The Evaluation of Gross Spread and Underpricing of Initial Public Offerings in Indonesia

By

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Abstract

This study is a comprehensive analysis of Initial Public Offerings (IPO) in the Indonesian market. The aim is to provide evidence on the: 1) characteristics and main determinants of gross spread and underpricing; 2) relationship of gross spread and underpricing; and 3) post-listing day performance of IPO in the Indonesian IPO market. The relationship between gross spread, underpricing, and the determinants of gross spread and underpricing was examined under 1) pooled data analysis; and 2) panel data analysis. The data used in this research are 150 IPO firms from 2007 to 2016. The data was arranged into three panel data of industry, firm size, and offer size of IPO. Further evaluation was employed to identify the relationship of gross spread and underpricing. The two-stage least squares (2SLS) regression model is adopted to identify the relationship of two IPO costs.The last evaluation on cost of IPO was the evaluation of post-listing day performance of IPO.

The distribution of gross spread components shows that the Indonesian underwriting market has different fee setting practices with greater focus on management fees. Evaluation of gross spread revealed that the gross spread level of 2% emerges as the common spread, however, gross spread showed weak clustering pattern at 2%. The pooled regression model result shows that underwriter reputation is the sole significant variable in explaining gross spread in the Indonesian IPO. The relationship of underwriter reputation and gross spread is negative and significant. This indicates that more reputable underwriters have lower gross spreads than less reputable underwriters. The result is contrary from previous works and this result can be explained by the competition hypothesis and economies of scale. The panel regression provided different results on the main determinant in gross spread. The main determinant of the industry panel analysis are firm size and firm age; and the main determinant of firm size and offer size panel analysis is offer price.

The result from the distribution of underpricing shows that all IPO firms in the sample were underpriced on the first day of trading at 23.73%. Hypothesis testing of the pooled analysis shows that in general, Shanghai Stock Exchange Index (SSE), firm size and firm age were significant in explaining underpricing in the Indonesian IPO market for both pooled regression model and panel regression model. Further analysis of relationships between underpricing and the determinants of underpricing was examined under a panel regression model of industry, firm size and IPO offer size. The main determinants of the industry panel were fixed asset investment, inflation rates and SSE. The main determinants of the firm size panel were SSE, firm age, and profitability. The determinant variables of SSE and all variables included in firm-specific characteristics (firm size, firm age and profitability) were significant in explaining underpricing.

Hypothesis testing on the pooled data and panel analysis provided different results on the main determinants of underpricing in Indonesian IPO market. In general, the result from both analyses indicates that the SSE and firm-specific characteristics (firm size, firm age and profitability) are more significant in explaining underpricing in Indonesia. This finding confirms that investors primarily use firms' information and the regional stock market index influence in making decision to participate in the Indonesian stock market. The evaluation on the relationship between gross spread and underpricing, found that the two IPO costs had negative relationship or substitute related. Further, the post-listing day performance of IPO in Indonesia showed lower Cumulative Average Abnormal Returns (CARs) at the 20^{th}-day after the listing day which indicates the return received by investors decreased.

Declaration

I, Nur Aida Arifah Tara, declare that PhD thesis entitled “The Evaluation of Gross Spread and Underpricing of Initial Public Offerings in Indonesia” is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature	Date
	
Nur Aida Arifah Tara	19 December 2019

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List of Publications and Presentations

Presentation

1. Tara NAA, Kulendran N, and Natoli R (2017), "Identifying Gross Spread Pattern in Indonesian Initial Public Offering Market" The 2nd International Conference on Indonesia Economy & Development (ICIED), Jakarta, Indonesia.
2. Tara NAA (2017), "Identifying Gross Spread Pattern in Indonesian Initial Public Offering Market" College of Business Higher Degree by Research, Victoria University, Australia.

Proceeding

1 Tara NAA, Kulendran N, and Natoli R (2017), "Identifying Gross Spread Pattern in Indonesian Initial Public Offering Market" The 2nd International Conference on Indonesia Economy & Development (ICIED), Jakarta, Indonesia.

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List of Abbreviations

AAR	Market Adjusted Average Abnormal Return
AGE	Firm Age
ASX	Australian Stock Exchange
BAPEPAM-LK	Badan Pengawas Pasar Modal dan Lembaga Keuangan
BIC	Basic Industry and Chemicals
BPKP	Badan Pengawasan Keuangan dan Pembangunan
CAR	Cumulative Average Abnormal Return
CGI	Consumer Goods Industry
DER	Debt to Equity Ratio
DJI	Dow Jones Index
DR	Debt Repayment
DV	Dependent Variable
DW	Durbin-Watson
EBIT	Earning Before Interest and Taxes
EPS	Earning Per Share
FAI	Fixed Asset Investment
FE	Fixed Effect
FER	Foreign Exchange Rate
FSIZE	Firm Size
FTSE	Financial Times Stock Exchange
GDP	Gross Domestic Product
GPC	Gross Proceeds
GSP	Gross Spread
HM	Hot Issue Market
IDR	Indonesian Rupiah
IDX	Indonesian Stock Exchange
IFR	Inflation Rate
IPO	Initial Public Offering
IR	Initial Return
ISS	Investment in Shares of Stock
IUT	Infrastructure, Utilities and Transportation
IV	Independent Variable
JCI	Jakarta Composite Index
JKSE	Jakarta Stock Exchange Composite Index
LM	Lagrange Multiplier
MAR	Market-Adjusted Abnormal Return
MI	Miscellaneous
MV	Market Volatility
OLS	Ordinary Least Squares
OP	Offer Price
P/E	Price/Earning

PROF	Profitability
PPh	Pajak Penghasilan
PRE	Property and Real Estate
PT	Perseroan Terbatas
R& D	Research and Development
ROA	Return on Asset
ROE	Return on Equity
RR	Raw Return
SD	Standard Deviation
SEO	Seasoned Equity Offering
SOE	State-Owned Enterprises
SSE	Shanghai Stock Exchange Index
TS	Trade and Service
UNDP	Underpricing
UWR	Underwriter Reputation
WCF	Working Capital Financing
2SLS	Two Stages Least Squares

Chapter 1: Introduction

1.1 Introduction

The process of initial public offering (IPO) involves considerable direct cost (gross spread) and indirect cost (underpricing). For several years, underpricing has been the focus of research on IPOs. IPO underpricing can be defined as the degree of positive difference between the offer price and the closing price on the first day of trading (Chong & Puah 2009). IPO underpricing is also known as initial returns or first-day returns. However, underpricing is not the only cost faced by issuers; another cost of going public is gross spread or underwriting discounts. Gross spread is the difference between the offer price and the price paid by the underwriter to the issuer, or a percentage commission per share paid to underwriters as compensation to cover expenses, management fees, commission and bearing the issuance risk (Ahn, Kim & Son 2007; Chen & Mohan 2002).

The level of underwriter compensation in IPOs has drawn considerable attention. As Chen and Ritter (2000) reported, evidence of gross spread of firm-commitment IPOs in the US market was relatively high at 7% for IPOs of between $20 million and $80 million.; higher than gross spread in other international stock markets. The US gross spread level was not only high, but had a high frequency of gross spread at 7%. This leads to the question of whether the gross spread cluster is collusive. Subsequently, numerous studies have confirmed that clustering is widespread, even in markets with low gross spread levels, such as Hong Kong, India, Malaysia, Singapore, Thailand, Belgium, France, Australia and Taiwan (Chen, Fok & Wang 2006; How & Yeo 2000; Torstila 2003).

Two main explanations have been offered regarding high gross spread: pricing strategy – book-building and fixed-price – and underwriter reputation. Book-building refers to the process by which an underwriter attempts to determine the offer price of an IPO based on the demand of institutional investors to reduce information asymmetries. Fixed-price offerings are priced without first soliciting investor interest. The results suggest that the high level of gross spread in underwriting is related to the use of book-building pricing strategies and reputable underwriters. Ljungqvist, Jenkinson and Wilhelm (2003) analysed the factors that might influence IPO gross spreads, differentiating the sample into fixed-price and book-building pricing strategies. They found that gross spread book-building is higher than fixed-price offerings. In addition, in line with their service, reputable underwriters generally charge higher fees than their less prestigious counterparts, and underwriters need to maintain their reputation. Reputable underwriters tend to attract high-quality firms through the IPO process, because issuers expect these underwriters to be able to

assess the value of firms accurately and mitigate information asymmetries and uncertainty at the IPO stage. The service provided by underwriters provides higher offer values, which is of significant benefit to issuers (Fernando et al. 2015). For that reason, underwriters must receive a return on their investment in building their reputation (Booth & Smith 1986; Fernando et al. 2015; Tinic 1988). The results of these studies suggest that high gross spread in underwriting is related to the use of a book-building pricing strategy rather than intense clustering.

While gross spread clustering is widespread in other markets, the Indonesian gross spread from 1986–1999 show low evidence of clustering. Torstila (2003), who studied the clustering pattern in the international market, including Indonesia, found that Indonesian gross spread level was 3.6%—higher than 2.4% for Asia Pacific countries, but relatively low compared with 4.3% for the aggregate 27 countries. This raises the question of whether low gross spread might result in poor underwriting, which cannot compensate for the underwriting risk. The low gross spread in turn might affect the indirect cost or level of underpricing on the first day of trading, such that IPOs with low gross spread might have significant underpricing (Chahine 2008; Chen, Fok & Wang 2006; Habib & Ljungqvist 2001; Yeoman 2001).

IPO underpricing[1] can be defined as the degree of positive difference between the offer price and the closing price on the first day of trading (Chong & Puah 2009). IPOs are underpriced because underwriters are better informed than issuers (Baron 1982), or informed investors are better informed than uninformed investors (Rock 1986). Baron (1982) argues this asymmetrical information between the two could be an advantage for underwriters in determining the offering price of the IPO at below market value to minimise the probability of unsuccessful issues. Evaluation of the offering and closing prices on the first day of trading shows a general phenomenon of underpricing in most markets. Bakke, Leite and Thorburn (2011) found that in the US, IPOs during 1981–2008 were underpriced at 19.2% on the first trading day. Chambers and Dimson (2009) found that the average first-day return of a sample of IPOs during 1987–2007 was 19%. IPOs in the Netherlands, Germany and France were underpriced by 17.6%, 52.89% and 21.06%, respectively (Doeswijk, Hemmes & Venekamp 2006; Goergen, Khurshed & Renneboog 2009). IPOs in Spain experienced underpricing on the first trading day of 18.8% (Pons-Sanz 2005); in Belgium, this was 13.95% (Huyghebaert & Van Hulle 2004). Regarding emerging markets, previous studies suggest that underpricing is higher than developed markets. Sri Lanka experienced underpricing on the first trading day of 34% (Samarakoon 2010), Malaysia 69.6% (Yong & Isa 2003) and Thailand 36.6% (Ekkayokkaya & Pengniti 2012). The level of underpricing in Indonesia varies, with estimates including 35% over 2000–2010 (Andriansyah & Messinis 2016), 22% over

[1] IPO underpricing is also know as initial return.

2003–2011 (Darmadi & Gunawan 2013) and 25.32% over 2007–2012 (Gumanti, Nurhayati & Maulidia 2015). While most IPOs are found to be underpriced, researchers argue that underpricing might not meet the purposes of raising equity capital because issuer firms sells shares at a price less than what the market is willing to pay; the pricing of an IPO is below market value.

The IPO literature has discussed the determinants of gross spread and underpricing. Previous studies use several determinants, including issue characteristics, firm characteristics and market characteristics. Fernando et al. (2015) studied 6,378 IPOs during 1980–2010 in the US, discussing the relationship between issue and firm characteristics and gross spread. Meoli, Signori and Vismara (2012) explored several determinants of gross spread—underwriter reputation, underpricing, issue size, dilution factor, privatisation, participation ratio, market timing and issue-specific risk—to explain the direct issue cost in the European market during 1995–2009. Song, Tan and Yi (2014) used firm and issue characteristics to explain underpricing in 948 IPOs in China during 2006–2011. Other studies have also used issue, firm and market characteristics in explaining underpricing (Hanafi & Setiawan 2018; Islam, Ali & Ahmad 2010; Mumtaz & Ahmed 2014; Samarakoon 2010).

Discussion of determinants of initial underpricing in previous studies focuses on microeconomic factors; little attention has been paid to evaluating macroeconomic factors, and global stock and regional stock indexes in IPO markets. In previous studies, macroeconomics variables are commonly used for aftermarket performance evaluation; for example, Ouma and Muria (2014) and Uwubanmwen and Eghosa (2015). Geetha et al. (2011) investigated the effect of the inflation rate, exchange rate, interest rate and Gross Domestic Product on stock returns in Malaysia, the US and China, and found a short-run relationship between macroeconomic factors and stock returns. Tripathi and Kumar (2014) examined inflation and stock returns in India over 2000–2013 and found a significant negative relationship between inflation and stock returns.

Macroeconomic factors are crucial in discussing IPOs and aftermarket performance, because different economic conditions will influence the decision to move to the IPO market, and investors' expectations about future returns. Macroeconomic indicators, including Gross Domestic Product (GDP) growth rates, interest rates, inflation rates and foreign exchange rates, contain useful information that influences IPOs (Chen, Roll & Ross 1986). High GDP growth rates, low interest rates, low inflation rates and foreign exchange rate appreciation are indicative of better economic conditions. Macroeconomic conditions affect the economic climate, thus affecting a firm's decision to go public (Angelini & Foglia 2018), higher interest rates drive investors away from the IPO market and affect the number of IPOs (Ameer 2012), and a change in macroeconomic policies has economic implications for market participants (Ameer 2007; Tran & Jeon 2011), because investors

invest more in IPOs if they expect the economic situation to improve (Gunturkun, Gurarda & Erdogen 2012). Meanwhile, positive global economic conditions influence emerging stock markets and investors' optimism in making a decision to participate in stock markets. Global and regional stock indexes influence a particular country's stock index. An increase in the Dow Jones Index (DJI), for example, influences other stock indexes in emerging countries in Asia because investors' optimism regarding global economic conditions influence their decision to buy stocks (Wong et al. 2004). Further, Darrat and Zhong (2002) and Karim, Majid and Karim (2009) noted that the DJI and Shanghai Stock Exchange (SSE) Index have a positive influence on other stocks in Asia. Investors' optimism about economic conditions increase stock market participation, and initial returns.

Extensive research on the cost of going public has been undertaken in the developed markets of the US (Gompers & Lerner 2003), France and the UK (Jenkinson & Mayer 1998), the Netherlands (Roosenbooma & Goot 2005), Germany (Georgen & Renneboog 2007) and Australia (Suchard & Singh 2007). However, little research has been carried out on emerging markets, particularly Indonesia. For several years, underpricing, the indirect cost of going public, has been the focus of research on the Indonesian IPO market, with few explorations of gross spread. To evaluate cost of going public in the Indonesian IPO market, this study examines gross spread and underpricing, identifies the determinant factors and examines the relationship between gross spread and underpricing, which has yet to be analysed for Indonesia. Indonesian IPO market practices might differ from those in developed markets, because of different regulations, investor behaviour when selecting investments, and expectations about future returns and risks. This study extends the current literature by examining the cost of going public for an emerging IPO market: Indonesia.

1.2 Research Problem

The Indonesian Government has tried to boost the capital market and increase the number of companies listed on the stock market. Over 2007–2016, the Indonesian Stock Exchange (IDX) has shown positive growth. By the end of 2018, 627 firms were listed, with a combined market capitalisation of IDR 7.415 billion (Indonesia Stock Exchange 2019). This situation has made Indonesia an investment destination for foreign investors, who dominate the Indonesian stock market, accounting for about 36.89% of total investors.

The 2012 IDX report showed that the total IPO cost of newly listed companies in 2011–2012 was 4.23%. This cost included a gross spread of 2.17%, in addition to legal counsel, audits, notaries, independent appraisals and other costs. This cost was considered high. Therefore, to boost the capital market, the Indonesian Government provided tax incentives through Government

Regulation No. 56 Year 2015 Concerning Amendment on Government Regulation No. 77 Year 2013 Concerning Reduction on Income Tax Rate for Domestic Public Corporation Taxpayer for listed firms. Eligible firms can obtain a decrease in the income tax rate (PPh) of 5%, from 25% of corporate income (*Pajak Penghasilan* / PPh) to 20%. Listed firms have a tax incentive, if 40% of firm shares are publicly listed and traded on the stock exchange, and have at least 300 shareholders (Directorate General of Taxation 2018). Further, since 2015, the IDX has been offering a 50% discount on the IPO listing fee (IDX 2015).

The Government has introduced regulations for pricing strategy, but has yet to establish regulations on the cost of going public. As a consequence, many issuer firms in Indonesia pay an underwriter fee close to 0%. For example, PT. Krakatau Steel paid an underwriting fee for an IPO of 0.25% (Prospectus 2010), PT. Sawit Sumbermas Sarana 0.35% (Prospectus 2013), and PT. Sido Muncul 0.25% (Prospectus 2013). Anticipating competition in the underwriting market, in 2006, BAPEPAM-LK (No.SE-05/BL/2006, 29 September 2006) as the financial services authority, suggested that gross spread and offer price information must be disclosed in the prospectus.

The evaluation of gross spread in Indonesia is important because it is relatively low (2.17%) and in decline, with underwriting fees close to 0%. The level of gross spread is significantly lower than the mean gross spread of Indonesia (3.60%) and some of the Asia Pacific stock market (Torstila 2003). This situation raises the question of whether low gross spread might result in poor underwriting and cannot compensate the underwriting risk. The low gross spread in turn might affect the indirect cost or level of underpricing on the first day of trading (Chahine 2008; Chen , Fok & Wang 2006; Habib & Ljungqvist 2001; Yeoman 2001).

Gross spread and underpricing need to be evaluated, and the determinants and the relationship between these two costs of going public identified, because comprehensive evaluation of these two costs has yet to be analysed in Indonesia. As an emerging market, Indonesian economic conditions are influenced by regional and global conditions. Macroeconomic conditions affect the economic climate, thus affecting firm decisions to go public (Angelini & Foglia 2018), and a change in macroeconomic policies has economic implications for market participants (Ameer, 2007; Tran & Jeon 2011). In addition, positive global economic conditions influence emerging stock markets and investors' optimism regarding the decision to participate in the stock market. Global and regional stock indexes influence individual countries' stock indexes. An increase in the DJI, for example, influences other stock indexes in emerging countries in Asia because investors' optimism regarding global economic conditions influence their decision to buy stocks (Wong et al. 2004). The effect of the macroeconomic situation and global markets on the Indonesian stock market was evident in 2009, when the number of IPOs decreased due to the 2008 global financial crisis. The crisis caused

the IDX composite index to plummet to its lowest level. As a result, some firms postponed their IPO, so that, in 2009, the total number of IPOs was only 13.

Therefore, in this thesis, a comprehensive evaluation of gross spreads and underpricing was undertaken for 150 IPO firms on the Indonesian stock market over 2007–2016. The findings provide a further explanation of the implementation costs of going public (gross spread and underpricing) in the Indonesian IPO market.

1.3 Research Questions

There are seven research questions arising from the research problem, as follows:

RQ1: What are the characteristics of IPO gross spread for Indonesian listed firms?
RQ2: What are the main determinants of IPO gross spread for Indonesian listed firms?
RQ3: What is the level of IPO underpricing for Indonesian listed firms?
RQ4: What are the main determinants of IPO underpricing for Indonesian listed firms?
RQ5: Do macroeconomic conditions and international stock markets have a role in explaining the level of IPO underpricing for Indonesian listed firms?
RQ6: What is the relationship between gross spread and underpricing of IPOs?
RQ7: What is the short-run post-listing day performance of IPOs for Indonesian listed firms?

1.4 Research Aims

The overall objective of this research is to evaluate the cost of going public and the post-listing day performance of IPOs for Indonesian listed firms. To achieve the research objective, the aims of the study are to:

1. Examine the characteristics of IPO gross spread for Indonesian listed firms.
2. Measure the impact of determinants of IPO gross spread for Indonesian listed firms.
3. Measure the level of IPO underpricing for Indonesian listed firms.
4. Measure the impact of determinants of IPO underpricing for Indonesian listed firms.
5. Measure the impact of macroeconomic conditions and international stock markets on the level of IPO underpricing for Indonesian listed firms.
6. Examine whether gross spread and underpricing are substitutes or complements.
7. Examine the short-run post-listing day performance of IPOs for Indonesian listed firms.

1.5 Overview of the Research Method

Two regression models are employed to examine the relationship between gross spread, underpricing, and the determinants of gross spread and underpricing: 1) pooled ordinary least

squares (OLS) regression; and 2) panel regression model. The study employed pooled OLS regression for the first stage of the analysis to test the hypotheses of main determinant of gross spead and underpricing, and this analysis consistent with previous studies (Bairagi & Dimovski 2012; Bajo, Barbi & Petrella 2017; Darmadi & Gunawan 2013; Fernando et al. 2015; Hanafi & Setiawan 2018; Mohamed & Saadouni 2018; Torstila 2003). The second stage of analysis employed panel regression model because panel data has greater variability to explore issues compared with cross-sectional or time-series data alone (Kennedy 2008, p. 282). Panel regression was used to to determine the fixed effects or random effects that may explain gross spread and underpricing on industry, firm size, and offer size sample. In this study, the sample data of 150 IPO firm listed on the IDX over 2007–2016, was arranged into three panels: 1) panel of industry; 2) panel of firm size; and 3) panel of offer size of IPO.

The evaluation starts with a discussion of the characteristics of IPO gross spreads in Indonesia. The distribution of gross spreads is presented to explain characteristics, including fee-setting practice and IPO gross spread patterns, to answer RQ1. Pooled OLS and panel regression models are employed to identify the significant determinants of gross spread to answer RQ2 and test proposed hypotheses 1–7. The relationship between gross spread and the determinants of gross spread was examined under two OLS regression models. The first focused on issue-specific and market-specific characteristics, and the second was estimated with independent variables included in issue-specific, firm-specific and market-specific characteristics. The relationship between gross spread and the determinants of gross spread was also examined under a panel regression model. This regression model was estimated by the independent variables included in issue-specific and firm-specific characteristics, including gross proceeds, offer price, firm size, firm age, profitability.

The next discussion is the distribution of IPO underpricing in Indonesia section addresses RQ3. The distribution of underpricing is presented to analyse the indirect costs occurring as a result of the number of shares sold which decomposed by listing year, industry, sub-period, SOE and non-SOE, and pricing strategy. Pooled OLS and panel regression models are also employed to identify the significant determinants of underpricing to answer RQ4, RQ5 and test hypotheses 8–22. The relationship between underpricing and the determinants of underpricing was examined via two regression models. The first model is focused on intended use of IPO proceeds, issue-specific characteristics, and firm-specific characteristics; the second model was estimated by independent variables from all categories, including intended use of IPO proceeds, macroeconomic factors, international stock markets, issue-specific characteristics, firm-specific characteristics, and market-specific characteristics. The relationship between underpricing and the determinants of underpricing was also examined under a panel regression model to identify the main determinant of underpricing across different industries, firm size, and offer size.

After evaluation of gross spread, underpricing and the determinants of gross spread and underpricing, the relationship between gross spread and underpricing is identified. There are three possible relationships between gross spread (direct cost) and underpricing (indirect cost): an insignificant relationship between the two variables; that the two variables are substitutes; or that the two variables are complementary. The two stage least squares (2SLS) regression model is adopted to identify the relationship between the two IPO costs. The evaluation of short-run post-listing day IPO performance was the last evaluation of IPO cost, with IPO firms evaluated up to 20 days after listing.

1.6 Statement of Significance

This study contributes to knowledge and practice by examining gross spreads and underpricing, identifying the determinant factors, and examining the relationship between gross spreads and underpricing in Indonesian IPOs—previously understudied. Many studies regarding IPO costs have been conducted in developed and developing markets (Chi & Padgett 2005; Fernando et al. 2015; Georgen & Renneboog 2007; Gompers & Lerner 2003; Roosenbooma & Goot 2005; Suchard & Singh 2007); however, the examination on gross spread in Indonesia have only been undertaken by Torstila (2003). Meanwhile other Indonesian studies focusing more on the indirect cost of going public or underpricing (Darmadi & Gunawan 2013; Gumanti, Nurhayati & Maulidia 2015; Hanafi 2016; Setiobudi, Warganegara & Warganegara 2011; Tandelilin et al. 2014; Tanjung & Hutagaol 2012; Tanjung & Hutagaol 2012; Warganegara & Warganegara 2014).

The present research differs from the above studies as it adopts a comprehensive study of the cost of going public (IPOs) in the Indonesian market. The aim of this reserarch is to provide evidence on the: 1) characteristics and main determinants of gross spreads and underpricing; 2) relationship between gross spreads and underpricing; and 3) post-listing day performance of IPOs in the Indonesian market. This study extends that of Torstila (2003) and other Indonesian studies in underpricing, in several ways. First, it expands the Indonesian sample size and time period examining gross spreads over 2007–2016, while Torstila (2003) who examined clustering patterns of IPO gross spreads in 27 countries, including Indonesia, used gross spread data from 1986–August 1999, and reported on 11 issuers, accounting for only 7% of IPOs in Indonesia. Second, the present research evaluates gross spreads and underpricing on industry, firm size, and offer size sample. Third, this study expand the Indonesian previous studies in underpricing which are not considered gross spread as determinants variables of underpricing (Darmadi & Gunawan 2013; Husnan, Hanafi & Munandar 2014; Hanafi & Setiawan 2018; Yuliani, Wahyuni & Bakar 2019). Fourth, this study examines three possible relationships between gross spreads (direct cost) and underpricing (indirect cost): an insignificant relationship between the two variables, that the two

variables are substitutes, or that the two variables are complementary (Chen & Mohan 2002; Kim, Palia & Saunders 2010).

The relationship between gross spreads, underpricing, and the determinants of gross spreads and underpricing was examined under 1) pooled OLS regression for testing the hypotheses which consistent with previous studies; 2) panel regression model. The findings of this research provide further understanding of the implementation costs of going public (gross spread and underpricing) in the Indonesian IPO market. The results contribute to the IPO literature on firms in emerging markets, particularly Indonesia. Further, the results of this research have implications for the Indonesian Government, issuers and investors when making decisions regarding IPOs. The results provide empirical evidence that should prove useful for the government when determining policy related to IPO costs in Indonesia, for issuer firms making a decision to go public, and investors making a decision to participate in the stock market.

1.7 Summary of Finding

The evaluation of the direct cost of going public or gross spread revealed that the mean gross spread during the sample period (2.05%). The greatest cost incurred in direct costs for this sample was management fees at 58%, followed by 23% for underwriting fees and 19% for selling fees. The result on the distribution of gross spread components found that the Indonesian underwriting market has different fee-setting practices, and is more focused on management fees. Management fees are used by underwriters to undertake marketing campaigns or road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation. Evaluation of gross spread using the mode and relative frequency revealed that the gross spread level of 2% emerged as the common spread; however, this was not a highly clustered pattern, with the number of IPOs with gross spread level of 2% only 13% of all IPOs.

Hypothesis testing of pooled OLS regression shows that underwriter reputation is the sole significant determinant variable in explaining gross spreads in the Indonesian IPO market for sub-period 2010-2016, non-SOE, book-building strategy and all sample; other variables included in issue-specific, firm-specific and market-specific characteristics were statistically insignificant. Underwriter reputation and gross spread was negatively correlated, indicating that more reputable underwriters have lower gross spreads than less reputable underwriters. This is contrary to previous work, and this result can be explained by the competition hypothesis and economies of scale. Competition in the underwriting market can be seen from the responsiveness of the gross spread to proceeds under different underwriter reputations, the results reveal that, mostly, the gross spread level of high-reputation underwriters was lower than that for low-reputation underwriters. The

changing competition level may also be the result of the increase in number of underwriters in Indonesia over 2007–2016. The number of underwriters was increasing over the sample period, and relatively high, at four–six times the total number of issuers. This was not accompanied by an increasing number of IPOs, creating competition in the underwriting market. Competition can be a factor that restrains a high spread; however reputable underwriters have the advantage of attracting larger transactions in all periods, reaching cost advantage or economies of scale, which results in a lower gross spread. Meanwhile, in regression model of sub-period of 2007-2009, the main determinant of gross spread are firm age and profitability. The coefficient of the variables shows a negative and significant relationship with gross spread, which indicates that older issuers firms and more profitable issuer firm pay less gross spread to underwriters.

The relationship between gross spread and determinants of gross spread was examined under a panel regression model of industry, firm size and IPO offer size. Panel regression gives different results on the main determinants of gross spread in the Indonesian IPO market. The main determinant in the industry panel was firm size, which had a significant and negative coefficient, indicating that larger IPO firm size has a lower gross spread. The firm size and offer size panel regressions indicated that offer price was the sole significant determinant of gross spread. Offer price shows a negative relationship with gross spread, implying that IPOs with a higher offer price tend to have lower gross spreads.

The evaluation of underpricing revealed that the distribution of underpricing shows that the IPO firms sampled during 2007–2016 were underpriced on the first day of trading, at 23.73%. The highest level of underpricing was for IPO firms listed in 2008, and the most money left on the table was in 2007. Hypothesis testing of the pooled analysis shows that the variables of Shanghai Stock Exchange index (SSE), gross proceeds, firm size, and firm age are the significant determinant variables in explaining underpricing in the Indonesian IPO market. Further analysis of relationships between underpricing and the determinants of underpricing was examined under a panel regression model of industry, firm size and IPO offer size. The main determinants of the panel of industry were fixed asset investment, inflation rates and SSE. The main determinants of the firm size panel were SSE, firm age, and profitability. The main determinants of the offer size panel were SSE, and firm-specific characteristics variables (firm size, firm age and profitability). Hypothesis testing on under pooled analysis and panel analysis gave different results on the main determinants of underpricing in the Indonesian IPO market. In general, the results from both analyses indicate that variables in firm-specific characteristics and SSE were significant in explaining underpricing in Indonesia. This finding confirms that investors primarily use firms' information and regional stock market index in their making decisions to participate in the Indonesian stock market.

This study also examines three possible relationships between gross spread and underpricing: an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary. OLS and 2SLS models were employed to identify the relationship between gross spread and underpricing. The result of the negative coefficient of gross spread indicates that gross spread and underpricing are substitutes. Further, post-listing day performance of IPOs in Indonesia shows lower CARs after the listing day, which indicates the returns received by investors, or the wealth of investors, decreased.

1.8 Outline of Thesis

This first chapter began with an introduction to the research, followed by the research problem, research questions, aims of the research, overview of research methods, the statement of significance and an outline of the thesis. Chapter 2 presents a review of the literature related to gross spreads and underpricing. The first part of this chapter presents reviews the literature examining gross spreads and underpricing generally and within an Indonesian context. The second part outlines the methodology used in previous studies to evaluate gross spreads and underpricing. Chapter 3 discusses the conceptual framework and method. This chapter presents the methodology employed in this study to evaluate gross spreads and underpricing, identify the determinant variables and evaluate post-listing day IPO performance.

Chapter 4 analyses the data and discusses the results for gross spreads. It examines the determinants of gross spreads in the Indonesian IPO market over several years and sub-periods, considering a larger sample, industries, pricing strategy, IPO size and underwriter reputation. Chapter 5 presents the analysis and discussion of underpricing and the determinants of underpricing in the Indonesian IPO market. Chapter 6 presents an analysis and discussion of the relationship between gross spreads and underpricing, and the post-listing day performance of IPO. Chapter 7 summarises research results, implications, limitations, and offers suggestions for further research.

Chapter 2: Literature Review on Gross Spreads and Underpricing

2.1 Introduction

This chapter presents the literature related to findings and methodology used in previous studies to examine gross spreads and underpricing generally and within an Indonesian context. The organisation of this chapter is as follows. Section 2.2 overviews the Indonesian IPO market, while Section 2.3 presents an overview of gross spreads, discussing a definition of gross spreads, components of gross spread (management fee, underwriting fee and selling fee), and different practices regarding underwriting compensation. It then presents evidence on gross spreads, discuss clustering patterns and its determinants. Section 2.4 presents an overview of underpricing, including a definition of underpricing and the different perspectives. It then presents evidence on underpricing, discussing the theoretical explanations on underpricing, determinants of underpricing in studies, and outlining the methodology on underpricing. Section 2.5 focuses on the relationship between gross spreads and underpricing. Section 2.6 identifies the gaps in the literature, while Section 2.7 provides a summary.

2.2 The Indonesian IPO Market

The Indonesian Government has been actively seeking to boost the capital market and increase the number of companies listed on the stock market. Over ten years from 2007–2016, the Indonesian Stock Exchange (IDX) has shown positive growth. By the end of 2018, 627 firms were listed, with a combined market capitalisation of IDR 7.415 billion (Indonesia Stock Exchange 2019). This situation has made Indonesia an investment destination for foreign investors, who dominate the Indonesian stock market, accounting for about 36.89% of total investors.

The 2012 IDX report showed that the total IPO cost of newly listed companies in 2011–2012 was 4.23%. This cost included a gross spread of 2.17%, in addition to legal counsel, audits, notaries, independent appraisals and other costs. This cost was considered high. Therefore, to boost the capital market, the Government now provides tax incentives through Government Regulation No. 56 Year 2015 Concerning Amendment on Government Regulation No. 77 Year 2013 Concerning Reduction on Income Tax Rate for Domestic Public Corporation Taxpayer for listed firms. Eligible firms can have an advantage of a decrease in income tax rate (PPh) of 5%, from 25% of corporate income (*Pajak Penghasilan* / PPh) to 20%. Listed firms have a tax incentive at 5%, if 40% of firm shares are publicly listed and traded on the stock exchange, and they have at least 300 shareholders (BPKP 2007). Further, since 2015, the IDX has offered a 50% discount on IPO listing fees.

The Indonesian Government has introduced regulations for pricing strategy, but has yet to establish regulations on the cost of going public. As a consequence, issuers in Indonesia may pay underwriter fees close to 0%. For example, PT. Krakatau Steel paid an IPO underwriting fee of 0.25% (Prospectus 2010), PT. Sawit Sumbermas Sarana 0.35% (Prospectus 2013a), and PT. Sido Muncul 0.25% (Prospectus 2013b). Anticipating competition in the underwriting market, in 2006, BAPEPAM-LK (No.SE-05/BL/2006, 29 September 2006) as the financial services authority, decided that gross spreads and offer price information must be disclosed in the prospectus.

2.3 Overview of Gross Spread

Gross spread is the difference between the offer price and the price paid by the underwriter to the issuer, or a percentage commission per share paid to underwriters. Gross spread or underwriting discount is a compensation to cover expenses, management fees, commission and bearing the issuance risk (Ahn, Kim & Son 2007; Berk & DeMarzo 2017; Chen & Mohan 2002). Gross spread is partitioned into three components: management fee, selling fee and underwriting fee. Management fees enable underwriters to undertake marketing campaigns, assess market conditions and organise road shows to obtain information and opinions from informed and potential investors prior to setting the offering price and IPO allocation (Lee 2012). Underwriting fees are used to compensate underwriters for making a capital commitment as a result of underwriting. Selling fees are used to compensate underwriters, who may be lead underwriters, co-managers, syndicate members or non-underwriters (selected dealers) in the selling group.

Underwriter compensation in some markets follows a differences practice; for example, the US underwriting market. Previous studies of IPOs in the US commonly refer to the fee received by underwriters, which includes management fees and selling concessions, as the underwriter spread. However, nowadays, the common practice is the industry division standard of 20/20/60 (20% for management fees, 20% for underwriting fees and 60% for selling concession) (Chen & Ritter 2000; Lee 2012; Torstila 2001). The cost of underwriting focuses more on the selling fee to compensate underwriters (Lee 2012).

Meanwhile, the cost of underwriting practices in the Australian market consists of underwriting fees, management fees and handling fees, quoted separately on a per share basis. Management costs compensate the major underwriters primarily for providing an advisory role in the preparation of prospectuses and participating in due diligence committees and finding retailers (namely, sub-underwriting syndicates) for this issue. Handling costs provide a means to compensate the Australian Stock Exchange (ASX) for carrying stamps or other identifiable receipts (How & Yeo 2000).

In Korea, there are no separate selling concessions because these are included in the cost of underwriting. According to practitioners, lead underwriters account for most of the underwriting fees, and only about 1% of total underwriting costs are given to syndicate members. Other direct costs are not part of underwriting compensation and are not considered by the underwriter. Therefore, the Korean IPO market considers 'underwriting fees' underwriting compensation (Ahn, Kim & Son 2007). This practice of no separation in fees and the most of the proportion to lead underwriter is similar in the Taiwan underwriting market (Chen, Fok & Wang 2006). Other members of the syndicate share selling fee based on the proportion of shares that they underwrite.

2.3.1 Evidence on Gross Spread

Torstila (2003) examined gross spread of 11,000 IPOs from 1986–August 1999 in 27 countries. This research used numerous samples of IPOs which gave an evidence of gross spread level in different markets across the world. The sample of IPO gross spread was including Indonesia, reporting on 11 issuers that accounted for 7% of IPOs in Indonesia. This study offers the only evaluation of gross spread in the Indonesian IPO market. After research undertaken by Torstila (2003), none of the research discuss about gross spread in Indonesia due to lack of the data and gross spreads information is disclosed in the prospectus only since 2007. A summary of evidence on gross spreads is provided in Table 2.1, which includes evidence from different markets in Asia Pacific, Europe, North and South America and Africa/Middle East.

According to Table 2.1 the French underwriting market (7.5%) shows the highest gross spread, followed by the US (7.40%), and the lowest gross spread was Taiwan (0.99%). The gross spread in Asia Pacific underwriting market group was between 1.82% and 6.43%. Japan (6.43%) and Korea (5.93%) shows significantly higher gross spread compared with other markets in Asia Pacific. Meanwhile Singapore gross spread was at 1.82% and Taiwan gross spread was less than 1% at 0.99%. This makes Taiwan gross spread as the lowest gross spread in group of Asia Pacific market and all group of IPO markets. The gross spread of 11 IPOs in Indonesia was 3.60% and this is relatively high compared with most of Asia Pacific underwriting markets, including Hong Kong (3.09%), Hungary (3.22%), India (2.30%), Malaysia (3.17), Philippines (3.10%), Singapore (1.82%), Taiwan (0.99%), and Thailand (3.00%).

Table 2.1. Evidence on Gross Spread

Country	Gross Spread (%)	Sample Size	Sample Period	Authors(s)
Indonesia	3.60	11	1986-1999	Torstila
Asia Pacific				
Australia	4.78	355	1980-2013	Dimovski; How & Yeo; Torstila
China	4.94	1,274	1992-2012	Ljungqvist & Jenkinson; Wang & Zhou; Chen & Wang
Hong Kong	3.09	123	1992-1999	Ljungqvist & Jenkinson
Hungary	3.22	15	1986-1999	Torstila
India	2.30	206	1986-1999	Torstila
Japan	6.43	630	1992-2011	Koda & Yamada; Ljungqvist & Jenkinson
Korea	5.93	433	2000-2006	Ahn, Kim &Son
Malaysia	3.17	234	1992-2012	Ammer & Ahmad-Zaluki; Ljungqvist & Jenkinson
New Zealand	4.90	5	1986-1999	Torstila
Philippines	3.10	26	1986-1999	Torstila
Singapore	1.82	60	1992-1999	Ljungqvist & Jenkinson
Taiwan	0.99	419	1989-1999	Chen, Wok & Fang
Thailand	3.00	14	1986-1999	Torstila
Europe				
Austria	3.49	23	1986-1999	Torstila
Belgium	2.89	11	1986-1999	Torstila
Denmark	3.61	12	1986-1999	Torstila
Finland	3.26	12	1986-1999	Torstila
France	7.50	172	1997-2000	Torstila; Chanine
Germany	5.01	269	1986-2001	Franzke & Schlag; Kaserer & Kraft; Torstila
Greece	3.41	5	1986-1999	Torstila
Italy	3.90	171	1999-2008	Meoli, Signori & Vismara; Signori, Meoli & Vismara; Torstila
Ireland	2.32	6	1986-1999	Torstila
Israel	7.29	51	1992-1999	Ljungqvist & Jenkinson
Netherlands	3.81	52	1986-1999	Torstila
Norway	4.12	7	1986-1999	Torstila
Poland	2.43	83	1986-2015	Torstila; Warwryszuk-Misztal
Portugal	3.01	12	1986-1999	Torstila
Spain	3.10	34	1986-1999	Torstila
Sweden	4.22	27	1986-1999	Torstila
Switzerland	3.11	12	1986-1999	Torstila
UK	2.17	53	1986-1999	Torstila

Europe	3.71	914	1998-2007	Abrahamson, Jenkinson & Jones
America				
Canada	6.20	496	1984-1999	Chung, Kryzanowski & Rakita; Ljungqvist & Jenkinson; Kooli & Suret
Mexico	4.75	27	1992-1999	Ljungqvist & Jenkinson
US	7.40	6,917	1975-2013	Abrahamson, Jenkinson & Jones; Bajo, Barbi & Petrella, Boulton, Smart & Zutterr; Garner & Marshall; Lee; Lyanders, Fu & Li; Torstila
Africa				
South Africa	2.08	19	1992-1999	Ljungqvist & Jenkinson
Rest of Africa/Middle East	4.23	31	1992-1999	Ljungqvist & Jenkinson

Source: Most of figures are taken from 'The Clustering of IPO Gross Spread: International Evidence' by Torstila (2003).

In European underwriting market, the highest gross spread was France IPO at 7.50% and the lowest mean gross spread was UK IPO at 2.17%. The second highest gross spread is German IPO market at 5.01%, following with Sweden at 4.22%, and the level of gross spread of most of other markets is around 3% (e.g. Austria, Denmark, Finland, Greece). The latest research on 914 IPOs in European IPOs market found the mean gross spread was 3.71% (Abrahamson, Jenkinson & Jones 2011). In America presents gross spread of Mexico was 4.75%, Canada was 6.20%, and US market was 7.40% which are shows relatively high gross spread. In South Africa the IPO the direct cost of IPO was at 2.08% and the rest of Africa/Middle East was at 4.23%.

The evidence on gross spread shows higher gross spread in the US market compared with most of other IPO markets. Comparison study on gross spread in the US and European market, the gross spread in the US is relatively higher than Europe with difference 3% higher (Chen & Ritter 2000; Liu & Ritter 2011). Several reasons have been proposed to justify this difference, such as the higher quality of underwriting services in the US (Torstila 2003) or the stronger litigation exposure (Lowry & Shu 2002). The fees paid to underwriters (gross spread) to the level of service they provide. Some of the services are indeed granted in every IPO (e.g., due diligence, road shows, book building and placement), some are compulsorily provided only in some markets (e.g., liquidity support), and others are completely optional (e.g, price stabilization). Ceteris paribus, investment banks will ask for higher fees when required to offer ancillary services. Among them, the price stabilization and the liquidity support are crucial for the success of an IPO (Ellis et al. 2000). A recent paper by Abrahamson, Jenkinson and Jones (2011), find evidence that the high gross spreads in the US can be justified by non-collusive reasons. A gap is only barely justified by the higher marketing costs, and legal expenses (Abrahamson, Jenkinson & Jones 2011).

Two main explanations have been offered regarding high gross spread: pricing strategy – book-building and fixed-price – and underwriter reputation. Book-building refers to the process by which an underwriter attempts to determine the offering price of an IPO based on the demand of institutional investors to reduce information asymmetries. Fixed-price offerings are priced without first soliciting investor interest. The results suggest that the high level of gross spread in underwriting is related to the use of book-building pricing strategies and reputable underwriters. Ljungqvist, Jenkinson and Wilhelm (2003) analysed the factors that might influence IPO gross spreads, differentiating the sample into fixed-price and book-building pricing strategies. They found that gross spread book-building is higher than fixed-price offerings. In addition, in line with their service, reputable underwriters generally charge higher fees than their less prestigious counterparts, and underwriters need to maintain their reputation. Reputable underwriters are expected to be able to assess the value of firms accurately and mitigate information asymmetries and uncertainty at the IPO stage. The service provided by underwriters provides higher offer values, which is of significant benefit to issuers (Fernando et al. 2015). For that reason, underwriters must receive a return on their investment in building their reputation (Booth & Smith 1986; Fernando et al. 2015; Tinic 1988). The results of these studies suggest that high gross spread in underwriting is related to the use of a book-building pricing strategy rather than intense clustering.

2.3.2 Clustering Patterns on Gross Spread

The level of underwriter compensation in IPOs has drawn considerable attention. As Chen and Ritter (2000) reported, evidence of gross spread of firm-commitment IPOs in the US market was relatively high at 7% for IPOs of between $20 million and $80 million, higher than gross spread in other international stock markets. The US gross spread level was not only high, but had a high frequency of gross spread at 7%. This leads to the question of whether the gross spread cluster is collusive. A summary of evidence on gross spreads clustering pattern is provided in Table 2.2, which includes evidence from different markets in Asia Pacific, Europe, and North America. The figures are taken from research undertaken by Torstila (2003).

Torstila (2003) examined gross spread of 11,000 IPOs from 1986–August 1999 in 27 countries. This research used numerous samples of IPOs which gave an evidence of gross spread level and clustering of gross spread in different markets across the world, and gross spread data are analyzed on both firm and country levels. Two measurements were used to examine clustering pattern: mode gross spread and relative frequency. The mode spread is the most common gross spread paid by IPO firms, while relative frequency is measured in percentages, as the number of

IPOs with mode gross spread divided by the number of IPOs. Relative frequency is used as a measure of clustering.

