarakoon(2008) documented a short run IPO underpricing of 34% in respect of all Issues of new shares except non-voting and preferred shares that took place in the period between 1987 to 2008.

It has been further investigated that, during the post war period the most underpriced IPO was Singer Finance Lanka namely, 228% on 17<sup>th</sup> January 2011. Whilst, the least underpriced IPO during the period was Softlogic Holdings that listed on 12<sup>th</sup> July 2011. That recorded an IPO overpricing of 38%. It is observed that not every IPO is underpriced and there are few more IPOs which are overpriced (7 IPOs) and which are closed at the same price as offer price at the end of the first day of trading (2 IPOs). But, on average IPOs are underpriced. IPO is an opportunity for investors to make quick profit out of day's trading. Though there is enough research studies that investigated short term IPO underpricing, there are very few studies which studies long run IPO underpricing. Especially, with related to the Sri Lankan stock exchange, almost no researches have done. According to the facts and data available, there is no proper window to declare long term. There are contrary arguments in determining long term. Short term IPO underpricing can be measured in terms of the sectors classified at CSE. On average, no sector was overpriced. It is revealed that, on average services

sector IPOs are more underpriced than any other sector at CSE with an IPO underpricing of 125%. On average, both Information Technology sector and Hotels and Travels sector were neither underpriced nor overpriced. It is been examined that the level of IPO underpricing in the immediate post war period is higher than in the later period. It was purely because of the motivation and confidence that gained by investors after ending of the 30 years of war. It increased the investor participation as a result of positive prospects in the country's economy and businesses. Not only domestic investors pump funds into the stock market but also foreign investors with huge fund portfolios diversified their investment portfolios to liberalized Sri Lankan stock exchange. Opening of the financial boom in the country after the ending of the war brought many new records and positives to the stock exchange. One of them was increase in the number of companies that searched for public equity that ultimately result in more IPOs and increased IPO underpricing. In addition, as a result ASPI recorded a growth of 125.3% for the year 2009, the highest growth recorded by the index for any given year (source: www.cse.lk). The below chart shows the spread in the significance of IPO underpricing.

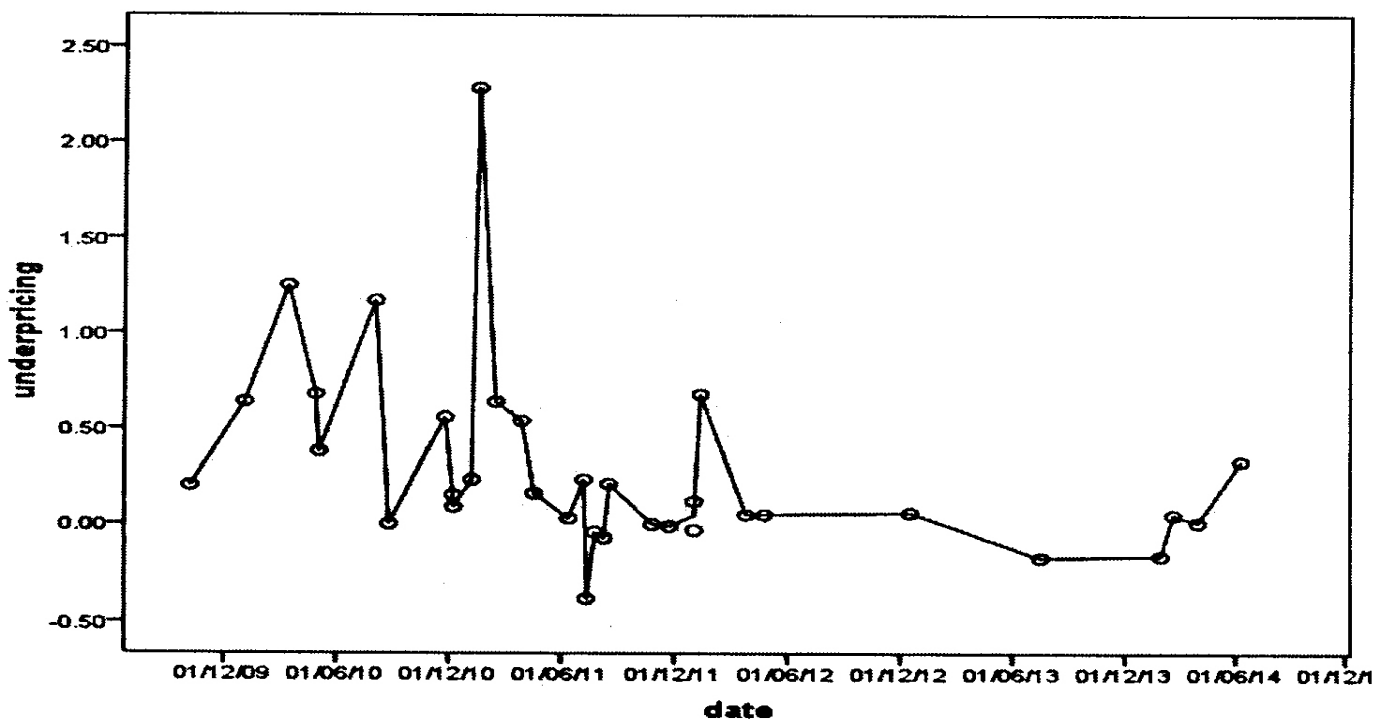


Figure 2: Spread of the level of IPO underpricing

### 6.3. Second Objective: Determinants of IPO underpricing

According to the second objective of the study, to investigate the relationship of Short Term IPO underpricing between, market related variables and IPO related variables. Out of the selected variables for the analysis, the most explanatory variables are number of trades during the first day of listing, IPO offer price and total indexed shares. It is found that not only IPO related variables affect short term IPO underpricing but also market related variables affect short term IPO underpricing. The relationship to the IPO underpricing can be measured through Pearson correlation. Table 11, Pearson correlation