Table 2.2. Gross Spread Clustering Pattern in IPO Markets by Country

Country	Mode Gross Spread[1] (%)	Relative Frequency[2]	Sample Size	Sample Period
Indonesia	3.50	27.3	11	1986-1999
Asia Pacific				
Australia	4.00	21.2	278	1986-1999
Hong Kong	2.50	94.8	268	1986-1999
India	2.50	86.0	2065	1986-1999
Malaysia	2.00	88.8	392	1986-1999
Philippines	3.00	65.4	26	1986-1999
Singapore	2.50	55.7	140	1986-1999
Thailand	3.00	42.9	14	1986-1999
Europe				
Austria	3.00	18.5	27	1986-1999
Belgium	2.50	66.7	12	1986-1999
Denmark	4.00	25.0	12	1986-1999
Finland	4.00	25.0	12	1986-1999
France	3.00	34.0	50	1986-1999
Germany	4.00	38.6	88	1986-1999
Greece	3.00	40.0	5	1986-1999
Italy	4.00	18.2	55	1986-1999
Netherlands	3.25	13.0	54	1986-1999
Norway	4.00	28.6	7	1986-1999
Portugal	3.25	16.7	12	1986-1999
Spain	3.50	26.5	34	1986-1999
Sweden	450	14.8	27	1986-1999
Switzerland	4.00	33.3	12	1986-1999
UK	6.00	8.9	56	1986-1999
North America				
Canada	6.00	18.3	749	1986-1999
US	7.00	43.0	6573	1986-1999

Source: Figures taken from 'The Clustering of IPO Gross Spread: International Evidence' by Torstila (2003).
Notes: [1] The mode spread is the most common gross spread paid by the IPO firms. [2] Relative frequency is measured in percentages, as the number of IPOs with mode gross spread divided by the number of IPOs. In this study, this relative frequency is used as the measure of clustering.

The high clustering pattern in Asia Pacific shows in Hong Kong market. In Hong Kong, 94.8% of all IPO sample have gross spread of 2.5%. Gross spread in Malaysia, India, Philippines and Singapore shows high relative frequencies of 88.8%, 86%, 65.4% and 55.7%, respectively. The mode spread was at 2% (Malaysia), 2.5% (India), 3% (Philippines), and at 2% in Singapore. The gross spread clustering is higher in Asia Pacific, however, the Indonesian gross spread from 1986–1999 did not show evidence of this—the gross spread level of 3.50%, which emerged as the most common gross spread, only accounted for 27.3% of all 11 IPOs in the sample. In the European underwriting market, the high clustering pattern shows in several countries. The higher relative frequency shows in Belgium which is 66.7% with mode spread at 2.5%, following with Greece which shows relative frequency of 40% with 3% emerged as the most common gross spread. The lowest relative frequency of gross spread was in the UK, only 8.9% of all sample have gross spread at 6%. In North America groups, the US market shows that 43% of all sample has 7% gross spread.

The figure in Table 2.2 showed that clustering patterns are widespread in other markets, not only in the US market. In several Asian markets show higher clustering pattern compared with the US and European market which is shown in relative frequency gross spread. However, the mode gross spread of country groups is lower than that in the US, particularly in the Asian markets in the range of 2% (Malaysia) and 3% (Philippines and Thailand).The clustering pattern in different markets indicates that the high clusstering pattern follows with low gross spread which is shows in Asian market. This evidence suggest that the high clusttering gross spread is not collusive, because collusion should lead to higher gross spreads, not lower.

2.3.3 Determinants of Gross Spread

Researchers have used many variables as determinants of gross spread; for example, Torstila (2001) used offering characteristics, market characteristic, and underwriter characteristic. Fernando et al. (2015) focus on offering characteristics and issuer (offer size, age of firm and profitability). Each study on gross spread has focus on different determinants and this section discusses determinants of gross spread.

2.3.3.1 Underwriter Reputation

Issuers choose highly reputable underwriters for the IPO process because, in addition to legal counsel, audits, notaries and independent appraisals, underwriters play an important role in the IPO process. Underwriters are expected to give advice to issuing firms, be able to assess the value of a firm accurately to mitigate information asymmetry and uncertainty at the IPO stage, and set offer prices (Razafindrambinina & Kwan 2013). Underwriters are also are expected to provide price stabilisation for IPOs to reduce price drops for a few days or weeks in the secondary market, and

reduce the volatility of the IPO initial return (Ellis, Michaely & O'Hara 2000; Lowry, Officer & Schwert 2010). Highly reputable underwriters is expected to be a signal of firm value because underwriters undertake only high-quality offerings through the IPO process (Beatty 1989; Booth & Smith 1986; Carter & Manaster 1990; Tinic 1988) and highly reputable underwriters can have a bargaining power to raise the fee because they able to provide high quality service in underwriting (Fang 2005; Meoli et al. 2012).

Fernando et al. (2015) examined price differentiation based on reputation in the US, and found consistent results with previous studies—reputable underwriters in the US earn higher gross spread than less reputable counterparts. Reputable underwriters receive average reputational premiums equal to 0.65% of average IPO underwritten proceeds. The high reputable underwriters charge higher fees than their less prestigious counterparts for the services and to maintain their reputation, because the issuer firms received benefit of higher offer value for their IPO.

Other study on gross spread and underwriter reputation have been undertaken and found different result which contrast with other studies because the result showed negative relationship that underwriter reputation more prestigious underwriters tend to charge lower underwriting fees (Pugel and White 1988). Ahn, Kim and Son (2007) examined the effect of underwriter reputation on gross spread in small and large IPOs sample in Korea. They used two measurements for underwriter reputation: frequency-based and market-based. The frequency-based measurement is the number of IPOs underwritten by a given underwriter, and the market-share measurement is market share in the IPO market. They found that underwriter reputation did not have a significant effect on gross spread.

2.3.3.2 IPO Size

The size of the IPO or proceeds have been found to be a key determinant of gross spread in numerous previous studies, such as Bairagi and Dimovski (2012), Bajo, Barbi and Petrella (2017), Beatty and Welch (1996), Chen and Wang (2016), Chung, Kryzanowski and Rakita (2000), Lee et al. (1996), Ritter (1987) and Torstila (2001), with researchers concluding that there is a negative relationship between gross spreads and proceeds. The responsiveness of gross spreads to proceeds could be indicative of a changing level of competition in the market. If the market becomes more competitive and less prone to collusion as proceeds increases, as suggested in Chen (1999), the relationship between gross spreads and proceeds may appear relatively responsive. Kaserer and Kraft (2003) documented that the level of underwriting fees has positive correlation with the degree of complexity of underwriting an IPO, and negative correlation with less volatile IPOs. Abrahamson, Jenkinson and Jones (2011) compared the effect of gross proceeds to gross spread in the US and Europe market. They arrange proceeds into three group of small to large proceeds, and

indicated that proceeds and gross spread are negatively related. Gross spreads are lower for the larger offerings in both regions.

2.3.3.3 Issuer-specific Risk

Firm size, firm age, profitability, and offer price are included as issuer-specific risks. Pugel and White (1988) argued that underwriters are concerned about issuer-specific risks and this can explain the variation in underwriter spreads. They examined the determinants of gross spreads of firm-commitment IPOs in the US from January–June 1981, using firm age and size as proxies for issuer-specific risks. The results show that underwriting risk related to issuer's age and size was lower and negatively related to gross spread, because investors and underwriters are more familiar with older issuing firms.

These result shows that the nature of the company going public is expected to affect the level of spread, for instance, larger firms pay relatively less spread (Torstila 2001). These argument supported with the result of gross spread evaluation undertaken by Chen and Wang (2016), Kaserer, Mettler and Obernberger (2011), and Meoli et al. (2012). They found significant negative relationship between firm size and firm age and gross spread. However, different result found in Taiwan IPO market in 1989-1999 which shows positive relationship between firm age and gross spread (Chen, Fok & Wang 2006).

In the US, Logue and Lindvall (1974) suggested that there is a negative relationship of offer price and gross spread. The gross spread was lower for IPO with higher offer price. However, if the offer price is determined simultaneously with the underwriting fee, the underwriters will require higher fee as a compensation of bearing risk form capital loss because of under-subscription, and the underwriters willing to negotiate for lower gross spread for IPO with higher offer price. The trade-off between offer price and gross spread found in Chen and Mohan (2002), Bajo, Barbi and Petrella (2017) on the evaluation of gross spread in the US market.

Ahn, Kim and Son (2007) used firm age and profitability as proxies for risk, and found that there was a negative relationship between profitability and underwriting fees only for large IPOs. They argued that risk of underwriting profitable IPOs might be lower, because these firms will be relatively easy to sell on the market. Therefore, it is expected that more profitable firms will pay lower underwriting fees.

2.3.3.4 Hot Issue Markets

The definition of a hot IPO market was first introduced by Ibbotson and Jaffe (1975), followed by Ritter (1984) and Ritter (1998). Ibbotson and Jaffe (1975) defined a hot issue market is a period when the average first-day return is greater than the median first-day return. Following with Ritter

(1984) who found a high number of IPOs, severe underpricing and frequent oversubscription in a hot issue market period. In contrast, a cold issue market is a period when the number of IPOs is low and there is less underpricing.

A hot issue market is also identified with a low cost of going public; therefore, issuing IPO firms find that going public in this period may be optimal (Bartling & Park 2009). Ahn, Kim and Son (2007) examined gross spread differentiation based on issuers' listing period in the market. They found that firms that go public during a hot issue market period pay lower underwriting fees than those that go public during cold issue market periods. Underwriters tend to charge lower fees during a hot issue market period because, in this period underwriters do more business.

2.3.3.5 IPO Pricing Strategy

Ljungqvist, Jenkinson and Wilhelm (2003) analysed the determinant factors that might influence IPO gross spreads, and the relationship between IPO spreads and underpricing. They differentiated the sample into fixed-price and book-building pricing strategies. Book-building refers to the process by which an underwriter tries to determine the offering price of an IPO based on the demand of institutional investors to reduce information asymmetries. Fixed-price offerings are priced without first soliciting investor interest. Investors make subscription decisions over a period that, typically, can range from two weeks to two months (Benveniste & Busaba 1997).

They found that gross spread book-building is higher compared with fixed-price offerings, which may explain the 7% gross spread of firm-commitment of moderate-size IPOs, and the clustering pattern in the US market found by Chen and Ritter (2000). The results suggest that a high gross spread in underwriting was related to the use of a book-building pricing strategy rather than to intense clustering. Book-building reflects higher-quality service in the IPO pricing and generally leads to more accurate pricing that is less underpriced. Book-building typically involves lower risks for the underwriter; it reflects higher-quality service regarding IPO pricing, and generally leads to more accurate pricing (Ljungqvist, Jenkinson & Wilhelm 2003; Sherman 2005).

2.4 Overview of Underpricing

Research on behavioural finance, which focuses on investors behaviour from the first day companies are introduced in the initial market, have become popular. Unlike corporate finance, which was introduced with the first theory of Modligiani Miller's (1958) theory of capital structure, behavioural finance was first introduced in 1980. The difference between research in corporate finance and behavioural finance is the focus of the research—corporate finance studies corporate

performance, which can be seen in financial statements and balance sheets, as a result of finance decisions and finance policy and investors' perception (market reaction) of this.

An IPO is a corporate action that occurs when a security is sold to the general public for the first time. The purpose for firms in going public, in most cases, is to raise equity capital and create a public market (Ritter & Welch 2002). Numerous empirical studies focusing on going public have identified two main phenomena: positive initial returns (*first-day return*), or that firms going public are underpriced, and long-run performance. IPO underpricing can be defined as the degree of positive difference between the offer price and the closing price on the first day of trading (Chong & Puah 2009). IPO underpricing is also known as initial returns or first-day returns.

Evaluation of the offering and closing prices on the first day of trading shows a general phenomenon of underpricing in the short run, with this first documented by Stoll and Curley (1970), Logue (1973) and Ibbotson (1975). There is debate about whether underpricing benefits companies or investors. Some research shows that underpricing only benefits investors, since the first-day companies are listed on the market, including Rock (1986), Beatty and Ritter (1986) and Brau and Fawcett (2006), who tested the theory and concept of underpricing, and argued that underpricing is compensation for investors because investors take a risk buying IPO shares. Even though most IPOs are underpriced, other researchers argue that underpricing might not be able to meet the purposes of raising equity capital because the issuer firms sells its shares at a price that is less than what the market is willing to pay, or the pricing of an IPO is below the market value.

2.4.1 Evidence on Underpricing

Empirical evidence recorded in previous research shows that IPOs are underpriced in most markets. Table 2.3 present evidence of underpricing in Indonesia and 54 other countries. The level of underpricing of IPOs in Indonesia on the first day of trading ranged between 10.20% and 53%. Hanafi and Setiawan (2018) found that the average level of underpricing in 182 IPO firms over 2006-2015 was 10.20%. The highest underpricing, 53%, was found in an IPO firm sample for 2000-2008 (Hasan, Hadad & Gorener 2013). The level of underpricing in Indonesia varies, with estimates including 35.21% for 2000-2010 (Andriansyah & Messinis 2016) and 22.20% for 2003-2011 (Darmadi & Gunawan 2013).

The level of underpricing in Indonesia was lower than that found for other countries. The highest underpricing was found in Saudi Arabia, with first-day underpricing of 239.80%, followed by the Chinese IPO stock market of 157.70%. In Europe, underpricing was relatively low for IPOs in the Netherlands, Germany and France, at 13.30%, 23% and 9.7%, respectively. Regarding emerging

markets, Sri Lanka experienced underpricing on the first trading day of 34% (Samarakoon 2010), Malaysia 51% (Yong & Isa 2003) and Thailand 40% (Ekkayokkaya & Pengniti 2012).

Table 2.3. Evidence on Underpricing

Country	Underpricing (%)	Sample Size	Sample Period	Authors(s)
Indonesia	42.32	86	1996-2001	Emasari & Tamara
Indonesia	22.89	290	1989-2005	Gumanti, Lestari & Mannan
Indonesia	46.00	78	2001-2005	Warganegara & Warganegara
Indonesia	53.00	71	2000-2008	Hasan, Hadad & Gorener
Indonesia	28.89	314	1990-2009	Ismiyanti & Armansyah
Indonesia	44.06	147	2000-2009	Setiobudi, Warganegara & Warganegara
Indonesia	35.21	140	2000-2010	Adriansah & Messinis
Indonesia	22.19	246	1990-2010	Hanafi
Indonesia	22.20	101	2003-2011	Darmadi & Gunawan
Indonesia	30.48	40	2008-2011	Putra & Damayanti
Indonesia	25.32	63	2007-2012	Gumanti, Nurhayati & Maulida
Indonesia	23.06	231	1995-2012	Husnan, Hanafi & Munandar
Indonesia	27.22	72	2009-2013	Indriani & Marlia
Indonesia	25.79	75	2010-2014	Fadila, Hamzah & Sihombing
Indonesia	49.80	221	2000-2014	Widarjo et al.
Indonesia	10.20	182	2006-2015	Hanafi & Setiawan
Indonesia	24.82	62	2012-2016	Rabiqy & Yusnaidi
Indonesia	26.40	531	1990-2017	Suherman
Indonesia	30.25	52	2013-2017	Yuliani, Wahyuni & Bakar
Non-Indonesia				
Argentina	5.70	30	1991-2018	Eijgenhuijsen & van der Valk; Dealogic
Australia	19.80	2,069	1976-2018	Lee, Taylor & Walter; Woo; Pham; Dealic
Austria	6.20	106	1971-2018	Aussenegg; Dealogic
Belgium	11.00	154	1984-2017	Rogiers, Manigart & Ooghe; Manigart DuMortier; Dealogic
Brazil	30.30	303	1979-2018	Aggarwal, Leal & Hernandez; Saito; Ushisima; Dealogic
Bulgaria	36.50	9	2004-2007	Nikolov
Canada	6.40	758	1971-2017	Jog & Riding; Jog & Srivastava; Kryzanowski, Lazrak & Rakita; Ritter
Chile	6.90	86	1982-2018	Aggarwal, Leal & Hernandez; Celis & Maturana; Dealogic
China	157.70	3,554	1990-2017	Chen, Choi & Jiang; Jia, Xie, Zhang & Ritter
Cyprus	20.30	73	1997-2012	Gounopoulos, Nounis & Stylianides; Chandriotis

Country	Underpricing (%)	Sample Size	Sample Period	Authors(s)
Denmark	7.40	173	1984-2017	Jakobsen & Sorensen; Ritter
Egypt	9.40	74	1990-2017	Omran; Hearn
Finland	14.20	209	1971-2018	Keloharju; Dealogic
France	9.70	834	1983-2017	Husson & Jacquillat; Leleux & Muzyka; Paliard & Belletante; Derrien & Womack; Chahine; Ritter; Vismara; Dealogic
Germany	23.00	779	1978-2014	Ljungqvist; Rocholl; Vismara; Dealogic
Greece	50.80	373	1976-2013	Nounis, Kazantzis & Thomas; Thomadakis, Gounopoulos & Nounis
Hong Kong	44.50	2,042	1980-2017	McGuiness; Zhao & Wu; Ljungqvist & Yu; Fung, Gul & Radhakrishnan; Dealogic
India	85.20	3,145	1990-2017	Marisetty & Subrahmanyam; Dealogic
Iran	22.40	279	1991-2004	Bagherzadeh
Ireland	21.60	38	1991-2013	Dealogic
Israel	13.80	348	1990-2006	Kandel, Sarig & Wohl; Amihud & Hauser; Ritter
Italy	15.20	312	1985-2013	Arosio, Giudici & Paleari; Cassia, Paleari & Redondi; Vismara
Japan	44.70	3,488	1970-2016	Fukuda; Dawson & Hiraki; Hebner & Hiraki; Pettway & Kaneko; Hamao, Packer & Ritter; Kaneko & Pettway
Jordan	149.00	53	1999-2008	Al-Ali & Braik
Korea	58.80	1,758	1980-2014	Dhatt, Kim & Lim; Ihm; Choi & Heo; Mosharian & Ng; Cho; Joh; Dealogic; Lee
Malaysia	51.00	562	1980-2018	Isa; Isa & Yong; Yong; Ma; Dealogic
Mauritius	15.20	40	1989-2005	Bundoo
Mexico	9.90	149	1987-2017	Aggarwal, Leal & Hernandez; Eijgenhuijsen & van der Valk; Villarreal
Morocco	33.30	33	2000-2011	Alami Talbi; Hearn
Netherlands	13.30	212	1983-2017	Wessels; Eijgenhuijsen & Buijs; Jenkinson, Ljungqvist & Wilhelm; Ritter
New Zealand	15.90	269	1979-2018	Vos & Cheung; Camp & Munro; Alqahtani; Dealogic
Nigeria	12.80	125	1989-2017	Ikoku; Achua; Dealogic
Norway	6.70	266	1984-2018	Emilsen, Pedersen & Saettem; Liden; Dealogic; Fjesme
Pakistan	22.10	80	2000-2013	Mumtaz
Philippines	17.30	173	1987-2018	Sullivan & Unite; Dealogic
Poland	12.70	309	1991-2014	Jelic & Briston; Woloszyn
Portugal	11.50	33	1992-2017	Almeida & Duque; Dealogic
Russia	3.30	64	1999-2013	Dealogic
Saudi Arabia	239.80	80	2003-2011	Al-Anazi, Forster & Liu; Alqahtani

Country	Underpricing (%)	Sample Size	Sample Period	Authors(s)
Singapore	25.80	687	1973-2017	Lee, Taylor & Walter; Dawson; Dealogic
South Africa	17.40	316	1980-2013	Page & Reyneke; Ali, Subrahmanyam & Gleason; Dealogic
Spain	9.20	199	1986-2018	Ansotegui & Fabregat; Alvarez Otera; Dealogic
Sri Lanka	33.50	105	1987-2008	Samarakoon
Sweden	25.90	405	1980-2015	Rydqvist; Schuster; de Ridder
Switzerland	27.30	164	1983-2013	Kunz, Drobets, Kammermann & Walchli; Dealogic
Taiwan	38.10	1,620	1980-2013	Chen; Chiang
Thailand	40.00	697	1987-2018	Wethyavivorn & Koo-smith; Lonkani & Tirapat; Ekkayokkaya & Pengniti; Vithessonthi; Dealogic
Tunisia	21.70	38	2001-2014	Hearn; Dealogic
Turkey	9.60	404	1990-2014	Kiymaz; Durukan; Ince; Kucukkocaoglu; Elma; Dealogic
United Arab Emirates	270.10	24	2003-2010	Alanzi & Al-Zoubi
United Kingdom	15.80	5,185	1959-2016	Dimson; Vismara; Levis; Doukas & Hoque
United States	16.80	13,134	1960-2018	Ibbotson, Sindelar & Ritter; Ritter
Vietnam	49.10	69	2005-2012	Tran, Le & Hoang

Source: Figures for the 54 non-Indonesian countries were taken from 'Initial Public Offerings: International Insights' by Loughran, Ritter and Rydqvist (1994, updated 2019).

2.4.2 Theoretical Explanation on Underpricing

The reason firms go public, in most cases, are to raise equity capital and create a public market. While it is acknowledged that IPOs are generally underpriced, questions remain as to (1) why underpricing occurs; and (2) who are benefited from underpricing.

Ibbotson and Ritter (1995) list various hypotheses about the causes of underpricing: 1) the winner's curse hypothesis; 2) the market feedback hypothesis, where underpricing is used to compensate investors who provide information during the period prior to bidding to help determine the offer price; 3) the bandwagon hypothesis, where underpricing an IPO is used to attract the first investors who increase demand and attract other investors regardless of the information they have; 4) the investment banker's monopsony power hypothesis, where investment bankers intentionally underprice shares to gain profits and convince issuer firms that underpricing is normal for IPOs; 5) the laws avoidance hypothesis, where underpricing is used to reduce the number of lawsuits due to misleading information in the prospectus material; 6) the signalling hypothesis, where the issue of underpricing can be used by firms and insiders to sell the (private) information they have on the

value of the firm in the future; and 7) the ownership of dispersion hypothesis, where issuer firms intentionally underprice shares to attract investors who buy small shares with the aim of creating market liquidity and retaining management. Further discussion of these theories is provided below.

2.4.2.1 The Winner's Curse Hypothesis

In general, the higher the uncertainty about the real new stock price, the higher the return of informed investors (Ritter 1984). Underpricing leads to abnormal returns for investors as compensation for their risk, especially informed investors, who have better information than individual investors. Institutional investors provide information to underwriters about long-term performance of the firm to help determine the offering price, reduce the cost of capital and increase liquidity (Diamond & Verrecchia 1991).

In the winner's curse hypothesis, underpricing occurs because of asymmetric information between informed investors (institutional investors) and uninformed investors (individual investors) (Rock 1986; Beatty & Ritter 1986). This hypothesis assumes that all IPOs need to be underpriced because underpricing can be used to attract uninformed investors when trading with informed investors (Ibbotson & Ritter 1995). Informed investors have an information advantage in terms of subscription and identifying quality issues; uninformed investors have limited information, resulting in subscribing to low-quality issues and receiving a disproportionate allocation of issues. Baron (1982) argued that IPOs are underpriced because underwriters are better informed than issuers. This asymmetrical information between the two serves as an advantage for underwriters in determining the offering price of the IPO at below market value to minimise the probability of unsuccessful issues. Underpricing increases participation of uninformed investors in the market by ensuring a fair return and avoiding the winner's curse; underpricing is required to allow them to break even (Bottazzi 2015).

2.4.2.2 The Market Feedback Hypothesis

Another explanation related to underpricing is the market feedback hypothesis suggested by Jegadeesh, Weinstein and Welch (1993). Underwriters obtain information through the book-building process because market participants are better informed about the true value of the firm than the initial shareholders. Under asymmetric information, underpricing is used to compensate investors who provide information during the period prior to bidding to help determine the offer price. Underwriters issue a large number of shares at the lower price to attract uninformed investors, thus reducing the probability of loss because of an unsuccessful IPO (van Bommel 2002).

2.4.2.3 The Bandwagon Hypothesis

The bandwagon effect is a phenomenon in which potential investors make the decision to buy shares not only based on information they have but also following other investors. If an investor notices that nobody pursues the security of a particular IPO, he or she may decide not to purchase even if there is promising information. According to this hypothesis, underwriters intentionally underprice an IPO to attract the first investors, who increase demand and attract other investors, to avoid the bandwagon effect (Ritter 1998)

2.4.2.4 The Investment Banker's Monopsony Power Hypothesis

According to the investment banker's monopsony power hypothesis, investment bankers intentionally underprice shares to gain profits and convince issuer firms that underpricing is normal for IPOs. Investment bankers use their superior knowledge of market conditions to take advantage of issuers (Ritter 1984). Underpricing is used by investment bankers to build relationships with clients and reduce their possible risk of loss in IPOs (Baron 1982). Asymmetric information between issuers and investment banks about market conditions and demand for new issues leads issuers to leave pricing decisions to bankers.

2.4.2.5 The Lawsuit Avoidance Hypothesis

Underpricing protects issuer firms from future lawsuits if investors were mislead or disappointed with the performance of stocks because issuer firms withheld or misrepresented important information. Under the lawsuit avoidance hypothesis (Ibbotson 1975; Logue 1973), issuer firms intentionally underprice the IPO to reduce possibility of future litigation by investors.

Lin, Pukthuanthong & Walker (2013) examined 13,759 IPO firms in 40 countries over 1991–2011, and found contrary results. They found a significant positive relationship between litigation risks and underpricing in a cross-country framework, which means greater underpricing cannot reduce litigation risk in all sample countries. This can be explained by the fact that investors also face systematic risk, which cannot be mitigated by diversification of investments or by companies even when underpricing, which can be insurance for investors, because systemic risk is an uncontrollable factor (for example, interest rates, regulations and other macroeconomic factors). For that reason, companies should reveal all information related to their prior performance in their prospectus, even though revealing information on the real value of the company is costly. The risk and cost of litigation can be reduced by choosing a reputable underwriter because underwriters provide price stabilisation in IPOs, reducing price drops in the aftermarket for a few days or weeks.

2.4.2.6 The Signalling Hypothesis

According to this hypothesis, issuer firms intentionally underprice the new issues to signal their quality to outside investors and to receive higher return from issue seasoned equity (SEO) (Allen & Faulhaber 1989; Grinblatt & Hwang 1989; and Welch 1989). Certo, Daily and Dalton (2001) suggest that even though underpricing presents a direct transfer of wealth from initial shareholders to new investors, this can be reduced by a number of governance-related signals that may potentially enhance firm value. However, a contrary result was found by Yatim (2011), who examines the relationship between board structures and IPO underpricing in 385 IPO in Malaysia during 1999–2008. They found that issuers firm with dual leadership structure and board reputation result on higher underpricing because investors perceived IPO firms with the separation of leadership as low quality firms. The investors in Malaysian IPO market are more prefer issuer firms which have continuity in leadership.

2.4.2.7 The Ownership Dispersion or Control Hypothesis

IPO underpricing helps ensure a wide base of owners, which increases the liquidity of the newly public firm (Booth & Chua 1996). Underpricing increases demand for shares in the aftermarket to gain greater returns in the short run or long run (Boehmer & Fishe 2001; Bouzouitaa, Gajewskib & Gresse 2015; Hahn & Ligon 2006; Zheng & Li 2008). Higher demand for the stock attracts more investors and is perceived positively by the market; as a result, a liquid market develops. Higher market demand represents information, especially for individual investors (uninformed investors), who only buy a small share of the firms involved in the market.

These results are in line with the ownership dispersion hypothesis of Booth and Chua (1996). This hypothesis assumes that IPO firms intentionally underprice shares to attract more individual investors to create market liquidity and retain management, because individual investors buy a small share of the firms. Small share ownership means companies are easier to acquire. Therefore, if the company needs more capital from the market, investors will buy shares because the shares are liquid. This hypothesis is supported by Zheng and Li (2008) results on 1,179 Nasdaq IPOs, which found a positive correlation between underpricing and the number of non-block institutional shareholders after IPO; however, underpricing was negatively related with changes in the total number of shareholders. Underpricing also has direct effects on aftermarket liquidity after controlling for ownership structure and other factors.

2.4.3 Determinants of Underpricing

Researchers have used many variables as determinants of gross spread, and each study on underpricing has focus on different determinants. Mumtaz and Smith (2017) used 11 variables of subscription rate, aftermarket risk, profitability, offer price, underwriter reputation, listing delay, leverage, firm size, firm age, market return, market condition as determinant of underpricing in Pakistan. Dimovski, Philavanh and Brooks (2011) selected six variables of offer price, capital structure, market sentiment, independent accountant, share options, underwriter reputation. Indonesian studies of Hasan, Hadael and Gorener (2013) focus on offer size, total assets, shareholders' equity, current assets, current liability, profit. The latest study of Yuliani, Wahyuni and Bakar (2019) used Debt to Equity Ratio (DER), Return on Equity (ROE), underwriter reputation, and the percentage of stocks offering to evaluate IPO first day of return. This section discusses determinants of underpricing.

2.4.3.1 Issue-specific Characteristics

2.4.3.1.1 Offer Price

Previous studies have found evidence that offer price, as one of the issue characteristics, can reduce underpricing which is a result of uncertainty. A higher issue price indicates lower uncertainty related to the future performance of the firm and this is reflected in lower underpricing (Certo 2003; Daily, Dalton & Canella 2003). Guo and Brooks (2008), who found that issuer firms with a lower offer price in the IPO generally have higher underpricing. This is supported by Dimovski, Philavanh and Brooks (2011) who examined 380 IPOs in Australia during 1994–2004, Zouari, Boudriga & Boulila (2009) and Chong, Yuan & Yan (2010). They found that offer price has a negative relationship with level of underpricing. However, Kutsuna, Dimovski and Brooks (2008) found a contrasting result—a statistically significant positive relationship between offer price and underpricing.

2.4.3.1.2 Offer Size

The offer size of the IPO indicates the level of uncertainty associated with the issuing firm (Miller & Reilly 1987). Larger IPOs are usually offered by well-known firms, and this reduces investors' perceived risk of the IPO (Carter, Dark & Singh 1998). Smaller offerings are more risky and the higher the degree of uncertainty for a high initial premium. Previous research has found a negative relationship between offer size and level of underpricing (Chi & Padgett 2005; Guo & Brooks 2008; Hassan & Quayes 2008; Marisetty & Subrahmanyam 2010). Similar results on a negative relationship between offer size and underpricing is found in several studies, including Chi and

Padgett (2005), and Belghitar and Dixon (2012). However, a contrary result is found in Suchard and Singh (2007) and Alli, Subrahmanyam and Gleason (2010), who reported gross offer proceeds as having a positive relationship with initial underpricing. In other study, the findings by shows that offer size has an insignificant relationship with the level of underpricing (Arosio et al. 2000).

2.4.3.1.3 Underwriter Reputation

Firms may seek to choose a particularly reputable underwriter for the IPO process to reduce underpricing. Highly reputable underwriters are able to assess the value of a firm and mitigate asymmetric information and uncertainty at the IPO stage (Razafindrambinina & Kwan 2013). Highly reputable underwriters can also be a signal of firm value because these underwriters undertake only high-quality offerings (Beatty 1986; Carter & Manaster 1990). Further, underwriters provide price stabilisation of IPOs, reducing price drops for a few days or weeks in the secondary market, and reduce the volatility of the IPO initial return (Ellis, Michaely & O'Hara 2000; Lowry, Officer & Schwert 2010). According to The Laws Avoidance Hypothesis, highly reputable underwriters are trying to present the true value of the firms to maintain their reputation and avoid legal impacts in the future.

Several studies have tested the relationship between underwriter reputation and underpricing by using different measures of underwriter reputation (Beatty & Ritter 1986; Booth & Chua 1996; Carter, Dark & Singh 1998; Johnson & Miller 1988; Leone, Rock & Willenborg 2007; McDonald & Fisher 1972; Nanda & Yun 1997; Neuberger & LaChapelle 1983). Following with Carter and Manaster (1990) who develop an equilibrium model that explains the relationship between underwriter reputation and the level of underpricing. According to their model, highly reputation underwriters have lower level of IPO underpricing. All these studies found a negative association between underwriters' reputation and underpricing.The IPOs are less underpriced when are brought to the market by more prestigious underwriters. Recent evaluation on underwriter reputation have been undertaken on 52 IPOs in Indonesia stock market from 2013-2017 (Yuliani, Wahyuni & Bakar 2019). The underwriter reputation is the top 20 selected underwriters and measured in accordance with the Frequency Total Trading listed in IDX Fact Book.They found that the underwriter's reputation has a negative and significant relationship with underpricing. This indicates that the initial return that can be obtained by investors from issuers using high reputation underwriters is relatively low.

A positive relationship between underwriter reputation and underpricing also found in other studies. A reverse result found in the US IPO of the 1990s as the highly reputable underwriters start to underwrite younger and more uncertain new issues (Loughran & Ritter 2004). New issuers firms became more willing to engage with more reputable underwriters since the underwriters can

satisfied issuer firms and investor clients. The high reputable underwriters can meet issuer firms expectation to maximize the capital raised from selling their securities and the investor clients can have benefit from higher underpricing. The positive relationship also found in 380 Australian IPOs from 1994 to 2004 (Dimovski, Philavanh & Brooks (2011). They suggest that highly reputable underwriters are related with a higher level of underpricing.

2.4.3.2 Firm-specific Characteristics

2.4.3.2.1 Firm Size

The size of the firm can be used to measure the ex-ante risk of the IPO offer, whereby large and established firms are perceived as posing less risk than small firms. Investors generally pay more attention to the size of firms because large firms tend to have more stable conditions, which attracts investors to buy shares. Investors have high expectations of large firms and expect rising share prices. Increased demand for the company's stock spurs increases in stock prices. Large firms are better known to the public with a longer corporate history and this reduces their underpricing compared with small sized firms.

Research on evaluation of underpricing has found a negative association between firm size and IPO underpricing (Carter, Dark & Singh 1998; Islam, Ali & Ahmad 2010; Mumtaz & Smith 2017; Wyatt 2014). A consistent result was also found in Leone, Rock and Willenborg (2007) who found a negative relationship between firm size and underpricing when they evaluated 787 IPOs underpricing during 1993-1994.This indicates that the large firm size are less underpriced compared with small firm size. The result support with result of Indonesian studies of Rabiqy and Yusnaidi (2017) which reports that firm size is negatively related to underpricing on 118 IPO firms between 2012-2016.

2.4.3.2.2 Firm Age

Research has found that firm age negatively influences underpricing on the first day (Belghitar & Dixon 2012; Loughran & Ritter 2004), with recent research in Tunisia confirming this (Zouari, Boudriga & Taktak 2011). Older firms are perceived to be less risky. Older firms are more established and have more information that can be easily accessed by the public (Gong & Shekhar 2001). This decreases uncertainty at the IPO stage and, in turn, is reflected in lower underpricing. Leone, Rock & Willenborg (2007) found negative relationship between firm age and underpricing when evaluated 787 IPOs underpricing during 1993-1994.

2.4.3.2.3 Profitability

Financial performance, including profitability, is essential because when firms go public, investors evaluate financial performance prior to IPO. Profitability can used by shareholders to assess firm performance (Bhabra & Pettway 2003). Profitability provides information to outside parties regarding operational effectiveness. Higher profitability attracts investors to buy the firm's IPO shares because investors expect a positive future performance (Pukthuanthong-Le & Varaiya 2007). Financial performance can indicate to investors the true value of the firm, which is useful for making decisions regarding the buying of IPO stocks (Deb & Marisetty 2010).

2.4.3.3 Hot Issue Market

The market conditions plays an important role in determining underpricing or short run performance of IPO (Derrien & Womack 2003). Issuer firms or underwriter can have benefit to raise a number of successful offering, a capital and smooth distribution of shares when they able to time their offering. The definition of a hot IPO market was first introduced by Ibbotson and Jaffe (1975), followed by Ritter (1984) and Ritter (1998). This concept was first reported by Ibbotson and Jaffe (1975), who defined a hot issue market is a period when the average first-day return is greater than the median first-day return. Following with Ritter (1984) who found a high number of IPOs, severe underpricing and frequent oversubscription in a hot issue market period. Severe underpricing starts with unusual oversubscription, which results in high underpricing. Investor sentiment is reported as a determinant of high initial returns in hot issue markets because investors are overoptimistic about the new issue and willing to pay more in the IPO (Bogan 2009). In contrast, a cold issue market is a period when the number of IPOs is low and there is less underpricing.

The higher level of underpricing in hot market was confirmed in other research (Helwege & Liang 1996; Hoffmann-Burchardi 2001; How, Izan & Monroe 1995; Lowry & Schwert 2002; Loughran & Ritter 2002). Guo, Brooks and Shami (2010) analyze Chinese A-share market and found hot issue markets as having a large volume of IPOs, severe underpricing, strong market conditions, and short waiting time to listing. Lowry, Officer and Schwert (2010) found higher initial return volatility for firms issue during hot market.The higher underpricing for firms issue during hot market also confirmed in Alli, Subrahmanyam and Gleason (2010) and Samarakoon (2010). Indonesian study of Warganegara and Warganegara (2014) indicated that hot issue markets occur in the Indonesian IPO market. They examined 78 IPOs during 2001–2005, and found high underpricing to be positively related to volume of IPOs. The same result was found in Italy, France and Germany, indicating high initial returns during hot issue markets (Gandolfi et al. 2018). Meanwhile, Helwege and Liang (2004) are characterised hot markets as high underpricing and

concentrated in particular industries. Investor sentiment is reported as a determinant of high initial returns in hot issue markets because investors are overoptimistic about the new issue and willing to pay more in the IPO (Bogan 2009).

The market conditions also plays an important role in determining long-run performance. The long-run performance of firms differ depending on the type of market conditions when IPOs are issued. Brav, Geczy and Gompers (2000) evaluated long-run performance of IPO firms from 1975–2002 in the US, and found that firms listing during a hot market tend to underperform to a greater extent compared with firms listing during a cold market.

2.4.3.4 Intended Use of IPO Proceeds

Intended use of IPO proceeds information is evaluated in the IPO underpricing context and can be used by investors to evaluate a firm's prospects and risks associated with the IPO (Leone, Rock & Willenborg 2007; Maulidia & Gumanti 2015; Wyatt 2014). This information is essential in the IPO process and should be disclosed in the prospectus (Bhabra & Pettway 2003; Hanley & Hoberg 2010). Autore at al. (2009) classified the use of IPO proceeds into three categories: investment, debt repayment, and general corporate purpose. Meanwhile in Indonesia, according to the Financial Services Authority of Indonesia (BAPEPAM-LK 2009), proceeds may be used for several purposes: debt repayment, R&D, expansion and acquisitions, marketing and promotion, distribution to pre-IPO shareholders, working capital and other uses. This classification of use of proceeds was simplified by Andriansyah and Messinis (2016). They categorised the use of proceeds as fixed asset investment, investment in shares of stock, working capital financing, secondary shares and debt repayment. The use of proceeds perceived as risky, such as debt repayment, working capital and secondary shares, need to compensate investors with high initial returns

Leone, Rock and Willenborg (2007) evaluated 787 IPOs underpricing during 1993-1994 and intended use of proceeds used as determinants. They classified the use of IPO proceeds into six categories: expansion or acquisitions, R&D or product development, pre-IPO shareholders, advertising, marketing, promotion, or sales, particular working capital uses, and other uses. The positive relationship shows when the firms use of proceeds for advertising, marketing, promotion, or sales. Other determinants shows negative relationship with underpricing. In Indonesia, Gumanti (2007) found that the use of proceeds for investment is negatively related to the level of underpricing.

2.4.4 Methodology on Underpricing

Another cost of going public is underpricing, which can be also considered the indirect cost of going public. Underpricing was measured as the initial return of the IPO or the difference between the offer price and the closing price on the first day of trading, following Abdou and Dicle (2007), and Wasiuzzaman et al. (2018). There are four steps in determining underpricing:

Step 1: Identify the first day of trading

Step 2: Calculate initial returns (IRs) of IPO for each company in period t.

Step 3: Calculate t-statistics to determine whether the initial returns were underpricing or overpricing.

$$IR_{it} = \frac{(P1_i - P0_i)}{P0_i} \tag{2.1}$$

where IR_{it} is initial return of IPO for company i, $P1_i$ is closing market price of company i on the first day of trading and $P0_i$ is offer price of company i. Positive (+) initial returns (IRs) is considered underpricing, and negative (−) initial returns (IRs) is considered overpricing. The t-statistic can be used to test whether the underpricing or overpricing are statistically significant.

2.4.5 Methodology on Evaluation of Post-listing Day Performance of IPO

The evaluation of post-listing day performance involves short-run performance analysis of the IPO after the listing day. There are six steps in evaluation of post-listing day performance of IPO:

Step 1: Calculate average raw returns (*RRs*) for each company in period t.

Step 2: Calculate market-adjusted abnormal return (*MARs*).

Step 3: Calculate market-adjusted average abnormal returns (AARs)

Step 4: Calculate t-statistics of market-adjusted average abnormal return to determine whether the returns were statistically significant.

Step 5: Calculate cumulative average abnormal returns (*CARs*)

Step 6: Calculate t-statistics of market cumulative abnormal returns to determine whether the returns were statistically significant.

First, calculated raw return of the IPO is the difference between the offer price and the closing price of trading(Chong & Puah 2009), as follows:

$$RR_{i_t} = \frac{(P1_i - P0_i)}{P0_i} \tag{2.2}$$

where RR_{it} is raw return of IPO for company i, $P1_i$ is closing market price of company i, and $P0_i$ is offer price of company i.

Second, the market-adjusted AAR (MARs) can be calculated after the calculation of average raw return, and following with calculating market-adjusted AAR:

$$MAR_{it} = R_{it} - R_{mt} \tag{2.3}$$

$$AAR_t = \frac{1}{n}\sum_{i=1}^{n} MAR_{i,t} \tag{2.4}$$

where MAR_{it} is MAR for company i of day t, R_{it} is return of company i, R_{mt} is return of market index during sample period t, AAR_t is market-adjusted AAR of day t.

The next step is calculating t-statistics of AAR to determine whether the abnormal returns were statistically significant (Omran 2005).The t-test statistics for AAR for each day during the post-listing period is calculated as under:

$$t(AAR) = AAR_t * \frac{\sqrt{n_t}}{\sigma_t} \tag{2.5}$$

where AAR_t is market-adjusted AAR of day t, n is the number of IPO firms in period t, σ_t is the cross-sectional standard deviation of the return for day t.

The RRs and AARs have been calculated in equations (2.2) and (2.4). From these, the equation for CARs can be calculated:

$$CAR_{q,s} = \sum_{i=q}^{s} AAR_t \tag{2.6}$$

where CAR_t is cumulative average abnormal returns, and AAR_t is market-adjusted average abnormal return of day t.

The next step is calculating t-statistics of CARs to determine whether the abnormal returns were statistically significant. The t-test statistics for CARs for each day during the post-listing day period is calculated as under:

$$t(CAR) = \frac{CAR_t}{\sigma(CAR)_t} \tag{2.7}$$

where CAR_t is cumulative average abnormal returns of day t, $\sigma(CAR)_t$ is the cross-sectional standard deviation of the return for day $t = \sigma(AR)_t * (t+1)^{½}$.

2.5 Relationship Between Gross Spread and Underpricing

The process of IPO involves considerable direct cost and indirect cost. The level of gross spread and underpricing are the underwriter's compensation for bearing the issuance risk. An underwriter spread may not be sufficient to cover the risk, however, underwriters can benefit from indirect compensation resulting from a high level of underpricing (Chen, Fok & Wang 2006). Studies on gross spread and underpricing examined three possible relationships between gross spread and underpricing (Chen & Mohan 2002; Fernando et al. 2015; Kim, Palia & Saunders 2010; Loughran & Ritter 2002; Logue & Lindvall 1974; Yeoman's 2001; Zhang 2004): 1) gross spread and underpricing might have an insignificant relationship; or 2) the two costs have a negative relationship as they are substitutes; or 3) they are complements if gross spread and underpricing shows positive relationship

Under the substitution hypothesis, the relationship between gross spread and underpricing is negative and significant when the relationship between these two costs is based on underwriter reputation. Gross spreads are high as underwriters might lose due to price uncertainty and underwriters have to sell IPO shares at lower prices than the preset offering price. Under prospect theory, underwriters have the bargaining power to set a higher offer price when selling a larger IPO. Underwriters can adjust the level of gross spread which depend on the negotiated range of the offering price, to achieve an equilibrium risk premium (Chen & Mohan 2002). When an underwriter could charge a high gross spread to compensate for all the issuance risk bearing, then underpricing becomes less important.

Yeoman (2001) provides a "net proceeds maximization theory," which suggests that gross spreads and underpricing are substitutes. He found that these two costs are negatively related when examined IPOs between 1988 and 1993. Chen and Mohan (2002) examined 806 IPO in the US from 1990-1992, they found the two costs are substitutes or negatively related. Following with Ljungqvist (2003) who examines IPOs in the UK IPOs. He found that gross spread in the UK IPO market are more varies than in the US market, and documents a negative relationship between returns spreads and underpricing. Fernando et al. (2015) examined gross spread differentiation based on reputation in the US and found similar findings: in general, gross spread is negatively related to underpricing.

The relationship between gross spreads and underpricing is positive when they are related to quality of issuer. Under the complementarily hypothesis, low-quality issuers would be charged an even higher underwriting spread than what they were actually charged if the underwriter had not received indirect compensation from underpricing (Chen & Mohan 2002; Kim, Palia & Saunders 2010). However, underwriters could not charge high spread because of competition and regulation (Chen and Mohan 2002). Further, underwriter need to conside r their reputation and the possibilility of pecuniary loss as a result of mispricing in determining gross spread and underpricing.

2.6 Identification of Gaps in the Literature

This section will discuss the gap in determinants variables, sample and in methodology used in previous studies to evaluate gross spread and underpricing of IPO.

2.6.1 Determinant Variables

The IPO literature discussing the determinants of gross spread and underpricing has considered issue characteristics, firm characteristics and market characteristics. Fernando et al. (2015) studied 6,378 IPOs during 1980–2010 in the US, discussing the relationship between issue and firm characteristics and gross spread. Meoli et al. (2012) explored several determinants of gross spread—underwriter reputation, underpricing, issue size, dilution factor, privatisation, participation ratio and market timing, issue-specific risk—to explain the direct issue cost in European markets during 1995–2009. Song et al. (2014) used firm and issue characteristics to explain underpricing of 948 IPOs in China during 2006–2011. Other studies have identified issue, firm and market characteristics as explaining underpricing (Hanafi & Setiawan 2018; Islam, Ali & Ahmad 2010; Mumtaz & Ahmed 2014; Samarakoon 2010).

The discussion of determinants of initial underpricing in previous studies focuses on microeconomic factors (e.g., issue and firm characteristics; little attention has been paid to evaluating macroeconomic factors, and global stock and regional stock indexes. In previous studies, macroeconomic variables are commonly used for aftermarket performance or long-run performance evaluation of stock markets, as in Ouma and Muria (2014) and Uwubanmwen and Eghosa (2015). Geetha et al. (2011) investigated the effect of the inflation rate, exchange rate, interest rate and GDP on stock returns in Malaysia, the US and China. They found a short-run relationship between macroeconomic factors and stock returns. Tripathi and Kumar (2014) examined inflation and stock returns in India for 2000–2013, using a panel co-integration test to find a significant negative relationship between inflation and stock returns.

Macroeconomic factors are crucial in IPOs and aftermarket performance because different economic conditions influence the decision of firms to move to the IPO market and investors' expectations of future returns. Macroeconomics conditions affect the economic climate, thus affecting firms' decision to go public (Angelini & Foglia 2018). Higher interest rates deter investors from the IPO market and affect the number of IPOs (Ameer 2012), and a change in macroeconomic policies has economic implications for market participants (Ameer 2007; Tran & Jeon 2011), because investors invest more in IPOs if they expect the economic situation to improve (Gunturkun, Gurarda & Erdogen 2012). In addition, positive global economic conditions influence emerging stock markets and investors' optimism regarding participation in stock markets.

Meanwhile, global and regional stock indexes influence a particular country's stock index. Darrat and Zhong (2002) suggest that the US, Hong Kong, Japan and Singapore stock market has significant impact on Asia Pacific stock market. The US, UK and Japan stock market have impact on Asian countries stock market. An increase in the DJI, for example, influences stock indexes in emerging countries in Asia because investors' optimism regarding global economic conditions influence the decision to buy stocks (Wong et al. 2004). Further, Darrat and Zhong (2002) noted that the DJI and SSE have a positive influence on other stock markets in Asia. Investors' optimism about economic conditions increases stock market participation, and initial returns.

Positive global economic conditions also influence Indonesian stock markets. Indonesian capital market is highly developed capital markets and over 10 years from 2007–2016, the Indonesian Stock Exchange (IDX) has shown positive growth. By the end of 2012, 553 firms were listed, with a combined market capitalisation of USD435.19 billion (Stock Exchange Statistics 2017). This situation has made Indonesia an investment destination for foreign investors, who dominate the Indonesian stock market, accounting for about 36.89% of total investors. The growing of Indonesian market was as result of growing of world investment and finance. Therefore, the changing in world economic indicators and stock index will impact to Indonesian stock market. Indonesian study of Karim et al (2009) have found that Indonesian stock market are affected by the US, Japan and China stock market condition. Andiyasa, Purbawangsa and Rahyuda (2014) research on the impact of global economic indicators to Indonesian stock index (JCI) from 2006-2012. Dow Jones index, Nikkei 225 index, Shanghai Composite Index, and the Financial Times Stock Exchange (FTSE) 100 index of the UK were used as global economic indicators, and they found these indicators positively affected Jakarta Stock Exchange Composite Index (JCI).

From previous studies suggest that macroeconomic factors, global and regional stock indexes influence market condition and the decision of firms to move to the IPO market and investors' expectations of future returns. Therefore, in evaluating underpricing and identifying the

determinants of underpricing of 150 IPO firms during 2007–2016, this study examines the relationship between underpricing and macroeconomic factors, global and regional stock indexes.

2.6.2 Sample

The first study on gross spread in Indonesian IPO market have been done by Torstila (2003) who examined clustering patterns of IPO gross spreads in 27 countries, including Indonesia. He used gross spread data from 1986–August 1999, and reported only on 11 issuers, accounting for only 7% of IPOs in Indonesia. Further evaluation on gross spread in Indonesia have not been conducted. since the first study. The limited sample on the study could not give a comprehensive explanation on gross spread practice in Indonesian IPO market. Meanwhile other Indonesian studies focusing more on the indirect cost of going public or underpricing (Darmadi & Gunawan 2013; Gumanti, Nurhayati & Maulidia 2015; Hanafi 2016; Setiobudi, Warganegara & Warganegara 2011; Tandelilin et al. 2014; Tanjung & Hutagaol 2012; Tanjung & Hutagaol 2012; Warganegara & Warganegara 2014). A comprehesive study of the cost of going public (IPOs) in the Indonesian market is needed to provide empirical evidence that should prove useful for the government when determining policy related to IPO costs in Indonesia, for issuer firms making a decision to go public, and investors making a decision to participate in the stock market. Therefore, this study expands the Indonesian sample size into 150 sample, and time period examining gross spreads over 2007–2016,

2.6.3 Methodology

Previous studies of gross spread and underpricing were mostly examined under pooled OLS regressions (Bajo, Barbi & Petrella 2017; Hanafi & Setiawan 2018; Koda & Yamada 2018; Mohamed & Saadouni 2018). Bajo, Barbi and Petrella (2017) used a pooled OLS regression to examine gross spread of 6,814 IPO firms in the US market during period 1983-2007, while Koda and Yamada (2018) used it to examine gross spread of 588 IPO firms in Japan market during period 2002-2011. Previous studies in Indonesia also shows that OLS regression has also been commonly used in evaluation of underpricing (Fadila, Hamzah & Sihombing 2015; Rabiqy & Yusnaidi 2017; Widarjo et al. 2017; Yuliani, Wahyuni & Bakar 2019). Fadila, Hamzah and Sihombing (2015) examined the determinant of underpricing of 75 IPOs firms in Indonesia market during period 2010-2014, while Hanafi and Setiawan (2018) examined the determinant of underpricing in Indonesian IPO market during 2006-2015.The objective of OLS regressions is to estimate the mean of the dependent variable conditional on the value of the independent variables. The estimated coefficients in OLS regression represent the average change in dependent variable associated with a change in independent variable. Recent study in evaluation of underpricing in the

Indonesian IPO market undertaken by Sasikirono et al. (2018), used quantile regressions developed by Koenker and Bassett (1978) and Koenker (2005). Sasikirono et al. (2018) argue that the OLS regression may not be appropriate in dealing with extreme values and outliers in the distribution of the dependent variables.

The previous studies show that OLS regression can be used to identify determinants of gross spread and underpricing. In OLS regression dummy variables was used to identify the difference level of gross spread and underpricing between unit, for example, year, industry, firm size or offer size. However, dummy variable cannot be used to identify the determinants of gross spread and underpricing in different unit of industry, firm size or offer size. Therefore, panel regression was used in this study to identify main determinants of gross spread and underpricing on industry, firm size, and offer size sample, and discussed further in chapter 3 of methodology in section 3.6.

2.7 Summary

This chapter presented the literature related to the theoretical concepts, findings and methodology used in previous studies to examine gross spread and underpricing generally and within an Indonesian context. The discussion started with an overview of IPOs. The second section focused on explanations of and evidence related to gross spread. This section presented an overview and discussion about the definition of gross spread, components of gross spread (management fee, underwriting fee and selling fee), and different practices in underwriting compensation. This was followed by evidence on gross spread, a discussion of clustering patterns of gross spread and determinants of gross spread.

The third section focused on evidence and methodology related to underpricing. This section presented an overview of underpricing, including a definition and different perspectives of underpricing. This was followed by evidence on underpricing, theoretical explanations and determinants of underpricing from previous studies, and an outline of the methodology on underpricing. The last part of this chapter explored the evidence and methodology to explain the relationship between gross spread and underpricing, and identified gaps in existing studies.

Chapter 3: Conceptual Framework and Method

3.1 Introduction

This chapter discusses the conceptual framework and research method employed in this study to evaluate gross spread, underpricing and post-listing day performance of IPOs, including discussions of measurement of variables and econometric models.

The organisation of this chapter is as follows. Section 3.2 presents the conceptual framework of the research. Section 3.3 discuss development of hypotheses for gross spread, underpricing and the relationship between gross spread and IPO underpricing based on the literature review. Section 3.4 presents the data, sample and time period for this study. Section 3.5 focuses on measurement of selected explanatory variables of gross spread and underpricing. The explanatory variables for gross spread used in this study were categorised as (i) issue-specific characteristics; (ii) firm-specific characteristics; and (iii) market-specific characteristics. The explanatory variables for underpricing used in this study were categorised as (i) intended use of IPO proceeds; (ii) firm-specific characteristics; (iii) macroeconomic factors; (iv) issue-specific characteristics; (v) market-specific characteristics; and (vi) international stock market. Section 3.6 outlines research methods employed in previous studies. Section 3.7 outlines the methods employed to evaluate gross spread, underpricing and the determinants of gross spread and underpricing. Section 3.8 presents diagnostic tests for the multiple regression models, while Section 3.9 presents the diagnostic test for the panel regression models. Section 3.10 evaluation of post-listing day performance of IPO, and Section 3.11 provides the chapter summary.

3.2 Conceptual Framework of This Study

Figure 3.1 presents the conceptual framework of this research. A conceptual framework was developed to encompass the associations between gross spread, underpricing and the determinant variables for Indonesian IPO firms. This framework was developed based on the literature review in Chapter 2 to address the research questions.

The IPO process involves considerable gross spread (direct cost) and underpricing (indirect costs). Gross spread is measured using the percentage value of the difference between the offer price and the price paid by issuers to underwriters. Based on the literature review in Chapter 2, gross spread is presumed to be the result of several determinant variables. In this research, seven determinant variables were selected and justified: underwriter reputation (UWR), gross proceeds (GPC), offer price (OP), firm size (FSIZE), firm age (AGE), profitability (PROF) and hot issue market (HM).

Issuer firms choose highly reputable underwriters for the IPO process because, in addition to legal counsel, audits, notaries and independent appraisals, underwriters play an important role in the IPO process. Underwriters are expected to give advice to issuing firms, be able to assess the value of a firm accurately to mitigate information asymmetry and uncertainty at the IPO stage, and set offering prices (Razafindrambinina & Kwan 2013). Underwriter reputation is measured by the frequency-based measurement which is the number of IPOs underwritten by the underwriters. This study also included size of the IPO or proceeds and offer price as determinant variable. Further, three firms-specific characteristic variables (firm size, firm age and profitability) are also included because these variables are issuer-specific risks which are important in explaining the variation in underwriter spreads. The different level of gross spread is also evaluated when IPO firms were issued in hot markets or cold market. A hot issue market is a period when there is a high number of IPOs, severe underpricing and frequent oversubscription. In contrast, a cold IPO markets have much lower issuance, less underpricing, and fewer instances of oversubscription.

The second cost of IPO is underpricing, which is the difference between the offer price and the closing price on the first day of trading. Underpricing is presumed to be the result of several determinant variables to explain IPO underpricing in the Indonesian market. In this research, fifteen determinant variables were selected and justified: fixed asset investment (FAI), working capital financing (WCF), investment in shares of stock (ISS), debt repayment (DR), inflation rate (IFR), foreign exchange rate (FER), Dow Jones Index (DJI) and Shanghai Stock Exchange Index (SSE), underwriter reputation (UWR), gross proceeds (GPC), offer price (OP), firm size (FSIZE), firm age (AGE), profitability (PROF), and hot issue market (HM).

Intended use of proceeds is information used by investors to evaluate a firm's prospects and risks associated with the IPO. There are four intended uses of proceeds, adopted from Andriansyah and Messinis (2016): fixed asset investment, working capital financing, investment in shares of stock, and debt repayment. Fixed asset investment is measured as the percentage share of total proceeds intended for investment in non-current assets. Investment in shares of stock is measured as the percentage share of total proceeds intended as a capital contribution to the firm's subsidiaries and other firms, including the share incremental of subsidiaries. Working capital financing is defined as the percentage share of total proceeds intended for investment in current assets. Debt repayment is defined as the percentage share of total proceeds intended for investment in current assets and debt repayment.

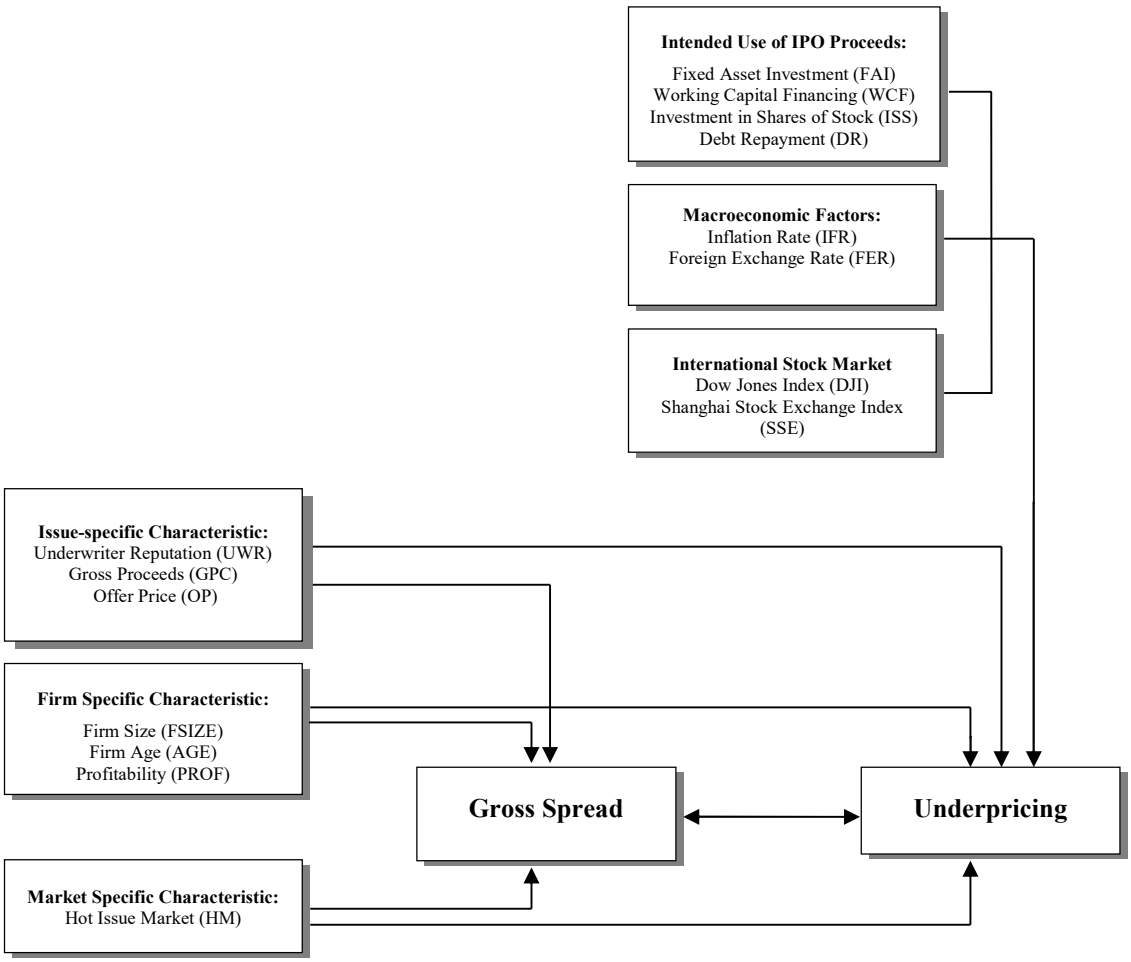


Figure 3.1. Conceptual Framework

Macroeconomic factors are included as determinant because macroeconomic factors are crucial drivers of IPO and aftermarket performance because different economic conditions influence the decision of firms to move to the IPO market and investors' expectations of future returns. The factors used in this study are inflation and foreign exchange rates. In addition, positive global stock indexes and regional stock indexes also influence investors' optimism regarding global and regional economic conditions. These economic condition influence their participation in stock markets, decision to buy stocks and initial returns. The factors used in this study are DJI and SSE Index.

Issuer-specific characteristic (underwriter reputation, gross proceeds, offer price) and firm-specific characteristic (firm size, firm age, and profitability) are included as variables to explain underpricing in Indonesian IPO market. Underwriter reputation is measured by the frequency-based measurement which is the number of IPOs underwritten by a given underwriter. With this

measurement, the level of underpricing can be compared by underwriter reputation. Gross proceeds or the offer size of the IPO indicates the level of uncertainty associated with the issuing firm (Miller & Reilly 1987). Gross proceeds and offer price were included because this two variables indicates the level of uncertainty and prospect associated with the issuing firm. A higher issue price indicates lower uncertainty related to the future performance of the firm (Daily et al. 2003), and this is reflected in lower underpricing. Meanwhile, the size and age of the firm can be used to measure the ex-ante risk of the IPO offer, whereby large and established firms are perceived as posing less risk than small firms, and older firms are perceived to be less risky compared with the same industry. Profitability provides information to outside parties regarding operational effectiveness. Financial performance can indicate to investors the true value of the firm, which is useful for making decisions regarding the buying of IPO stocks (Deb & Marisetty 2010). The different level of underpricing is also evaluated when IPO firms were classified into hot issue markets and cold issue market. A hot issue market is a period when there is a high number of IPOs, severe underpricing and frequent oversubscription. In contrast, a cold issue market is a period when the number of IPOs is low and there is less underpricing.

3.3 Development of Hypotheses

This study developed hypotheses to identify the relationship between gross spread, underpricing, and the explanatory variables. The developed hypotheses are categorised as follows: (i) development of hypotheses on gross spread; and (ii) development of hypotheses on underpricing.

3.3.1 Development of Hypotheses of Gross Spread

This study developed hypotheses to identify the relationship between gross spread and related explanatory variables. This study used seven determinant variables to explain IPO gross spread in the Indonesian market: underwriter reputation, gross proceeds, offer price, firm size, firm age, profitability and hot issue market.

These hypotheses aim to address RQ2:

RQ2: What are the main determinants of IPO gross spread for Indonesian listed firms?

The study developed hypotheses for variables are set out below:

3.3.1.1 Issuer-specific Characteristic

3.3.1.1.1. Underwriter reputation

Issuer firms choose highly reputable underwriters for the IPO process because, in addition to legal counsel, audits, notaries and independent appraisals, underwriters play an important role in the IPO process. Underwriters are expected to give advice to issuing firms, be able to assess the value of a firm accurately to mitigate information asymmetry and uncertainty at the IPO stage, and set offering prices (Razafindrambinina & Kwan 2013). Previous researchers have argued that highly reputable underwriters tend to bring more high-quality firms through the IPO process (Booth & Smith 1986; Tinic 1988). Therefore, they tend to charge higher fees than their less prestigious counterparts, to maintain their reputation. Fernando et al. (2015) supports the previous studies of Booth and Smith (1986) and Tinic (1988). They examined price differentiation based on reputation in the US and showed that more reputable underwriters in the US earn higher gross spreads than less reputable underwriters—reputable underwriters receive average reputational premiums equal to 0.65% of average IPO underwritten proceeds. In contrast, Pugel and White (1988) showed that more prestigious underwriters tend to charge lower underwriting fees. Meanwhile, Ahn, Kim and Son (2007) found different result when examined small and large IPOs in Korea. They found that underwriter reputation did not have a significant effect on gross spread.

H_1 : *There is a relationship between gross spread and underwriter reputation.*

3.3.1.1.2 Gross Proceeds

The size of the IPO or proceeds have been found to be a key determinant of the gross spread in numerous previous studies (Bairagi & Dimovski 2012; Bajo, Barbi & Petrella 2017; Sohn & Seo 2013; Torstila 2001). These researchers concluded that there is a negative relationship between gross spreads and proceeds. A negative relationship between proceeds and gross spread also found in the US market during period 1990-2007 (Kaserer, Mettler & Obernberger 2011). Abrahamson, Jenkinson and Jones (2011) compared the effect of gross proceeds to gross spread in the US and Europe market. They arrange proceeds into three group of small to large proceeds, and indicated that proceeds and gross spread are negatively related. Gross spreads are lower for the larger offerings in both regions. The responsiveness of gross spreads to proceeds in previous studies could be indicative of a changing level of competition in the market. If the market becomes more competitive and less prone to collusion as proceeds increase, as suggested in Chen (1999), the relationship between gross spreads and proceeds may appear relatively responsive.

H_2 : *There is a negative relationship between gross proceeds and gross spread.*

3.3.1.1.3 Offer Price

In the US, Logue and Lindvall (1974) suggested that there is a negative relationship of offer price and gross spread. The gross spread was lower for IPO with higher offer price. However, if the offer price is determined simultaneously with the underwriting fee, the underwriters will require higher fee as a compensation of bearing risk form capital loss because of under-subscription, and the underwriters willing to negotiate for lower gross spread for IPO with higher offer price. is likely to speed up the distribution period and lower the likelihood of under-subscription. The trade-off between offer price and gross spread found on the evaluation of gross spread in the US market. Chen and Mohan (2002) documented that higher quality IPOs have higher offering prices and higher offering price is associated with lower underwriter spread when they evaluate IPO firms in the US market during period 1990-1992. Underwriter will set higher offer price when they confidence about the prospect of firms, and underwriters are willing to charge lower gross spread (Chen, Fok & Wang 2006). The negative relationship between offer price and gross spread is supported by latest study from Bajo, Barbi and Petrella (2017) and and Petrella (2017).

H_3 : There is a negative relationship between offer price and gross spread.

3.3.1.2 Firm -specific Characteristic

Pugel and White (1988) argued that underwriters are concerned with issuer-specific risks and this explains the variation in underwriter spreads. They examined the determinants of gross spreads of firm-commitment IPOs in the US from January–June 1981. They used firm age and size as proxies for issuer-specific risks. The results show that underwriting risk related to issuer age and size was lower and negatively related to gross spread, because investors and underwriters are more familiar with older issuing firms. Evaluation of gross spread in the US market during period 1990-2007 found consistent result that firm size and firm age have a negative relationship with gross spread (Kaserer, Mettler & Obernberger 2011). They assumed that the relationship is negative when older firms have a better developed accounting infrastructure to increase transparency and accountability and, therefore, have to pay slightly lower accounting and legal fees.

Ahn, Kim and Son (2007) used firm age and profitability as proxies for risk and found a negative relationship between profitability and underwriting fees for large IPOs. They argued that risk of underwriting profitable IPOs might be lower, because these firms are relatively easy to sell on the market. Therefore, it is expected that more profitable firms will pay lower underwriting fees.

H_4 : There is a negative relationship between firm size and gross spread.

H_5 : There is a negative relationship between firm age and gross spread.

H_6 : There is a negative relationship between profitability and gross spread.

3.3.1.3 Hot Issue Markets

The definition of a hot IPO market was first introduced by Ibbotson and Jaffe (1975), followed by Ritter (1984, 1998). A hot issue market is a period when there is a high number of IPOs, severe underpricing and frequent oversubscription. In contrast, a cold issue market is a period when the number of IPOs is low and there is less underpricing. Hot issue markets are also identified with a low cost of going public; therefore, IPO issuing firms may find going public in this period optimal (Bartling & Park 2009).

Ahn, Kim and Son (2007) examined gross spread differentiation based on issuers' listing period in the market. They found that firms that go public during a hot issue market pay lower underwriting fees than those going public during cold issue markets. Underwriters tend to charge lower fees during a hot issue market because in this period underwriters can do more business. This result is consistent for both small and large IPOs.

H_7: Gross spread of IPOs issued in hot markets is lower than for IPOs issued in cold markets.

Table 3.1. Summary of Development of Hypotheses of Gross Spread

Dependent Variable	Independent Variable	Hypothesis	Expected Sign
Gross Spread (GSP)	Underwriter Reputation (UWR)	H_1	Positive/Negative
	Gross Proceeds (GPC)	H_2	Negative
	Offer Price (OP)	H_3	Negative
	Firm Size (FSIZE)	H_4	Negative
	Firm Age (AGE)	H_5	Negative
	Profitability (PROF)	H_6	Negative
	Hot Issue Market (HM)	H_7	Negative

3.3.2 Development of Hypotheses of Underpricing

This study develops hypotheses to identify the relationship between underpricing and related explanatory variables, using 15 determinant variables to explain IPO underpricing in the Indonesian market: fixed asset investment, working capital financing, investment in shares of stock, debt repayment, inflation, foreign exchange rates, DJI, SSE, underwriter reputation, gross proceeds, offer price, firm size, firm age, profitability, and hot issue market. The hypotheses seek to address RQ4 and RQ5:

RQ4: What are the main determinants of IPO underpricing for Indonesian listed firms?
RQ5: Do macroeconomic conditions and international stock markets have a role in explaining the level of IPO underpricing for Indonesian listed firms?

The study developed hypotheses for variables as set out below.

3.3.2.1 Intended Use of IPO Proceeds

The intended use of proceeds from the IPO should be disclosed in the prospectus. This information has been evaluated in the underpricing context, and can be used by investors to evaluate a firm's prospects and risks associated with the IPO (Leone, Rock & Willenborg 2007; Maulidia & Gumanti 2015; Wyatt 2014). The use of proceeds perceived as risky, such as debt repayment, working capital and primary shares, require compensating investors with high initial returns. In Indonesia, according to the Financial Services Authority of Indonesia (BAPEPAM-LK), proceeds may be used for several purposes: debt repayment, research and development (R&D), expansion and acquisitions, marketing and promotion, distribution to pre-IPO shareholders, working capital and other uses. Andriansyah and Messinis (2016) categorise the use of proceeds as fixed asset investment, investment in shares of stock, working capital financing, secondary shares and debt repayment. Gumanti (2007) found that the use of proceeds for investment in Indonesia is negatively related to the level of underpricing, and Maulidia and Gumanti (2015) found that the use of proceeds for working capital is negatively related to underpricing. However, these results contrast with previous research, which finds the two variables are positively related.

H_8 : *There is a negative relationship between fixed asset investment and underpricing.*

H_9 : *There is a negative relationship between working capital financing and underpricing.*

H_{10}: *There is a positive relationship between investment in shares of stock and underpricing.*

H_{11}: *There is a negative relationship between debt repayment and underpricing.*

3.3.2.2 Macroeconomic Factors

Macroeconomic factors are crucial drivers of IPOs and aftermarket performance because different economic conditions influence the decision of firms to move to the IPO market and influence investors' expectations about future returns. Indicators of macroeconomic factors, including Gross Domestic Product (GDP) growth rates, interest rates, inflation rates and foreign exchange rates contain useful information that influences IPOs (Chen, Roll & Ross 1986). High GDP growth rates, low interest rates, low inflation rates and foreign exchange rate appreciation are indicative of better economic conditions. Macroeconomics conditions affect the economic climate, thus affecting firms' decision to go public (Angelini & Foglia 2018), higher interest rates keep investors away from the IPO market and affect the number of IPOs (Ameer 2012), and a change in macroeconomic policies has economic implications for market participants (Ameer 2007; Tran & Jeon 2011), because investors invest more in IPOs if they expect the economic situation to improve (Gunturkun, Gurarda & Erdogen 2012).

H_{12}: There is a positive relationship between inflation rates and underpricing.

H_{13}: There is a negative relationship between foreign exchange rates and underpricing.

3.3.2.3 International Stock Market

Global and regional stock indexes influence an individual country's stock index. An increase in the Dow Jones Index (DJI), for example, influences stock indexes in emerging countries in Asia because investors' optimism regarding global economic conditions influence their decision to buy stocks (Wong et al. 2004). In their evaluation of the relationship between stock markets of major developed countries and Asian emerging markets, it has been observed that there has been increasing interdependence between most of the developed and emerging markets since the 1987 Stock Market Crash. Indonesia has started stock market liberalization since 1989 which allows foreign investors to increase the portfolio diversification with buying stocks in Indonesia and some others Asian countries. Further, Darrat and Zhong (2002) and Karim et al. (2009) noted that the DJI and Shanghai Stock Exchange Index (SSE) have a positive influence on other stocks in Asia, and according to Karim et al (2009) the Indonesian market responds more to shocks in the US in the short run. Investors' optimism about economic conditions increase stock market participation and initial returns.

H_{14}: There is a positive relationship between the DJI and underpricing.

H_{15}: There is a positive relationship between the SSE and underpricing.

3.3.2.4 Issuer-specific Characteristics

3.3.2.4.1 Underwriter Reputation

Firms play an important role in choosing a particularly reputable underwriter for the IPO process in order to reduce underpricing. Highly reputable underwriters are able to assess the value of a firm and can mitigate the asymmetric information and uncertainty at the IPO stage (Razafindrambinina & Kwan 2013). Highly reputable underwriters can also be a signal of firm value because they undertake only high-quality offerings (Beatty 1989; Carter & Manaster 1990). Further, underwriters provide price stabilization for IPOs, reducing price drops for a few days or weeks in the secondary market, and reduce the volatility of IPO initial returns (Ellis, Michaely & O'Hara 2000; Lowry, Officer & Schwert 2010). This result is consistent with the research findings of Carter, Dark & Singh (1998), who found a negative association between underwriter reputation and IPO underpricing—the better the reputation of the underwriter, the lower the IPO underpricing. Negative relationship also found in 72 Indonesian IPOs from 2009-2013 (Indriani & Marlia 2014) and other Indonesian studies (Fadila, Hamzah & Sihombing 2015; Syukur, Fathoni & Gagah 2018; Yuliani, Wahyuni & Bakar 2019).

Contrary result found in Cooney et al. (2001), and Loughran and Ritter (2004), who found positive relationship between underwriter reputation and underpricing. This result is different from other previous studies in the US, and they documented negative relationship between underwriters and underpricing occurs in IPO of 1980s and positive relationship found in IPO of 1990s. In 1990s, highly reputable underwriters began to underwrite younger and more risk IPO firms which they avoided in the 1980s (Loughran & Ritter 2004). The positive result also found in Dimovski, Philavanh and Brooks (2011) when they evaluate underwriter reputation and underpricing of 380 IPO firms in Australia from 1994-2004. They found underwriter reputation and underpricing are positively related, highly reputation underwriters associated with a higher level of underpricing.

H_{16}: There is a relationship between underwriter reputation and underpricing.

3.3.2.4.2 Gross proceeds

Gross proceeds or the offer size of the IPO indicates the level of uncertainty associated with the issuing firm (Miller & Reilly 1987). Larger IPOs are usually offered by well-known firms, and this reduces investors' perceived risk of the IPO (Carter, Dark & Singh 1998). Previous research has found a negative relationship between offer size and level of underpricing (Chi & Padgett 2005; Guo & Brooks 2008; Marisetty & Subrahmanyam 2010). Similar results on a negative relationship between offer size and underpricing is found in several studies, including Chi and Padgett (2005) and Belghitar and Dixon (2012). However, a contrary result is found in Suchard and Singh (2007) and Alli, Subrahmanyam and Gleason (2010), who reported gross proceeds as having a positive relationship with initial underpricing.

H_{17}: There is a negative relationship between gross proceeds and underpricing.

3.3.2.4.3 Offer price

Previous studies have found evidence that offer price, as one of the issue characteristics, can reduce underpricing as a result of uncertainty. A higher issue price indicates lower uncertainty related to the future performance of the firm (Daily et al. 2003), and this is reflected in lower underpricing. Dimovski, Philavanh and Brooks (2011) examined 380 IPOs in Australia during 1994–2004 and found that offer price has a negative relationship with level of underpricing. This is supported by Guo and Brooks (2008), who found that issuer firms with a lower offer price in the IPO generally have higher underpricing. Meanwhile, higher offer prices indicate lower uncertainty regarding the future performance of the firm (Certo et al. 2003). However, Kutsuna, Dimovski and Brooks (2008) found a contrasting result—a statistically significant positive relationship between offer price and underpricing.

H_{18}: There is a negative relationship between offer price and underpricing.

3.3.2.5 Firm Specific Characteristic

3.3.2.5.1 Firm Size

The size of the firm can be used to measure the ex-ante risk of the IPO offer, whereby large and established firms are perceived as posing less risk than small firms. Investors generally pay more attention to large firms, because these tend to have a more stable condition, which attracts investors to own shares. Investors have high expectations of large firms and expect rising share prices. Increased demand for a company's stock spurs an increase in stock prices. Firm size affects underpricing, with research finding a negative association between firm size and IPO underpricing (Carter, Dark & Singh 1998, Islam, Ali & Ahmad 2010).

H_{19} : *There is a negative relationship between firm size and underpricing.*

3.3.2.5.2 Firm Age

Research conducted to determine the relationship between firm age and underpricing shows that firm age negatively influences underpricing on the first day (Loughran & Ritter 2004; Belghitar & Dixon 2012), with recent research in Tunisia supporting this contention (Zouari, Boudriga & Taktak 2011). Older firms are perceived to be less risky compared with the same industry. Older firms are perceived as less risky, as they are more established and have more information that can be easily accessed by the public (Gong & Shekhar 2001). This decreases uncertainty at the IPO stage, and is reflected in lower underpricing.

H_{20} : *There is a negative relationship between firm age and underpricing.*

3.3.2.5.3 Profitability

Financial performance, including profitability is essential because when firms go public investors will evaluate financial performance prior to IPO. Profitability can used by shareholders to assess the performance of the firms (Bhabra & Pettway 2003). Profitability provides information to outside parties regarding the operational effectiveness of the firms. Higher profitability attracts investors to a firm's IPO because investors expect a positive future performance (Pukthuanthong-Le & Varaiya 2007). Financial performance can indicate to investors the true value of the firm, which is useful for making decisions regarding the buying of IPO stocks (Deb & Marisetty 2010).

H_{21} : *There is a negative relationship between profitability and underpricing.*

3.3.2.6 Hot Issue Market

The definition of a hot IPO market was first introduced by Ibbotson and Jaffe (1975) followed by Ritter (1984) and Ritter (1998). A hot issue market is a period when there is a high number of

IPOs, experience severe underpricing, and there is frequent oversubscription. In contrast, a cold IPO markets have much lower issuance, less underpricing, and fewer instances of oversubscription. A Hot issue market also identify with low cost of going public; therefore, issuing IPO firms find that going public in this period can be optimal (Bartling & Park 2009). Severe underpricing starts with unusual oversubscription (Ritter 1984). Investor sentiment is reported as a determinant of high initial returns in hot issue markets because investors are overoptimistic about the new issue and willing to pay more in the IPO (Bogan 2009). Helwege and Liang (2004) reported that hot markets are also concentrated in particular industries. Darmawangsa and Darmawangsa (2014) indicated that hot issue markets occur in the Indonesian IPO market. They examine 78 IPOs during 2001–2005, and found high underpricing to be positively related to the volume of IPOs. Similar results were found in Italy, France and Germany, indicating high initial returns during hot issue markets (Gandolfi et al. 2018). The short-run and long-run performance of firms also differ depending on the type of market conditions when IPOs are issued. Brav, Geczy and Gompers (2000) evaluated the long-run performance of IPO firms from 1975–2002 in the US and found that firms listing during a hot market tend to underperform compared with firms listing during a cold market.

H_{22}: *IPO firms issued in hot markets are more underpriced than IPO firms issued in cold markets.*

Table 3.2. Summary of Development of Hypotheses of Underpricing

Dependent Variable	Independent Variable	Hypothesis	Expected Sign
Underpricing (UNDP)	Fixed Asset Investment (FAI)	H_8	Negative
	Working Capital Financing (WCF)	H_9	Negative
	Investment in Shares of Stock (ISS)	H_{10}	Positive
	Debt Repayment (DR)	H_{11}	Negative
	Inflation Rates (IFR)	H_{12}	Positive
	Foreign Exchange Rates (FER)	H_{13}	Negative
	Dow Jones Index (DJI)	H_{14}	Positive
	SSE Index (SSE)	H_{15}	Positive
	Underwriter Reputation (UWR)	H_{16}	Positive/Negative
	Gross Proceeds (GPC)	H_{17}	Negative
	Offer Price (OP)	H_{18}	Negative
	Firm Size (FSIZE)	H_{19}	Negative
	Firm Age (AGE)	H_{20}	Negative
	Profitability (PROF)	H_{21}	Negative
	Hot Issue Market (HM)	H_{22}	Negative

3.3.3 Development of Hypotheses for Relationship of Gross Spread and Underpricing

Chen and Mohan (2002) and Kim, Palia and Saunders (2010) examined three possible relationships between direct cost (gross spread) and indirect cost (underpricing): an insignificant relationship

between the two variables, that the two variables are substitutes, and that the two variables are complements. Both studies found that the gross spread and underpricing are complementary or positively related if the relationship between the costs is based on the quality of the issuer. However, if the relationship between gross spread and underpricing is based on underwriter reputation, Chen and Mohan (2002) found the two costs are substitutes or negatively related. Fernando et al. (2015) examined gross spread differentiation based on reputation in the US and similarly found that gross spread is negatively related to underpricing.

This study developed a hypothesis to address RQ6:

RQ6: What is the relationship between gross spread and underpricing?

The hypothesis to evaluate the relationship between gross spread and underpricing is as follows:

H_{23}: *Gross spread and underpricing are jointly determined.*

3.4 Data, Sample and Time Period

The study examines the cost of going public – both gross spread and underpricing – of firms listed on the IDX during January 2007–December 2016. The study chose to start at the beginning of 2007, because information on gross spread and offer price have been available in the prospectuses of companies only since then. This was a result of BAPEPAM-LK, the Financial Services Authority of Indonesia, mandating that this information had to be disclosed in a firm's prospectus. Prospectuses were collected from The Indonesia Capital Market Institute, and other data were collected from prospectuses and IDX databases.

The selection of the sample employed purposive sampling. The selected IPO firms had to meet the following criteria: (i) listed on the IDX during the sample period January 2007–December 2016, (ii) non-financial sector firms, and (iii) provide gross spread and offer price information in the prospectus, as required for this study. The initial sample included 207 IPOs in the IDX databases. Financial sector firms were excluded from the sample, including firms in the banking industry, financial institutions, securities companies and insurance firms. The initial sample excluded 11 IPO firms due to the unavailability of prospectuses, and seven because of incomplete data in prospectuses. Another 10 firms were excluded because their data contained outliers. The final sample comprised 150 IPOs, representing 72% of the total firms listed from 2007-2016, from eight industries: 1) agriculture; 2) mining; 3) basic industry and chemicals; 4) miscellaneous; 5) consumer goods; 6) property and real estate; 7) infrastructure, utilities and transportation; and 8) trade and services, as shown in Table 3.3.

Table 3.3. Research Sample

Firm Sample Size	Firms
Total Indonesian listed firms in IDX from 2007- 2016	207
Less:	
Financial sector (i.e., bank, financial institutions, securities companies, and insurances)	(29)
Total Indonesian non – financial sector listed firms in IDX from 2007-2016	178
Less:	
Unavailable of prospectus	(11)
Incomplete gross spread data in prospectus	(7)
Outlier	(10)
Final Sample	150

Table 3.4 shows the distribution of the total listed IPOs and sample according to year. The number of IPOs listed per year varies—2013 had the highest number of IPOs (30 IPOs), and 2009, the lowest (13 IPOs), due to the global financial crisis in 2008. The crisis caused the IDX composite index to plummet to its lowest level. As a result, some firms postponed their IPO. The decrease in number of IPOs in 2015 and 2016 arose because of Indonesian economic conditions.

From a total of 207 IPOs listed on the IDX during the sample period, 150 IPOs (72%) comprised the final sample, with the lowest proportion (61%) in 2014 and the highest proportion (86%) in 2012. For the non-finance industry sample, the proportion in the consumer goods industry was the lowest (60%), with a total of six IPOs during the sample period; mining and miscellaneous industry had the highest proportion (100%).

Table 3.4. Distribution of Total Listed IPO and Sample by Year and Industry

Year	Total Listed IPO	Sample of IPOs	Sample of IPOs (%)
2007-2016	207	150	72
Panel A : Year			
2007	22	15	68
2008	18	12	67
2009	13	9	69
2010	23	17	74
2011	25	19	76
2012	22	19	86
2013	30	22	73
2014	23	14	61
2015	16	12	75
2016	15	11	73
Panel B : Industry			
Agriculture	12	11	92
Mining	23	23	100
Basic Industry and Chemicals	11	10	91
Miscellaneous Industry	7	7	100
Consumer Goods	10	6	60
Property and Real Estate	40	31	78
Infrastructure, Utilities, and Transportation	23	22	96
Finance	33	0	0
Trade, Service and Investment	48	40	83

Source: www.idx.co.id and prospectuses

3.5 Measurement of Variables

3.5.1 Measurement of Gross Spread and Selected Determinants of Gross Spread

Based on the literature review, the explanatory variables for gross spread used in this study were underwriter reputation, gross proceeds, offer price, firm size, firm age, profitability, and hot issue market. Measurement of these variables is explained below.

3.5.1.1 Gross Spread

Gross spread or underwriting discount (direct cost) is the difference between the offer price and the price paid by the underwriter to the issuer (Ahn, Kim & Son 2007). The gross spread is a percentage commission per share paid to underwriters as compensation to cover expenses, management fees, commission and risk. In this research, gross spread is the total of the three fee components: management fee, underwriting fee and selling fee.

3.5.1.2 Underwriter Reputation

Underwriter reputation in previous studies was measured based on frequency and total gross proceeds. However, in this study underwriter reputation was only measured based on the frequency of underwritten IPOs of each underwriter, due to lack of total gross proceeds data. The measurement of underwriter reputation is partitioned using median frequency into a two-tier system, adopted from Lee (2012).

At first, the period of observation is divided into two—2007-2009 and 2010-2016. The sub-periods are based on the fluctuation in number of IPOs and gross proceeds during the sample period. In 2008, the global financial market affected the number of IPOs and gross proceeds. These indicators fell to their lowest in 2009, and increased significantly in 2010. Therefore, this research defined 2009 as the cut-off of the first period (2007-2009), which included the global financial crisis of 2008, and 2010–2016 as the second period. The all sample of IPO are grouped into two period of 2007-2009 and 2010-2016—to examine changes in underwriter rank. Underwriters were ranked based on the frequency of underwritten IPOs of each underwriter within sub-period. Within each period, the underwriters are partitioned using median frequency into a two-tier system.The first-tier underwriters, with number of offerings higher than the median, are referred to as high-reputation underwriters; the second-tier underwriters, with number of offerings lower than the median group, are the low-reputation underwriters.

3.5.1.3 Gross Proceeds

Gross proceeds or offering size was measured as the natural logarithm of proceeds. Gross proceeds is defined as the number of issued shares by the offer price per share, as follows:

Gross proceeds = offer price per share x number of issued shares (3.1)

3.5.1.4 Offer Price

Offer price was measured as the natural logarithm of the offer price of IPO. This information can be obtained from prospectus of IPO.

3.5.1.5 Firm-specific Characteristics

Firm-specific characteristics are identified as determinant variables of gross spread. Firm-specific characteristics for this study are firm size, age and profitability. The variables are based on information available in firm prospectuses, showing firm performance prior to the IPO. Firm size, firm profitability and firm age data used in this research were drawn from the year before the IPO.

Since this research adopts the transcendental logarithmic (translog) functional form, firm size was measured with the natural logarithm of total assets of the firm. The natural logarithm of the age of an issuing firm from establishment to a year prior to the IPO ($t-1$) was used to measure firm age. Firm profitability was measured using the proxy return on equity (ROE), expressed as a percentage and calculated as:

$$Return\ on\ Equity = \frac{Net\ \ Income}{Shareholders'\ \ Equity} \tag{3.2}$$

3.5.1.6 Hot Issue Market

The definition of hot and cold markets is based on total number of IPOs completed per three months (Helwege & Liang 2004). The measurement consists of a three-month centred moving average of IPO firms for each month. A hot IPO market occurs when there is a high volume of offerings (a monthly moving average equal to or more than the median), while a cold IPO market occurs when there is a low volume of offerings (or monthly moving average less than the median). The dummy hot issue market is equal to one ($D_{HM} = 1$) if the firm issues in a hot market and equal to zero ($D_{HM} = 0$) if the firm issues in a cold market. From 150 IPO firms, 126 had their IPO in a hot market, and 24 had their IPO in a cold market.

3.5.2 Measurement of Underpricing and Selected Determinants of Underpricing

This study developed several explanatory variables based on the literature review to examine the determinants of underpricing: intended use of IPO proceeds, macroeconomic factors, international stock markets, issue-specific characteristics, firm-specific characteristics, and market-specific characteristics. Intended use of IPO proceeds included fixed asset investment, working capital financing, investment in shares of stock, and debt repayment. Macroeconomic factors included inflation rate and foreign exchange rate. International stock markets were incorporated by the DJI and the SSE. The measurement of issue-specific characteristi, firm-specific characteristi, and market-specific characteristic variables have discussed in previous section 3.5.

3.5.2.1 Underpricing

Underpricing is considered the indirect cost of going public. Underpricing was measured as the initial return of the IPO or the difference between the offer price and the closing price on the first day of trading, following Abdou and Dicle (2007) and Wasiuzzaman et al. (2018), as follows:

$$IR_{it} = \frac{(P1_i - P0_i)}{P0_i} \tag{3.3}$$

where IR_{it} is initial return of IPO for company i, $P1_i$ is closing market price of company i on the first day of trading and $P0_i$ is offer price of company i. Positive (+) initial returns (IRs) is considered underpricing, and negative (−) initial returns (IRs) is considered overpricing.