table shows the relationship the dependent variable and individual independent variables. In other words the relationship between IPO underpricing and number of trades, number of shares indexed and offer price separately. Generally results are range from -1.0 to +1.0. If the sign of the relationship is positive (+) or else the trend line of the scatter graph is upward sloping, relationship between IPO underpricing and relevant independent variable is said to be positive.

Table 11: Pearson correlation table

		underpricing	Trades	IPOPrice	Indexedshare s
underpricing	Pearson Correlation	1	.508**	-.218	-.327
	Sig. (2-tailed)		.002	.215	.059
	N	34	34	34	34
Trades	Pearson Correlation	.508**	1	.228	.034
	Sig. (2-tailed)	.002		.196	.848
	N	34	34	34	34
IPOPrice	Pearson Correlation	-.218	.228	1	-.049
	Sig. (2-tailed)	.215	.196		.784
	N	34	34	34	34
Indexedshares	Pearson Correlation	-.327	.034	-.049	1
	Sig. (2-tailed)	.059	.848	.784	
	N	34	34	34	34

\*\* Correlation is significant at the 0.01 level (2-tailed).

## 7: Conclusion

The first objective of the study was to investigate the short term IPO underpricing in Sri Lankan stock exchange in the post war period that marks from June 2009 to June 2014. The study was done based on 34 IPOs in CSE. The population of data includes new voting share and non-voting share IPOs whilst did not include preference share IPOs and Units IPOs. It is discovered that, on average IPOs are underpriced 29.3%. Moreover, it is observed that, not every IPO is underpriced but on average IPOs are underpriced. In numbers, seven (7) IPOs are overpriced and there were two (2) IPOs that closed the first trading day at its IPOs offer price (neither underpricing nor overpricing).

It has been further investigated that, during the post war period the most underpriced IPO was Singer Finance Lanka namely, 228% on 17<sup>th</sup> January 2011. Whilst, the least underpriced IPO during the period was Softlogic Holdings that listed on 12<sup>th</sup> July 2011. That recorded an underpricing of -38%, which is said to be an overpricing of IPO. It is measured that, on average services sector IPOs are more underpriced than any other sector at CSE with an IPO underpricing of 125%. On average, both Information Technology sector and Hotels and Travels sector were neither underpriced nor overpriced. It has been examined that the level of IPO underpricing in the immediate post war period is higher than in the later period. It was further found that number of IPOs that witnessed in the market was higher in the immediate post war period than thereafter. It was purely because of the motivation and confidence that gained by

investors after ending of the 30 years of war. It increased the investor participation as a result of positive prospects in the country's economy and businesses.

The second objective of the study was to investigate whether there is relationship of Short Term IPO underpricing between, market related variables and IPO related variables. The study documented a relationship between short term IPO underpricing and market related variables and IPO related variables. It is found that not only IPO related variables affect the short term IPO underpricing but also market related variables affect the short term IPO underpricing, individually and collectively. Market related variables have been further classified as market sentiment and investor participation. Findings of the second objective as follows;

- In line with the research paper findings which was done by Miller and Reilly in 1987, it has found that higher the investor participation that is quantified by number of trades during the first day of trading higher the underpricing is.
- In agreement with the results found by Daniel J. Bradley, John W. Cooney Jr., Steven D. Dolvin and Bradford D. Jordan in 2006, Short term IPO underpricing is higher when the IPO offer price is small in value (generally called as penny stocks).
- Repeating the same finding which was found by N. Ranjan and T. P. Madhusoodanan (2004) under the topic of IPO underpricing, Issue Mechanisms and Issue size based on Indian stock market; it has investigated when the total indexed shares are a smaller amount, the short term IPO underpricing is higher.
- One of the other major finding from this research is that, offer price of the IPO share plays a key role in this regression model where smaller the IPO price higher the possibility of IPO underpricing. Moreover, one rupee decrease in IPO price result in 2.4% increase in IPO underpricing.

However, the overall result of the study was Sri Lankan post war period IPOs are underpriced by 29.3%. Which the answer is less than the short term IPO underpricing that has been found by Samarakoon in 2008 as 34%. It is observed that, not every IPO is underpriced but on average IPOs are underpriced. Research study has found that both market related and IPO related variables influence the short term IPO underpricing. Where, higher the investor participation, that is quantified by number of trades during the first day of trading higher the underpricing is. Short term IPO underpricing is higher when the IPO offer price is small in value. When the total indexed shares are a smaller amount, the short term IPO underpricing is higher.

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