3.5.2.2 Intended Use of IPO Proceeds

According to the Financial Services Authority of Indonesia (BAPEPAM-LK), proceeds may be used for several purposes: debt repayment, research and development (R&D), expansion and acquisitions, marketing and promotion, distribution to pre-IPO shareholders, working capital and other uses. Andriansyah and Messinis (2016) categorised the use of proceeds as fixed asset investment, investment in shares of stock, working capital financing, secondary shares and debt repayment. The intended use of IPO proceeds were categorised into four purposes, adopted from Andriansyah and Messinis (2016): fixed asset investment, investment in shares, working capital financing and debt repayment. Fixed asset investment is measured as the percentage share of total proceeds intended for investment in non-current assets. Investment in shares of stock is measured as the percentage share of total proceeds intended as a capital contribution to the firm's subsidiaries and other firms, including the share incremental of subsidiaries. Working capital financing is defined as the percentage share of total proceeds intended for investment in current assets. Debt repayment is defined as the percentage share of total proceeds intended for investment in current assets and debt repayment. All these information are collected from the prospectuses.

3.5.2.3 Macroeconomic Factors

Macroeconomic factors in this research are inflation rates and foreign exchange rates. The inflation rates used was inflation rates data a month before the IPO. The inflation rates monthly data are obtain from the Indonesian Central Bureau of Statistics or *Badan Pusat Statistik Indonesia* (BPS). Foreign exchange rate data were the Indonesian Rupiah spot from Bloomberg. The exchange rates was mean of daily exchange rates from 30 days to 1 day prior IPO.

3.5.2.4 International Stock Market

Two market index of international stock markets used in this research: DJI and SSE. The Dow Jones Index or the Dow is a stock market index of the 30 largest publicly owned firms in the US stock market, measuring the average share price of the 30 stocks The second international stock market variable of SSE is based on all firms traded on the Shanghai stock exchange market.

Table 3.5. Summary of Determinants Variables and Expected Sign

Variables	Variables in Equation	Measurement	Expected Sign	
			Gross Spread	Underpricing
Gross Spread	GSP	The percentage of fee paid to the underwriters as compensation, to cover underwriting fee, management fee and selling fee		
Underpricing	UNDP	The difference between the offer price and the closing price on the first day of trading for each company		
Issue-specific Characteristic				
Underwriters' Reputation	UWR	A dummy variable equal to '1' if the underwriter has higher reputation, and '0' otherwise	Positive/Negative	Positive/Negative
Gross Proceeds	GPC	The natural logarithm of proceeds (the Offer price times the number of shares offered	Negative	Negative
Offer Price	OP	The natural logarithm of the offer price of the issue	Negative	Negative
Firm -specific Characteristic				
Firm Size	FSIZE	The natural logarithm of total asset of the firm	Negative	Negative
Firm Age	AGE	The natural logarithm of the age of issuing firm from establishment to a year prior to IPO *t-1*	Negative	Negative
Profitability	PROF	The Return on Equity (ROE) of the firm	Negative	Negative
Market -specific Characteristic				
Hot Issue Market	HM	Three-month centred moving-average of IPO firms for each month, during the period of 2007 up to 2016. A dummy for hot issue market equal to '1' if the firm issue in hot market and '0' otherwise.	Negative	Negative
Intended Use of IPO Proceeds				
Fixed Asset Investment	FAI	The percentage shares of total proceeds intended for investment in non-current assets	_	Negative
Working Capital Financing	WCF	The percentage shares of total proceeds intended for investment in current assets	_	Negative
Investment in Shares of Stock	ISS	The percentage shares of total proceeds intended as a capital contribution to the firm's subsidiaries and other firms which includes share incremental of subsidiaries	_	Positive
Debt Repayment	DR	The percentage shares of total proceeds intended for the debt repayment	_	Negative
Macroeconomic Factors				
Inflation Rates	IFR	Inflation rates	_	Positive
Foreign Exchange Rates	FER	Exchange rates to domestic currency	_	Negative
International Stock Markets				
Dow Jones Index	DJI	Dow Jones Index	_	Positive
Shanghai Stock Exchange Index	SSE	SSE Index	_	Positive

3.6 Research Method Review

This section will discuss about research methods employed in previous studies and present study to evaluate gross spread, underpricing, and the determinants of gross spread and underpricing.

3.6.1 Research Methods Employed in Previous Studies

As evidenced in Tables 3.6 and Table 3.7, previous studies of gross spread and underpricing were mostly examined under pooled OLS regressions (Bajo, Barbi & Petrella 2017; Hanafi & Setiawan 2018; Koda & Yamada 2018; Mohamed & Saadouni 2018). Bajo, Barbi and Petrella (2017) used a pooled OLS regression to examine gross spread of 6,814 IPO firms in the US market during period 1983-2007, while Koda and Yamada (2018) used it to examine gross spread of 588 IPO firms in Japan market during period 2002-2011. OLS regression has also been commonly used in evaluation of gross spread and underpricing in previous studies, including in Hanafi and Setiawan (2018), who examined the determinant of underpricing in Indonesian IPO market during 2006-2015.The objective of OLS regressions is to estimate the mean of the dependent variable conditional on the value of the independent variables. The estimated coefficients in OLS regression represent the average change in dependent variable associated with a change in independent variable .

The evaluation of gross spread and underpricing are employed two-stage least squares (2SLS). This technique is the extension of the OLS method and this is used when the dependent variable's error terms are correlated with the independent variables. In cost of IPO study, the 2SLS regression model was used to examined three possible relationships between gross spread and underpricing: 1) gross spread and underpricing might have an insignificant relationship; 2) the two costs have a negative relationship as they are substitutes; or 3) they are complements if gross spread and underpricing shows positive relationship (Chen & Mohan 2002; Fernando et al. 2015; Kim, Palia & Saunders 2010; Loughran & Ritter 2002; Logue & Lindvall 1974; Yeoman 2001; Zhang 2003). Chen and Mohan (2002) using 2SLS to examined 806 IPO firms in the US from 1990 and 1992 to test joint correlation between gross spread and underpricing. Evaluation on gross spread and underpricing have also been undertaken to 3,317 IPO firms in the US market using 2SLS (Zang 2003), and following with Fernando et al. (2015) examined gross spread differentiation based on reputation in the US using a 2SLS approach.

Table 3.6. Summary of Empirical Evidence on Gross Spread, Determinant Variables and Econometric Models

Author(s)	Period	No. Sample	Country	Determinant Variables	Econometric Models
Chung, Kryzanowski & Rakita (2000)	1984-1993	463	Canada	Offer price, IPO size, underwriter reputation, number in underwriter syndicate, return	Pooled OLS
How & Yeo (2000)	1980-1996	282	Australia	Underwriter reputation, gross proceeds, ex-ante offering risk, subscription period, retained ownership, low-balling effect	Pooled OLS
Hansen	1998	4153	US	Proceeds, return volatility, EBIT, debt, underwriter ranking	Pooled OLS
Torstila (2001)	1986-1999	565	European	Offering characteristics, market characteristics, underwriter characteristics	Pooled OLS
Torstila (2001)	1990	4186	US	Initial return, abnormal bid-ask spread, number of book-runners, revenues, underwriter rank	Pooled OLS
Chen & Mohan (2002)	1990-1992	806	US	Gross proceeds, offer price, underpricing, other expenses	2SLS
Fields, Frazer & Bhargava (2003)	1991-1997	4566	US	Use of IPO proceeds, underwriter reputation, issue size, issuer risk, ownership structure	Pooled OLS
Kaserer & Kraft (2003)	1993-1998	117	German	Firm size, firm risk, offering method	Pooled OLS
Torstila (2003)	1986-1999	11,000	Asia Pacific, Europe, North America	Gross proceeds, pricing strategy, underpricing, number of analysts	Pooled OLS
Zhang (2003)	1990-2004	3,317	US	Underwriter reputation, gross proceeds, volume, age, underpricing	Pooled OLS; 2SLS
Chen, Fok & Wang (2006)	1989-1999	419	Taiwan	Offer size, firm age, subscription success rate, number of subscriptions, underwriter retention rate	Pooled OLS
Ahn, Kim & Son (2007)	2000-2006	433	Korea	Underwriter reputation, issue-specific risks, IPO market conditions, largest shareholder ownership, subscription period, regulation change	Pooled OLS; 2SLS
Kim, Palia & Saunders (2010)	1980-2000	4,875	US	Underwriter reputation, competition, investment banking analysts, market timing, volume, issuer-specific variable, volatility, overallotment options	Pooled OLS; 3SLS
Abrahamson, Jenkinson & Jones (2011)	1998-2007	1,931	US	Gross proceeds, venture capital, privatisation	Pooled OLS
		914	Europe		

Kaserer, Mettler & Obernberger (2011)	1990-2007	116	US	Proceeds, firm assets, firm age	Pooled OLS
Bairagi & Dimovski (2012)	1996-2010	125	Australia	Gross proceeds, underwriter reputation, return volatility	Pooled OLS
Lee (2012)	1993-2002	1,894	US	Underwriter reputation, underpricing, aftermarket standard deviation	Pooled OLS
Meoli, Signori & Vismara (2012)	1995-2009	1,858	European market	Underwriter reputation, underpricing, issue size, dilution factor, privatisation, participation ratio, market timing, issue-specific risk	Pooled OLS; 2SLS
Sohn & Seo (2013)	2000-2006	433	Korea	Proceeds, secondary sale, volatility, debt, EBIT, underwriter ranking	Pooled OLS
Chen & Wang (2015)	2004-2012	1,217	China	Underwriter reputation, sponsoring representatives reputation, gross proceeds, firm size, firm age	Pooled OLS
Fernando et al. (2015)	1980-2010	6,378	US	Offering characteristics, issuer characteristics	Pooled OLS; 2SLS
Warwryszuk-Misztal (2016)	2006-2015	83	Poland	issue size, ownership concentration, a proportion of shares allotted to institutional/large investors, profitability, issuer risk and a stock market situation	Pooled OLS
Bajo, Barbi & Petrella (2017)	1983-2007	6,814	US	Proceeds, IPO return, market volatility, IPO frequency, offer price, underwriter reputation	Pooled OLS
Koda & Yamada (2018)	2002-2011	588	Japan	Earnings, assets, main bank, subsidiary venture capital	Pooled OLS

Table 3.7. Summary of Empirical Evidence on Underpricing, Determinants Variables and Econometric Models

Author(s)	Period	No. Sample	Country	Determinants Variables	Econometric Models
Darmadi & Gunawan (2013)	2003-2011	101	Indonesia	Board size, board independence and institutional ownership	Pooled OLS
Hasan, Hadael & Gorener (2013)	20000-2008	71	Indonesia	Offer size, total assets, shareholders' equity, current assets, current liability, profit	Pooled OLS
Joni (2013)	2010-2013	80	Indonesia	ROA, EPS, firm age, financial leverage	Pooled OLS
Utaminingsih (2013)	2001-2010	118	Indonesia	IPO price, underwriter reputation, firm age, gross proceeds, revenue, sales	Pooled OLS
Husnan, Hanafi & Munandar (2014)	1995-2012	231	Indonesia	Price to book value, underwriter reputation, IPO size, IPO percentage	Pooled OLS
Indriani & Marlia (2014)	2009-2013	72	Indonesia	Underwriter reputation, financial leverage	Pooled OLS
Fadila, Hamzah & Sihombing (2015)	2010-2014	75	Indonesia	Interest rates, inflation rates, exchange rates, Return on Asset (ROA), Debt to Equity Ratio (DER), underwriter reputation, firm age, firm size, percentage number of shares	Pooled OLS
Gumanti, Nurhayati & Maulidia (2015)	2007-2012	109	Indonesia	Underwriter reputation, use of IPO proceeds, risk factors	Pooled OLS
Rabiqy & Yusnaidi (2017)	2012-2016	118	Indonesia	Current ration, firm size, financial leverage, profitability	Pooled OLS
Widarjo et al. (2017)	2000-2014	221	Indonesia	Intellectual capital disclosure, underwriter reputation	Pooled OLS
Hanafi & Setiawan (2018)	2006-2015	182	Indonesia	Ownership concentration, institutional ownership, firm size, Return on Asset (ROA)	Pooled OLS
Sasikirono, Sumiati & Indrawati (2018)	2009-2013	105		Assets, gross proceeds, firm age, underwriter reputation	Quantile Regression
Yuliani, Wahyuni & Bakar (2019)	2013-2017	52	Indonesia	Debt to Equity Ratio (DER), Return on Equity (ROE), underwriter reputation, and the percentage of stocks offering	Pooled OLS
Non-Indonesia					
Kiymaz (2000)	1990-1996	138	Turkey	Firm size, market return and self-IPOs	Pooled OLS
Koli & Suret (2001)	1991-1998	971	Canada	Size of issue, underwriter reputation, market condition	Pooled OLS
Ghosh (2005)	1993-2001	1,842	India	Firm size, seasoned offerings and hot/cold IPOs	Pooled OLS

Borges (2007)	1988-2004	41	Portugal	Private ownership, secondary offerings and book-building	Pooled OLS
Kenourgios, Papathanasiou & Melas (2007)	1997-2002	169	Greece	Prestigious underwriter, time of oversubscription	Pooled OLS
Leone, Rock & Willenborg (2007)	1993-1994	787	US	Intended use of proceeds, firm size, firm age, book to market, exchange listing, ownership retention, underwriter reputation, pre-IPO price setting, risk factors, insider selling.	Pooled OLS
Sohail & Nasr (2007)	2000-2005	50	Pakistan	Firm size, market capitalisation	Pooled OLS
Hassan & Quayes (2008)	1991-1997	90	Bangladesh	Offer size, long-term debt/total assets, foreign ownership, and insider share	Pooled OLS
Deng & Dorfleitner (2008)	2002-2004	237	China	Offer size, P/E ratio, cost of offerings, and net asset per share	Pooled OLS
Lin & Hsu (2008)	1999-2004	103	Taiwan	Oversubscription, trading volume, and services dummy	Pooled OLS
		171	Hong Kong		
Kucukkocaoglu (2008)	1993-2005	217	Turkey	Offer size, percentage of shares offered, net profit, and age of firm	Pooled OLS
Zouari et al. (2009)	1992-2008	34	Tunis	Oversubscription, capital retention, underwriters, and offer price	Pooled OLS
Pande & Vaidyanathan (2009)	2002-2004	55	India	Oversubscription and listing delay	Pooled OLS
Islam et al. (2010)	1995-2005	117	Bangladesh	Offer size, and firm's size	Pooled OLS
Samarakoon (2010)	1987-2008	105	Sri Lanka	Offer size, underwriter's prestige, hot market dummy, market sentiment, and privatisation issues	Pooled OLS
Chong et al. (2010)	1993-2003	92	Hong Kong	Offer price, market conditions, historical growth of firm, and price to book ratio	Pooled OLS
Adjasi et al. (2011)	1990-2006	80	Nigeria	Offer price, quality of audit firms, and offer size	Pooled OLS
Bagherzadeh (2011)	1997-2005	142	Iran	Firm size, firm age, financial risk, gross proceeds, market sentiment, offer rate, ownership	Pooled OLS
Dimovski, Philavanh & Brooks (2011)	1994-2004	380	Australia	Offer price, capital structure, market sentiment, independent accountant, share options, underwriter reputation	Pooled OLS
Kayani & Amjad (2011)	2000-2010	59	Pakistan	Oversubscription, ex-ante uncertainty, offer size and market capitalisation	Pooled OLS
Naifar (2011)	1992-2008	38	Tunisia	Ownership concentration, future offerings, underwriter reputation	Pooled OLS

Agathee et al. (2012)	1989-2005	44	Mauritius	Firm age, aftermarket risk level of IPOs, Z-score and earnings per share	Pooled OLS
Jewartowski & Lininska (2012)	1998-2008	186	Poland	Firm size, profitability, and volatility of market return	Pooled OLS
Lin & Tian (2012)	2001-2009	674	China	Accounting conservatism, pricing strategy, issue size, ownership, leverage, profitability	Pooled OLS
Sahoo (2012)	2002-2008	72	India	Post-issue promoters holding, P/E ratio, IPO activity, and book value	Pooled OLS
Avelino (2013)	2004-2011	129	Brazil	Market returns and assets of the firm	Pooled OLS
Chuanrommanee & Boonchuaymetta (2013)	2001-2011	153	Thailand	Offer size, IPO allocation to institutional investors and length of lockup period	Pooled OLS
Afza et al. (2013)	2000-2011	55	Pakistan	Corporate governance and CEO duality	Pooled OLS
Ritchie, Dimovski & Deb (2013)	2004-2010	49	India	Ownership, oversubscription, gross proceeds	Pooled OLS
Song, Tan & Yi (2014)	2006-2011	948	China	Offer size, firm age, and earnings per share	Pooled OLS
Mumtaz & Ahmed (2014)	2000-2011	75	Pakistan	Offer price, aftermarket risk, oversubscription, and financial leverage	Pooled OLS
Islam (2014)	2003-2013	2015	Bangladesh	Subscription rate, offer size, market capitalisation, underwriters' prestige and ownership retention	Pooled OLS
Wyatt (2014)	1994-2000	241	Australia	Use of proceeds, firm size, firm age, market condition, underwriter reputation, earning forecast	Pooled OLS
Ammer & Zaluki (2015)	2002-2012	190	Malaysia	Ownership structure, auditors quality, firm size, firm age, leverage	Pooled OLS
Dzimiri & Radikoko (2015)	1993-2003	19	Zimbabwe	Size, subscription rate, market condition, gross proceeds, use of gross proceeds, retained ownership, time from offering to listing, age of firm	Pooled OLS
Mumtaz & Smith (2017)	1995-2014	121	Pakistan	Subscription rate, aftermarket risk, profitability, offer price, underwriter reputation, listing delay, leverage, firm size, firm age, market return, market condition.	Pooled OLS

Recent study in evaluation of underpricing in the Indonesian IPO market undertaken by Sasikirono et al. (2018), used quantile regressions developed by Koenker and Bassett (1978) and Koenker (2005). Sasikirono et al. (2018) argue that the OLS regression may not be appropriate in dealing with extreme values and outliers in the distribution of the dependent variables. The use of OLS will result in some interest groups such as issuers with the lowest initial return being ignored. Estimation with quantile regressions in addition to the more traditional OLS regression allows one to compare the marginal effect of independent variables across the conditional distribution of dependent variables. In addition, unlike OLS regression, the estimated coefficients of the quantile regressions are not sensitive to outliers of the dependent variable (Koenker 2005).

The present research differs from the above studies as it adopts a comprehensive study of the cost of going public (IPOs) in the Indonesian market. The aim is to provide evidence on 1) the characteristics and main determinants of gross spreads and underpricing; 2) the relationship between gross spreads and underpricing; and 3) post-listing day performance of IPOs in the Indonesian market. The pooled OLS regression model employed in prior studies was used in the first part of the analysis of this study to identify main determinants of gross spread and underpricing of all IPO sample. Pooled OLS regression can be used to identify determinants of gross spread and underpricing. In pooled OLS regression dummy variables was used to identify the difference level of gross spread and underpricing between unit, for example, year, industry, firm size or offer size. However, dummy variable cannot be used to identify the determinants of gross spread and underpricing in different unit of industry, firm size or offer size. Therefore, panel regression was used in the second analysis in this study to identify main determinants of gross spread and underpricing on industry, firm size, and offer size sample.

Panel data are a set of the number of observations of the same unit (individuals, firms) over a number of periods (Verbeek 2004). Panel data may have individual (group) effect, time effect, or both, which are analyzed by fixed effect and/or random effect models. In order to deal with the repetition of a unit's observation and time, the panel data approach is considered more reasonable. Panel data have more variability and allow to explore more issues than do cross section or time-series data alone (Kennedy 2008, p. 282). The advantages of panel data include the following (Ghozali 2006):

1. Panel data combines time-series and cross-section data, and thus provides more informative and varied data, low multicollinearity between variables, and a greater degree of freedom and efficiency.

2. Panel data relate to individuals, firms, cities and countries at all times, and are heterogeneous within the unit. Techniques for estimating panel data can explicitly enter heterogeneity for each individual variable.
3. Panel data are able to detect and measure unobservable effects through time-series or cross-section data.
4. Panel data allow for learning more complex behavioural models.

In the case of control variables, panel data are the most suitable choice when compared to OLS or time series, because panel data suggest that the unit (countries or states) are heterogeneous. However, time series or OLS do not control for such heterogeneity; hence, the risk of obtaining biased results increases (Baltagi 2013).

Before performing regression analysis, the step taken is to test the model estimations to obtain the most appropriate model estimation used. Then the next step is to test the classical assumption to test the research hypothesis. Regression analysis with panel data can be done with three estimation method:

1. Common Effect Model.

Common effect model estimation is an estimation of panel data that only combines time series and cross-section data using OLS method. This approach does not take into account individual dimensions or time. In this model, there is an assumption that intercepts and regression coefficients are fixed for each research object and time.

2. Fixed Effect Model.

Fixed-effects (FE) model was used to analyse the impact of variables that vary over time. FE explore the relationship between predictor and outcome variables within an entity (country, person, company, etc.). Each entity has its own individual characteristics that may or may not influence the predictor variables.

Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. The equation for the fixed effects model becomes:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \quad (3.4)$$

where α_i (i=1….n) is the unknown intercept for each entity (n entity-specific intercepts); Y_{it} is the

dependent variable (DV) where i = entity and t = time; $X1_t$ represents one independent variable (IV); β_1 is the coefficient for that IV; u_{it} is the error term.

3. Random Effect Model.

The rationale behind random effects model is that, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model:

> "…the crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not" (Greene 2008, p.183)

In the fixed effects model these variables are absorbed by the intercept. Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables.

3.6.2 Research Method for Present Study

This study adopts a comprehensive study of the cost of going public in the Indonesian market. The aim is to provide evidence on 1) the characteristics and main determinants of gross spreads and underpricing; 2) the relationship between gross spreads and underpricing; and 3) post-listing day performance of IPOs in the Indonesian market. This study extends that of Torstila (2003), and other Indonesian studies in underricing in several ways. First, it expands the Indonesian sample size and time period examining gross spreads over 2000–2016, while Torstila (2003) who examined clustering patterns of IPO gross spreads in 27 countries, including Indonesia, used gross spread data from 1986–August 1999, and reported on 11 issuers, accounting for only 7% of IPOs in Indonesia. Second, the present research evaluates gross spreads and underpricing on industriy, firm size, and offer size sample. Third, this study expand the Indonesian previous studies in underpricing which are not considered gross spread as determinants variables of underpricing (Darmadi & Gunawan 2013; Husnan, Hanafi & Munandar 2014; Hanafi & Setiawan 2018; Yuliani, Wahyuni & Bakar 2019). Fourth, this study also examines three possible relationships between gross spreads (direct cost) and underpricing (indirect cost): an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary (Chen & Mohan 2002; Kim, Palia & Saunders 2010).

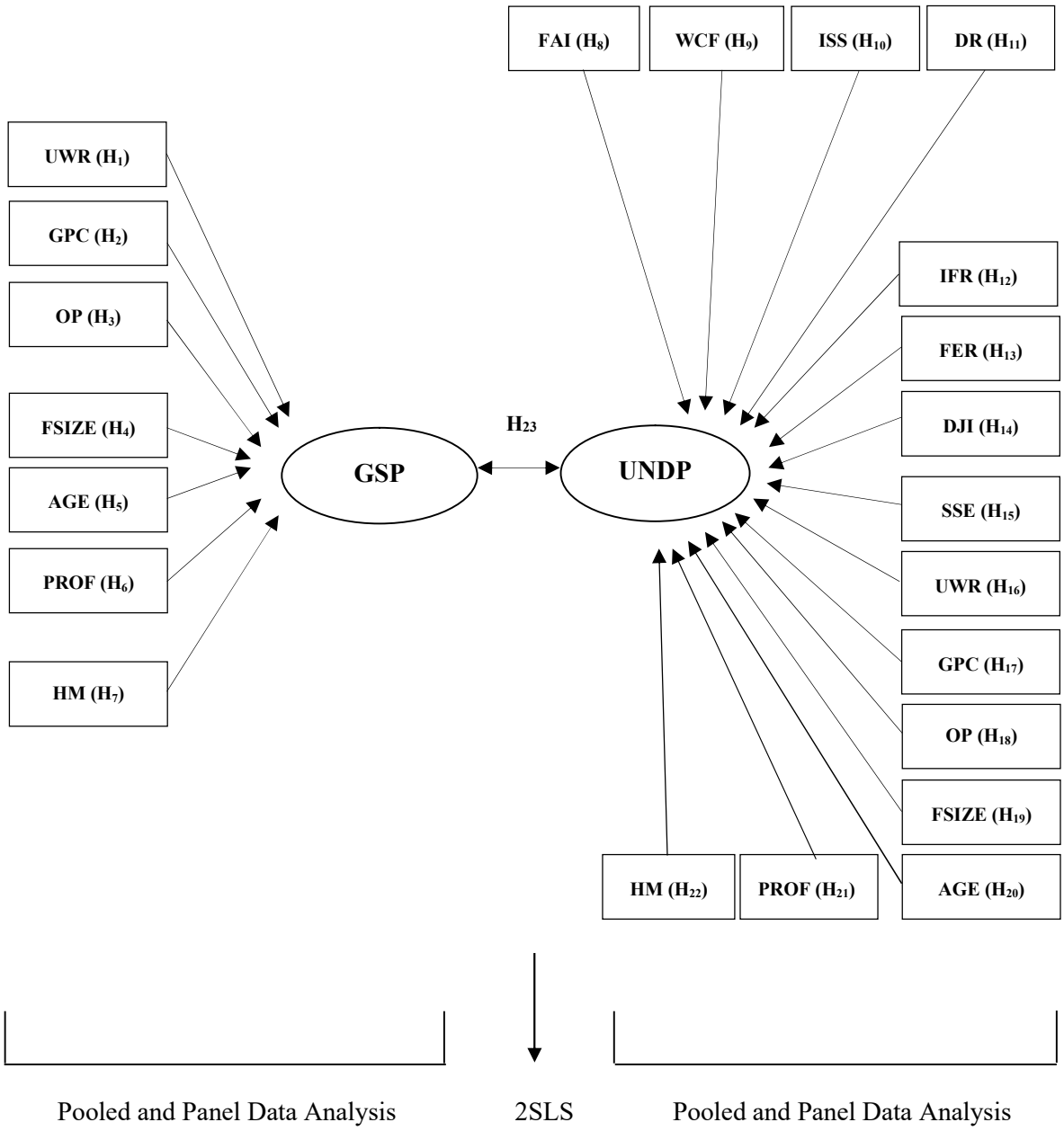


Figure 3.2. Model of Research

Note: GSP = gross spread, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index.

Two regression models are employed to examine the relationship between gross spread, underpricing, and the determinants of gross spread and underpricing: 1) pooled OLS regression for testing the hypotheses which consistent with previous studies, as discussed in previous section; 2) panel regression model. Panel regression was used to identify the determinants of gross spread and underpricing of panel data across different industries, firm size, and offer size. In this study, the 150 IPO firm of sample was arranged into three panel data: 1) panel of industry; 2) panel of firm size; and 3) panel of offer size of IPO. There are two steps in arranging pooled data into panel data:

Step 1: Grouping the IPO data into the same unit of industry, firm size, and offer size. Panel of industry was panel gross spread of 8 cross-sectional industries. Panel firm size was panel gross spread of 4 cross-sectional of firm size, and panel offer size of IPO was panel of 4 cross-sectional offer size of IPO. Panel firm size and offer size were classified into four group panels using quartiles range.

Step 2: Arrange the IPO data in each cross-section into 10 years of time series from 2007 to 2016. If each year has more than two IPOs, the data was made into average.

The evaluation starts with a discussion of the characteristics of IPO gross spreads in Indonesia. The distribution of gross spreads is presented to explain characteristics, including fee-setting practice and IPO gross spread patterns, to answer RQ1.

The first discussion of gross spread employed pooled OLS and panel regression model was designed to answer RQ2 and test proposed hypotheses 1–7. The relationship between gross spread and the determinants of gross spread was examined under two OLS regression models. The first regression model was focused on issue-specific and market-specific characteristics, and the second was estimated with independent variables included in issue-specific, firm-specific and market-specific characteristics. The relationship between gross spread and the determinants of gross spread was also examined under a panel regression model. This regression model was estimated by the independent variables included in issue-specific and firm-specific characteristics, including gross proceeds, offer price, firm size, firm age and profitability, and this can be seen in Figure 3.2.

The next discussion is the distribution of IPO underpricing in Indonesia section addresses RQ3. The distribution of underpricing is presented to analyse the indirect costs occurring as a result of the number of shares sold, and the underpricing data is decomposed by listing year, industry, sub-period, SOE and non-SOE, and pricing strategy.

Pooled OLS and panel regression model are also employed to identify the main determinants of underpricing to answer RQ4, RQ5 and test hypotheses 8–22. The relationship between underpricing and the determinants of underpricing was examined via two regression models. The

first is focused on intended use of IPO proceeds, issue-specific characteristics, and firm-specific characteristics; the second was estimated by independent variables from all categories, including intended use of IPO proceeds, macroeconomic factors, international stock markets, issue-specific characteristics, firm-specific characteristics, and market-specific characteristics. The relationship between underpricing and the determinants of underpricing was also examined under a panel regression model to identify the main determinant of underpricing across different industries, firm size, and offer size.

After evaluation of gross spread, underpricing and the determinants of gross spread and underpricing, the relationship between gross spread and underpricing is identified. There are three possible relationships between gross spread (direct cost) and underpricing (indirect cost): an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary. The 2SLS regression model is adopted to identify the relationship between the two IPO costs. The evaluation of short-run post-listing day IPO performance was the last evaluation of IPO cost, with IPO firms evaluated up to 20 days after listing.

3.7 Research Method Approach

The relationship between gross spread, underpricing, and the determinants of gross spread and underpricing was examined under 1) OLS regression model; and 2) panel regression model. The two-stage least squares (2SLS) regression model is adopted to identify the relationship of gross spread and underpricing.

3.7.1 Pooled Ordinary Least Squares (OLS) Regression Model

This study employed pooled regression models to answer RQ2, RQ4, and RQ5, and test the proposed hypotheses 1 to 22.

3.7.1.1 Regression Model of Gross Spread

The relationship between gross spread and the determinants of gross spread was estimated by the independent variables which are included in the issue-specific characteristic, firm-specific and market-specific characteristic. The model specification is written as:

$$GSP_i = \alpha + \beta_1 UWR_i + \beta_2 GPC_i + \beta_3 OP_i + \beta_4 FSIZE_i + \beta_5 AGE_i + \beta_6 PROF_i + \beta_7 HM_i + \varepsilon_i \quad (3.5)$$

where GSP_i is gross spread of IPO for company i, UWR_i is underwriter reputation, GPC_i is gross proceeds of company i, OP_i is offer price of IPO for company i, $FSIZE_i$ is firm size of company i, AGE_i is firm age of company i, $PROF_i$ is profitability of company i, and HM_i is hot issue market.

3.7.1.2 Regression Model of Underpricing

The relationship between underpricing and the determinants of underpricing was estimated by the independent variables which are included in intended use of IPO proceeds, macroeconomic factors, international stock markets, issue-specific characteristic, firm specific characteristic, and market-specific characteristic. The model specification is written as:

$$\begin{aligned} UNDP_i = {} & \alpha + \beta_1 FAI_i + \beta_2 WCF_i + \beta_3 ISS_i + \beta_4 DR_i + \beta_5 IFR_i + \beta_6 FER_i + \beta_7 DJI_i + \beta_8 SSE_i \\ & + \beta_9 UWR_i + \beta_{10} GPC_i + \beta_{11} OP_i + \beta_{12} FSIZE_i + \beta_{13} AGE_i + \beta_{14} PROF_i \\ & + \beta_{15} HM_i + \varepsilon_i \end{aligned} \quad (3.6)$$

where $UNDP_i$ is underpricing of company i, FAI_i is fixed asset investment of company i, WCF_i is working capital financing of company i, ISS_i is investment in shares of stock of company i, DR_i is debt repayment of company i, IFR_i is inflation rates, FER_i is foreign exchange rates, DJI is Dow Jones Index, SSE is Shanghai Stock Exchange Index, UWR_i is underwriter reputation, GPC_i is gross proceeds of company i, OP_i is offer price of IPO for company i, $FSIZE_i$ is firm size of company i, AGE_i is firm age of company i, $PROF_i$ is profitability of company i, and HM_i is hot issue market.

3.7.2 Panel Regression Model

The relationship between gross spread, underpricing and the determinants of gross spread and underpricing was also examined under panel regression model. The data was arranged into three panel data: by industry, by firm size and by IPO offer size.

3.7.2.1 Panel Regression Model of Gross Spread

The panel regression relationship between gross spread and the determinants of gross spread was estimated by independent variables that included issue-specific, firm-specific and market-specific characteristics. The model specification is written as:

Model 1 : Industry Panel

$$GSP_{it} = \alpha + \beta_1 GPC_{it} + \beta_2 OP_{it} + \beta_3 FSIZE_{it} + \beta_4 AGE_{it} + \beta_5 PROF_{it} + \varepsilon_{it} \quad (3.7)$$

Model 2 : Firm Size Panel

$$GSP_{it} = \alpha + \beta_1 GPC_{it} + \beta_2 OP_{it} + \beta_3 AGE_{it} + \beta_4 PROF_{it} + \varepsilon_{it} \quad (3.8)$$

Model 3 : Offer Size Panel

$$GSP_{it} = \alpha + \beta_1 GPC_{it} + \beta_2 OP_{it} + \beta_3 FSIZE_{it} + \beta_4 AGE_{it} + \beta_5 PROF_{it} + \varepsilon_{it} \quad (3.9)$$

where GSP_{it} is gross spread of IPO for company i, GPC_{it} is gross proceeds of IPO for company i, OP_{it} is offer price of IPO for company i, $FSIZE_{it}$ is firm size of IPO for company i, AGE_{it} is firm age of IPO for company i, and $PROF_{it}$ is profitability of IPO for company i.

3.7.2.2 Panel Regression Model of Underpricing

The relationship between underpricing and the determinants of underpricing in the panel regression was estimated by independent variables that included intended use of IPO proceeds, firm-specific characteristics, macroeconomic factors, issue-specific characteristics, market-specific characteristics and international stock markets. The model specification is written as:

Model 1 : Industry Panel

$$UNDP_{it} = \alpha + \beta_1 FAI_{it} + \beta_2 WCF_{it} + \beta_3 ISS_{it} + \beta_4 DR_{it} + \beta_5 IFR_{it} + \beta_6 FER_{it} + \beta_7 DJI_{it} + \beta_8 SSE_{it} + \beta_9 FSIZE_{it} + \beta_{10} AGE_{it} + \beta_{11} PROF_{it} + \varepsilon_{it} \quad (3.10)$$

Model 2 : Firm Size Panel

$$UNDP_{it} = \alpha + \beta_1 FAI_{it} + \beta_2 WCF_{it} + \beta_3 ISS_{it} + \beta_4 DR_{it} + \beta_5 IFR_{it} + \beta_6 FER_{it} + \beta_7 DJI_{it} + \beta_8 SSE_{it} + \beta_9 AGE_{it} + \beta_{10} PROF_{it} + \varepsilon_{it} \quad (3.11)$$

Model 3 : Offer Size Panel

$$UNDP_{it} = \alpha + \beta_1 FAI_{it} + \beta_2 WCF_{it} + \beta_3 ISS_{it} + \beta_4 DR_{it} + \beta_5 IFR_{it} + \beta_6 FER_{it} + \beta_7 DJI_{it} + \beta_8 SSE_{it} + \beta_9 FSIZE_{it} + \beta_{10} AGE_{it} + \beta_{11} PROF_{it} + \varepsilon_{it} \quad (3.12)$$

where $UNDP_{it}$ is underpricing of industry i, FAI_{it} is fixed asset investment of industry i, $WCF_{it,}$ is working capital financing of industry i, ISS_{it} is investment in shares of stock of industry i, DR_{it} is debt repayment of industry i, IFR is inflation rates, FER is foreign exchange rates, DJI_t is the Dow Jones Index, and SSE is the Shanghai Stock Exchange Index, $FSIZE_{it}$ is firm size of industry i, AGE_{it} is firm age of industry i, and $PROF_{it}$ is profitability of industry i.

3.7.3 Two-Stage Least Squares (2SLS) Regression Model

This model is to answer RQ5: what is the relationship between gross spreads and underpricing? This study examines three possible relationships between gross spread and underpricing: an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary. The 2SLS regression model is adopted to identify this relationship, as follows:

$$GSP_i = \alpha + \beta_1 UWR_i + \beta_2 GPC_i + \beta_3 OP_i + \beta_4 FSIZE_i + \beta_5 AGE_i + \beta_6 PROF_i + \beta_7 HM_i + \beta_8 UNDP_i + \varepsilon_i \quad (3.13)$$

The underpricing regression model (3.14) is the instrumental variable of gross spread regression model (3.13):

$$UNDP_i = \alpha + \beta_1 FAI_i + \beta_2 WCF_i + \beta_3 ISS_i + \beta_4 DR_i + \beta_5 IFR_i + \beta_6 FER_i + \beta_7 DJI_i + \beta_8 SSE_i + \beta_9 UWR_i + \beta_{10} GPC_i + \beta_{11} OP_i + \beta_{12} FSIZE_i + \beta_{13} AGE_i + \beta_{14} PROF_i + \beta_{15} HM_i + \varepsilon_i \quad (3.14)$$

where GSP_i is gross spread of IPO for company i, UWR_i is underwriter reputation, GPC_i is gross proceeds of company i, OP_i is offer price of IPO for company i, $FSIZE_i$ is firm size of company i, AGE_i is age of company i, $PROF_i$ is profitability of company i, HM_i is a hot issue market, $UNDP_i$ is underpricing of company i, FAI_i is fixed asset investment of company i, WCF_i is working capital financing of company i, ISS_i is investment in shares of stock of company i, DR_i is debt repayment of company i, IFR_i is inflation rates, FER_i is foreign exchange rates, DJI_i is Dow Jones Index, and SSE_i is Shanghai Stock Exchange Index.

3.8 Diagnostic Test for Multiple Regression Models

Coefficient of determination, F-statistics and probability of F-statistic, autocorrelation test, heteroscedasticity test and multicollinearity test were used as diagnostic tests for the multiple regression models. These test statistics are discussed below.

3.8.1 Coefficient of Determination

The coefficient of determination, or R-squared, measures how well the OLS regression model explains dependent variation. R-squared values range from 0 and 1. If the value of R-squared is close to 1, the independent variables provide almost all the information needed to predict the dependent variable (Gujarati 2009). In general, the determination coefficient for cross-section data

is relatively low because of the large variation between each observation, whereas for time series data usually has a high coefficient of determination.

3.8.2 F-statistics

The F-statistic tests the regression coefficient (slope): whether the regression coefficients are significant (not statistically zero). If the slope coefficient is zero, there is not enough evidence to indicate that the independent variable has a relationship with the dependent variable (Maddala & Lahiri 2009).

3.8.3 Test for Autocorrelation

The autocorrelation test aims to test whether in the linear regression model there is a correlation between the confounding errors in period t and the interfering errors in the t-1 period. Autocorrelation arises because sequential observations over time are related to each other. This problem arises because the residuals are not free from one observation to another (Ghozali 2016). In this study, the autocorrelation test was undertaken using the Durbin Watson test.

3.8.4 Heteroscedasticity Test

Heteroscedasticity test aims to test whether in the regression model there is an inequality of residual variance, one observation to another observation (White 1980). If the variance of the errors from one observation to another is constant then it is called homoscedasticity. If the variance is not constant, this issue is considered a heteroscedasticity problem.

3.8.5 Multicolinearity Test

The multicollinearity test aims to test whether the regression model is found to have correlation between independent variables. If the independent variables correlate with each other, then these variables are not orthogonal. Orthogonal variables are independent variables whose correlation value between independent variables is zero (Ghozali 2016). According to Gujarati (2009), multicollinearity occurs when the R-squared value is high but a small t ratio is significant.

3.9 Diagnostic Test for Panel Regression Models

Breusch and Pagan's Lagrange multiplier (LM) test, Hausman test, and Chow Test were used as diagnostic tests for the panel regression models. These test statistics are discussed below.

3.9.1 Breusch-Pagan LM Test for Random Effects

Breusch and Pagan's (1980) LM test examines if individual (or time) specific variance components are zero, $H_0 : \sigma_u^2 = 0$. If the H_0 is rejected, it can be concluded that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than does the pooled OLS.

3.9.2 Hausman Test for Comparing Fixed and Random Effects

The Hausman specification test compares fixed and random effect models under the null hypothesis that individual effects are uncorrelated with any regressor in the model (Hausman 1978). If the null hypothesis of no correlation is rejected, it can be concluded that a fixed effect regression model is preferred than the random effect regression model.

3.9.3 Chow Test

Chow test is a test to determine the model of whether pooled least squares or fixed effect is most appropriately used in estimating panel data. The null hypothesis of this Chow test is the slope of a regressor is the same regardless of individual for all k regressors, $H_0 : \beta_{ik} = \beta_k$. (Baltagi 2001, p. 51). If the null hypothesis is rejected, the panel data are not poolable. Each individual has its own slopes for all regressors. Under this circumstance the random coefficient model or hierarchical regression model.

3.10 Evaluation of Post-listing Day Performance of IPO

The evaluation of post-listing day performance involves a short-run performance analysis of IPO after the listing day. The post-listing day performance was calculated up to 20 trading days after the listing day. There are six steps in determining the underpricing:

Step 1: Calculate average raw returns (*RRs*) for each company in period t.

Step 2: Calculate market-adjusted abnormal return (*MARs*).

Step 3: Calculate market-adjusted average abnormal returns (*AARs*)

Step 4: Calculate t-statistics of market-adjusted average abnormal return to determine whether the returns were statistically significant.

Step 5: Calculate cumulative average abnormal returns (*CARs*)

Step 6: Calculate t-statistics of market cumulative abnormal returns to determine whether the returns were statistically significant.

First, calculated raw return of the IPO is the difference between the offer price and the closing price of trading , as follows:

$$RR_{it} = \frac{(P1_i - P0_i)}{P0_i} \tag{3.15}$$

where RR_{it} is raw return of IPO for company i, $P1_i$ is closing market price of company i of trading, and $P0_i$ is offer price of company i.

Second, the market-adjusted abnormal return (*MARs*) can be calculated after the calculation of average return. Adjusted market model was used to calculate abnormal return because IPO returns have no historic performance. This study used the Jakarta Stock Exchange Composite Index (JKSE) or JCI, an index of all stocks traded on the IDX to calculate MARs:

$$MAR_{it} = R_{it} - R_{mt} \tag{3.16}$$

where MAR_{it} is market-adjusted abnormal return, R_{it} is return for company i, R_{mt} is return of the market index during sample period t or the daily return of the benchmark portfolio period t.

Market-adjusted average abnormal returns (*AARs*) can be calculated after calculation of average returns and market-adjusted abnormal returns (*MARs*):

$$AAR_t = \frac{1}{n}\sum_{i=1}^{n} MAR_{i,t} \tag{3.17}$$

where AAR_t is market-adjusted average abnormal returns of day t, MAR_{it} is market-adjusted abnormal return, and n = number of IPO firms.

The next step is calculating t-statistics of market-adjusted average abnormal returns (*AARs*) to determine whether the abnorml returns were statistically significant. The t-test statistics for AAR for each day during the post-listing period is calculated as under:

$$t(AAR) = AAR_t * \frac{\sqrt{n_t}}{\sigma_t} \tag{3.18}$$

where AAR_t is market-adjusted average abnormal returns of day t, n is the number of IPO firms in period t, and σ_t is the cross-sectional standard deviation of the return for day t.

The market-adjusted AARs have been calculated in equations (3.17). From the equations, CARs can be calculated, followed by calculating t-statistics of the CARs to determine whether the

abnormal returns were statistically significant. The t-test statistics for AAR for each day during the post-listing period is calculated as under:

$$CAR_{q,s} = \sum_{i=q}^{s} AAR_t \tag{3.19}$$

where CAR_t is cumulative average abnormal returns of 5-day, 15-day and 20-day, AAR_t is market-adjusted AAR of day t.

$$t(CAR) = \frac{CAR_t}{\sigma(CAR)_t} \tag{3.20}$$

where CAR_t is cumulative AAR of day t, and $\sigma(CAR)_t$ is the cross-sectional standard deviation of the return for day $t = \sigma(AR)_t * (t+1)^{½}$.

3.11 Summary

In this chapter, a conceptual framework was developed to encompass the associations between gross spread, underpricing and the determinants of gross spread and underpricing of Indonesian IPO firms. Based on the literature review, the gross spread is presumed to be the result of seven determinant variables, drawn from issue-specific, firm-specific, and market-specific characteristics. The second IPO cost, underpricing, is presumed to be the result of determinant variables, including (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; (iv) issue-specific characteristics; (v) firm-specific characteristics; and (vi) market-specific characteristics.

This study employed two methods to examine the relationship between gross spread, underpricing, and the determinant variables of gross spread and underpricing: 1) pooled OLS regression; and 2) panel regression model. These regression models were designed to answer the research questions and test the proposed hypotheses.

Pooled OLS regression model was used in the first analysis for testing the hypotheses, and this consistent with previous studies. The data used in this research are data of 150 IPO firms listed on the IDX from 2007–2016. The relationship between gross spread, underpricing, and the determinants of gross spread and underpricing was also examined under a panel regression model to identify the determinants of gross spread and underpricing in panel regression model. The data were arranged into three panels: (i) by industry, (ii) by firm size and (iii) by IPO offer size. The industry panel was gross spread of eight cross-sectional industries, the firm size panel was gross

spread of four cross-sectional firm sizes, and the IPO offer size panel was four cross-sectional IPO offer sizes. Each panel used 10 years of time-series data, from 2007–2016.

After evaluation of gross spread, underpricing and the determinants of gross spread and underpricing, the relationship between gross spread and underpricing was identified. There are three possible relationships between gross spread (direct cost) and underpricing (indirect cost): an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary. The 2SLS regression model was adopted to identify the relationship between the two IPO costs. The last evaluation was evaluation of short-run post-listing day IPO performance up to 20 days after listing.

Chapter 4: Results and Discussion of Gross Spread

4.1 Introduction

Gross spread or underwriting discount (direct cost) is the difference between the offer price and the price paid by issuers to underwriters, or a percentage commission per share paid to the underwriters as compensation to cover expenses, management fees, commission and risk (Ahn, Kim & Son 2007; Chen & Mohan 2002). The evaluation of gross spread in Indonesia is important because IPO gross spread is relatively low and in decline, with underwriting fees close to 0%, lower than the mean gross spread of Indonesian market and some of the Asia Pacific stock market found in a previous study (Torstila 2003). The main concern about low gross spreads and underwriting fees is this might result in poor underwriting that cannot compensate the underwriting risk. This situation raises a question regarding the reason for the decline in gross spread.

This chapter examines gross spread and determinants of gross spread in the Indonesian IPO market. The aim is to provide evidence on the characteristics of gross spread and identify gross spread patterns and its main determinants. The different environmental setting (e.g., regulations, underwriting market conditions) might influence fee-setting practices in Indonesia. The findings are expected to provide a comprehensive explanation of the gross spread or direct cost associated with firms going public in Indonesia.

The chapter begins with Section 4.2, which presents a summary of gross spread and its determinants, including issue-specific, firm-specific and market-specific characteristics such as underwriter reputation, gross proceeds, offer price, firm size, firm age, profitability and hot issue markets. Section 4.3 presents and discusses the characteristics of IPO gross spread in four sub-sections: 1) distribution of gross spread components; 2) distribution of gross spread and gross proceeds; 3) distribution of gross spread and underwriters in IPO; and 4) clustering patterns of gross spread in the Indonesian IPO market. Section 4.4 presents results on the relationship between gross spread and determinants of gross spread. Section 4.5 discusses characteristics of gross spread, Section 4.6 discusses the results of relationship between gross spread and determinants of gross spread, and Section 4.7 presents a summary of the chapter.

4.2 Descriptive Statistics

This section presents and discusses summary statistics of gross spread and determinants, over the sample period 2007–2016. This summary is calculated based on a sample size of 150 IPO firms.

Table 4.1 provides a statistical summary based on (i) issue-specific characteristics; (ii) firm-specific characteristics; and (iii) market-specific characteristics.

Table 4.1. Descriptive Statistics of Gross Spread and Determinants of Gross Spread

	Abbvn	N	Mean	Median	SD	Min	Max
Gross Spread (%)	GSP	150	2.09	2.05	0.83	0.27	4.11
Issue-specific Characteristics							
Dummy Underwriter Reputation	UWR	150	0.84	1.00	0.37	0.00	1.00
Gross Proceeds (IDR billion)	GPC	150	1,113	358	4,123	0.138	48,333
Offer Price (IDR)	OP	150	1,079	410	2,059	102	17,000
Firm-specific Characteristics							
Firm Size (IDR billion)	FSIZE	150	2,085	1,045	3,123	0.188	21,064
Firm Age	AGE	150	17	15	13	2	90
Profitability (%)	PROF	150	17.04	14.15	31.06	-196.70	146.38
Market-specific Characteristic							
Dummy Hot Issue Market	HM	150	0.84	1.00	0.37	0.00	1.00

Note: Abbvn = Abbreviation of variable in equation, N = number of sample, SD = standard deviation, GSP = gross spread, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market.

The mean gross spread of the sample is 2.09%, and the median is 2.05%. The variation of gross spread data within the sample is relatively low (0.83), ranging from a minimum of 0.27% to a maximum of 4.11%. For the first determinant in issue-specific characteristics, gross proceeds, the mean (median) is IDR 1,113 billion (IDR 358 billion) and the standard deviation is 4,123. This shows that disparities in total proceeds that a firm receives from an IPO is relatively high, from IDR 0.138 billion to IDR 48,333 billion. The mean offer price is IDR 1,079 and the median is IDR 410. The variation in offer price is relatively high, ranging from a minimum of IDR 102 to a maximum of IDR 17,000.

Firm size, firm age and profitability are included in firm-specific characteristics. Size of firms going public varied greatly, from IDR 0.188 billion to IDR 21,064 billion, with a mean of IDR 2,085 billion and a median of IDR 1,045 billion. Almost half of the sample (46%) had total assets less than IDR 1,000 billion. The statistical summary of firm age shows that the average (median) age of firms going public was 17 years (15 years), ranging from 2 years to 90 years, and with the majority of IPO firms (59.77%) lying below the sample mean age (19 years). Firms must be at least 2 years old to be listed in the IPO market. The third determinant of gross spread, a firm-specific characteristic, is profitability. The average profitability of IPO firms was 17.04% and the median was 14.15%. Profitability varied from a minimum of −196.70% to 146.38%. In terms of the whole

sample, 37.43% of the IPO firms had a good performance prior to IPO, with profitability higher than the average.

4.3 Results on Characteristics of Gross Spread

This section presents and discusses the results on the characteristics of IPO gross spread in four sub-sections: (i) distribution of gross spread components; (ii) distribution of gross spread and gross proceeds; (iii) distribution of gross spread and underwriters; and (iv) clustering patterns of gross spreads in the Indonesian IPO market. The distribution of gross spread is designed to answer RQ1:

RQ1: What are the characteristics of IPO gross spreads for Indonesian listed firms?

4.3.1 Distribution of Gross Spread Components

This section discusses three gross spread components: management fees, underwriting fees, and selling fees. Management fees enable underwriters to undertake marketing campaigns, assess market conditions and organise road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation (Lee 2012). Underwriting fees are used to compensate underwriters for making a capital commitment as a result of underwriting commitment. Selling fees are used to compensate underwriters, who may be lead underwriters, co-managers, syndicate members or non-underwriters (selected dealers) in the selling group. The purpose of evaluating gross spread components in Indonesian IPO markets is to determine the proportion of each component, and direct costs incurred by going public.

Table 4.2. Distribution of Gross Spread, Gross Spread Components, and Proportion of Gross Spread Components by Year and Industry

	N	Distribution				Proportion[1]		
		Underwriting Fee (%)	Management Fee (%)	Selling Fee (%)	Gross Spread (%)	Proportion of Underwriting Fee (%)	Proportion of Management Fee (%)	Proportion of Selling Fee (%)
All Sample	150	0.49	1.22	0.41	2.09	24	59	20
Panel A: Year								
2007	15	0.64	1.09	0.52	2.25	28	48	23
2008	12	0.54	1.07	0.39	2.08	27	54	19
2009	9	0.54	1.00	0.39	1.93	28	52	20
2010	17	0.64	0.83	0.51	1.98	32	42	26
2011	19	0.53	1.03	0.53	2.09	25	49	25
2012	19	0.39	1.33	0.37	2.09	18	64	18
2013	22	0.48	1.43	0.38	2.29	21	62	17
2014	14	0.35	1.21	0.30	1.85	19	65	16
2015	12	0.21	1.47	0.27	1.95	11	75	14
2016	11	0.66	1.27	0.37	2.30	28	55	16
Panel B: Industry								
Agriculture	11	0.42	0.97	0.39	1.79	23	55	22
Mining	23	0.53	1.05	0.47	2.05	26	51	23
Basic Industry and Chemicals	10	0.34	1.33	0.31	1.98	17	67	16
Miscellaneous	7	0.34	1.42	0.43	2.19	16	65	20
Consumer Goods	6	0.38	1.68	0.33	2.39	16	70	14
Property and Real Estate	31	0.58	0.97	0.43	1.98	29	49	22
Infrastructure, Utilities and					2.32	21	64	15
Transportation	22	0.48	1.49	0.35				
Trade and Service	40	0.52	1.16	0.43	2.11	25	55	20

Note: P = proportion, [1]Proportion = (level of each fee / gross spread) x 100%.

Table 4.2 shows the level of gross spread and gross spread components, and the proportion of each by year and industry. Mean gross spread of IPOs during 2007–2016 was 2.09%, comprising 0.49% underwriting fee, 1.22% management fee and 0.41% selling fee. The biggest proportion of gross spread components was the management fee (59%), followed by the underwriting fee (24%) and the selling fee (20%) (see Figure 4.1). The proportion of gross spread components shows that the Indonesian underwriting market has a greater focus on management fees to assess market conditions and obtain information prior to setting the offer price and IPO allocation.

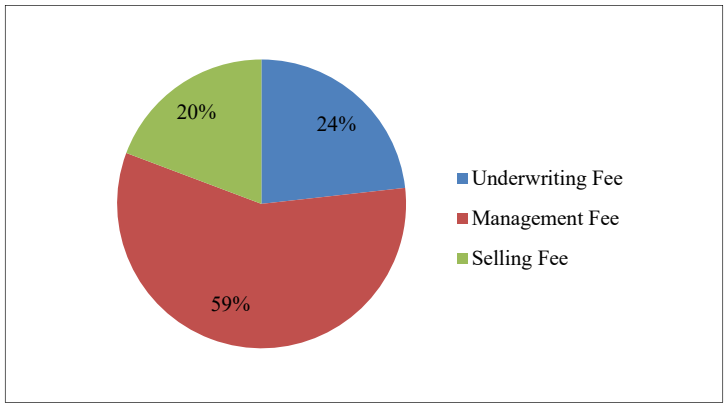


Figure 4.1. Proportions of Gross Spread Components 150 IPO Firms in 2007–2016

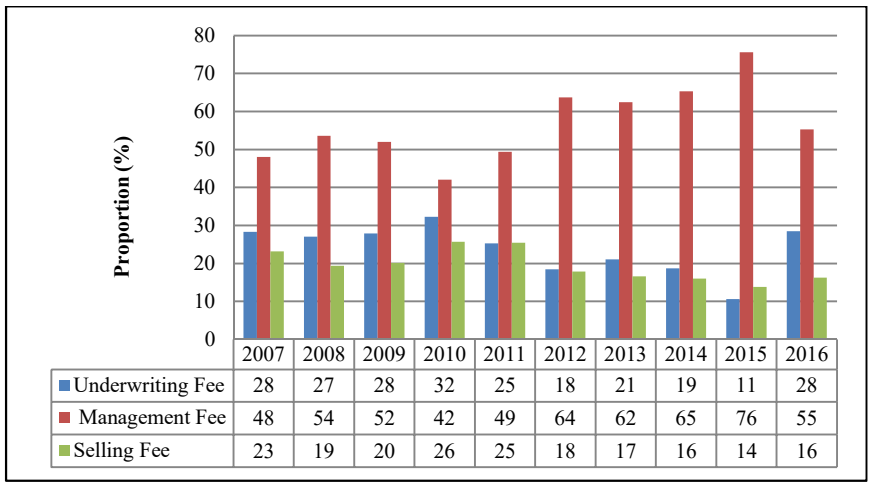
4.3.1.1 Listing Year Analysis

Table 4.2 Panel A presents the distribution of gross spread, gross spread components and the proportion of gross spread components by year. The level of gross spread varies over time, from a low of 1.85% (in 2014) to a high of 2.30% in 2016. The average gross spread level decreased from 2.25% (2007) to 1.93% (2009), and remained stable for the following years (2011 and 2012). Gross spread reached its highest level in 2016. Most years had a gross spread below or the same as the mean gross spread for the sample; only in 2007 and 2016 was gross spread higher than mean gross spread, at 2.25% and 2.30% respectively.

In term of gross spread components, IPO underwriting and selling fees in the Indonesian market during the sample period were relatively low, at less than 1%. The level of underwriting fees ranged from 0.21% (2015) to 0.66% (2016), and the level of selling fees was between 0.27% (2015) and 0.53% (2011). Management fees fluctuated—during 2007–2010, they decreased to a lowest of 0.83%, but increased to 1.47% in 2015—but were generally higher than underwriting and selling fees.

In terms of proportions, management fees were the biggest component compared with other fees during the sample period, as much as two–three times as much as the underwriting and selling fees.

Figure 4.2 shows the highest proportion for management fees was 75%, in 2015; proportions for underwriting and selling fees for the same year were only 11% and 14%, respectively.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Underwriting Fee	28	27	28	32	25	18	21	19	11	28
Management Fee	48	54	52	42	49	64	62	65	76	55
Selling Fee	23	19	20	26	25	18	17	16	14	16

Figure 4.2. Proportions of Gross Spread Components by Year

4.3.1.2 Industry Analysis

Table 4.2 Panel B presents the distribution of gross spread, gross spread components, and the proportion of gross spread components by industry. It shows that the gross spread level of the eight industries varied from 1.79% to 2.39%. The gross spread level of the agriculture industry was the lowest, while the consumer goods industry was the highest. Four of the eight industries had a lower gross spread than the sample mean: agriculture (1.79%), basic industry and chemicals (1.98%), property and real estate (1.98%), and mining (2.05%).

The distribution of each gross spread component can also be seen in Panel B. The level of underwriting fees by industry were between 0.34% and 0.58%, and only underwriters from three industries had a gross spread higher than the mean: trade and services, mining, and property and real estate, at 0.52%, 0.53% and 0.58% respectively. Two industries—basic industry and chemicals, and miscellaneous—had the lowest selling fees (0.34%), meanwhile mining had the highest selling fee (0.47%). Further, it appears that management fees of all industries were higher than other fees—industries spent 49%–70% of the gross spread on management fees (see Figure 4.3). Only the property and real estate industry spent under 50% (49%), and the consumer goods industry had the highest proportion of management fees (70%). The proportion of management fees was almost twice as much as underwriting and selling fees for all industries.

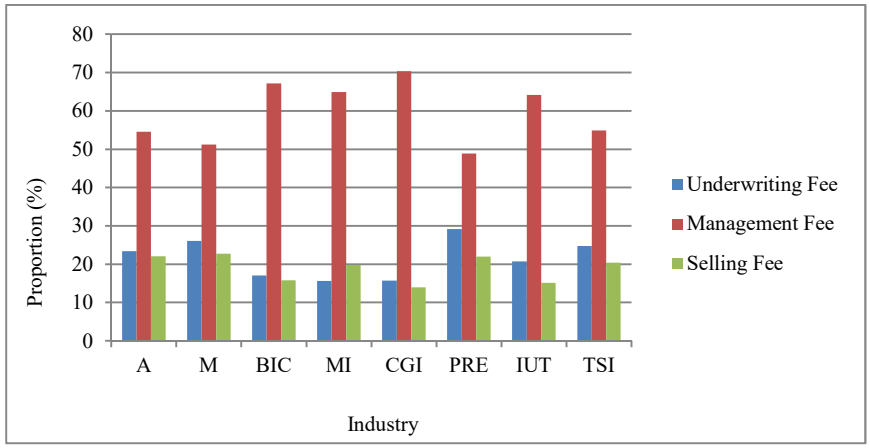


Figure 4.3. Proportions of Gross Spread Components by Industry

Note: A = agriculture, M = mining, BIC = basic industry and chemicals, MI = miscellaneous, CGI = consumer goods industry, PRE = property and real estate, IUT = infrastructure, utilities and transportation, TS = trade and service.

The data suggest that the Indonesian underwriting market has a greater focus on management fees, and does not follow the industry standard of a 20/20/60 division (20% management fee, 20% underwriting fee, and 60% selling concession), unlike, for example, the US (Chen & Ritter 2000; Lee 2012). The US underwriting market focuses more on selling fees to compensate underwriters, who may be lead underwriters, co-managers, syndicate members or non-underwriters (selected dealers) in the selling group (Lee 2012). The Indonesian underwriting market has a greater focus on management fees because Indonesian underwriting uses a book-building pricing strategy, according to which an underwriter tries to determine the offer price of an IPO based on the demand of institutional investors. Management fees enable underwriters to undertake marketing campaigns, assess market conditions and organise road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation.

4.3.2 Distribution of Gross Spread and Gross Proceeds

This section describes the distribution of the level of gross spread, gross proceeds and gross spread in IDR billion. The purpose is to analyse the direct cost or gross spread as a result of IPO offer size in the Indonesian IPO market. In this section, offer size or gross proceeds was measured by number of issued shares by offer price per share, to calculated nominal direct cost.

Table 4.3 shows the distribution of gross spread, gross proceeds and gross spread in IDR billion, decomposed into listing year, industry, sub-period, state-owned enterprises (SOE) and non-state-owned enterprise (non-SOE), and pricing strategy. The mean gross spread of the sample during

2007–2016 was 2.09%, with a total IPO offer size or proceeds of IDR 718 billion. This direct cost or gross spread in nominal terms was equal to IDR 15.13 billion.

4.3.2.1 Listing Year Analysis

Table 4.3 Panel A shows that the overall distribution of gross spread varied over time, from a low of 1.85% (2014) to a high of 2.30% (2016). Average gross spread in the first three years (2007–2009) decreased from 2.25% (2007) to 1.93% (2009). It increased to 1.98% in 2010, and remained stable over 2011 and 2012. Gross spread reached its highest level of 2.30% in 2016.

In terms of gross proceeds, the offer size in 2009 was the lowest, and in 2007 was the highest (IDR 1,137 billion), followed by proceeds of IDR 1,056 billion in 2010 and IDR 966 billion in 2016. Gross proceeds in 2010 was almost six times higher than in 2009. After 2010, the offer size fell below IDR 1,056 billion, down to IDR 393 billion in 2012, before increasing to IDR 966 billion in 2016. Panel A shows the direct cost of IPO or gross spread in nominal terms was the highest in 2007 at IDR 28.05 billion, and the lowest in 2009 at IDR 3.70 billion.

4.3.2.2 Industry Analysis

Table 4.3 Panel B presents the gross spread, gross proceeds and gross spread in IDR billion across industries. The agriculture industry had the lowest gross spread at 1.79%, and the consumer goods industry had the highest, at 2.39%. Gross spread by industry varied; however, the variation within the sample was relatively low. Three of eight industries (35% of sample) had mean gross spread lower than the sample mean: agriculture, basic industry and chemicals, and property and real estate, at 1.79%, 1.98%, and 1.98%, respectively. In terms of IPO offer size, gross proceeds by industry were between IDR 324 billion (miscellaneous) and IDR 1,593 billion (mining). Two industries had offer sizes greater than IDR 1,000 billion: basic industry and chemicals (IDR 1,016 billion) and mining (IDR 1,593 billion); the offer sizes of other industries were less than IDR 1,000 billion. As a consequence, those two industries had to pay direct costs of IDR 16.83 billion and IDR 34.80 billion, respectively—higher than the sample average for direct costs.

Table 4.3. Distribution of Gross Spread and Gross Proceeds by Year, Industry, Sub-Periods, SOE and non-SOE and Pricing Strategy

	N	Gross Spread (%)			Gross Proceeds[1] (IDR billion)			Gross Spread[2] (IDR billion)		
		Mean	Median	Std Dev.	Mean	Median	Std Dev.	Mean	Median	Std Dev.
All Sample	150	2.09	2.05	0.83	718	348	1,031	15.13	6.40	22.51
Panel A: Year										
2007	15	2.25	2.25	0.91	1,137	480	1,317	28.05	8.91	34.49
2008	12	2.08	2.00	0.54	418	43	850	8.85	0.96	19.08
2009	9	1.93	2.00	0.73	183	150	189	3.70	2.29	4.95
2010	17	1.98	2.00	0.69	1,056	483	1,329	22.54	10.26	31.24
2011	19	2.09	2.25	0.95	856	400	1,237	18.07	10.23	26.03
2012	19	2.09	2.17	0.66	393	300	349	8.38	4.73	9.11
2013	22	2.29	2.39	0.73	528	394	491	12.85	9.30	13.58
2014	14	1.85	1.75	1.11	627	447	864	10.96	3.92	17.71
2015	12	1.95	1.50	1.04	896	854	1,188	15.67	10.47	19.35
2016	11	2.30	1.88	0.91	966	322	1,572	16.91	3.6	25.60
Panel B: Industry										
Agriculture	11	1.79	2.00	0.93	805	509	933	17.04	12.71	21.98
Mining	23	2.09	2.18	0.96	1,593	847	2,680	34.80	12.47	58.62
Basic Industry and Chemicals	10	1.98	1.87	0.83	1,016	527	1,529	16.83	12.18	24.55
Miscellaneous	7	2.19	2.00	1.01	324	204	462	6.09	2.70	9.31
Consumer Goods	6	2.39	2.17	0.58	417	302	370	9.54	6.72	8.33
Property and Real Estate	31	1.98	2.00	0.74	639	400	674	12.33	7.50	15.22
Infrastructure, Utilities and Transportation	22	2.32	2.17	0.52	851	208	1,363	17.78	5.34	27.09
Trade and Service	40	2.11	2.27	0.93	531	168	919	12.58	2.88	22.04
Panel C: Sub-Periods										
2007-2009	36	2.12	2.00	0.76	673	172	1,060	15.96	3.25	27.07
2010-2016	114	2.09	2.15	0.85	732	400	1,027	14.87	7.15	21.09
Panel D: SOE and non-SOE										
SOE	6	1.75	1.87	0.31	2,360	1,995	1,554	43.41	31.76	32.60
Non-SOE	144	2.10	2.15	0.84	1,061	326	4,191	18.90	6.12	48.88
Panel E: Pricing Strategy										
Book-building	137	2.07	2.00	0.81	711	356	1,032	14.51	6.27	21.39
Fixed-price	13	2.37	2.50	0.96	787	329	1,061	21.49	8.94	32.39

Note : SOE =State-owned Enterprises, non-SOE = non State-owned Enterprises, [1]Gross Proceeds (IDR billion) = size of the IPO in IDR billion,
[2]Gross Spread (IDR billion) = gross spread (%) x gross proceeds (IDR billion)

4.3.2.3 Sub-period Analysis

In Table 4.3 Panel C, the period of observation is divided into two—2007–2009 and 2010–2016—to examine changes in gross spread, gross proceeds and gross spread in IDR billion. The sub-periods are based on the fluctuation in number of IPOs and gross proceeds during the sample period (see Figure 4.4 and Table 4.4). In 2008, the global financial market affected the number of IPOs and gross proceeds. These indicators fell to their lowest in 2009, and increased significantly in 2010. Therefore, this research defined 2009 as the cut-off of the first period (2007–2009), which included the global financial crisis of 2008, and 2010–2016 as the second period.

Table 4.3 panel C shows a comparison of gross spread, gross proceeds and gross spread in IDR billion in the two periods. The gross spread in the two periods declined compared with mean gross spread of 1986–1999—3.5%, as evaluated by Torstila (2003). The gross spread level for 2007–2009 (2.12%) was higher than that for 2010–2016 (2.09%); however, mean proceeds in the first period (IDR 673 billion) were lower than those in the second period (IDR 732 billion). Further, firms issuing in the first period paid more direct costs compared with the second period; IDR 15.96 billion compared with IDR 14.87 billion.

The higher gross spread level in 2007–2009 is related to the lower proceeds in this period. In 2007–2009, the number of IPOs decreased due to the global financial crisis, which caused the IDX composite index to plummet to its lowest level. As a result, some firms postponed their IPO, so that in 2009, the total number of IPOs was only 13, with gross proceeds the lowest during the sample period at only IDR 183 billion.

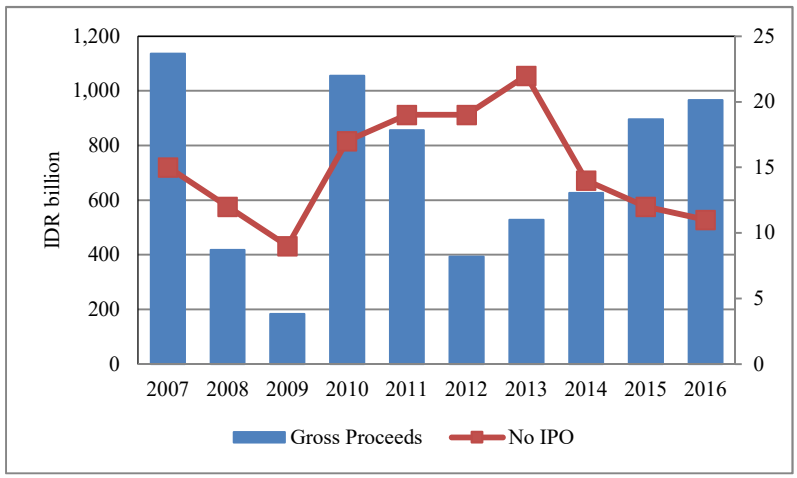


Figure 4.4. Gross Proceeds and Number of IPO in 2007–2016

Table 4.4. Sample of IPO and Gross Proceeds

Year	Sample of IPO	Gross Proceeds[1] (IDR billion)
2007	15	1,137
2008	12	418
2009	9	183
2010	17	1,056
2011	19	856
2012	19	393
2013	22	528
2014	14	627
2015	12	896
2016	11	966
Total	150	7,060

Note: [1]Gross Proceeds (IDR billion) = size of the IPO in IDR billion

4.3.2.4 SOE and non-SOE Analysis

Indonesian SOEs have been listed on the IDX since 1991, and the government has attempted to increase the number of SOEs going public. Up to 2015, 20 of 119 SOEs were listed, with a value of USD102.31 billion or 26.6% of total market capitalisation (IDX Fact Book 2015). The reasons for SOEs going public are to: (1) increase transparency, public control and independency; (2) create a better financial structure and management; (3) increase efficiency and productivity; (4) create competitive SOEs with a global orientation; (5) create a better and competitive industry structure, business environment, macroeconomic and market capacity; and (6) maintain a majority government ownership (Ministry of State-Owned Enterprises 2003). Megginson and Netter (2001) argue that governments generally choose this market approach because privatisation can promote competition, increase public control, and importantly, improve efficiency. Further, privatisation can be seen as a commitment by government to reduce intervention and control over SOEs to create greater entrepreneurial opportunities and improve productivity (D'Souza et al. 2001).

In Table 4.3 Panel D, the distribution of gross spread, gross proceeds and gross spread in IDR billion are decomposed into SOEs and non-SOEs. During the observation period, six IPO firms were SOEs and 144 were non-SOEs. The results show that mean gross spread of SOEs was lower than that of non-SOEs. The mean gross spread of SOEs was 1.75% and of non-SOEs was 2.10%, with gross proceeds at IDR 2,360 billion and IDR 1,061 billion, respectively. The nominal direct

cost was equal to IDR 43.41 billion for SOE IPO firms and IDR 18.90 billion for non-SOE IPO firms.

The lower gross spread of SOEs compared with non-SOEs is consistent with previous studies, such as Wang and Zhou (2013) in the case of China. IPOs of SOEs are attractive for investors because government-owned firms are mostly in well-established industries, which are perceived to be less risky compared with privately owned firms from the same industry (Ritter 1984). Further, the larger size of the IPO offering makes SOEs more attractive for underwriters, which is taken into consideration by underwriters in determining direct cost or gross spread.

4.3.2.5 Pricing Strategy Analysis

Panel E shows gross spread, gross proceeds and gross spread in IDR billion based on pricing strategy (book-building vs fixed-price). Book-building refers to the process by which an underwriter tries to determine the offer price of an IPO based on the demand of institutional investors to reduce information asymmetric. Fixed-price offerings are priced without first soliciting investor interest. During the sample period, 137 IPOs used a book-building strategy and 13 a fixed-price strategy. It can be seen that, at 2.07%, the gross spread level of the book-building strategy was lower than that of the fixed-price strategy (2.37%), and the proceeds of book-building (IDR 711 billion) were also lower than for fixed-price (IDR 787 billion). This result on lower direct cost in nominal terms was paid by IPO firms using a book-building pricing strategy.

These results for Indonesia are in contrast to those for other IPO markets, for example, the US, as indicated by findings of previous studies, which indicate that gross spread for book-building should be higher than that for fixed-price (Fernando et al. 2015; Wang & Zhou 2013). This result indicates that the use of pricing strategy might not be relevant in explaining the lower gross spread of book-building compared with fixed strategy, because the difference was not significant. The difference in gross spread may be more related to competition in the underwriting market, especially because the choice of IPO pricing strategy in Indonesia is exogenous for Indonesian issuer firms (Hanafi 2016). Issuer firms cannot choose their pricing strategy because the book-building pricing strategy has been mandatory since 2000 in line with the Capital Market and Financial Institutions Supervisory Agency or *Badan Pengawas Pasar Modal dan Lembaga Keuangan* (BAPEPAM-LK) Regulation No IX.A.2 (2000) on Registration of Public Offering.

4.3.3 Distribution of Gross Spread and Underwriter in IPO

This section begins with a discussion of distribution of total listed IPOs and underwriters (see Table 4.5). Total IPOs in every year over 2007–2016 fluctuated between 13 in 2009 and 30 in

2013. The number of underwriters tended to increase, from 93 in 2007–2010 and 2012, to 101 in 2016. The number of underwriters was relatively high: up to four–six times the total number of issuers during the sample period. The increasing trend in underwriters was not accompanied by an increasing number of IPOs, potentially creating high competition in the underwriting market.

Table 4.5. Distribution of Total Listed IPO and Underwriter

Year	Total IPO	No. Underwriter
2007	22	93
2008	18	93
2009	13	93
2010	23	93
2011	25	94
2012	22	93
2013	30	97
2014	23	97
2015	16	100
2016	15	101

Table 4.6 presents the distribution of gross spread and lead underwriters in the Indonesian IPO market. Lead underwriters are responsible for managing the IPO process and determining the final offer price. The table presents distribution of gross spread by size of IPO and by period of time.

Table 4.6. Distribution of Gross Spread and Lead Underwriter in IPO

No. Lead Underwriters	All Sample		Gross Proceeds[1]				Period			
	N	Gross Spread (%)	N	Small IPO	N	Large IPO	N	2007-2009	N	2010-2016
1	88	2.01	54	2.05	34	1.95	21	2.04	67	2.00
2	37	2.21	18	1.97	19	2.44	10	2.07	27	2.26
3	21	2.21	3	2.67	18	2.16	5	2.30	16	2.18
4	3	2.04		-	3	2.04			3	2.04
5	1	1.20		-	1	1.20			1	1.20
Total	150		75		75		36		114	

Note : [1]Gross Proceeds (IDR billion) = size of the IPO in IDR billion

The majority of IPOs in the sample (88, or 58.66%) had one lead underwriter, followed by 37 IPOs (24.67%) with two lead underwriters, 21 IPOs with three lead underwriters, and only one IPO with five lead underwriters. Gross spreads varied between 1.20%, when the IPO only had one lead underwriter, to 2.21% for IPOs with two and three lead underwriters. Further, the sample was divided into small and large IPOs. IPOs were included in small group when the offer size was between IDR 0 and IDR 357 billion (median of gross spread), and in large group when the offer size was more than IDR 357 billion. Of the 75 IPOs in the small group, 54 had one lead underwriter, 18 had two lead underwriters and three had three lead underwriters. In large IPO sample, 34 IPOs had one lead underwriter, 19 had two lead underwriters, 18 had three lead underwriters, four had four underwriters and one had five underwriters. The mean gross spread of small IPOs varied from 1.97% to 2.67%, and of large IPOs from 1.20% to 2.44%.

Of the 36 IPOs in the first period sample (2007–2009), 21 had one lead underwriter, 10 had two lead underwriters and five had three lead underwriters. Of the second period sample (2010–2016), 67 had one lead underwriter, 27 had two lead underwriters, 16 had three lead underwriters, three had four underwriters and one had five underwriters. For both periods, it can be seen that mean gross spread varied from 2.04% to 2.30% in the first period, and from 1.20% to 2.26% in the second period. In the first period the distribution of gross spreads indicates a pattern related to the number of lead underwriters in that IPOs with more lead underwriters had a higher gross spread. The distribution of gross spreads in the second period did not show any pattern related to number of lead underwriters.

Underwriters play a key role in the IPO process as they advise issuing firms, set offer prices and distribute new issues (Chen, Wok & Fang 2006). In return, issuing firms pay underwriters according to a contractual agreement. Table 4.7 shows the distribution of the gross spread level and underwriters' reputation to analyse the direct cost occurring as a result of IPO firms' decision of either a high-reputation and low-reputation underwriter. The sample is again divided into two periods of 2007–2009 and 2010–2016. Underwriters were ranked according to the number of offerings underwritten by each underwriter for each year, then partitioned using a two-tier system into high- and low-reputation groups using the median number of offerings underwritten by each underwriter.

Further, gross spread data for the high- and low-reputation groups were divided into three groups: low spread, medium spread and high spread. The high-spread and low-spread groups comprised the top and bottom 20% of the gross spread distribution, and the remaining 60% was classified as the medium-spread group.

Table 4.7. Distribution of Gross Spread, Gross Proceeds and Underwriter Reputation

Underwriter Reputation Level	N	Low-spread (%)	Gross Proceeds[1] (IDR bill)	Medium-spread (%)	Gross Proceeds (IDR bill)	High-spread (%)	Gross Proceeds (IDR bill)
Period: 2007-2009							
High Reputation	27	0.93	259	2.05	1,422	3.25	300
Low Reputation	9	1.89	18	2.15	864	2.87	1,916
Period: 2010-2016							
High Reputation	92	0.75	458	2.06	955	3.16	590
Low Reputation	22	1.24	253	2.39	694	3.38	327

Note : [1]Gross Proceeds (IDR billion) = size of the IPO in IDR billion

The results show that for 2007–2009, mean gross spread of high-reputation underwriters was lower than that for low-reputation underwriters, for both low-spread and medium-spread groups. In the low-spread group, the mean gross spread of high-reputation underwriters was 0.93%, compared with mean gross spread of low-reputation underwriters of 1.89%. The mean gross spread of high-reputation underwriters in the medium-spread group was 2.05%, compared with 2.15% for low-reputation underwriters. Conversely, the mean gross spread of high-reputation underwriters (3.25%) was higher than for low-reputation underwriters (2.87%) in the high-spread group.

The period 2010–2016 shows an almost consistent pattern with 2007–2009, in that the mean gross spread of high-reputation underwriters was lower than that of low-reputation underwriters for each of the low-spread, medium-spread and high-spread groups. The mean gross spread of high-reputation underwriters in the low-spread group was 0.75%, compared with low-reputation underwriters at 1.24%. In the medium-spread group, the gross spread of high-reputation underwriters was 2.06%, compared with low-reputation underwriters at 2.39%. The high-spread group shows similar results, with mean gross spread of high-reputation underwriters (3.16%) lower than that of low-reputation underwriters (3.38%). The results from the two periods have a consistent pattern, because when Indonesian IPO gross spreads were examined under different underwriter reputations, the results reveal that, mostly, the gross spread level of high-reputation underwriters in all sub-periods was lower than that for low-reputation underwriters.

4.3.4 Clustering Pattern of Gross Spread

This section examines gross spreads to identify clustering patterns in the Indonesian IPO market. It begins with a frequency distribution by sub-period and industry, followed by a discussion on clustering patterns.

In calculating a frequency distribution, gross spreads were divided into five ranges, from the lowest at 0% to the highest at 4% and more than 4% (see Table 4.8). The gross spreads of most IPOs (71 IPOs, or 47.33%) were between 2% and 3%, followed by gross spreads from 1% to 2%. Considering sub-periods, 17 IPOs (47.22%) in 2007–2009 and 54 IPOs (47.37%) in 2010–2016 paid direct costs between 2% to 3%. Only one IPO in the first period and four in the second period paid the highest gross spread of more than 4%.

Table 4.8. Distribution of Frequency of Gross Spread by Sub-Period and Industry

	Gross Spread (%)	0% - <1%	1% - <2%	2% - <3%	3% - <4%	4%≤
All sample	2.09	17	36	71	21	5
Panel A : Sub-Periods						
2007 -2009	2.12	3	10	17	5	1
2010 – 2016	2.09	14	26	54	16	4
Panel B : Industry						
Agriculture	1.79	3	1	6	1	-
Mining	2.05	3	7	8	3	2
Basic Industry and Chemicals	1.98	1	5	2	2	-
Miscellaneous	2.19	1	1	3	2	-
Consumer Goods	2.39	-	-	5	1	-
Property and Real Estate	1.98	2	12	15	1	1
Infrastructure, Utilities and Transportation	2.32	-	3	14	5	-
Trade and Service	2.11	7	7	18	6	2

Table 4.8 Panel B presents the frequency distribution of gross spread by industry. Trade and services has the highest number of IPOs (18 IPOs) with gross spreads between 2% and 3%, followed by property and real estate (15 IPOs), and infrastructure, utilities and transportation (14 IPOs); the number of IPOs in other industries was less than 10 IPOs. Almost all IPO firms in all industries paid direct costs between 2% and 3%, except basic industry and chemicals, which paid a lower gross spread, between 1% and 2%. Gross spreads between 1% and 2% were the second most common spread, especially for property and real estate, accounting for 12 IPOs or 8%, followed by trade and services, and mining.

The frequency distribution of gross spread by industry can be examined to determine clustering patterns (see Table 4.9). This examination is done via two measurements: mode gross spread and relative frequency. The mode spread is the most common gross spread paid by IPO firms; relative frequency of mode spread is measured in percentages, as the number of IPOs with the mode gross spread divided by the number of IPOs. In this study, this relative frequency is used as the measure of clustering. The table also shows the total percentage frequency of the three most common spreads. Further, the sample was divided into small and large IPOs, where the small group included offer sizes between IDR 0 and IDR 357 billion (median gross spread) the large group included offer sizes of more than IDR 357 billion.

The discussion of clustering patterns starts with results for the first period sample. It can be seen that 2% is the most common spread for both small and large IPOs, accounting for 22.75% and 14.29%, respectively. The second most common spread for small IPOs was 2.5%, followed by 3%, with the total frequency of the three most common spreads accounting for 50 % of IPOs. For large IPOs, 2.25% and 2.5% were the second and third most common spreads, with a total frequency for these most common spreads of 42.86%.

In the second period sample, gross spreads of 2.5% were the most common for small IPOs, accounting for 15.09%. The second most common spread was 3% (11.32%), followed by 2% (9.43%). These three gross spreads had a total frequency of 35.85% of IPOs. For large IPOs, 2% was the most common spread, accounting for 16.39%. The second most common spread was 2.5% (13.11%), followed by 3% (9.83%). These three gross spreads had a total frequency of 39.34% of large IPOs. The results show that the most common spread of large IPOs (2%) was lower than that of small IPOs (2.5%).

For the total sample (2007–2016), a gross spread of 2.5% emerged as the most common for small IPOs, accounting for 14.67% of the sample. The second most common spread was 2% (14%), followed by 3% (12%). These three gross spreads had a total frequency of 40% of small IPOs. For large IPOs, 2% was the most common spread, accounting for 16% of the sample. The second most common spread was 2.5% (13%), followed by 3% (9.3%). These three gross spreads had a total frequency of 38.67% of large IPOs. The clustering pattern of the whole sample is the same as that of the second period (2010–2016), with the most common spread of large IPOs lower than that of small IPOs. The difference is that 2% and 3% emerged as the second and third most common spreads for small IPOs.

Table 4.9. Gross Spread Clustering Pattern

	Small IPO			Large IPO			All IPOs		
	Mode Spread[1]		Three Most Common Spread	Mode Spread		Three Most Common Spread	Mode Spread		Three Most Common Spread
	Level (%)	Relative[2] Frequency	Relative Frequency	Level (%)	Relative Frequency	Relative Frequency	Level (%)	Relative Frequency	Relative Frequency
2007 -2009	2.00	22.73%	50%	2.00	14.29%	42.86%			
2010 -2016	2.50	15.09%	39.85%	2.00	16.39%	39.34%			
2007-2016	2.50	14.67%	40%	2.00	16%	38.67%	2	15%	40%

Note: [1]mode spread = the most common gross spread paid by the IPO firms, [2] relative frequency = the number of IPOs with the mode gross spread or three most common spread is divided by the number of IPOs, measured in percentages.

For all IPOs, it can be seen that 2% emerged as the most common spread, accounting for 15% of the sample. The second most common spread was 2.5% (14%), followed by 3% (11%). These three gross spreads had a total frequency of 39% of IPOs. A gross spread of 2% emerged as the mode; however, gross spreads did not show a high clustering pattern at 2%, because the number of IPOs with gross spread level of 2% was only 15% of all IPOs.

Indonesian IPOs show a weaker clustering pattern than those of other markets. In Torstila (2003), the gross spread in the US market was clustered at 7%, accounting for 43% of the total. In the Asia Pacific market, such as Hong Kong, India and Singapore, gross spread was clustered at 2.5%, accounting for 94.8%, 86% and 55.7%, respectively. The European market also shows a high clustering pattern, such as Belgium, at 66.7%. The weak clustering pattern in Indonesia can also be seen from the standard deviation of gross spreads, which was relatively high (0.83) compared with the US standard deviation of only 0.0045 (Lee 2012).

4.4 Results of Relationship Between Gross Spread and Determinants of Gross Spread

This study employed two methods to examine the relationship between gross spread, underpricing, and the determinant variables of gross spread and underpricing: 1) pooled OLS regression; and 2) panel regression. Pooled OLS regression and panel regression were designed to answer RQ2 and test the proposed hypotheses 1–7.

RQ2: What are main determinants of IPO gross spreads for Indonesian listed firms?

4.4.1 Results of Pooled Ordinary Least Squares (OLS) Regression Model

To address RQ2, the relationship between gross spread and the determinants of gross spread was examined under six regression models decomposed into sub-period, non State-Owned Enterprises (SOE), book-building strategy and all sample. The regression model was estimated by independent variables including issue-specific, firm-specific and market-specific characteristics: underwriter reputation, gross proceeds, offer price, firm size, firm age, profitability and hot issue market. The results of the two regression models are presented in Table 4.10, and are discussed below.

Table 4.10. Gross Spread and Determinants of Gross Spread

Variables	Abbvn	Gross Spread Equation				All Sample	
		2007-2009	2010-2016	Non-SOE	Book-building Strategy	Model 1	Model 2
Constant		1.864***	3.387***	2.952***	2.949***	2.741***	2.976**
		(3.606)	(6.488)	(7.207)	(6.924)	(9.900)	(7.322)
Issue-specific Characteristic							
Underwriter Reputation	UWR	-0.446*	-0.455**	-0.418***	-0.381**	-0.459**	-0.387**
		(-1.709)	(-2.499)	(-2.741)	(-2.409)	(-3.03)	(-2.454)
Gross Proceeds	GPC	–	–	–	–	-0.030	–
						(-0.789)	
Offer Price	OP	0.283**	-0.063	-0.001	-0.017	–	-0.017
		(0.539)	(-0.830)	(-0.097)	(-0.255)		(-0.268)
Firm-specific Characteristic							
Firm Size	FSIZE	-0.064	-0.043	-0.051	-0.059	–	-0.053
		(-0.621)	(-1.181)	(-1.345)	(-1.523)		(-1.453)
Firm Age	AGE	-0.016**	–		–	–	-0.001
		(-2.157)					(0.554)
Profitability	PROF	-0.021***	-0.001	-0.001	-0.001	–	-0.001
		(-4.306)	(-0.164)	(-1.187)	(-0.784)		(-0.692)
Market-specific Characteristic							
Hot Issue Market	HM	-0.128	-0.260	-0.129	-0.063	-0.131	-0.118
		(-0.342)	(-1.575)	(-0.741)	(-0.395)	(-0.749)	(-0.692)
Observation		36	114	144	137	150	150
R^2		0.370	0.086	0.070	0.067	0.061	0.082
Adjusted R^2		0.240	0.048	0.036	0.031	0.042	0.043
F-statistic		2.843**	2.570**	2.852**	2.338**	3.182**	2.983***

Note : The dependent variable is gross spread. Abbvn = Abbreviation of variable in equation, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, *** is significant at the 0.01 level, ** is significant at the 0.05 level, * is significant at the 0.10 level

4.4.1.1 Sub-period Analysis, Non-State-Owned Enterprises (SOE), and Book-building Strategy

Based on Table 4.10, the regression model estimates of the relationship between gross spread and the determinants of gross spread are:

Model 2007-2009: Gross Spread

$$GSP = 1.864 – 0.446*UWR + 0.283OP** – 0.064FSIZE – 0.016**AGE – 0.021***PROF – 0.128HM \quad (4.1)$$

Model 2010-2016: Gross Spread

$$GSP = 3.387 – 0.455**UWR – 0.063OP – 0.043FSIZE – 0.001PROF – 0.260HM \quad (4.2)$$

Model non-SOE: Gross Spread

$$GSP = 2.952 – 0.418**UWR – 0.001OP – 0.051FSIZE – 0.001PROF – 0.129HM \quad (4.3)$$

Model Book-building Strategy: Gross Spread

$$GSP = 2.949 – 0.381**UWR – 0.017OP – 0.059FSIZE – 0.001PROF – 0.063HM \quad (4.4)$$

Regression model 2007-2009 was estimated by independent variables included in issue-specific, firm-specific and market-specific characteristics. The result present an R-squared (adjusted R-squared) of 0.370 (0.240), which can be interpreted as up to 24% of the variation in gross spreads being explained by these determinants. The results of the model imply acceptance of hypothesis H_5 and H_6 because the regression model indicates that firm age and profitability is the significant determinant variable in explaining gross spread. This finding supports the proposed hypothesis that firm age and profitability have a negative relationship with gross spread (H_5 and H_6). The negative coefficient of firm age and profitability indicates that older issuer firm and more profitable issuer firm pay less gross spread than others. Proposed hypothesis H_3 is not supported because the coefficient of offer price is positive.

Regression model of 2010-2016, non-SOE and book-building strategy shows the same result that underwriter reputation is the sole significant determinant variable in explaining gross spreads in the Indonesian IPO market. Underwriter reputation shows a negative relationship with gross spread and is statistically significant at the 5%, 5% and 1% level, respectively. According to this result, the proposed hypothesis that underwriter reputation has a negative relationship with gross spread (H_1) is accepted. Remaining variables shows insignificant relationship with gross spread (H_3, H_4, H_6 and

H_7). The negative coefficient of underwriter reputation implies that more reputable underwriters have lower gross spreads than less reputable underwriters, as supported by the previous work of Chen, Fok and Wang (2006), Chishty, Hasan and Smith (1996), Ljungqvist, Jenkinson and Wilhelm (2003), and Pugel and White (1988), who found that more prestigious underwriters tend to charge lower underwriting fees; however, it is contrary to Fernando et al. (2015), Ahn, Kim and Son (2007) and Zhang (2007), and this is discussed further in Section 4.6.

4.4.1.2 All Sample

Based on Table 4.10, the regression model estimates of the relationship between gross spread and the determinants of gross spread of all sample are:

Model 1: Gross Spread

$$GSP = 2.741 - 0.459^{**}UWR - 0.030GPC - 0.131HM \quad (4.5)$$

Model 2: Gross Spread

$$GSP = 2.976 - 0.387^{**}UWR - 0.017OP - 0.053FSIZE - 0.001AGE - 0.001PROF - 0.118HM \quad (4.6)$$

In Table 4.10, the first gross spread regression model demonstrates that underwriter reputation is the sole significant determinant variable in explaining gross spreads in the Indonesian IPO market. Underwriter reputation shows a negative relationship with gross spread and is statistically significant at the 5% level. According to this result, the proposed hypothesis that underwriter reputation has a negative relationship with gross spread (H_1) is accepted. This implies that more reputable underwriters have lower gross spreads than less reputable underwriters. The remaining determinants had an insignificant relationship with gross spread. The results rejected proposed hypotheses H_2, H_3 and H_7. The R-squared (adjusted R-squared) is 0.061 (0.042), which can be interpreted as up to 4.2% of the variation in gross spreads being explained by these determinants.

Regression model 2 result present an adjusted R-squared of 0.043, which can be interpreted as up to 4.3% of the variation in gross spreads being explained by these determinants. The results of Model 2 imply acceptance of hypothesis H_1 because the regression model indicates that underwriter reputation is the sole significant determinant variable in explaining gross spread. Offer price, firm size, firm age, profitability and a hot issue market have a negative relationship with gross spread, however, these variables had insignificant relationships with gross spread. Therefore, proposed hypotheses H_3–H_7 are not supported, and this is discussed further in Section 4.6.

4.4.2 Results of Panel Regression

The relationship between gross spread and the determinants of gross spread was also examined under a panel regression model to identify the main determinants by industry, firm size and offer size. The industry panel comprised eight cross-sectional industries, the firm size panel comprised four cross-sectional firm sizes, and the IPO offer size panel comprised four cross-sectional offer sizes. Each panel had 10 years of time-series data, from 2007–2016.

The panel regression model was estimated by independent variables included in issue-specific and firm-specific characteristics: 1) gross proceeds; 2) offer price; 3) firm size; 4) firm age; and 5) profitability. Discussion on the results of the panel regression is provided in two parts: the first describes the industry, firm size and offer size panels, and the second discusses the panel analysis results.

4.4.2.1 Descriptive Statistic of Panels

Table 4.11 Panel A presents summary statistics of the industry panel and the determinants of gross spread (gross proceeds, offer price, firm size, firm age and profitability). The mean gross spread of all samples in the industry panel is 2.01%, and the median is 2.11%. The variation of gross spread data within the sample is relatively low (0.71), ranging from a minimum of 0.09% to a maximum of 4.00%. Firm size, firm age and profitability are firm-specific characteristics. Size of firms going public varied greatly, from IDR 48 billion to IDR 11,055 billion, with a mean of IDR 1,884 billion and a median of IDR 1,264 billion. The summary statistics of firm age show that the average (median) age of firms going public was 18 years (16 years), ranging from two years to 55 years (two years is the minimum requirement for firms to be listed on the IPO market). The third determinant in the firm-specific characteristics is profitability. The average profitability of IPO firms was 16.10% and the median was 16.12%. Profitability varied from −25.23% to 67.09%.

Table 4.11 Panel B presents summary statistics of the firm size panel and the determinants of gross spread. There are four cross-sectional firm sizes, calculated based on 38 unbalanced panel data for firm size. The mean gross spread of all samples was 2.06%, and the median was 2.06%. The variation of gross spread data within the sample was relatively low (0.53), ranging from a minimum of 0.75% to a maximum of 3.50%.The descriptive statistics show that the mean (median) of gross proceeds of all samples was IDR 1,458 billion (IDR 668 billion), and the standard deviation was 3,401. This shows that disparities in total proceeds that firms received from IPOs were relatively high, from IDR 84 billion to IDR 21,117 billion. The mean offer price was IDR 1,222 and the median was IDR 775.

Table 4.11. Descriptive Statistics of Gross Spread and Determinants of Gross Spread for Panel of Industry, Panel of Firm Size and Panel of Offer Size

	Abbvn	N	Mean	Median	SD	Min	Max
Panel A: Panel of Industry							
Gross Spread (%)	GSP	59	2.01	2.11	0.71	0.09	4.00
Gross Proceeds (IDR billion)	GPC	59	1,210	424	3,107	18	20,390
Offer Price (IDR)	OP	59	764	430	993	10	4,613
Firm Size (IDR billion)	FSIZE	59	1,884	1,264	1,958	48	11,055
Firm Age	AGE	59	18	16	10	2	55
Profitability (%)	PROF	59	16.10	16.12	15.44	-25.23	67.09
Panel B: Panel of Firm Size							
Gross Spread (%)	GSP	38	2.06	2.06	0.53	0.75	3.50
Gross Proceeds (IDR billion)	GPC	38	1,458	668	3,401	84	21,117
Offer Price (IDR)	OP	38	1,222	775	1,406	105	5,533
Firm Age	AGE	38	19	14	9	5	43
Profitability (%)	PROF	38	19.12	14.26	22.35	-16.92	122.70
Panel C: Panel of Offer Size							
Gross Spread (%)	GSP	34	2.02	2.02	0.57	0.83	3.20
Offer Price (IDR)	OP	34	734	550	586	102	2,342
Firm Size (IDR billion)	FSIZE	34	2,791	1,619	2,793	477	12,524
Firm Age	AGE	34	19	17	11	2	47
Profitability (%)	PROF	34	15.41	13.50	16.29	-31.04	52.83

Note: Abbvn = Abbreviation of variable in equation, N = number of sample, SD = standard deviation, GSP = gross spread, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability.

The variation of offer price was relatively high, ranging from a minimum of IDR 105 to a maximum of IDR 5,533. Firm age and profitability are included in firm-specific characteristic variables. The summary statistics on firm age show that the average (median) age of firms going public is 19 years (14 years), ranging from a minimum of five years to 43 years. The second determinant of gross spreads in firm-specific characteristics is profitability. The average of profitability of IPO firms was 19.22% and the median was 14.26%. Profitability varied from a minimum of −16.92% to 122.70%.

Table 4.11 Panel C presents summary statistics on the offer size panel and determinants of gross spread (offer price, firm size, firm age and profitability). There were four cross-sectional offer sizes, calculated based on 34 unbalanced panel data on offer size. The mean gross spread of all samples was 2.02%, and the median was 2.02%. The variation of gross spread data within the sample was relatively low (0.57), ranging from a minimum of 0.83% to a maximum of 3.20%. The mean offer price was IDR 734 and the median was IDR 550. The variation of offer price was relatively high (586), ranging from a minimum of IDR 102 to a maximum of IDR 2,342. Firm size, firm age and profitability are included in firm-specific characteristic variables. Size of the firms

going public varied greatly, from IDR 477 billion to IDR 12,524 billion, with mean of IDR 2,791 billion and median of IDR 1,619 billion. The summary statistics on firm age show that the average (median) age of firms going public was 19 years (17 years), ranging from a minimum of two years to 47 years. The third determinant in firm-specific characteristic is profitability. The average of profitability of IPO firms was 15.41% and the median was 13.50%. Profitability varied from a minimum of −31.04% to 52.83%.

4.4.2.2 Result of Gross Spread and Panel Regression Model of Industry

The relationship between gross spread and determinants of gross spread was examined under a panel regression model by industry. The industry panel was an unbalanced panel of eight cross-sectional industries and 10 years of time-series data from 2007–2016. The eight industries were (i) agriculture, (ii) mining, (iii) basic industry and chemicals, (iv) miscellaneous, (v) consumer goods, (vi) property and real estate, (vii) infrastructure, utilities and transportation and (viii) trade and services. The results of panel regression model are presented and discussed below.

4.4.2.2.1. Hausman Test for Comparing Fixed and Random Effects

The Hausman specification test compares fixed and random effect models. If the null hypothesis of no correlation is rejected, it can be concluded that a fixed effect model is preferred. The results strongly reject H_0 (p-value = 0.05), which means that the fixed effects regression model was preferred for the industry panel.

Table 4.12. Hausman Test Results

Panel data	Test Summary	Chi-Sq. Statistic	Chi-Sq. df	P-value
Industry	Cross-section random	10.99	5	0.05

Note: *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

4.4.2.2.2. Estimation of Gross Spread and Panel Regression Model of Industry

The relationship between gross spread and determinants of gross spread was examined under a panel regression model of industry, with independent variables included in issue-specific and firm-specific characteristics: 1) gross proceeds; 2) offer price; 3) firm size; 4) firm age; and 5) profitability. The results are presented in Table 4.13 and discussed below.

Table 4.13. Gross Spread and Panel Regression of Industry

Variables	Abbvn	Fixed Effect
Constant		1.404***
		(2.692)
Issue-specific Characteristic		
Gross Proceeds	GPC	0.063
		(0.613)
Offer Price	OP	0.257***
		(3.524)
Firm Specific Characteristic		
Firm Size	FSIZE	-0.254**
		(-2.261)
Firm Age	AGE	0.023***
		(3.260)
Profitability	PROF	0.008
		(1.557)
N		59
R^2		0.523
Adjusted R^2		0.399
F-statistic		4.210***

Note : The dependent variable is gross spread Abbvn = Abbreviation of variable in equation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, *** is significant at the 0.01 level, ** is significant at the 0.05 level, * is significant at the 0.10 level

Based on Table 4.13, the panel regression model estimates of the relationship between gross spread and the determinants of gross spread, is:

$$GSP = 1.404 + 0.063\text{GPC} + 0.257^{***}\text{OP} - 0.254^{**}\text{FSIZE} + 0.023^{***}\text{AGE} + 0.008\text{PROF} \quad (4.7)$$

The results indicate an R-squared (adjusted R-squared) of 0.523 (0.399), which can be interpreted as up to 39.9% of the variation in gross spread being explained by these determinants. The gross spread regression model indicates that offer price, firm size and firm age are the main determinants in explaining gross spread. Offer price and firm age are statistically significant at the 1% level, and firm size is statistically significant at the 5% level. However, according to the results, only firm size supports the proposed hypothesis (H_4) because the negative coefficient is consistent with the proposed hypothesis. The negative coefficient indicates that larger issuer firms have lower gross spreads. The variables of offer price and firm age show a significant relationship; however, the positive coefficients of these two variables are inconsistent with the proposed hypotheses of a

negative relationship with gross spread. Therefore, hypotheses H_3 and H_5 are not supported. Hypotheses H_2 and H_6 are also not supported because gross proceeds and profitability show a positive and insignificant relationship with gross spread—this is discussed further in Section 4.6.

4.4.2.3 Result of Gross Spread and Panel Regression Model of Firm Size

The relationship between gross spread and the determinants of gross spread was also examined under a panel regression model of firm size. The firm size panel was an unbalanced panel of four cross-sectional firm sizes based on quartiles, and 10 years of time-series data, from 2007–2016. The results of the panel regression model are presented and discussed below.

4.4.2.3.1. Breusch-Pagan LM Test for Random Effects

The Breusch-Pagan LM test is used to compare random effect models and pooled OLS. The Hausman specification test cannot be used because of the limited number of cross-sectional firm sizes (T > N). The Breusch-Pagan LM test can be run to examine whether the individual- (or time-) specific variance is zero. If the null hypothesis (H_0) is rejected, it can be concluded that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than pooled OLS. Based on the present analysis, H_0 was accepted (p-value = 0.23), which means that the pooled OLS model was preferred for the firm size panel.

Table 4.14. Breusch-Pagan LM Test

Panel data	Test Summary	Statistic	df	P-value
Firm size	Breusch-Pagan LM	8.089	6	0.23

Note: *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

4.4.2.3.2. Estimation of Gross Spread and Panel Regression Model of Firm Size

The relationship between gross spread and the determinants of gross spread was examined under a panel regression model of firm size. This regression model was estimated by independent variables included in issue-specific and firm-specific characteristics: 1) gross proceeds; 2) offer price; 3) firm age; and 4) profitability.

Based on Table 4.15, the panel estimates the relationship between gross spread and the determinants of gross spread is:

$$GSP = 2.389 - 0.007\text{GPC} - 0.088\text{OP}^{*} + 0.013^{***}\text{AGE} - 0.002\text{PROF} \quad (4.8)$$

Table 4.15. Gross Spread and Panel Regression of Firm Size

Variables	Abbvn	Pooled Panel
Constant		2.389***
		(7.390)
Issue-specific Characteristic		
Gross Proceeds	GPC	-0.007
		(-0.227)
Offer Price	OP	-0.088*
		(-1.714)
Firm-specific Characteristic		
Firm Age	AGE	0.013***
		(3.092)
Profitability	PROF	-0.002
		(-1.251)
N		33
R^2		0.357
Adjusted R^2		0.265
F-statistic		3.895**

Note: The dependent variable is gross spread, Abbvn = Abbreviation of variable in equation, GPC = gross proceeds, OP = offer price, AGE = firm age, PROF = profitability, *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

The results indicate the R-squared (adjusted R-squared) is relatively high at 0.357 (0.265), which can be interpreted as up to 26.5% of the variation in gross spreads being explained by these determinants. The gross spread regression model indicates that offer price and firm age are the significant determinant variables in explaining gross spread in the firm size panel regression. Table 4.13 shows that offer price is statistically significant at the 10% level and firm age is significant at the 1% level. The coefficient of offer price shows a negative relationship, and this is consistent with previous studies (Ahn, Kim & Son 2007; Chen & Mohan 2002; Meoli, Signori & Vismara 2012). This indicates that IPO firms with a higher offer price tend to have lower gross spreads; however the proposed hypothesis H_3 is not supported. Firm age shows a significant relationship, however, the positive coefficient is inconsistent with the proposed hypothesis of a negative relationship with gross spread, and thus, H_5 is not supported. The negative coefficients of gross proceeds and profitability are consistent with proposed hypotheses H_2 and H_6; however, the hypotheses are not supported because the coefficients indicate insignificant relationships. This is discussed further in Section 4.6.

4.4.2.4 Result of Gross Spread and Panel Regression Model of Offer Size

The relationship between gross spread and determinants of gross spread was examined under the offer size panel regression model. The offer size panel was an unbalanced panel of four cross-sectional IPO offer sizes, delineated via quartiles, for 10 years of time-series data, from 2007–2016.

4.4.2.4.1. Breusch-Pagan LM Test for Random Effects

The Breusch-Pagan LM test is used to compare random effect models and pooled OLS. The Hausman specification test cannot be used because of the limited number of cross-sections for firm size (T > N). The Breusch-Pagan LM test can be run to examine whether the individual- (or time-) specific variance is zero. If the null hypothesis (H_0) is rejected, it can be concluded that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than pooled OLS. Based on the present analysis, H_0 was accepted (p-value = 0.99), which means pooled OLS model was preferred for the offer size panel.

Table 4.16. Breusch-Pagan LM Test

Panel data	Test Summary	Statistic	df	P-value
Firm size	Breusch-Pagan LM	0.584	6	0.99

Note: *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

4.4.2.4.2. Estimation of Gross Spread and Panel Regression Model of Offer Size

The relationship between gross spread and determinants of gross spread was examined under a panel regression model for offer size. This regression model was estimated by independent variables included in issue-specific and firm-specific characteristics: 1) offer price; 2) firm size; 3) firm age; and 4) profitability.

According to Table 4.17, the panel regression model estimates of the relationship between gross spread and the determinants of gross spread is:

$$GSP = 2.070 - 0.0001^{**}OP - 0.042FSIZE + 0.023^{***}AGE - 0.003PROF \quad (4.9)$$

Table 4.17. Gross Spread and Panel Regression of Offer Size

Variables	Abbvn	Pooled Panel
Constant		2.070***
		(3.527)
Issue-specific Characteristic		
Offer Price	OP	-0.0001**
		(-2.247)
Firm-specific Characteristic		
Firm Size	FSIZE	-0.042
		(-0.692)
Firm Age	AGE	0.023***
		(2.962)
Profitability	PROF	-0.003
		(0.953)
N		34
R^2		0.382
Adjusted R^2		0.297
F-statistic		4.493***

Note: The dependent variable is gross spread, Abbvn = Abbreviation of variable in equation, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

The results indicate an R-squared (adjusted R-squared) of 0.382 (0.297), which can be interpreted as up to 29.7% of the variation in gross spread being explained by these determinants. The gross spread regression model indicates that offer price and firm age are the significant determinant variables in explaining gross spread in the offer size panel regression. The results in Table 4.17 show that offer price is statistically significant at the 5% level and firm age is statistically significant at the 1% level. According to the results, only offer price supports the proposed hypothesis (H_3)—the coefficient of offer price shows a negative relationship, consistent with previous studies (Ahn, Kim & Son 2007; Chen & Mohan 2002; Meoli, Signori & Vismara 2012) and the proposed hypothesis. The negative coefficient of offer price indicates that IPO firms with higher offer prices tend to have lower gross spreads; therefore, the proposed hypothesis H_3 is supported. Firm age shows a significant relationship; however, the positive coefficient is inconsistent with the proposed hypothesis of a negative relationship with gross spread, and thus, H_5 is not supported. Negative coefficients of firm size and profitability are consistent with proposed hypotheses H_4 and H_6; however, the hypotheses are not supported because the coefficients show insignificant relationships with gross spread—this is discussed further in Section 4.6.

4.5 Discussion of Characteristics of Gross Spread

This section discusses the characteristics of gross spread. The discussion starts with the distribution of gross spread components, followed by distribution of gross spread and gross proceeds, and gross spread and underwriter reputation. The last item is the clustering pattern of gross spreads.

4.5.1 Discussion of Distribution of Gross Spread Components

Gross spread is partitioned into three components: management fees, underwriting fees and selling fees (Lee 2012). Management fees enable underwriters to undertake marketing campaigns, assess market conditions and organise road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation. Underwriting fees are used to compensate underwriters for making a capital commitment as a result of underwriting commitment. Selling fees are used to compensate underwriters, who may be lead underwriters, co-managers, syndicate members or non-underwriters (selected dealers) in the selling group.

The evaluation of the direct cost of going public or gross spread revealed the mean gross spread during the sample period (2.05%). This gross spread declined compared with that during 1986–1999 (3.5%), as evaluated in Torstila (2003). The greatest cost incurred in direct costs for this sample was management fees at 58%, followed by 23% for underwriting fees and 19% for selling fees. The proportions for underwriting and selling fees tend to move together, while the proportion for management fees fluctuated.

The data suggest that the Indonesian underwriting market does not follow the industry standard 20/20/60 division (20% management fee, 20% underwriting fee and 60% selling concession), unlike the US (Chen & Ritter 2000; Lee 2012). The US underwriting market focuses more on the selling fee to compensate underwriters, who may be lead underwriters, co-managers, syndicate members or non-underwriters (selected dealers) in the selling group (Lee 2012). The Indonesian underwriting market has a greater focus on the management fee in line with a book-building pricing strategy, by which an underwriter tries to determine the offer price of an IPO based on the demand of institutional investors to reduce information asymmetries. Management fees enable underwriters to undertake marketing campaigns, assess market conditions and organise road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation.

4.5.2 Discussion of Distribution of Gross Spread and Gross Proceeds

The characteristics of gross spreads in Indonesia are different from those of other IPO markets, for example, the US, as indicated by the findings, which are inconsistent with those of previous studies. For the sub-period sample, the gross spread level in the first period (2007–2009) was higher, and this is related to low proceeds compared with proceeds in the second period. In the first period, the number of IPOs decreased due to the global financial crisis in 2008, which caused the IDX composite index to plummet to its lowest level. As a result, some firms postponed their IPOs, so that in 2009 the total number of IPOs was only 13, with gross proceeds the lowest during sample period, at only IDR 183 billion.

The results for gross spreads in SOE and non-SOE samples show that the gross spread level of SOEs is lower than non-SOEs, with proceeds higher than those for non-SOEs. The lower gross spread of SOEs compared with non-SOEs is consistent with previous studies, such as Wang and Zhou (2013) in the case of China. IPOs of SOEs are attractive for investors because government-owned firms are mostly in well-established industries, which are perceived as less risky when compared with privately owned firms from the same industry (Ritter 1984). Further, the larger size of the offering makes IPOs of SOEs more attractive for underwriters, which can be a consideration for underwriters in determining direct cost or gross spread.

In the pricing strategy sample, there is an indication that the use of a pricing strategy might not be relevant in explaining the lower gross spread of book-building compared with fixed strategy. This finding differs from that of Fernando et al. (2015), who found that gross spread book-building should be higher than fixed-price. The difference in gross spreads is related to competition in the underwriting market, especially because the choice of IPO pricing strategy in Indonesia is exogenous for Indonesian issuer firms (Hanafi 2016)—issuer firms cannot choose a pricing strategy because a book-building pricing strategy was suggested in regulations in 2000.

4.5.3 Discussion of Distribution of Gross Spread and Underwriter Reputation

Total IPOs per year over 2007–2016 fluctuated between 13 in 2009 and 30 in 2013, meanwhile the number of underwriters tended to increase, up to 101 in 2016. The number of underwriters was relatively high, up to four–six times the total number of issuers during the sample period. This increase was not accompanied by an increasing number of IPOs, which might create high competition in the underwriting market.

The distribution of gross spread level by underwriter reputation is used to analyse the direct cost occurring as a result of an IPO firm's decision to choose either a high-reputation or low-reputation

underwriter. As before, the sample was divided into two periods: 2007–2009 and 2010–2016. The results show that for 2007–2009, mean gross spread of high-reputation underwriters was lower than low-reputation underwriters. The period 2010–2016 has a pattern almost consistent with the first period 2007–2009, such that mean gross spread of high-reputation underwriters was lower than that of low-reputation underwriters in all groups (low spread, medium spread and high spread). The results from these two periods show a consistent pattern, because when the gross spread in the Indonesian IPO market was examined under different underwriter reputations, most of the gross spread levels of high-reputation underwriters in all sub-periods were lower than those of low-reputation underwriters.

The findings are inconsistent with those of Fernando et al. (2015), who showed that higher-reputation underwriters in the US earned a higher gross spread than lower-reputation underwriters, and received average reputational premiums equal to 0.65% of average IPO underwritten proceeds. This is because highly reputable underwriters tend to attract more high-quality firms through the IPO process; therefore, they generally charge higher fees than their less prestigious counterparts, to maintain their reputation (Booth & Smith 1986; Tinic 1988).

4.5.4 Discussion of Clustering Patterns of Gross Spread

The last evaluation is of the clustering pattern of gross spreads in the Indonesian market. The results show that 2% emerged as the most common spread, accounting for 13% of the sample. The second most common spread was 2.5% (12%), followed by 3% (11%). These spreads had a total frequency of 36% of IPOs.

The gross spread of 2% emerged as the mode; however, there was not a high clustering pattern at 2%. The number of IPOs with gross spread level of 2% was only 13% of all IPOs—small compared with the high clustering patterns in other markets. For example, as mentioned in Torstila (2003), gross spreads in the US market are clustered at 7%, accounting for 43%. In the Asia Pacific market, such as Hong Kong, India and Singapore, gross spread was clustered at 2.5%, accounting for 94.8%, 86% and 55.7%, respectively. The European market also shows a high clustering pattern, such as Belgium at 66.7%. The weaker clustering pattern in Indonesia can also be seen in the standard deviation of gross spreads, which was relatively high (0.88) compared with the US standard deviation of only 0.0045 (Lee 2012).

4.6 Discussion of Results of Relationship Between Gross Spread and Determinants of Gross Spread

This section discusses the results for the relationships between gross spread and determinants of gross spread. The discussion starts with results for the relationship between gross spread and issue-specific characteristics (underwriter reputation, gross proceeds and offer price), followed by discussion of the results for the relationship between gross spread and firm-specific characteristics (firm size, firm age and profitability), and a hot issue market. The summary of hypothesis testing is presented in Table 4.18.

4.6.1 Discussion of Results of Relationship Between Gross Spread and Underwriter Reputation

The reason issuers choose highly reputable underwriters for the IPO process is because underwriters are expected to be able to assess the value of a firm accurately to mitigate information asymmetry and uncertainty at the IPO stage (Razafindrambinina & Kwan 2013). For this service, reputable underwriters charge higher fees than their less prestigious counterparts. Ahn, Kim and Son (2007) examined small and large IPOs in Korea and found that underwriter reputations have a negative relationship with gross spread. Fernando et al. (2015) showed that higher-reputation underwriters in the US earned a higher gross spread than did lower-reputation underwriters, and received average reputational premiums equal to 0.65% of average IPO underwritten proceeds.

The results from the gross spread regression model of sub period of 2010-2016, non-SOE, book-building strategy and all sample show that underwriter reputation is the sole significant determinant variable in explaining gross spread in the Indonesian IPO market. The relationship between gross spread and underwriter reputation is negative and significant. This indicates that more reputable underwriters have lower gross spreads than less reputable underwriters. This can be explained by the competition hypothesis (Chen & Mohan 2002). Competition in the underwriting market can be seen from the responsiveness of the gross spread to proceeds, which is presented in Table 4.7, the distribution of gross spread, gross proceeds and underwriter reputation in two periods of 2007-2009 and 2010-2016. The results from the two periods have a consistent pattern, because when Indonesian IPO gross spreads were examined under different underwriter reputations, the results reveal that, mostly, the gross spread level of high-reputation underwriters in all sub-periods was lower than that for low-reputation underwriters. The changing competition level may also be the result of the increase in number of underwriters in Indonesia over 2007–2016, as presented in Table 4.6, the distribution of total listed IPO and underwriter. The number of underwriters was relatively

high, up to four–six times the total number of issuers during the sample period. The increasing number was not accompanied by an increasing number of IPOs, which may have created high competition in the underwriting market. Competition can also be a factor that restrains a high spread; however, reputable underwriters have the advantage of attracting larger transactions in all periods, reaching cost advantage or economies of scale, which result in low gross spread. This finding is supported by Pugel and White (1988), Ljungqvist, Jenkinson and Wilhelm (2003), and Chen, Fok and Wang (2006). Under competition, underwriters set a lower underwriting fee to compete for the underwriting business. As a result of competition, underwriter spread may not be sufficient to cover the risk premium. However, underwriters can adjust the level of gross spread which depend on the negotiated range of the offer price, to achieve an equilibrium risk premium (Chen & Mohan 2002) or underwriters can benefit from indirect compensation resulting from a high level of underpricing (Chen, Fok & Wang 2006).

4.6.2 Discussion of Results of Relationship Between Gross Spread and Gross Proceeds

The results in this study reveal that gross spreads in Indonesia appear to be related to gross proceeds (offer size of IPO). A negative relationship was found between gross proceeds and gross spread, which implies the larger the offer size of an IPO, the smaller the level of the gross spread.

IPO gross proceeds is a fundamental consideration in the pricing of underwriting services. Previous studies have documented that the economies of scale is related with gross proceeds or issue size (Bae & Levy 1990; Bhagat & Frost 1986; Booth & Smith 1986; Logue & Lindvall 1974). The larger the offer size, the higher the fixed costs incurred in the underwriting process (Pugel &White 1988). Therefore, the underwriter will lower underwriting fee per share for a larger issue. The responsiveness of the gross spread to proceeds could also be indicative of a changing level of competition in the market (Chen 1999).

Competition in the underwriting market can be seen from the responsiveness of the gross spread to proceeds, which is presented in Table 4.7, the distribution table of gross spread, gross proceeds and underwriter reputation. The distribution shows that the lower gross spread is related to size of the IPO or gross proceeds, where IPO firms with higher proceeds tend to have lower gross spreads. This shows that IPOs with larger gross proceeds tend to have lower gross spreads. This is consistent with past studies that have concluded that IPO size is a key determinant of gross spread, and that there is a trade-off between gross spread and proceeds (Beatty & Welch 1996; How & Yeo 2000; Torstila 2003; Zhang 2003).

Table 4.18. Summary of Hypothesis Test Results for Gross Spread and Determinants of Gross Spread in the Indonesian IPO Market in 2007–2016

Dependent Variable	Independent Variable	Expected Sign	2007-2009	2010-2016	Non-SOE	Book-building Strategy	All Sample		Panel Regression Result		
							Model 1	Model 2	Industry	Firm Size	Offer Size
GSP	UWR (H_1)	Positive / Negative	(–) NS	**(–) S**	**(–) S**	**(–) S**	**(–) S**	**(–) S**	–	–	–
	GPC (H_2)	Negative	–	–	–	–	(–) N	–	(+) NS	(–) NS	–
	OP (H_3)	Negative	(+) NS	(–) NS	(–) NS	(–) NS	–	(–) NS	(+) NS	(–) NS	(–) **S**
	FSIZE (H_4)	Negative	(–) NS	(–) NS	(–) NS	(–) NS	–	(–) NS	(–) **S**	–	(–) NS
	AGE (H_5)	Negative	**(–) S**	–	–	–	–	(–) NS	(+) NS	(+) NS	(+) NS
	PROF (H_6)	Negative	**(–) S**	(–) NS	(–) NS	(–) NS	–	(–) NS	(+) NS	(–) NS	(–) NS
	HM (H_7)	Negative	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	–	–	–

Note: The dependent variable is GSP = gross spread. UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, S = Supported, NS = not Supported.

4.6.3 Discussion of Results of Relationship Between Gross Spread and Offer Price

A negative and insignificant relationship was found between offer price and gross spread in the pooled data analysis. However, the results in this study reveal that gross spread in Indonesia appear to be related to offer price in panel data analysis of firm size and offer size. This shows that IPOs with higher offer prices tend to have lower gross spreads. This is consistent with work of Ahn, Kim and Son (2007), Chen and Mohan (2002), and Meoli, Signori and Vismara (2012). According to Logue and Lindvall (1974), if the offer price is determined simultaneously with the underwriting fee, the underwriters will require higher fee as a compensation of bearing risk form capital loss because of under-subscription, and the underwriters willing to negotiate for lower gross spread for IPO with higher offer price.

4.6.4 Discussion of Results of Relationship Between Gross Spread and Firm-specific Characteristics

The results in this study revealed that gross spread in Indonesia appears to be related to firm size. A negative and significant relationship between firm size and gross spread was found in the results for the industry panel. This shows that IPOs with larger firm size tend to have lower gross spreads. A negative relationship was found between firm age and gross spread. This is consistent with Pugel and White (1988), who examined the determinants of gross spreads of firm-commitment IPOs in the US from January–June 1981. They used firm age and size as proxies for issuer-specific risks to explain the variation in underwriter spreads. The results show that issuer age and size were negatively related to gross spread, and underwriting risk related to these variables was lower, because investors and underwriters are more familiar with older issuing firms.

The results in this study also found that firm age, profitability and gross spread are negatively correlated and significant in explaining gross spread for sub-period 2007-2009 sample. This shows that older issuer firms and higher profitability tend to have lower gross spreads. This is consistent with Ahn, Kim and Son (2007), who used firm age and profitability as proxies for risk and found that there was a negative relationship between profitability and underwriting fees. They argued that risk of underwriting profitable IPOs might be lower, because these firms will be relatively easy to sell on the market. Therefore, it is expected that more profitable firms will pay lower underwriting fees. Meanwhile, the negative relationship between firm age and gross spread indicates that investors and underwriters are more familiar with older issuing firms.

4.6.5 Discussion of Results of Relationship Between Gross Spread and Hot Issue Market

The results in this study revealed that IPO firms issued in a hot market tend to have lower gross spread, even though the difference is insignificant. This is consistent with Ahn, Kim and Son (2007), who examined gross spread differentiation based on issuers' listing period in the market. They found that firms that go public during a hot issue market pay lower underwriting fees than those going public during cold issue markets. Underwriters tend to charge lower fees during a hot issue market because in this period underwriters can do more business. This result is consistent for small and large IPOs.

4.7 Summary

Gross spread or underwriting discount (direct cost) is the difference between the offer price and the price paid by the underwriter to the issuer or a percentage commission per share paid to the underwriters as compensation to cover expenses, management fees, commission and risk. The evaluation of gross spread in Indonesia is important because it is low and in decline, with underwriting fees close to 0%. Gross spread is also lower than the mean gross spread of Indonesia and the Asia Pacific from previous studies. The main concern about low gross spreads and underwriting fees is this might result in poor underwriting that cannot compensate the underwriting risk. This situation raises a question regarding the reason for the decline in gross spreads. This chapter discussed gross spread and determinants in the Indonesian IPO market. The aim was to provide evidence on the characteristics of gross spread, identify gross spread patterns and the main determinants of gross spread.

This study employed two methods to examine the relationship between gross spread and determinants: 1) pooled OLS regression; and 2) panel regression. This study employed OLS regression for testing the hypotheses, consistent with previous studies. Pooled OLS regression was used in the first analysis. The relationship between gross spread and the determinants of gross spread was also examined under panel regression. The data were arranged into three panels: (i) by industry; (ii) by firm size; and (iii) by IPO offer size. The regression model was estimated by independent variables included in issue-specific, firm-specific and market-specific characteristics.

The result on the distribution of gross spread components found that the Indonesian underwriting market has different fee-setting practices, and is more focused on management fees. Management fees are used by underwriters to undertake marketing campaigns or road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation. Evaluation of gross spread using the mode and relative frequency revealed that the

gross spread level of 2% emerged as the common spread; however, this was not a highly clustered pattern, with the number of IPOs with gross spread level of 2% only 13% of all IPOs.

Hypothesis testing of pooled OLS regression result of sub-period 2010-2016 sample, book-building strategy, non-SOE and all sample shows that underwriter reputation is the sole significant determinant variable in explaining gross spreads in the Indonesian IPO market; other variables included in issue-specific, firm-specific and market-specific characteristics were statistically insignificant. Underwriter reputation and gross spread was negatively correlated, indicating that more reputable underwriters have lower gross spreads than less reputable underwriters. This is contrary to previous work, however can be explained by the competition hypothesis and economies of scale. The number of underwriters was increasing over the sample period, and relatively high, at four–six times the total number of issuers. This was not accompanied by an increasing number of IPOs, creating competition in the underwriting market. Under competition, more reputable underwriters have the advantage of attracting larger transactions in all periods, reaching cost advantage or economies of scale, which results in a lower gross spread. Firm age and gross spread The older firms and more profitable issuer firms. Meanwhile hypothesis testing result of sub-period 2007-2009 sample shows that firm age and profitability have a negative and significant relationship with gross spread.

The relationship between gross spread and determinants of gross spread was examined under a panel regression model of industry, firm size and IPO offer size. Panel regression gives different results on the main determinants of gross spread in the Indonesian IPO market. The main determinant in the industry panel was firm size, which had a significant and negative coefficient, indicating that larger IPO firm size has a lower gross spread. The firm size and offer size panel regressions indicated that offer price was the sole significant determinant of gross spread. Offer price shows a negative relationship with gross spread, implying that IPOs with a higher offer price tend to have lower gross spreads.

Chapter 5: Results and Discussion of Underpricing

5.1 Introduction

Evaluation of the offering and closing prices on the first day of trading shows a general phenomenon of underpricing in the short run. Underpricing exists when the closing price on the first day of trading is higher than the offer price; underpricing is the difference between the offer price and the closing price on the first day of trading for each company (Chong & Puah 2009). Previous studies show that IPOs are underpriced in most markets, including Indonesia, where they are underpriced by 25.32% (Bakke, Leite & Thorburn 2011; Chambers & Dimson 2009; Ekkayokkaya & Pengniti 2012; Gumanti, Nurhayati & Maulidia 2015). Even though most IPOs are found to be underpriced, researchers argue that underpricing might not meet the purposes of raising equity capital because issuers are likely to sell shares at a price that is less than what the market is willing to pay, or the pricing of an IPO is below the market value.

This chapter examines underpricing and its determinants in the Indonesian IPO market. The findings are expected to provide an explanation of the underpricing or indirect cost associated with firms going public. Section 5.2 presents the summary statistics on underpricing and its determinants, including: 1) intended use of IPO proceeds; 2) macroeconomic factors; 3) international stock markets; 4) issue-specific characteristic; and 5) firm-specific characteristics. Section 5.3 presents the distribution of underpricing, gross proceeds and money left on the table. Section 5.4 examines the relationship between underpricing and determinants of underpricing. This study employed pooled and panel regressions to identify the significant determinants of underpricing. Section 5.5 is discussion of the results. Section 5.6 presents a summary of this chapter.

5.2 Descriptive Statistics

This section presents and discusses the summary statistics of underpricing and determinants of underpricing, over the sample period 2007–2016. This summary is calculated based on a sample size of 150 IPO firms. Table 5.1 shows summary statistics of underpricing and determinants, including (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; (iv) issue-specific characteristics; (v) firm-specific characteristics; and (vi) market-specific characteristics.

Table 5.1. Descriptive Statistics of Underpricing and Determinants of Underpricing

	Abbvn	N	Mean	Median	SD	Min	Max
Underpricing (%)	UNDP	150	23.73	13.57	25.81	-18.13	70.00
Intended Use of IPO Proceeds							
Fixed Asset Investment (%)	FAI	150	43.82	42.00	36.22	0.00	90.00
Working Capital Financing (%)	WCF	150	23.16	15.00	24.46	0.00	71.00
Investment in Shares of Stock (%)	ISS	150	13.87	0.00	27.28	0.00	50.98
Debt Repayment (%)	DR	150	17.14	0.00	23.50	0.00	54.78
Macroeconomic Factors							
Inflation Rates (%)	IFR	150	5.84	5.90	2.10	2.57	12.14
Foreign Exchange Rates (IDR)	FER	150	10,302	9,519	1,629	8,564	14,024
International Stock Market							
Dow Jones Index	DJI	150	13,696	13,234	2,658	8,183	19,252
Shanghai Stock Exchange Index	SSE	150	2,919	2,730	946	1,910	5,716
Issue-specific Characteristics							
Dummy Underwriter Reputation	UWR	150	0.84	1.00	0.37	0.00	1.00
Gross Proceeds (IDR billion)	GPC	150	1,113	358	4,123	0.138	48,333
Offer Price (IDR)	OP	150	1,079	410	2,059	102	17,000
Firm-specific Characteristic							
Firm Size (IDR billion)	FSIZE	150	2,085	1,045	3,123	0.188	21,064
Firm Age	AGE	150	17	15	13	2	90
Profitability (%)	PROF	150	17.04	14.15	31.06	-196.70	146.38
Market Specific Characteristic							
Dummy Hot Issue Market	HM	150	0.84	1.00	0.37	0.00	1.00

Note: Abbvn = Abbreviation of variable in equation, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market.

The mean underpricing of the sample was 23.73%, and the median was 13.57%. The variation of underpricing data within the sample was relatively high, ranging from a minimum of -18.13% to a maximum of 70%. The intended use of IPO proceeds descriptive statistics show that the mean (median) of fixed asset investment was 43.82% (42%) and the standard deviation was 36.22. This shows that disparities in fixed asset investment within firms were relatively high, from 0% to 90%. The mean working capital financing was 23.16% and the median was 15%. The working capital financing varied from a minimum of 0% to a maximum of 71%. The third variable, investment in shares of stock, had a mean (median) of 13.87% (0%). The variation of investment in shares of stock was relatively high (27.28), ranging from a minimum of 0% to a maximum of 50.98%. With

respect to debt repayment, the mean was 17.14% and the median was 0%, ranging from a minimum of 0% to a maximum of 54.78%.

The macroeconomic factors descriptive statistics show that the mean and median of inflation rates were 5.84% and 5.90%, respectively. The variation of inflation rates was low (2.10), ranging from a minimum of 2.57% to a maximum of 12.14%. For foreign exchange rates, the descriptive statistics show that the mean (median) of the sample was IDR 10,302 (IDR 9,519) and the standard deviation was 1,629. This shows that the disparities are relatively high, from IDR 8,564 to IDR 14,024. The DJI and SSE indexes are included in international stock markets. For the DJI, the descriptive statistics shows that the mean (median) of the sample was 13,696 (13,234), ranging from 8,183 to 19,252. The mean SSE was 2,919 and the median was 2,730, ranging from 1,910 to 5,716.

For the first determinant in issue-specific characteristics, gross proceeds, the mean (median) is IDR 1,113 billion (IDR 358 billion), and the standard deviation is 4,123. This shows that disparities in total proceeds that a firm receives from an IPO is relatively high, from IDR 0.138 billion to IDR 48,333 billion. The mean offer price is IDR 1,079 and the median is IDR 410. The variation in offer price is relatively high, ranging from a minimum of IDR 102 to a maximum of IDR 17,000.

Firm size, firm age and profitability are included in firm-specific characteristic variables. Size of firms going public varied greatly, from IDR 0.188 billion to IDR 21,064 billion, with a mean of IDR 2,085 billion and a median of IDR 1,045 billion. Almost half of the sample (46%) had total assets less than IDR 1,000 billion. The summary statistics of firm age show that the average (median) age of firms going public was 17 years (15 years), ranging from a minimum of two years to 90 years; the majority of IPO firms (59.77%) had age less than the mean firm age (19 years). Two years is the minimum requirement for firms to be listed on the IPO market. The third determinant in firm-specific characteristics is profitability. Average profitability of IPO firms was 17.04% and the median was 14.15%. Profitability varied from a minimum of −196.70% to 146.38%. According to the profitability of all samples, 37.43% of the IPO firms had a good performance prior to IPOs, and had profitability higher than the average.

5.3 Distribution of Underpricing, Gross Proceeds and Money Left on the Table

This section presents the distribution of underpricing, proceeds and money left on the table in the Indonesian IPO market. The purpose is to analyse the indirect costs occurring as a result of the number of shares sold. Underpricing is the difference between the offer price and the closing price on the first day of trading for each company. Offer size or gross proceeds was measured by the

number of issued shares by offer price per share. Money left on the table is the first day of return in IDR billion, or the difference between the offer price and the closing price on the first day of trading for each company multiplied by the number of shares sold.

Table 5.2 shows the distribution of underpricing, proceeds and money left on the table, decomposed by listing year, industry, sub-period, SOE and non-SOE, and pricing strategy. The mean underpricing of the sample during the period 2007–2016 was 23.73%, with total IPO offer size or proceeds of IDR 718 billion. This money left on the table in nominal terms was equal to IDR 139 billion.

5.3.1 Listing Year Analysis

In Table 5.2 Panel A, it can be seen that underpricing varied over time, from a low of 11.85% (in 2011) to a high of 40.48% in 2008. It is apparent that average underpricing in the first two years was higher than underpricing in other years—40.17% (2007) and 40.48% (2008). Four years have underpricing lower than mean underpricing of the sample: 13.71% (2009), 11.85% (2011), 13.46% (2013), 19.71% (2014), and 19.20% (2016).

In term of gross proceeds, the offer size in 2009 was the lowest, while that in 2007 was the highest (IDR 1,137 billion), followed by IDR 1,056 billion in 2010 and IDR 966 billion in 2016. Gross proceeds in 2010 were almost six times those in 2009. After 2010, the offer size was less than IDR 1,056 billion, and fell to IDR 393 billion in 2012 before increasing to IDR 966 billion in 2016. In a comparison of number of IPOs with gross proceeds and money left on the table by year, 15 firms in 2007 had the highest of both proceeds (IDR 1,137 billion) and money left on the table (IDR 251 billion) compared with all other years.

Table 5.2. Distribution of Underpricing, Gross Proceeds and Money Left on the Table by Year, Industry, Sub-Period, SOE and non-SOE, and Pricing Strategy

	N	Underpricing (%)			Gross Proceeds[1] (IDR billion)			Money Left on the Table[2] (IDR billion)		
		Mean	Median	Std Dev.	Mean	Median	Std Dev.	Mean	Median	Std Dev.
All Sample	150	23.73	13.57	25.81	718	348	1,031	139	36	660
Panel A: Year										
2007	15	40.17	40.00	30.90	1,137	480	1,317	251	126	382
2008	12	40.48	30.85	25.75	418	43	850	92	26	136
2009	9	13.71	3.64	26.88	183	150	189	17	6	35
2010	17	31.03	19.23	22.80	1,056	483	1,329	235	58	336
2011	19	11.85	7.35	21.31	856	400	1,237	17	25	236
2012	19	27.10	22.02	24.92	393	300	349	90	32	118
2013	22	13.46	5.81	21.47	528	394	491	26	16	58
2014	14	19.71	13.03	22.67	627	447	864	134	50	167
2015	12	27.19	19.10	25.18	896	854	1,188	215	94	326
2016	11	19.20	5.45	25.83	966	322	1,572	76	21	152
Panel B: Industry										
Agriculture	11	8.54	3.64	21.44	805	509	933	67	13	144
Mining	23	19.08	9.40	25.41	1,593	847	2,680	245	50	406
Basic Industry and Chemicals	10	15.33	10.87	14.27	1,016	527	1,529	135	48	185
Miscellaneous	7	21.78	10.35	22.41	324	204	462	44	30	45
Consumer Goods	6	20.32	18.77	16.54	417	302	370	60	32	66
Property and Real Estate	31	35.41	33.33	28.65	639	400	674	146	77	177
Infrastructure, Utilities and Transportation	22	15.41	11.98	22.98	851	208	1,363	48	27	263
Trade and Service	40	28.71	21.40	26.44	531	168	919	80	29	188
Panel C: Sub-Periods										
2007-2009	36	33.25	29.85	30.05	673	172	1,060	142	32	279
2010-2016	114	20.85	12.12	23.68	732	400	1,027	104	39	223
Panel D: SOE and non-SOE										
SOE	6	17.48	18.85	23.40	2,360	1,995	1,554	282	229	717
Non-SOE	144	23.98	13.41	25.95	1,061	326	4,191	133	34	660
Panel E: Pricing Strategy										
Book-building	137	22.32	13.33	24.71	711	356	1,032	112	32	238
Fixed-price	13	38.00	32.34	32.33	787	329	1,061	120	85	223

Note: [1]Gross Proceeds (IDR million rupiah) = offer price per share x number of issued shares.
[2]Money left on the table (million rupiah) = the first-day returns x number of shares sold.

5.3.2 Industry Analysis

Panel B shows the distribution of the sample by industry. The listed IPOs during the period of observation were divided into eight industries. IPOs from the financial and investment industries were excluded from the sample. The trade and services industry had the largest share of the sample, followed by property and real estate—40 IPOs (26.66%) and 31 IPOs (20.66%) respectively. The consumer goods industry had the least IPOs, accounting for only six (4%).

The agriculture industry had the lowest underpricing at 8.54% and the property and real estate industry had the highest level at 35.41%. Two of eight industries (47% of sample) had higher mean underpricing than the sample mean: property and real estate (35.41%), and trade and services (28.71%). In terms of IPO offer size, the gross proceeds of industries were between IDR 324 billion (miscellaneous industry) and IDR 1,593 billion (mining industry). The offer sizes of two industries were more than IDR 1,000 billion: basic industry and chemicals (IDR 1,016 billion) and mining (IDR 1,593 billion); the offer sizes of other industries were less than IDR 1,000 billion. In a comparison of the number of IPOs with gross proceeds and money left on the table (indirect cost) by year, 23 firms in the mining industry had the highest of both proceeds (IDR 1,593 billion) and money left on the table (IDR 245 billion) compared with all other industries. These results show that all industries are underpricing.

5.3.3 Sub-period Analysis

In Table 5.2 Panel C, the period of observation is divided into two—2007–2009 and 2010–2016—to examine the differences in underpricing, proceeds and money left on the table. The division of sub-periods was based on the fluctuating number of IPOs in the sample period and gross proceeds. In 2008, the global financial market affected the number of IPOs and gross proceeds. These two indicators declined to their lowest levels in 2009, and increased significantly in 2010. Therefore, this research defined 2009 as the cut-off point, with the first period (2007–2009) including the global financial crisis of 2008, and 2010–2016 the second period.

The results show that the first period had more underpricing (33.25%) than the second period (20.85%), with mean proceeds in the first period of IDR 673 billion) and mean proceeds in the second period of IDR 732 billion. This means wealth transfer from shareholders of issuing firms to investors (money left on the table) in the first period was higher than in the second period, at IDR 142 billion compared with IDR 104 billion.

5.3.4 SOE and non-SOE Analysis

In Table 5.2 Panel D, the distribution of underpricing, proceeds and money left on the table are decomposed into SOEs and non-SOEs. During the observation period, six IPO firms were SOEs and 144 were non-SOEs. The results show that mean underpricing of SOEs (17.48%) was lower than mean underpricing of non-SOEs (23.96%), with gross proceeds at IDR 2,360 billion and IDR 1,061 billion, respectively. This implies that non-SOE IPO firms are more underpriced than SOE IPO firms.

In a comparison of gross proceeds and money left on the table (indirect cost), SOE IPO firms had the highest of both proceeds (IDR 2,360 billion) and money left on the table (IDR 282 billion) compared with non-SOE IPO firms. This indicates that SOE IPO firms paid more indirect costs than non-SOE IPO firms, as the money left on the table for SOE IPO firms (IDR 282 billion) was higher than for non-SOE IPO firms (IDR 133 billion).

Previous research shows that underpricing of IPOs of SOEs is higher than that of privately owned firms (Gong & Shekhar 2001; Suchard & Singh 2007). Sum Lam, Kuan Tan and Min Wee (2007) conducted research in 19 countries and found that the average market-adjusted initial return of the privatised IPO sample was higher than the IPO sample of privately owned firms, at 13.9% and 8.3%, respectively. IPO underpricing may occur due to higher information asymmetry and uncertainty surrounding the company, which brings problems in determining the offering price. Further, Beatty and Ritter (1986) found that the complexity of pricing was also related to certain types of firms. Companies characterised by higher information asymmetry tend to be more underpriced on average. Highly uncertain firms tend to offer higher discounts to encourage investors to risk buying IPO stocks and to attract more investors (Beatty & Ritter 1986; Ritter 1984; Rock 1986). Perroti (1995) indicated that government ownership is generally perceived as a signal of uncertainty due to possible changes in future government policies. Biais and Perotti (2002) explained that the government gives higher discounts for privatised IPOs, or underprice IPOs, as a positive signal of value of firms and commitment of governments to privatisation. Jenkinson and Mayer (1998) conducted research in the UK and found a positive relationship between ownership retention of governments and underpricing. This result is supported by findings on the privatisation of 33 SOEs in the UK and seven in Australia (Suchard & Singh 2007) and across 19 countries (Lam, Tan & Wee 2007).

Government-owned firms in Indonesia may be perceived as signalling uncertainty related to future government policies, which might affect the offer price of the IPOs of SOEs. However, government-owned firms are mostly in well-established industries, which are perceived to be less

risky than privately owned firms from the same industry (Ritter 1984). Therefore, IPOs of SOEs are generally underpriced, to attract more investors.

5.3.5 Pricing Strategy Analysis

Table 5.2 Panel E shows the underpricing, proceeds and money left on the table based on pricing strategy (book-building and fixed-price). Book-building refers to the process by which an underwriter tries to determine the offering price of an IPO based on the demand of institutional investors to reduce information asymmetries. Fixed-price offerings are priced without first soliciting investor interest. During the sample period, 137 IPOs used a book-building strategy and 13 used a fixed-price strategy. It can be seen that the underpricing level of the book-building strategy (22.32%) was lower than that of the fixed-price strategy (38%), and the proceeds of book-building (IDR 711 billion) were higher those of fixed-price (IDR 787 billion). In a comparison of money left on the table, IPO firms with a book-building strategy had less money left on the table than those with a fixed-price strategy, at IDR 112 billion and IDR 120 billion, respectively.

5.4 Result of Relationship Between Underpricing and Determinants of Underpricing

This section examines the relationship between underpricing and determinants of underpricing. This study used 13 determinant variables to explain the underpricing of IPOs in the Indonesian market, drawn from (i) intended use of IPO proceeds; (ii) firm-specific characteristics; (iii) macroeconomic factors; (iv) issue-specific characteristics; (v) market-specific characteristics; and (vi) international stock markets. Pooled OLS regression and panel regression were employed to identify the significant determinants, to answer RQ4, RQ5 and test hypotheses 8–20.

RQ4: What are the main determinants of IPO underpricing for Indonesian listed firms?
RQ5: Do macroeconomic conditions and international stock markets have a role in explaining the level of IPO underpricing for Indonesian listed firms?

5.4.1 Results of Pooled Ordinary Least Squares (OLS) Regression Model

To address RQ4 and RQ5, the relationship between underpricing and determinants of underpricing was examined using five regression models decomposed into sub-period, non State-Owned Enterprises (SOE), book-building strategy and all sample. The results of the two regression model are presented in Table 5.3 and discussed below.

Table 5.3. Underpricing and Determinants of Underpricing

Variables	Abbvn	Underpricing Equation			All Sample	
		2010-2016	Non-SOE	Book-building Strategy	Model 1	Model 2
Constant		49.585**	50.141**	46.174**	61.532***	45.941**
		(1.987)	(2.551)	(2.339)	(4.169)	(1.973)
Intended Use of IPO Proceeds						
Fixed Asset Investment	FAI	-0.162	-0.087	-0.135*	-0.145	-0.070
		(-1.025)	(-0.933)	(-1.877)	(-1.310)	(-0.504)
Working Capital Financing	WCF	-0.060	-0.027	–	-0.130	-0.009
		(-0.340)	(-0.236)		(-1.001)	(-0.061)
Investment in Shares of Stock	ISS	0.028	–	0.045	–	0.016
		(0.171)		(0.445)		(0.100)
Debt Repayment	DR	-0.194	-0.203	-0.200*	-0.295**	-0.184
		(-1.093)	(-1.643)	(-1.743)	(-2.091)	(-1.110)
Macroeconomic Factors						
Inflation Rates	IFR	0.861	1.484	1.603	–	1.466
		(0.657)	(1.370))	(1.450)		(1.357)
Foreign Exchange Rates	FER	-0.001	-0.003	-0.002	–	-0.003
		(-0.260)	(-1.379)	(-1.143)		(-1.291)
International Stock Market						
Dow Jones Index	DJI	–	0.001	0.001	–	0.001
			(0.972)	(0.790)		(0.909)
Shanghai Stock Exchange Index	SSE	0.006*	0.006**	0.007***	–	0.007**
		(1.711)	(2.381)	(2.833)		(2.592)
Issue-specific Characteristic						
Underwriter Reputation	UWR	4.480	1.774	1.282	2.672	1.975
		(0.828)	(0.343)	(0.237)	(0.505)	(0.380)
Gross Proceeds	GPC	–	-0.001***	-0.001***	-0.001**	-0.001***
			(-3.491)	(-2.855)	(-2.534)	(-2.681)
Offer Price	OP	-0.002**	–	–	-0.001	-0.001
		(-2.096)			(-0.462)	(-1.011)
Firm-specific Characteristic						
Firm Size	FSIZE	-2.533**	-3.204***	-3.116**	-2.610**	-2.884**
		(-2.151)	(-2.716)	(2.532)	(-2.148)	(-2.441)
Firm Age	AGE	-0.230	-0.263*	0.292**	-0.261**	-0.263**
		(-1.571)	(-1.850)	(-2.120)	(-2.048)	(-2.036)
Profitability	PROF	–	-0.035	-0.050	-0.045	-0.029
			(-0.703)	(-0.896)	(-0.806)	(-0.599)
Market-specific Characteristic						
Hot Issue Market	HM	-18.325	-8.461	-6.730	–	-8.893
		(-2.768)	(-1.516)	(-1.104)		(-1.545)
Observation		114	144	137	150	150
R^2		0.222	0.186	0.204	0.096	0.193
Adjusted R^2		0.129	0.105	0.120	0.031	0.103
F-statistic		3.074***	2.297***	3.536***	3.191***	3.038***

Note: The dependent variable is underpricing, Abbvn = Abbreviation of variable in equation, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, , *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

5.4.1.1 Sub-period Analysis, Non-State-Owned Enterprises (SOE), and Book-building Strategy

Based on Table 5.3, the regression model estimates the relationship between underpricing and the determinants of underpricing are:

Model 2010-2016: Underpricing

$$\begin{aligned} UNDP \;=\; & 49.585 - 0.162\text{FAI} - 0.060\text{WCF} + 0.028\text{ISS} - 0.194\text{DR} + 0.861\text{IFR} - 0.001\text{FER} \\ & + 0.006^{*}\text{SSE} + 4.480\text{UWR} - 0.002^{**}\text{OP} - 2.533^{**}\text{FSIZE} \\ & - 0.230\text{AGE} - 18.325\text{HM} \end{aligned} \tag{5.1}$$

Model non-SOE: Underpricing

$$\begin{aligned} UNDP \;=\; & 50.141 - 0.087\text{FAI} - 0.027\text{WCF} - 0.203\text{DR} + 1.484\text{IFR} - 0.003\text{FER} \\ & + 0.001\text{DJI} + 0.006^{**}\text{SSE} + 1.774\text{UWR} - 0.001^{***}\text{GPC} \\ & - 3.204^{***}\text{FSIZE} - 0.263^{*}\text{AGE} - 0.035\text{PROF} - 8.461\text{HM} \end{aligned} \tag{5.2}$$

Model Book-building Strategy: Underpricing

$$\begin{aligned} UNDP \;=\; & 46.174 - 1.35^{*}\text{FAI} + 0.045\text{ISS} - 0.200^{*}\text{DR} + 1.603\text{IFR} - 0.002\text{FER} \\ & + 0.001\text{DJI} + 0.007^{**}\text{SSE} + 1.282\text{UWR} - 0.001^{***}\text{GPC} \\ & - 3.116^{**}\text{FSIZE} - 0.292^{**}\text{AGE} - 0.050\text{PROF} - 6.730\text{HM} \end{aligned} \tag{5.3}$$

Regression model 2010-2016 indicate an R-squared (adjusted R-squared) of 0.222 (0.129), which can be interpreted as up to 12.9% of the variation in underpricing can be explained by determinants variables of underpricing. The result of the regression model indicates that there are two variables which have a significant relationship with underpricing at 5% level. Offer price and firm size are the main determinants in explaining underpricing in the Indonesian IPO market on 2010-2016 sample. Coefficient of offer price and firm size shows a negative relationship with underpricing and thus finding support proposed hypothesis (H_{18} dan H_{19}). This indicates that IPO firms with higher offer price and larger firms are less underpriced. Remaining variables show insignificant relationships with underpricing; thus, other proposed hypotheses (H_8–H_{17} and H_{20}–H_{22}) are not supported.

In the regression model of non-SOE variables of Shanghai Stock Exchange Index (SSE), gross proceeds, and firm size were the main determinant in explaining underpricing in the Indonesian IPO market. In the regression model of book-building strategy, variables of SSE, gross proceeds, firm size and firm age shows a significant relationship with underpricing. The regression model of two sample group (non-SOE and book-building strategy) have similar significant determinant variables which are SSE, gross proceeds, and firm size. The results for the SSE support proposed

hypothesis (H_{15}) because the SSE has a positive and significant relationship with underpricing. This indicates that positive SSE affected on positive Indonesian Stock Exchange (IDX) index which give optimism for investor to buy stock and result on underpricing or initial return. The result for the gross proceeds support proposed hypothesis (H_{17}) because the gross proceeds has a negative relationship with underpricing and this significant at the 5% level. The negative relationship imply that issuer firms with high offer size of IPO or gross proceeds are less underpriced. Firm size has a negative relationship with underpricing for two regression model (significant at the 1% and 5%, respectively), which indicates that larger firms are less underpriced. This finding supports the proposed hypothesis H_{19}. Proposed hypothesis H_{20} also supported in book-building strategy regression model because coefficient of firm age was significant at 5%. The result of gross proceeds, firm size and firm age is supported by previous work by Alli, Subrahmanyam and Gleason (2010), Hasan, Haded and Gorener (2013), Jewartowski and Lizinska (2012), Ammer and Zaluki (2015). Other variables drawn from intended use of IPO proceeds, macroeconomic factors, international stock market, issue-specific characteristics, firm-specific characteristics, and market-specific characteristics and are statistically insignificant, and is discussed further in Section 5.7.

5.4.1.2 All Sample

Based on Table 5.3, the regression model estimates the relationship between underpricing and the determinants of underpricing are:

Model 1: Underpricing

$$\begin{aligned} UNDP &= 61.532 - 0.145FAI - 0.130WCF - 0.099ISS - 0.295{**}DR + 2.672UWR \\ &\quad - 0.001{**}GPC - 0.001OP - 2.610{**}FSIZE - 0.261{**}AGE - 0.045PROF \end{aligned} \quad (5.4)$$

Model 2: Underpricing

$$\begin{aligned} UNDP &= 45.941 - 0.070FAI - 0.009WCF + 0.016ISS - 0.184DR + 1.466IFR - 0.003FER \\ &\quad + 0.001DJI + 0.007{**}SSE + 1.975UWR - 0.001{***}GPC - 0.001OP \\ &\quad - 2.884{**}FSIZE - 0.263{**}AGE - 0.029PROF - 8.893HM \end{aligned} \quad (5.5)$$

The first focused on intended use of IPO proceeds, issue-specific characteristic, and firm-specific characteristics; the second was estimated by independent variables drawn from (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; (iv) issue-specific characteristics; (v) firm-specific characteristics; and (vi) market-specific characteristics. The results of the two regression model are presented in Table 5.3 and discussed below.

Regression model 1 were estimated by independent variables drawn from intended use of IPO proceeds, issue-specific characteristics, and firm-specific characteristics. The results indicate an R-squared (adjusted R-squared) of 0.096 (0.031), which can be interpreted as up to 3.1% of the variation in underpricing can be explained by these determinants. In Table 5.3, the result of the regression model indicates that there are three variables which have a significant relationship with underpricing. The coefficient of debt repayment shows a negative relationship with underpricing and is statistically significant at the 5% level. However, the finding does not support the proposed hypothesis (H_{11}) because the coefficient is negative. The result for the gross proceeds support proposed hypothesis (H_{17}) because the gross proceeds has a negative relationship with underpricing and this significant at the 5% level. Other two variables of firm-specific characteristic (firm size and firm age) also show a negative relationship with underpricing and both variables are statistically significant at the 5% level, which indicates that larger firms and older firms are less underpriced. This finding supports the proposed hypothesis H_{19} and H_{20}. The underpricing regression model indicates that debt repayment, gross proceeds, firm size and firm age are the main determinants in explaining underpricing in the Indonesian IPO market. Remaining variables show insignificant relationships with underpricing; thus, other proposed hypotheses (H_8–H_{10}, H_{16}, H_{18}, and H_{21}) are not supported.

Regression model 2 were estimated by independent variables drawn from intended use of IPO proceeds, macroeconomic factors, international stock markets, issue-specific characteristics, firm-specific characteristics, and market-specific characteristics. The results indicate an R-squared (adjusted R-squared) of 0.193 (0.103), which can be interpreted as up to 10.3% of the variation in underpricing being explained by these determinants.

The underpricing regression model indicates that SSE, gross proceeds, firm size, and firm age are important determinant variables in explaining underpricing in Indonesian IPOs. The results for the SSE support proposed hypothesis (H_{15}) because the SSE has a positive and significant relationship with underpricing. This indicates that positive SSE affected on positive Indonesian Stock Exchange (IDX) index which give optimism for investor to buy stock and result on underpricing or initial return. The result for the gross proceeds support proposed hypothesis (H_{17}) because the gross proceeds has a negative significant relationship with underpricing which means that firm with high offer size of IPO or gross proceeds are less underpriced. Firm size has a negative relationship with underpricing (significant at the 5%), which indicates that larger firms are less underpriced. This finding supports the proposed hypothesis H_{19}. The coefficient of firm age shows a negative relationship with underpricing (statistically significant at the 5% level). This finding supports the proposed hypothesis that older firms are less underpriced (H_{20}). Other variables drawn from intended use of IPO proceeds, macroeconomic factors, international stock market, issue-specific

characteristics, firm-specific characteristics, and market-specific characteristics and are statistically insignificant. Therefore, proposed hypothesis H_8–H_{14} and H_{16}, H_{18}, H_{21}, and H_{22} are not supported; this is discussed further in Section 5.7.

5.4.2 Results of Panel Regression

The relationship between gross spread, underpricing and determinants of underpricing was also examined under panel analysis. The data were arranged into three panels: (i) by industry, (ii) by firm size and (iii) by IPO offer size. The firm size panel has gross spread for four cross-sectional firm sizes, and the IPO offer size panel has four cross-sectional offer sizes. Each panel has 10 years of time-series data, from 2007–2016.

The panel analysis is discussed in two parts: the first part describes the panels and the second part presents the results.

5.4.2.1 Descriptive Statistics of Panels

5.4.2.1.1. Descriptive Statistics for Panel of Industry

This section presents and discusses summary statistics of the determinants of underpricing for the industry panel. The industry panel was calculated based on a 57 unbalanced panel data of industry. Table 5.4 shows summary statistics on underpricing and the determinants, including (i) intended use of IPO proceeds, (ii) macroeconomic factors, (iii) international stock market, (iv) issue-specific characteristic, and (v) firm-specific characteristics.

The mean underpricing of the sample was 20.38% and the median was 17.57%. The variation of underpricing data within the sample was 17.77, ranging from a minimum of −11.50% to a maximum of 69.81%. The intended use of IPO proceeds descriptive statistics show that the mean (median) of fixed asset investment was 54.05% (41.67%) and the standard deviation was 79.88. This shows that the disparities in fixed asset investment within firms, was relatively high, from 0% to 60.59%. The mean working capital financing was 23.17% and the median was 16.50%. The working capital financing varied from a minimum of 0% to a maximum of 76%. The third variable in intended use of IPO proceeds, investment in shares of stock, had a mean (median) of 14.85% (3.33%). The variation of investment in shares of stock was relatively high (23.56), ranging from a minimum of 0% to a maximum of 100%. With respect to debt repayment, the mean was 15.79% and the median was 13.76%, ranging from a minimum of 0% to a maximum of 65.18%.

Table 5.4. Descriptive Statistics of Underpricing and Determinants of Underpricing of Panel of Industry

	Abbvn	N	Mean	Median	SD	Min	Max
Underpricing (%)	UNDP	57	20.38	17.57	17.77	-11.50	69.81
Intended Use of IPO Proceeds							
Fixed Asset Investment (%)	FAI	57	54.05	41.67	79.88	0.00	60.59
Working Capital Financing (%)	WCF	57	23.17	16.50	20.38	0.00	76.00
Investment in Shares of Stock (%)	ISS	57	14.85	3.33	23.56	0.00	100.00
Debt Repayment (%)	DR	57	15.79	13.76	16.76	0.00	65.18
Macroeconomic Factors							
Inflation Rates (%)	IFR	57	5.79	5.72	2.04	2.57	12.14
Foreign Exchange Rates (IDR)	FER	57	10,446	9,668	1,655	8,565	14,024
International Stock Market							
Dow Jones Index	DJI	57	13,719	13,437	2,936	5,169	18,174
Shanghai Stock Exchange Index	SSE	57	2,927	2,755	899	1,950	5,602
Firm-specific Characteristic							
Firm Size (IDR billion)	FSIZE	57	1,661	1,180	1,542	48	7,056
Firm Age	AGE	57	17	15	9	2	42
Profitability (%)	PROF	57	15.85	16.12	16.21	-25.23	67.09

Note: Abbvn = Abbreviation of variable in equation, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, FSIZE = firm size, AGE = firm age, PROF = profitability.

The macroeconomic factor descriptive statistics show that the mean and median of inflation rates were 5.79% and 5.72%, respectively. The variation of inflation rates was low (2.04), ranging from a minimum of 2.57% to a maximum of 12.14%. For foreign exchange rates, the descriptive statistics show that the mean (median) was IDR 10,446 (IDR 9,668) and the standard deviation was 1,655. This shows that the disparities are relatively high, from IDR 8,565 to IDR 14,024.

The DJI and SSE are included in international stock markets. For the DJI, the descriptive statistics show that the mean (median) of the sample was 13,719 (13,437), ranging from 5,169 to 18,174. The mean SSE was 2,927 and the median was 2,755, ranging from 1,950 to 5,602.

Firm size, firm age and profitability are included in firm-specific characteristic variables. Size of firms going public varied greatly, from IDR 48 billion to IDR 7,056 billion, with a mean of IDR 1,661 billion and a median of IDR 1,180. The summary statistics for firm age show that the average (median) age of firms going public was 17 years (15 years), ranging from a minimum of two years to 90 years. The third determinant of underpricing in firm-specific characteristics is profitability. The average profitability of IPO firms was 15.85% and the median was 16.12%. Profitability varied from a minimum of −25.23% to 67.09%.

5.4.2.1.2. Descriptive Statistics for Panel of Firm Size

This section presents and discusses summary statistics of determinants of underpricing for the firm size panel. The firm size panel was calculated based on a 38 unbalanced panel data of firm size. Table 5.5 shows summary statistics for underpricing and the determinants, drawn from (i) intended use of IPO proceeds, (ii) macroeconomic factors, (iii) international stock markets, and (vi) firm-specific characteristics.

Table 5.5. Descriptive Statistics of Underpricing and Determinants of Underpricing for Panel of Firm Size

	Abbvn	N	Mean	Median	SD	Min	Max
Underpricing (%)	UNDP	38	21.74	22.11	17.89	- 9.06	69.52
Intended Use of IPO Proceeds							
Fixed Asset Investment (%)	FAI	38	41.35	40.67	25.53	0.00	90.00
Working Capital Financing (%)	WCF	38	23.94	20.20	15.93	0.00	71.00
Investment in Shares of Stock (%)	ISS	38	14.47	8.33	16.50	0.00	50.98
Debt Repayment (%)	DR	38	15.85	12.69	15.15	0.00	54.73
Macroeconomic Factors							
Inflation Rates (%)	IFR	38	5.80	6.01	1.87	2.64	11.59
Foreign Exchange Rates (IDR)	FER	38	10,442	9,598	1,670	8,768	13,702
International Stock market							
Dow Jones Index	DJI	38	13,761	13,293	2,840	9,026	18,126
Shanghai Stock Exchange Index	SSE	38	3,074	2,779	964	2,059	5,626
Firm-specific Characteristic							
Firm Size (IDR billion)	FSIZE	38	2,945	2,002	3,325	196	17,365
Firm Age	AGE	38	19	17	9	5	43
Profitability (%)	PROF	38	19.12	14.26	22.35	-16.93	122.70

Note: Abbvn = Abbreviation of variable in equation, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, FSIZE = firm size, AGE = firm age, PROF = profitability.

The mean underpricing of the sample was 21.74% and the median was 22.11%. The variation of underpricing data within the sample was 17.89, ranging from a minimum of −9.06% to a maximum of 69.52%. The intended use of IPO proceeds descriptive statistics show that the mean (median) of fixed asset investment was 41.35% (40.67%) and the standard deviation was 25.53. This shows that the disparities in fixed asset investment within firms, was relatively high, from 0% to 90%. The mean working capital financing was 23.94% and the median was 20.20%. The working capital financing varied from a minimum of 0% to a maximum of 71%. The third variable in intended use of IPO proceeds, investment in shares of stock, had a mean (median) of 14.47% (8.33). The investment in shares of stock ranged from a minimum of 0% to a maximum of 50.98%. With respect to debt repayment, the mean was 15.85% and the median was 14.26%, ranging from a minimum of 0% to a maximum of 54.73%.

Firm size, firm age and profitability are included in firm-specific characteristic variables. Size of firms going public varied greatly, from IDR 477 billion to IDR 12,524 billion, with mean of IDR 2,795 billion and median of IDR 1,619. The summary statistics for firm age show that the average (median) age of firms going public is 19 years (17 years), ranging from a minimum of two years to 47 years. The third determinant in firm-specific characteristics is profitability. The average profitability of IPO firms was 15.36% and the median was 13.16%. Profitability varied from a minimum of 31.04% to 52.83%.

The macroeconomic factor descriptive statistics show that the mean and median of inflation rates were 5.80% and 6.01%, respectively. The variation of inflation rates was low (1.87), ranging from a minimum of 2.64% to a maximum of 11.59%. For foreign exchange rates, the descriptive statistics show that the mean (median) was IDR 10,442 (IDR 9,598) and the standard deviation was 1,670. This shows that the disparities were relatively high, from IDR 8,768 to IDR 13,702.

The DJI and SSE are included in international stock markets. For the DJI, the descriptive statistics show that the mean (median) of all sample was 13,761 (13,293), ranging from 9,026 to 18,126. The mean SSE was 3,074 and the median was 2,779, ranging from 2,059 to 5,626.

Firm size, firm age and profitability are included in firm-specific characteristic variables. Size of firms going public varied greatly, from IDR 196 billion to IDR 17,365 billion, with mean of IDR 2,945 billion and median of IDR 2,002. The summary statistics for firm age show that the average (median) age of firms going public was 19 years (17 years), ranging from a minimum of five years to 43 years. The third determinant of underpricing in firm-specific characteristics is profitability. The average profitability of IPO firms was 19.12% and the median was 14.26%. Profitability varied from a minimum of −16.93% to 122.70%.

5.4.2.1.3. Descriptive Statistics for Panel of Offer Size

This section presents and discusses summary statistics of determinants of underpricing for the offer size panel. The offer size panel was calculated based on a 34 unbalanced panel data of offer size. Table 5.6 shows summary statistics for underpricing and determinants drawn from (i) intended use of IPO proceeds, (ii) macroeconomic factors, (iii) international stock markets, and (vi) firm-specific characteristics.

Table 5.6. Descriptive Statistics of Underpricing and Determinants of Underpricing for Panel of Offer Size

	Abbvn	N	Mean	Median	SD	Min	Max
Underpricing (%)	UNDP	34	23.68	22.71	17.26	-7.24	69.81
Intended Use of IPO Proceeds							
Fixed Asset Investment (%)	FAI	34	42.01	46.08	24.73	0.00	85.00
Working Capital Financing (%)	WCF	34	23.80	21.34	16.47	0.00	89.67
Investment in Shares of Stock (%)	ISS	34	15.70	8.83	19.68	0.00	67.50
Debt Repayment (%)	DR	34	15.29	13.44	12.99	0.00	40.16
Macroeconomic Factors							
Inflation Rates (%)	IFR	34	5.78	5.73	1.93	2.68	11.96
Foreign Exchange Rates (IDR)	FER	34	10,505	9,557	1,743	8,592	13,632
International Stock Market							
Dow Jones Index	DJI	34	14,091	13,530	2,731	9,204	18,213
Shanghai Stock Exchange Index	SSE	34	3,064	2,800	1,018	2,038	5,590
Firm-specific Characteristics							
Firm Size (IDR billion)	FSIZE	34	2,795	1,619	2,791	477	12,524
Firm Age	AGE	34	19	17	11	2	47
Profitability (%)	PROF	34	15.36	13.16	16.32	31.04	52.83

Note: Abbvn = Abbreviation of variable in equation, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, FSIZE = firm size, AGE = firm age, PROF = profitability.

The mean underpricing of the sample was 23.68% and the median was 22.71%. The variation of underpricing data in the sample was 17.26, ranging from a minimum of −7.24% to a maximum of 69.21%. The intended use of IPO proceeds descriptive statistics show that the mean (median) of fixed asset investment was 42.01% (46.08%) and the standard deviation was 24.73. This shows that disparities in fixed asset investment within firms, was relatively high, from 0% to 85%. Mean working capital financing was 23.80% and the median was 21.34%. Working capital financing varied from a minimum of 0% to a maximum of 89.67%. The third variable in intended use of IPO proceeds, investment in shares of stock, had a mean (median) of 15.70% (8.33). The investment in shares of stock ranged from a minimum of 0% to a maximum of 67.50%. With respect to debt repayment, the mean was 15.29% and the median was 13.44%, ranging from a minimum of 0% to a maximum of 40.16%.

The macroeconomic factor descriptive statistics show that the mean and median of inflation rates were 5.78% and 5.73%, respectively. The variation of inflation rates was low (1.93), ranging from a minimum of 2.68% to a maximum of 11.96%. For foreign exchange rates, the descriptive statistics show that the mean (median) was IDR 10,505 (IDR 9,557) and the standard deviation was 1,743. Thus, disparities were relatively high, from IDR 8,592 to IDR 13,632. For the DJI, the descriptive statistics show that the mean (median) of the sample was 14,091 (13,530), ranging from 9,024 to 18,213. The mean (median) SSE was 3,064 (2,800), ranging from 2,038 to 5,590.

Firm size, firm age and profitability are included in firm-specific characteristic variables. Size of firms going public varied greatly, from IDR 477 billion to IDR 12,524 billion, with mean of IDR 2,795 billion and median of IDR 1,619. The summary statistics for firm age show that the average (median) age of firms going public was 19 years (17 years), ranging from a minimum of two years to 47 years. The third determinant of underpricing in firm-specific characteristics is profitability. The average profitability of IPO firms was 15.36% and the median was 13.16%. Profitability varied from a minimum of 31.04% to 52.83%.

5.4.2.2 Results of Underpricing and Panel Regression Model of Industry

The relationship between underpricing and determinants of underpricing was examined under an industry panel regression model. The industry panel was an unbalanced panel of eight cross-sectional industries and 10 years of time-series data, from 2007–2016. The eight industries included (i) agriculture, (ii) mining, (iii) basic industry and chemicals, (iv) miscellaneous, (v) consumer goods, (vi) property and real estate, (vii) infrastructure, utilities and transportation and (viii) trade and services.

5.4.2.2.1. Breusch-Pagan LM Test for Random Effects

The Breusch-Pagan LM test is used to compare random effect models and pooled OLS. The Hausman specification test cannot be used because of the limited number of cross-sections of firm size (T > N). The Breusch-Pagan LM test can be run to examine whether the individual- (or time-) specific variance is zero. If the null hypothesis (H_0) is rejected, it can be concluded that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than the pooled OLS. Based on the present analysis, H_0 was accepted (p-value = 0.89), which means that the pooled OLS model was preferred for the industry panel.

Table 5.7. Breusch-Pagan LM Test

Panel data	Test Summary	Statistic	df	P-value
Industry	Breusch-Pagan LM	37.50	6	0.11

Note: *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

5.4.2.2.2. Estimation of Underpricing and Panel Regression Model of Industry

The relationship between underpricing and determinants of underpricing was examined under a panel regression model of industry. This regression model was estimated by independent variables drawn from (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; and (iv) firm-specific characteristics. The independent variables for underpricing are constructed with 1) fixed asset investment; 2) working capital financing; 3) investment in shares of stock; 4) debt repayment; 5) inflation rates; 6) foreign exchange rates; 7) DJI; 8) SSE; 9) firm size; 10) firm age; and 11) profitability. The results of the industry panel regression are presented in Table 5.8 and discussed below.

Based on Table 5.8, the OLS estimates of the relationship between underpricing and the determinants of underpricing is:

$$\begin{aligned} UNDP \;=\; & 16.147 - 0.017^{**}FAI + 0.059ISS - 0.066DR + 1.599^{***}IFR \\ & - 0.001^{*}FER + 0.004^{***}SSE - 1.295FSIZE - 0.063AGE \end{aligned} \quad (5.6)$$

Table 5.8. Underpricing and Panel Regression of Industry

Variables	Abbvn	Pooled Panel
1.1. Constant		16.147**
		(2.147)
1.2. **Intended Use of IPO Proceeds**		
Fixed Asset Investment	FAI	-0.017**
		(-2.129)
Working Capital Financing	WCF	–
Investment in Shares of Stock	ISS	0.059
		(0.465)
Debt Repayment	DR	-0.066
		(-0.987)
1.3. **Macroeconomic Factors**		
Inflation Rates	IFR	1.599***
		(5.952)
Foreign Exchange Rates	FER	-0.001*
		(-1.679)
International Stock Market		
Dow Jones Index	DJI	–
Shanghai Stock Exchange Index	SSE	0.004***
		(4.209)
Firm-specific Characteristics		
Firm Size	FSIZE	-1.295
		(-1.203)
Firm Age	AGE	-0.063
		(-0.636)
Profitability	PROF	–
Observation		57
R^2		0.390
Adjusted R^2		0.288
F-statistic		3.837**

Note: The dependent variable is underpricing, Abbvn = Abbreviation of variable in equation, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, FSIZE = firm size, AGE = firm age, PROF = profitability. *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

The results indicate R-squared (adjusted R-squared) is 0.390 (0.288), which can be interpreted as up to 2838% of the variation in underpricing being explained by the determinant of underpricing. The underpricing regression model indicates that fixed asset investment, inflation rates and the SSE are significant in explaining underpricing in the Indonesian IPO market. The coefficient of fixed asset investment shows a negative and significant relationship with underpricing, thus support the proposed hypothesis H_8. The coefficient of inflation rates shows positive and significant relationship with underpricing at 1% level. Proposed hypotheses H_{15} are supported because the coefficient SSE shows a positive relationship with underpricing. Inflation rates show a significant positive relationship with underpricing, which means an increase in inflation rates affects the increase in underpricing. The remaining variables show insignificant relationships with underpricing. Therefore, other proposed hypotheses (H_9–H_{11}, H_{13}, H_{14}, and H_{19}–H_{21}) are not supported; this is discussed further in Section 5.7.

5.4.2.3 Result of Underpricing and Panel Regression Model of Firm Size

The relationship between underpricing and the determinants of underpricing was also examined under a firm size panel regression model. The firm size panel was an unbalanced panel of four cross-sectional firm sizes (via quartiles), and 10 years of time-series data from 2007–2016.

5.4.2.3.1. Breusch-Pagan LM Test for Random Effects

The Breusch-Pagan LM test is used to compare random effect models and pooled OLS. The Hausman specification test cannot be used because of the limited number of cross-sections of firm size (T > N). The Breusch-Pagan LM test can be run to examine whether the individual- (or time-) specific variance is zero. If the null hypothesis (H_0) is rejected, it can be concluded that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than the pooled OLS. Based on the present analysis, H_0 was accepted (p-value = 0.89), which means that the pooled OLS model was preferred for the firm size panel.

Table 5.9. Breusch-Pagan LM Test

Panel data	Test Summary	Statistic	df	P-value
Firm size	Breusch-Pagan LM	1.004	6	0.985

Note: *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

5.4.2.3.2. Estimation of Underpricing and Panel Regression Model of Firm Size

The relationship between underpricing and the determinants of underpricing was examined under a panel regression model of firm size. This regression model was estimated by independent variables drawn from (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; and (iv) firm-specific characteristics. The results of the firm size panel regression are presented in Table 5.10 and discussed below.

Based on Table 5.10, the OLS estimates of the relationship between underpricing and the determinants of underpricing is:

$$\begin{aligned} UNDP = \; & 60.262 - 0.118\text{FAI} - 0.093\text{DR} - 0.002\text{FER} + 0.001\text{DJI} \\ & + 0.003^{**}\text{SSE} - 0.001\text{OP} - 0.932^{***}\text{AGE} - 0.291^{**}\text{PROF} \end{aligned} \tag{5.7}$$

The results indicate the R-squared (adjusted R-squared) was 0.611 (0.485), which can be interpreted as up to 48.5% of the variation in underpricing being explained by these determinants. The underpricing regression model indicates that SSE, firm age, and profitability are significant in explaining underpricing in the Indonesian IPO market. Proposed hypothesis H_{15} is supported because the SSE has a positive significant (at the 5% level) relationship with underpricing. The coefficient of firm age shows a negative relationship with underpricing (statistically significant at the 1% level), which means older IPO firms are less underpriced. This finding supports proposed hypothesis H_{20}. The relationship between profitability and underpricing is negative and significant at the 5% level; this is consistent with the proposed hypothesis, and thus hypothesis H_{21} is supported. The remaining variables show insignificant relationships with underpricing; therefore, other proposed hypotheses (H_8–H_{14} and H_{16} –H_{19}) are not supported. This is discussed further in Section 5.7.

Table 5.10. Underpricing and Panel Regression of Firm Size

Variables	Abbvn	Pooled Panel
Constant		60.262***
		(4.355)
Intended Use of IPO Proceeds		
Fixed Asset Investment	FAI	-0.118
		(-1.247)
Working Capital Financing	WCF	_
Investment in Shares of Stock	ISS	_
Debt Repayment	DR	-0.093
		(-0.618)
Macroeconomic Factors		
Inflation Rates	IFR	_
Foreign Exchange Rates	FER	-0.002
		(-1.171)
International Stock Market		
Dow Jones Index	DJI	0.001
		(0.426)
Shanghai Stock Exchange Index	SSE	0.003**
		(2.107)
Issue-specific Characteristic		
Underwriter Reputation	UWR	_
Gross Proceeds	GPC	_
Offer Price	OP	-0.001
		(-0.471)
Firm-specific Characteristics		
Firm Age	AGE	-0.932***
		(-4.139)
Profitability	PROF	-0.291**
		(-2.665)
Observation		38
R^2		0.611
Adjusted R^2		0.485
F-statistic		4.886***

Note: The dependent variable is underpricing, UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, AGE = firm age, PROF = profitability. *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

5.4.2.4 Results of Underpricing and Panel Regression of Offer Size

The relationship between underpricing and the determinants of underpricing was examined under the third panel regression model, for the offer size panel. The offer size panel was an unbalanced panel of four cross-sections of IPO offer size (based on quartiles) and 10 years of time-series data, from 2007–2016.

5.4.2.4.1. Breusch-Pagan LM Test for Random Effects

The Breusch-Pagan LM test is used to compare random effect models and pooled OLS. The Hausman specification test cannot be used because of the limited number of cross-sections of firm size (T > N). The Breusch-Pagan LM test can be run to examine whether the individual- (or time-) specific variance is zero. If the null hypothesis (H0) is rejected, it can be concluded that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than the pooled OLS. Based on the present analysis, H_0 was accepted (p-value = 0.21), which means that the pooled OLS model was preferred for the offer size panel.

Table 5.11. Breusch-Pagan LM Test

Panel data	Test Summary	Statistic	df	P-value
Offer size	Breusch-Pagan LM	8.31	6	0.21

Note: *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

5.4.2.4.2. Estimation of Underpricing and Panel Regression Model of Offer Size

The relationship between underpricing and the determinants of underpricing was examined under a panel regression model of offer size. The regression model focused on intended use of IPO proceeds, firm-specific characteristics, macroeconomic factors and international stock markets. The independent variables for underpricing are constructed with 1) fixed asset investment; 2) investment in shares of stock; 3) debt repayment; 4) inflation rates; 5) foreign exchange rates; 6) DJI; 7) SSE; 8) firm size; 9) firm age; and 10) profitability. The results of the offer size panel regression are presented in Table 5.12 and discussed below.

Based on Table 5.12, the OLS estimates of the relationship between underpricing and the determinants of underpricing:

$$UNDP_i = 36.847 + 0.061FAI + 0.031ISS - 0.036DR + 1.586IFR - 0.002FER + 0.001DJI + 0.005**SSE - 0.002**FSIZE - 0.519***AGE - 0.412***PROF \quad (5.8)$$

Table 5.12. Underpricing and Panel Regression of Offer size

Variables	Abbvn	Pooled Panel
Constant		36.847*
		(1.882)
Intended Use of IPO Proceeds		
Fixed Asset Investment	FAI	0.061
		(0.578)
Investment in Shares of Stock	ISS	0.031
		(0.261)
Debt Repayment	DR	-0.036
		(-0.214)
Macroeconomic Factors		
Inflation Rates	IFR	1.586
		(1.537)
Foreign Exchange Rates	FER	-0.002
		(-1.257)
International Stock Market		
Dow Jones Index	DJI	0.001
		(0.566)
Shanghai Stock Exchange Index	SSE	0.005**
		(2.448)
Firm-specific Characteristics		
Firm Size	FSIZE	-0.002**
		(-2.477)
Firm Age	AGE	-0.519**
		(-2.626)
Profitability	PROF	-0.412***
		(-3.173)
Observation		34
R^2		0.630
Adjusted R^2		0.469
F-statistic		3.920***

Note: The dependent variable is underpricing, Abbvn = Abbreviation of variable in equation, FAI = fixed asset investment, ISS = investment in shares of stock, DR = debt repayment, FSIZE = firm size, AGE = firm age, PROF = profitability, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index. *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

The results indicate the R-squared (adjusted R-squared) was 0.630 (0.469), which can be interpreted as up to 46.9% of the variation in underpricing can be explained by these determinants. The underpricing regression model indicates that the SSE and all variables included in firm-specific characteristics (firm size, firm age and profitability) are significant in explaining underpricing in the Indonesian IPO market. The result for the SSE supports proposed hypothesis (H_{15}) because the SSE has a positive relationship with underpricing (significant at the 5% level). Firm size has negative relationship with underpricing (significant at the 5% level), which indicates that larger firms are less underpriced. This finding supports proposed hypothesis H_{19}. The coefficient of firm age shows a negative relationship with underpricing (significant at the 5% level), which means older firms are less underpriced. This finding supports proposed hypothesis H_{20}. The relationship between profitability and underpricing is negative and significant at the 1% level, and thus, proposed hypothesis H_{21} is supported. The remaining variables show insignificant relationships with underpricing; therefore, other proposed hypotheses (H_8–H_{14} and H_{16}–H_{18}) are not supported. This is discussed further in Section 5.7.

5.5 Discussion of Results of Relationship Between Underpricing and Determinants of Underpricing

This section discusses the results for the relationship between underpricing and determinants of underpricing, the relationship between gross spread and underpricing, and post-listing day performance. The discussion starts with the results of the relationship between underpricing and intended use of IPO proceeds, followed by a discussion of the results of the relationship between underpricing and macroeconomic factors, international stock market, issue-specific characteristics, and other determinants of underpricing. The next discussion is on the relationship between gross spread and underpricing, and a discussion of post-listing day performance. The summary of hypothesis testing is presented in Table 5.19.

5.5.1 Discussion of Results of Relationship Between Underpricing and Intended Use of IPO Proceeds

The information on intended use of IPO proceeds is disclosed in prospectuses to help potential investors in their decision-making process. This information has been evaluated in the IPO underpricing context, and can be used by investors to evaluate a firm's prospects and risks associated with the IPO (Leone, Rock & Willenborg 2007; Maulidia & Gumanti 2015; Wyatt 2014).

In this study, the use of proceeds is categorised into fixed asset investment, working capital financing, investment in shares of stock, and debt repayment. The results of all OLS regression show that variables of intended use of IPO proceeds are negatively in explaining underpricing, except investment in shares of stock variable. This consistent with previous study that firms allocated the proceed on investment in shares need to compensate investors with high initial returns (Leone, Rock & Willenborg 2007). The consistent result of negative relationship between the use of proceeds and underpricing also found in panel regression model of industry. Meanwhile positive coefficient only shows when firms allocated investment in shares of stock. Fixed asset investment and debt repayment has a negative relationship with underpricing. In panel regression of firms size, the variables of fixed assets investment and debt repayment also shows negative coefficient. The negative coefficient result in this study were consistent with Gumanti (2007), who found that the use of proceeds for investment was negatively related to the level of IPO underpricing for Indonesia. Further, Maulidia and Gumanti (2015) found that the use of proceeds for working capital was negatively related to underpricing, which contrasts with previous research that found the two variables are positively related.

5.5.2 Discussion of Results of Relationship Between Underpricing, Macroeconomic Factors and International Stock Market

Previous studies focus on internal firm and market characteristics; however, macroeconomics and international stock markets should be considered because investor participation in the Indonesian market considers Indonesian economic conditions. Different economic conditions influence the decision of firms to move to the IPO market and investors' expectations about future returns. The indicator of better economic conditions will increase stock market participation, the number of IPOs and initial returns. In the Indonesian market, inflation rates and exchange rates show a positive and negative coefficient relationship with underpricing. The coefficient of inflation rates is significant in explaining of variation of underpricing only on panel regression of industry.

The variable of international stock market shows that SSE is more significant in explaining the level of underpricing of the IPO compared with DJI index in six regression model (non-SOE, book-building strategy, model 2, and all three panel regression). Positive conditions of regional stock index of SSE are perceived as positive for potential investors in the Indonesian market. An increase in the SSE influences Indonesian stock indexes because investors' optimism regarding global economic conditions and influence the decision to buy stocks (Wong et al. 2004).This indicates that the Indonesian market, as a developing market, depends on the international stock market situation, especially the SSE (Darrat & Zhong 2002).

5.5.3 Discussion of Results of Relationship Between Underpricing and Issue-specific Characteristics

Firms play an important role in choosing a reputable underwriter for the IPO process to reduce underpricing, which occurs because of information asymmetry and uncertainty about the real new stock price. Highly reputable underwriters are able to assess the value of a firm and mitigate asymmetric information and uncertainty at the IPO stage (Razafindrambinina & Kwan 2013). Highly reputable underwriters can also be a signal of firm value because these underwriters undertake only high-quality offerings (Beatty 1989; Carter & Manaster 1990). Further, underwriters provide price stabilisation for IPOs, reducing price drops for a few days or weeks in the secondary market, and reduce the volatility of the IPO initial return (Ellis, Michaely & O'Hara 2000; Lowry, Officer & Schwert 2010). The results for underwriter reputation in Indonesia show a positive but insignificant relationship with underpricing. The positive relationship with underpricing is consistent with the research findings of Dimovski, Philayanh and Brooks (2011) for Australia and Loughran and Ritter (2004). Highly reputable underwriters are related with a higher level of underpricing.

Gross proceeds is the sole determinant of underpricing for issue-specific characteristics and shows negative relationship with underpricing. The result of this study consistent with previous research has found a negative relationship between offer size and level of underpricing (Chi & Padgett 2005; Guo & Brooks 2008; Hassan & Quayes 2008; Marisetty & Subrahmanyam 2010). Similar results on a negative relationship between offer size and underpricing is also found in several studies, including Chi and Padgett (2005), and Belghitar and Dixon (2012). The offer size of the IPO indicates the level of uncertainty associated with the issuing firm (Miller & Reilly 1987). This indicates that the higher offer size of IPO in Indonesia, the less underpriced of IPOs. Larger IPOs are perceived to be less risky, less uncertainty and this reduces investors' perceived risk of the IPO (Carter, Dark & Singh 1998). Meanwhile, the proposed hypothesis of offer price is not supported as the coefficient is not significant in non-SOE and book-building sample group, however, the variables is negatiev and significant in sub-period 2010-2016 gsampe group. The negative coefficient support the previous study of relationship between underpricing and offer price (e.g. Chong et al. 2010; Dimovski, Philavanh & Brooks 2011; Guo & Brooks 2008; Zouari et al. 2009).

Table 5.19. Summary of Hypothesis Test Result for Underpricing and Determinant of Underpricing in Indonesian IPO Market in 2007-2016

Dependent Variable	Independent Variable	Expected Sign	2010-2016	Non-SOE	Book-building Strategy	All Sample		Panel Regression Result		
						Model 1	Model 2	Industry	Firm Size	Offer Size
UNDP	FAI (H_8)	Negative	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	**(–) S**	(–) NS	(+) NS
	WCF (H_9)	Negative	(–) NS	(–) NS	–	(–) NS	(–) NS			–
	ISS (H_{10})	Positive	(+) NS	–	(+) NS	–	(+) NS	(+) NS		(+) NS
	DR (H_{11})	Negative	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS
	IFR (H_{12})	Positive	(+) NS	(+) NS	(+) NS	–	(+) NS	**(+) S**		(+) NS
	FER (H_{13})	Negative	(–) NS	(–) NS	(–) NS	–	(–) NS	(–) NS	(–) NS	(–) NS
	DJI (H_{14})	Positive	–	(+) NS	(+) NS	–	(+) NS		(+) NS	(+) NS
	SSE (H_{15})	Positive	(+) NS	**(+) S**	**(+) S**	–	**(+) S**	**(+) S**	**(+) S**	**(+) S**
	UWR (H_{16})	Positive	(+) NS	(+) NS	(+) NS	(+) NS	(+) NS	–	–	–
	GPC (H_{17})	Negative	–	**(–) S**	**(–) S**	**(–) S**	**(–) S**	–	–	–
	OP (H_{18})	Negative	**(–) S**	–	–	(–) NS	(–) NS	–	(–) NS	–
	FSIZE (H_{19})	Negative	**(–) S**	**(–) S**	**(–) S**	**(–) S**	**(–) S**	(–) NS	–	**(–) S**
	FAGE (H_{20})	Negative	(–) NS	(–) NS	**(–) S**	**(–) S**	**(–) S**	(–) NS	**(–) S**	**(–) S**
	PROF (H_{21})	Negative	–	(–) NS	(–) NS	(–) NS	(–) NS		**(–) S**	**(–) S**
	HM (H_{22})	Negative	(–) NS	(–) NS	(–) NS	–	(–) NS	–	–	–

Note: The dependent variable is UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, S = supported, NS = not supported.

5.5.4 Discussion of Results of Relationship Between Underpricing and Firm-specific Characteristics

The results in this study reveal that underpricing in Indonesia appears to be significantly and negatively related to firm size, implying large firms tend to have lower gross spreads. Firm size affects underpricing, and research has found a negative association between firm size and IPO underpricing (Carter, Dark & Singh 1998; Islam, Ali & Ahmad 2010). The size of the firm can be used to measure the ex-ante risk of the IPO, whereby large and established firms are perceived as posing less risk than small firms. The size of an IPO firm has also been found to be negatively associated with risk (Avelino 2013; Boudriga, Slama & Boulila 2009). The results in this study reveal that underpricing in Indonesia appears to be significantly and negatively related to firm age, implying that older firms tend to have lower underpricing. The age of the firm shows its operating history prior to going public, which measures the ex-ante risk of the offer.

Newly formed firms exhibit higher ex-ante uncertainty than older firms. Older firms are moreestablished and have more information that can be easily accessed by the public (Gong & Shekhar 2001). This will decrease uncertainty at the IPO stage and, in turn, will be reflected in lower underpricing. Research conducted to determine the relationship between firm age and underpricing shows that firm age negatively influences underpricing on the first day (Belghitar & Dixon 2012; Loughran & Ritter 2004). Younger firms are expected to be more underpriced during IPOs. Recent research in Tunisia supports previous research indicating that older firms experience lower underpricing on the first day (Zouari, Boudriga & Taktak 2011).

Profitability is another variable examined in this study. The results in this study reveal that underpricing in Indonesia appears to be significantly and negatively related to profitability for panel regression of firm size, implying that IPO firms with higher profitability tend to have lower gross spreads. In theory and practice, profitability is widely used to evaluate the financial health of a firm (Deb & Marisetty 2010). Financial performance, including profitability, is essential because when firms go public, investors evaluate financial performance prior to IPO. Profitability can used by shareholders to assess firm performance (Bhabra & Pettway 2003). Profitability provides information to outside parties regarding operational effectiveness. Higher profitability attracts investors to buy the firm's IPO shares because investors expect a positive future performance (Pukthuanthong-Le & Varaiya 2007). Financial performance can indicate to investors the true value of the firm, which is useful for making decisions regarding the buying of IPO stocks (Deb & Marisetty 2010). Bhabra and Pettway (2003) used profitability as a variable in their study and showed that financial and operating characteristics have a limited relationship with stock returns.

5.5.5 Discussion of Results of Relationship Between Underpricing and Hot Issue Market

The results in this study reveal that underpricing level in Indonesia appears to be negatively related to a hot issue market. This shows that IPO firms issued in hot markets are less underpriced than IPO firms issued in cold markets.This result is contrary with previous study of Alli, Subrahmanyam and Gleason (2010), Gandolfi et al. (2018), Guo, Brooks and Shami (2010), Ritter (1984) and Samarakoon (2010) who found a high number of IPOs, severe underpricing and frequent oversubscription in a hot issue market period. This result also contrary with Indonesian study on underpricing of Darmawangsa and Darmawangsa (2014) who indicated that hot issue markets occur in the Indonesian IPO market. They examined 78 IPOs during 2001–2005, and found high underpricing to be positively related to volume of IPOs. The high underpricing is a result of investor sentiment because investors are overoptimistic about the new issue and willing to pay more in the IPO (Bogan 2009).

5.6 Summary

This chapter discusses the examination of underpricing and the determinants of underpricing in the Indonesian IPO market. Further discussion examined the relationships between gross spread and underpricing, and post-listing day performance of IPOs in the Indonesian market. The aim was to provide evidence on the characteristics and the main determinants of underpricing. The findings are also expected to provide a comprehensive explanation of the relationship between gross spread and underpricing.

This study employed two methods to examine the relationship between underpricing and the determinants of underpricing: 1) pooled data analysis; and 2) panel data analysis. This study employed pooled data analysis for testing the hypotheses, consistent with previous studies. Pooled data analysis was used in the first analysis. The relationship between underpricing and the determinants of underpricing was also examined under a panel analysis. The data were arranged into three panels: (i) by industry, (ii) by firm and (iii) by IPO offer size. The regression model was estimated by independent variables drawn from intended use of IPO proceeds, firm-specific characteristics, macroeconomic factors, issue-specific characteristics, market-specific characteristics and international stock markets.

The distribution of underpricing shows that the IPO firms sampled during 2007–2016 were underpriced on the first day of trading, at 23.73%. The highest level of underpricing was for IPO firms listed in 2008, and the most money left on the table was in 2007.

Hypothesis testing of the pooled analysis shows that the variables of SSE, gross proceeds, offer price, firm size, and firm age are the significant determinant variables in explaining underpricing in the Indonesian IPO market. Other variables included in intended use of IPO proceeds, macroeconomic factors, international stock markets, issue-specific characteristics, firm-specific characteristics, and market-specific characteristics had insignificant relationships with underpricing. Further analysis of relationships between underpricing and the determinants of underpricing was examined under a panel regression model of industry, firm size and IPO offer size. Both analyses gave different results on the main determinants of underpricing in the Indonesian IPO market. The main determinants of the industry panel were fixed asset investment, inflation rates and SSE. The main determinants of the firm size panel were SSE, firm age, and profitability. The main determinants of the offer size panel were SSE, and all firm-specific characteristics variables (firm size, firm age and profitability).

Hypothesis testing on under pooled analysis and panel analysis gave different results on the main determinants of underpricing in the Indonesian IPO market. In general, the results from both analyses indicate that variables in firm-specific characteristics and SSE were significant in explaining underpricing in Indonesia. This finding confirms that investors primarily use firms' information and regional stock market index in their making decisions to participate in the Indonesian stock market.

Chapter 6: Results and Discussion of Relationship Between Gross Spread and Underpricing, and Post-Listing Day Performance of IPO

6.1 Introduction

This chapter examines the relationship between gross spread and underpricing, and evaluates post-listing day performance of IPOs in the Indonesian market. The findings are expected to provide a comprehensive explanation of the relationship between of gross spread and underpricing, and the post-listing day performance of IPO in the Indonesian IPO market. Section 6.2 presents the result for relationship between gross spread and underpricing. Section 6.3 presents evaluation of post-listing day performance of IPO. Section 6.4 and 6.6 presents discussion of the results, and 6.6 presents a summary of this chapter.

6.2 Results for Relationship Between Gross Spread and Underpricing

This section examines the relationship between gross spread and underpricing: an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary. OLS and 2SLS models are employed to identify this relationship, to answer RQ5 and test hypothesis 21.

RQ5: What is the relationship between gross spreads and underpricing?

6.2.1 Distribution of Gross Spread and Underpricing

This section presents the distribution of gross spread, underpricing, gross proceeds and money left on the table in the Indonesian IPO market. The purpose is to analyse the distribution of direct and indirect costs occurring as a result of IPO offer size and number of shares sold on the Indonesian IPO market.

Table 6.1 shows the distribution of gross spread, underpricing, gross proceeds and money left on the table, decomposed by listing year, industry, sub-period, SOE and non-SOE, and pricing strategy. The mean gross spread of the sample during the period 2007–2016 was 2.09%. The mean underpricing of the sample during the period 2007–2016 was 23.73%, with total IPO offer size or proceeds of IDR 718 billion. This money left on the table in nominal terms was equal to IDR 15.13 billion.

Table 6.1. Distribution of Gross Spread and Underpricing

	N	Gross Spread (%)	Underpricing (%)	Gross Proceeds[1] (IDR billion)	Gross Spread[2] (IDR billion)	Money Left on the Table[3] (IDR billion)
All Sample	150	2.09	23.73	718	15.13	139
Panel A: Year						
2007	15	2.25	40.17	1,137	28.05	251
2008	12	2.08	40.48	418	8.85	92
2009	9	1.93	13.71	183	3.70	17
2010	17	1.98	31.03	1,056	22.54	235
2011	19	2.09	11.85	856	18.07	17
2012	19	2.09	27.10	393	8.38	90
2013	22	2.29	13.46	528	12.85	26
2014	14	1.85	19.71	627	10.96	134
2015	12	1.95	27.19	896	15.67	215
2016	11	2.30	19.20	966	16.91	76
Panel B: Industry						
Agriculture	11	1.79	8.54	805	17.04	67
Mining	23	2.09	19.08	1,593	34.80	245
Basic Industry and Chemicals	10	1.98	15.33	1,016	16.83	135
Miscellaneous	7	2.19	21.78	324	6.09	44
Consumer Goods	6	2.39	20.32	417	9.54	60
Property and Real Estate	31	1.98	35.41	639	12.33	146
Infrastructure, Utilities and Transportation	22	2.32	15.41	851	17.78	48
Trade and Service	40	2.11	28.71	531	12.58	80
Panel C: Sub-Periods						
2007-2009	36	2.12	33.25	673	15.96	142
2010-2016	114	2.09	20.85	732	14.87	104
Panel D: SOE and non-SOE						
SOE	6	1.75	17.48	2,360	43.41	282
Non-SOE	144	2.10	23.98	1,061	18.90	133
Panel E: Pricing Strategy						
Book-building	137	2.07	22.32	711	14.51	112
Fixed-price	13	2.37	38.00	787	21.49	120

Note: [1]Gross Proceeds (IDR million rupiah) = offer price per share x number of issued shares, [2]Gross Spread (IDR billion) = gross spread (%) x gross proceeds (IDR billion), [3]Money left on the table (million rupiah) = the first-day returns x number of shares sold.

6.2.1.1 Listing Year Analysis

The distribution of gross spread varied over time, from a low of 1.85% in 2014 to a high of 2.30% in 2016. The average of gross spread decreased from 2.25% in 2007 to 1.93% in 2009. The gross spread then increased to 1.98% in 2010 and remained stable for the following years (2011 and 2012). The gross spread reached the highest level of 2.30% in 2016. Underpricing varied over time, from a low of 11.85% in 2011 to a high of 40.48% in 2008. The average of underpricing in the first two years was higher than underpricing in other years—40.17% (2007) and 40.48% (2008). Four years had underpricing lower than mean underpricing of the whole sample: 13.71% (2009), 11.85% (2011), 13.46% (2013), 19.71% (2014) and 19.20% (2016)

In term of gross proceeds, the offer size in 2009 was the lowest, while 2007 was the highest (IDR 1,137 billion), followed by proceeds of IDR 1,056 billion in 2010 and IDR 966 billion in 2016. Gross proceeds in 2010 were almost six times those in 2009. After 2010, the offer size was less than IDR 1,056 billion, fell to IDR 393 billion (2012) and then increased to IDR 966 billion (2016). In a comparison of number of IPOs with gross proceeds and money left on the table by year, 15 firms in 2007 had the highest of both proceeds (IDR 1,137 billion) and money left on the table (IDR 251 billion) compared with all other years.

6.2.1.2 Industry Analysis

Table 6.1 Panel B presents the distribution of the sample by industry. Panel B shows that the agriculture industry had the lowest gross spread at 1.79% and the consumer goods industry had the highest, at 2.39%. The gross spread of industries varied; however, the variation within the sample was relatively low. Three of eight industries (35% of sample) had mean gross spread lower than the mean gross spread of the whole sample: agriculture, basic industry and chemicals, and property and real estate industry, at 1.79%, 1.98% and 1.98%, respectively. The agriculture industry had the lowest underpricing at 8.54% and property and real estate industry had the highest at 35.41%.

Two of eight industries (47% of sample) had mean underpricing higher than mean underpricing of the whole sample: property and real estate, and trade and services, at 35.41% and 28.71%, respectively. In terms of IPO offer size, the gross proceeds of the industries ranged between IDR 324 billion (miscellaneous industry) and IDR 1,593 billion (mining industry).

The offer sizes of two industries were more than IDR 1,000 billion: basic industry and chemicals (IDR 1,016 billion) and mining (IDR 1,593 billion); the offer sizes of other industries were less than IDR 1,000 billion. As a consequence, these two industries had to pay direct costs of IDR 16.83 billion and IDR 34.80 billion, respectively—higher than the average of direct costs of the whole sample. In a comparison of number of IPOs with gross proceeds and money left on the table

(indirect cost) by year, 23 firms in the mining industry had the highest of both proceeds (IDR 1,593 billion) and money left on the table (IDR 245 billion) compared with all other industries.

6.2.1.3 Sub-period Analysis

In Table 6.1 Panel C, the period of observation is divided into two periods—2007–2009 and 2010–2016—to examine differences in gross spread, underpricing, proceeds and money left on the table in the two periods. This research defined 2007–2009 as the first period and 2010–2016 as the second period.

The results show that gross spread level for the first period (2.12%) was higher than for the second period (2.09%), the first period was more underpriced (33.25%) than the second period (20.85%), and mean proceeds in the first period (IDR 673 billion) were lower than those in the second period (IDR 732 billion). This shows that firms issuing in the first period paid more in direct costs (IDR 15.96 billion) and indirect costs (IDR 142 billion) compared with the second period, indicating that the wealth transfer from shareholders of issuing firms to investors of firms issued in the first period was higher than in the second period.

6.2.1.4 SOE and non-SOE Analysis

In Table 6.1 Panel D, the distribution of gross spread, gross proceeds and gross spread in IDR billion are decomposed into SOEs and non-SOEs. During the observation period, six IPO firms were SOEs and 144 were non-SOEs. The results show that mean gross spread and underpricing of SOEs were lower than for non-SOEs. The mean of gross spread for SOEs was 1.75% and for non-SOEs was 2.10%. The mean of underpricing for SOEs was 17.48% and for non-SOEs are 23.96%. This implies that non-SOE IPO firms paid more direct costs and were more underpriced than IPOs of SOEs. The direct cost in nominal terms was equal to IDR 43.41 billion for SOE IPO firms, and IDR 18.90 billion for non-SOE IPO firms. In a comparison of gross proceeds and money left on the table (indirect cost), SOE IPO firms had the highest of both proceeds (IDR 2,360 billion) and money left on the table (IDR 282 billion) compared with non-SOE IPO firms. Further, the wealth transfer from shareholders of issuing firms to investors of firms issued in the first period was higher than in the second period, at IDR 282 billion compared with IDR 133 billion.

6.2.1.5 Pricing Strategy Analysis

Table 6.1 Panel E shows the distribution of gross spread, underpricing, proceeds and money left on the table based on pricing strategy (book-building and fixed-price). During the sample period, 137 IPOs used a book-building strategy and 13 used a fixed-price strategy.

It can be seen that the book-building strategy had a lower gross spread and was less underpriced than the fixed-price strategy. The gross spread level of the book-building strategy was 2.07%, compared with the fixed-price strategy at 2.37%. The level of underpricing of firms with a book-building strategy was 22.32%, compared with fixed-price strategy firms at 38%. The proceeds of book-building (IDR 711 billion) were higher than for fixed-price (IDR 787 billion). In a comparison of money left on the table, IPO firms with a book-building strategy had less money left on the table than those with a fixed-price strategy (IDR 112 billion and IDR 120 billion, respectively). This resulted in lower direct costs in nominal terms (IDR 14.51 billion) paid by IPO firms that used a book-building pricing strategy, and lower wealth transfer from shareholders of issuing firms to investors (IDR 112 billion) compared with firms with a fixed-price strategy.

6.2.2 Result of Two-Stage Least Squares (2SLS) Estimates

The relationship between gross spread and underpricing was examined under a 2SLS regression model. There are three possible relationships between gross spread and underpricing: an insignificant relationship between the two variables; that the two variables are substitutes; or that the two variables are complementary. The two variables are substitutes if gross spread and underpricing are negatively related or the coefficient of the variable is negative. The two variables are complementary if gross spread and underpricing are positively related or the coefficient of the variable is positive. To answer RQ5 and test hypothesis H_{23}, a 2SLS model was employed. The results of the regression model are presented in Table 6.2 and discussed below.

According to Table 6.2, the 2SLS regression model estimates of the relationship between gross spread and underpricing are:

Model : Underpricing

$$\begin{aligned} UNDP = {} & 68.606 - 0.017FAI + 0.068WCF + 0.058ISS - 0.122DR + 0.782IFR \\ & - 0.003***FER + 0.001DJI + 0.006*SSE + 0.344UWR - 6.815**GSP \\ & - 3.983*FSIZE - 0.228***AGE - 0.071PROF - 8.850HM \end{aligned} \quad (6.1)$$

Model 1: Gross Spread

$$GSP = 3.096 - 0.439**UWR - 0.060GPC - 0.177HM - 0.006***UNDP \quad (6.2)$$

Model 2: Gross Spread

$$\begin{aligned} GSP = {} & 3.520 - 0.362**UWR - 0.064OP - 0.063*FSIZE - 0.001AGE - 0.001PROF \\ & - 0.167HM - 0.006***UNDP \end{aligned} \quad (6.3)$$

Table 6.2. Gross Spread, Underpricing and Two-Stage Least Squares Estimates

Variables	Abbvn	Underpricing	Gross Spread	
			Model 1	Model 2
Constant		68.606** (2.924)	3.096*** (9.948)	3.520** (7.736)
Intended Use of IPO Proceeds				
Fixed Asset Investment	FAI	-0.017 (-0.129)	–	–
Working Capital Financing	WCF	0.068 (0.453)	–	–
Investment in Shares of Stock	ISS	0.058 (0.401)	–	–
Debt Repayment	DR	-0.122 (-0.768)	–	–
Macroeconomic Factors				
Inflation Rates	IFR	0.782 (0.730)	–	–
Foreign Exchange Rates	FER	-0.003*** (-1.656)	–	–
International Stock Market				
Dow Jones Index	DJI	0.001 (1.135)	–	–
Shanghai Stock Exchange Index	SSE	0.006* (2.787)	–	–
Issue-specific Characteristic				
Underwriter Reputation	UWR	0.344 (0.065)	-0.439** (-2.912)	-0.362** (-2.350)
Gross Proceeds	GPC	–	-0.060 (-1.509)	–
Offer Price	OP	–	–	-0.064 (-0.992)
Gross Spread[1]	GSP	-6.815** (-2.402)	–	–
Firm-specific Characteristic				
Firm Size	FSIZE	-3.983* (-3.360)	–	-0.063* (-0.992)
Firm Age	AGE	-0.228*** (-1.746)	–	-0.001 (0.534)
Profitability	PROF	-0.071 (-1.212)	–	-0.001 (-1.325)
Market-specific Characteristic				
Hot Issue Market	HM	-8.850 (-1.505)	-0.177 (-0.946)	-0.167 (-0.916)
Underpricing	UNDP	–	-0.006** (-2.303)	-0.006** (-2.314)

Observation	150	150	150
R^2	0.213	0.103	0.122
Adjusted R^2	0.132	0.078	0.079
F-statistic	2.620*	4.273***	3.587***

Note: The dependent variable is gross spread and underpricing, Abbvn = Abbreviation of variable in equation, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = underwriter reputation, OP = offer price, GSP = gross spread, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, UNDP = underpricing, *** is significant at the 0.01, ** is significant at the 0.05, * is significant at the 0.10.

In Table 6.2, the underpricing regression models was instrumental variable. The underpricing was estimated by independent variables: 1) fixed asset investment; 2) working capital financing; 3) investment in shares of stock; 4) dept repayment; 5) inflation rates; 6) foreign exchange rates; 7) Dow Jones Index; 8) Shanghai Stock Exchange Index; 9) underwriter reputation; 10) gross spread; 11) firm size; 12) firm age; 13) profitability; and 14) hot issue market.

The model shows that foreign exchange rates, gross spread, and firm age are significant in explaining underpricing (statistically significant at the 1%, 5%, and 1% level, respectively). The coefficient foreign exchange rates show a negative relationship with underpricing. The negative coefficient of gross spread indicates that gross spread and underpricing are substitutes, which implies that issuer firms with low gross spread have high underpricing. Proposed hypothesis H_{23} is supported because this relationship is significant. Firm age has a negative relationship with underpricing, which indicates that older firms are less underpriced. Other proposed hypotheses are not supported because the determinants show insignificant relationships with underpricing. The R-squared (adjusted R-squared) of the model was 0.213 (0.132). This can be interpreted as up to 13.2 % of the variation in underpricing model being explained by the determinants of underpricing.

In Table 6.2, the gross spread regression models was estimated by independent variables drawn from issue-specific, firm-specific and market-specific characteristics. The independent variables of gross spread are constructed with 1) underwriter reputation; 2) gross proceeds; 3) offer price; 4) firm size; 5) firm age; 6) profitability; 7) hot issue market; and 8) underpricing.

The first gross spread regression model indicates that underwriter reputation and underpricing show negative relationships with gross spread (significant at the 5% and 1% levels, respectively). The negative coefficient of underwriter reputation implies that more reputable underwriters have lower gross spreads. The coefficient underpricing shows a negative significant relationship with gross spread, which indicates that gross spread and underpricing are substitutes. Proposed hypothesis H_{23} is supported. The R-squared (adjusted R-squared) of the model was 0.103 (0.078). This can be interpreted as up to 7.8% of the variation in gross spread in Model 1 being explained by the determinants of gross spread.

The second model shows the same result that two variables—underwriter reputation and underpricing—had a significant relationship with gross spread. The coefficient of underwriter reputation is negative. The coefficient underpricing also shows a negative significant relationship with gross spread, which indicates that gross spread and underpricing are substitutes and thus, the proposed hypotheses H_{23} is supported . Further, R-squared (adjusted R-squared) of gross spread was 0.122 (0.079). This can be interpreted as up to 7.9% of the variation in gross spread being explained by the determinant of gross spread; this is discussed further in Section 5.7.

6.3 Evaluation of Post-listing Day Performance of IPO

This section evaluates short-run post-listing day performance of IPOs. This section presents an analysis of post-listing day returns, calculated up to 20 days after listing. The post-listing day performance was based on the Cumulative Average Abnormal Returns (CARs) of all IPOs, to answer RQ6:

RQ6: What is the short-run post-listing day performance of IPOs for Indonesian listed firms?

6.3.1 Distribution of Post-listing Day Performance of IPOs

Table 6.3 presents post-listing day performance of IPOs for the 5th, 15th and 20th days of all IPO firms, decomposed into listing year and industry. The mean CARs of all sample are 23.96% at day-5 to 23.47% at day 15 and 23.31% at day-20. The post-listing day performance of Indonesian IPOs shows that IPOs were underperformed and returns of IPOs decreased from 24.11% at day-1 to 23.31% at day-20 (see Figure 6.1). This indicates that investors receive returns up to day-20 after listing day, however the return decreased; or the wealth of investors decreased from the first day of trading.

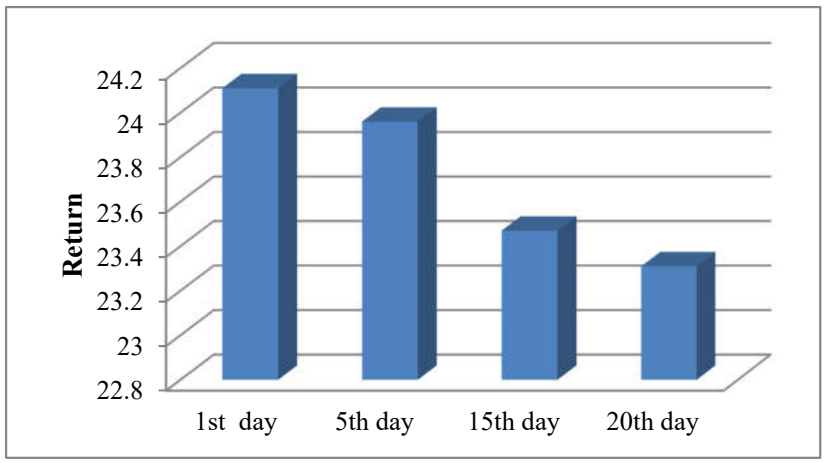


Figure 6.1. Post-listing Day Performance of IPO 1st-Day to 20th-Day

Table 6.3. Post-listing Day Performance of IPO by Listing Year and Industry

	N	Gross Spread (%)	Underpricing (%)	Day 5		Day 15		Day 20	
				CAR[1]	t-stat	CAR	t-stat	CAR	t-stat
All Sample	150	2.09	23.73	23.96	5.87***	23.47	5.51***	23.31	5.40***
Panel A: Year									
2007	15	2.25	40.17	49.84	3.45***	47.51	3.28***	46.44	3.23***
2008	12	2.08	40.48	45.12	3.66***	48.34	3.23***	48.11	3.16***
2009	9	1.93	13.71	21.90	1.06	17.22	0.82	16.95	0.76
2010	17	1.98	31.03	31.59	3.69***	27.58	2.99***	27.10	2.80***
2011	19	2.09	11.85	6.31	1.02	3.62	0.49	5.29	0.61
2012	19	2.09	27.10	29.30	2.49**	32.40	2.44**	33.37	2.56**
2013	22	2.29	13.46	4.50	0.68	5.82	1.05	6.71	1.29
2014	14	1.85	19.71	25.06	1.12	28.68	1.21	26.90	1.12
2015	12	1.95	27.19	15.32	1.06	19.31	1.25	18.22	1.15
2016	11	2.30	19.20	23.70	1.54	14.41	1.17	12.04	1.06
Panel B: Industry									
Agriculture	11	1.79	8.54	2.49	0.22	1.70	0.15	1.63	0.15
Mining	23	2.09	19.08	10.27	1.27	8.32	1.00	8.56	0.99
Basic Industry and Chemicals	10	1.98	15.33	1.40	0.11	2.58	0.23	6.36	0.47
Miscellaneous	7	2.19	21.78	21.87	1.77	19.38	1.64	21.85	1.60
Consumer Goods	6	2.39	20.32	19.19	1.40	18.96	1.45	19.91	1.42
Property and Real Estate	31	1.98	35.41	46.36	3.64***	45.25	3.34***	44.39	3.24***
Infrastructure, Utilities and Transportation	22	2.32	15.41	22.72	2.32**	20.28	2.04**	16.94	1.84
Trade and Service	40	2.11	28.71	27.78	3.97***	29.66	3.96***	29.94	3.86***

Note: [1]CAR = Cumulative Average Abnormal Return, Positive CAR indicates underpricing and negative CAR indicates overpricing, *** is significant at the 0.01 level, ** is significant at the 0.05 level, * is significant at the 0.10 level

6.3.1.1 Listing Year Analysis

Table 6.3 presents post-listing day performance of IPOs from 2007 to 2016 and shows that the return of post-listing day performance of 5 years (2007, 2009, 2010, 2011 and 2016) was positive and decreased at day-5, day-15 and day-20. IPO firms in 2007 had the highest return based on CARs on day-5 (significant at the 1% level), however the return decreased up to day-20. The return on day-5 was 49.84%, day-15 was 47.51%, and day-20 was 46.44%. Meanwhile, IPO firms in 2008 had the highest CARs on day-15 and day-20 after listing day (48.34% and 48.11%). The lowest level of return on day-5 was in 2013. The lowest level of return on day-5 was in 2013. The CARs of IPOs in this year was the lowest, however, the CARs increased from 4.50% (day-5) to 6.71% (day-20), which means that investors in 2013 received returns up to day-20; and the return increased.

In day-15 and day-20, the CARs of all year show positive return which means that investors received returns up to day-20. The highest CARs on day-15 and day-20 was the CARs of year 2008 (48.34% and 48.11%, respectively), and the lowest was 2011 (3.62% and 5.29%, respectively).

6.3.1.2 Industry Analysis

The examination of returns by industry in Table 6.3 Panel B shows that the CARs all industries are positive on the fifth day up to 20 days after listing.. The highest return in day-5 was the property and real estate industry at 46.36% and this was statistically significant. The lowest CARs was the basic industry and chemicals (1.40%). Three industries of basic industry and chemicals, consumer goods industry, and trade and service industry shows increasing return from day-5 up to day-20. The CARs of basic industry and chemicals increased from 1.40% (day-5) to 6.36% (day-20), consumer goods industry increased from 19.19% (day-5) to 19.91% (day-20) after slightly decreased in day-15 (18.96) because the closing price is higher as demand is increasing. The CARs of trade and service industry increased from 27.78% (day-5) to 29.94% (day-20). The return of these three industries increasing from day-5 up to day-20, however when comparing with the return on the first day (underpricing), the return of the three industries decreased. Meanwhile the CARs of the other five industries shows decreasing return up to day-20.

In day-15 and day-20, the CARs of all industries show positive return which means that investors received returns up to day-20. The highest CARs on day-15 and day-20 was property and real estate industry (45.25% and 44.39%, respectively), and the lowest was agriculture industry (1.70% and 1.63%, respectively).

6.3.2 Post-listing Day Performance of IPO Estimates

Table 6.4 presents post-listing day performance of IPO estimates for the fifth, 15th and 20th days of all IPO firms. The regression model was estimated by independent variables drawn from (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; (iv) issue-specific characteristics; (v) firm-specific characteristics; and (vi) market-specific characteristics. The results of the regression model are presented in Table 6.4 and discussed below.

Based on Table 6.4, the regression model estimates of post-listing day performance of IPO are:

Model 1: Underpricing

$$\begin{aligned} UNDP = {} & 45.941 - 0.070FAI - 0.009WCF + 0.016ISS - 0.184DR + 1.466IFR - 0.003FER \\ & + 0.001DJI + 0.007^{**}SSE + 1.975UWR - 0.001^{***}GPC - 0.001OP \\ & - 2.884^{**}FSIZE - 0.263^{**}AGE - 0.029PROF - 8.893HM \end{aligned} \quad (6.4)$$

Model 2: CAR day-5

$$\begin{aligned} UNDP = {} & 103.617 - 0.224FAI - 0.275WCF - 0.385DR + 0.284IFR - 0.005FER \\ & + 0.002DJI + 0.005SSE + 6.640UWR - 0.001^{**}GPC \\ & - 5.251^{**}FSIZE - 0.534^{**}AGE - 0.215PROF - 14.202HM \end{aligned} \quad (6.5)$$

Model 3: CAR day-15

$$\begin{aligned} UNDP = {} & 89.698 - 0.234FAI - 0.296WCF - 0.373DR + 1.439IFR \\ & - 0.005FER + 0.002DJI + 0.004SSE + 6.955UWR - 0.001^{**}GPC \\ & - 4.451^{**}FSIZE - 0.651^{**}AGE - 0.105PROF - 13.607HM \end{aligned} \quad (6.6)$$

Model 4: CAR day-20

$$\begin{aligned} UNDP = {} & 99.554 - 0.262FAI - 0.342WCF - 0.373DR + 1.439IFR \\ & - 0.005FER + 0.002DJI + 0.004SSE + 6.955UWR - 0.001^{***}GPC \\ & - 4.451^{**}FSIZE - 0.651^{**}AGE - 0.105PROF - 13.607HM \end{aligned} \quad (6.7)$$

Table 6.4. Post-listing Day Performance of IPO Estimates

Variables	Abbvn	Underpricing	CAR		
			Day-5	Day-15	Day-20
Constant		45.941**	103.617***	89.698**	99.554**
		(1.973)	(2.659)	(2.191)	(2.388)
Intended Use of IPO Proceeds					
Fixed Asset Investment	FAI	-0.070	-0.224	-0.234	-0.262
		(-0.504)	(-1.125)	(-1.126)	(-1.302)
Working Capital Financing	WCF	-0.009	-0.275	-0.296	-0.342
		(-0.061)	(-1.075)	(-1.144)	(-1.302)
Investment in Shares of Stock	ISS	0.016	_	_	_
		(0.100)			
Debt Repayment	DR	-0.184	-0.385	-0.355	-0.373
		(-1.110)	(-1.596)	(-1.465)	(-1.499)
Macroeconomic Factors					
Inflation Rates	IFR	1.466	0.284	1.871	1.439
		(1.357)	(0.149)	(0.855)	(-0.675)
Foreign Exchange Rates	FER	-0.003	-0.005	-0.004	-0.005
		(-1.291)	(-1.306)	(-1.227)	(-1.365)
International Stock Market					
Dow Jones Index	DJI	0.001	0.002	0.002	0.002
		(0.909)	(0.968)	(0.907)	(0.865)
Shanghai Stock Exchange Index	SSE	0.007**	0.005	0.004	0.004
		(2.592)	(1.192)	(0.835)	(0.901)
Issue-specific Characteristic					
Underwriter Reputation	UWR	1.975	6.640	8.360	6.955
		(0.380)	(0.708)	(0.892)	(0.714)
Gross Proceeds	GPC	-0001***	-0.001**	-0.001***	-0.001***
		(-2.681)	(-1.972)	(-2.982)	(-2.444)
Offer Price	OP	-0.001	_	_	_
		(-1.011)			
Firm-specific Characteristic					
Firm Size	FSIZE	-2.884**	-5.251**	-4.171**	-4.451**
		(-2.441)	(-2.351)	(-1.917)	(-2.037)
Firm Age	AGE	-0.263**	-0.534**	-0.672**	-0.651**
		(-2.036)	(-2.124)	(-2.564)	(-2.410)
Profitability	PROF	-0.029	-0.215	-0.139	-0.105
		(-0.599)	(-1.613)	(-1.328)	(-1.034)
Market-specific Characteristic					
Hot Issue Market	HM	-8.893	-14.202	-15.757	-13.607
		(-1.545)	(-1.170)	(-1.136)	(-0.977)
Observation		150	150	150	150
R^2		0.193	0.125	0.121	0.118
Adjusted R^2		0.103	0.042	0.038	0.034
F-statistic		3.038**	2.966***	2.850***	2.99***

Note: The dependent variable are UNDP = underpricing; and CAR = Cumulative Average Abnormal Return, Abbvn = Abbreviation of variable in equation, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = underwriter reputation, GPC =gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, , *** is significant at the 0.01 level, ** is significant at the 0.05 level, * is significant at the 0.10 level.

The regression model 1 of underpricing indicates that SSE, gross proceeds, firm size, and firm age are important determinant variables in explaining underpricing in Indonesian IPOs market. The coefficient of the SSE has a positive and significant relationship with underpricing. This indicates that positive SSE affected on positive Indonesian Stock Exchange (IDX) index which give optimism for investor to buy stock and result on underpricing or initial return. The coefficient of the gross proceeds has a negative significant relationship with underpricing which means that firm with high offer size of IPO or gross proceeds are less underpriced. Firm size has a negative relationship with underpricing (significant at the 5%), which indicates that larger firms are less underpriced. The last result which shows significant relationship with underpricing was the coefficient of firm age which shows a negative relationship with underpricing (statistically significant at the 5% level).

The regression model 2 of CARs day-5 indicates that gross proceeds, firm size, and firm age are important determinant variables in explaining post-listing day return of day-5 in Indonesian IPOs market. The coefficient of the gross proceeds has a negative significant relationship with underpricing which means that firm with high offer size of IPO or gross proceeds are less underpriced. Further, firm size has a negative relationship with underpricing (significant at the 5%), which indicates that larger firms are less underpriced.The last result which shows significant relationship with underpricing, was the coefficient of firm age which shows a negative relationship with underpricing (statistically significant at the 5% level).

The regression model 3 and 4 of CARs day-15 and CARs day-20 has the same significant variables with regression model 2. These regression models indicates that gross proceeds, firm size, and firm age are important determinant variables in explaining post-listing day return of day-15 and day-20 in Indonesian IPOs market. The results from three regression models show that some of the determinants are significant in explaining underpricing and post-listing day IPO performance. The different determinants present in the results show the main determinants on different post-listing days. Gross proceeds, firm size and firm age are consistently can be used to explain IPO performance, from the first day of trading up to day-20 post-listing day of IPO. The variables of SSE is the significant determinant on the first day of trading.

6.4 Discussion of Results of Relationship Between Gross Spread and Underpricing

The negative coefficient for gross spread indicates that gross spread and underpricing are substitutes. This result supports the substitution hypothesis: that the relationship between gross spread and underpricing is negative and significant when the relationship between these two costs is based on underwriter reputation. Gross spreads are high as underwriters might lose due to price

uncertainty and underwriters have to sell IPO shares at lower prices than the preset offer price. Under prospect theory, underwriters have the bargaining power to set a higher offer price when selling a larger IPO. Underwriters can adjust the level of gross spread which depend on the negotiated range of the offering price, to achieve an equilibrium risk premium (Chen & Mohan 2002). When an underwriter could charge a high gross spread to compensate for all the issuance risk bearing, then underpricing becomes less important. The result oft this study consistent with Chen and Mohan (2002) and Yeoman (2001). Following with Ljungqvist (2003), who examines IPOs in the United Kingdom, and Fernando et al. (2015).

6.5 Discussion of Results of Post-listing Day Performance of IPO

The post-listing day performance of IPOs evaluation by listing year analysis shows that the Cumulative Average Abnormal Return (CAR) of post-listing day performance of 5 years (2007, 2009, 2010, 2011 and 2016) was positive and decreased at day-5, day-15 and day-20. This indicates that investors receive returns up to day-20 after listing even thought the return decreased. The examination of returns by industry shows that the CARs all industries are positive on the fifth day up to 20 days after listing. The highest CARs in day-5 up to day-20 is the property and real estate industry and the lowest CARs at day-5 was the basic industry and chemicals, at day-15 and day-20 was agriculture industry.

The decrease of return of post-listing day performance was explained in regression model to identify the determinants. The regression model was estimated by independent variables drawn from (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; (iv) issue-specific characteristics; (v) firm-specific characteristics; and (vi) market-specific characteristics.

The regression model 1 of underpricing indicates that SSE, gross proceeds, firm size, and firm age are important determinant variables in explaining underpricing in Indonesian IPOs market. The coefficient of the SSE has a positive and significant relationship with underpricing. This indicates that positive SSE affected on positive Indonesian Stock Exchange (IDX) index which give optimism for investor to buy stock and result on underpricing or initial return. The coefficient of the gross proceeds, firm size, and firm age has a negative significant relationship with underpricing.

The regression model 2 of CARs day-5 indicates that SSE, gross proceeds, offer price, and firm age are important determinant variables in explaining post-listing day return of day-5 in Indonesian IPOs market. The coefficient of the SSE has a positive and significant relationship with underpricing. The coefficient of the gross proceeds, offer price, and firm age has a negative

significant relationship with underpricing. The regression model 3 and 4 of CARs day-15 and CARs day-20 has the same significant variables. These regression models indicates that foreign exchange rates, DJI Index, gross proceeds, firm size, and hot issue market are important determinant variables in explaining post-listing day return of day-15 and day-20 in Indonesian IPOs market. The coefficient of the foreign exchange rates, gross proceeds, firm size has a negative and significant relationship with underpricing. The coefficient of the DJI Index has a positive and significant relationship with underpricing. The results from four regression models show that some of the determinants are significant in explaining underpricing and post-listing day IPO performance, and only gross poceeds which is consistantly as a significant determinants of underpricing since the first day of trading until twenty days after listing of the IPOs.

6.6 Summary

This chapter examines three possible relationships between gross spread and underpricing: an insignificant relationship between the two variables, that the two variables are substitutes, or that the two variables are complementary. 2SLS models were employed to identify the relationship between gross spread and underpricing. The result of the negative coefficient of gross spread indicates that gross spread and underpricing are substitutes. Further, post-listing day performance of IPOs in Indonesia shows lower mean CARs of all sample after the listing day, which indicates the returns received by investors, or the wealth of investors, decreased.

The decrease of return of post-listing performance was explained in regression model to identify the determinants. The regression model was estimated by independent variables drawn from (i) intended use of IPO proceeds; (ii) macroeconomic factors; (iii) international stock markets; (iv) issue-specific characteristics; (v) firm-specific characteristics; and (vi) market-specific characteristics. The regression model of CARs day-5 indicates that gross proceeds, firm size, and firm age are important determinant variables in explaining post-listing return of day-5 in Indonesian IPOs market. The regression model 3 and 4 of CARs day-15 and CARs day-20 has the same significant variables. These regression models indicates that gross proceeds, firm size, and firm age are also important determinant variables in explaining post-listing return of day-15 and day-20 in Indonesian IPOs market. These three determinants are consistently can be used to explain IPO performance, from the first day of trading up to day-20 post-listing day of IPO. Meanwhile, only SSE which are the significant determinant for IPO performance of first day of the trading.

Chapter 7: Conclusion and Recommendations

7.1 Introduction

Chapter 6 reported the results of the data analysis. Following the discussion in Chapter 6, this chapter provides an overview of the thesis and summarises its main findings. It then examines policy implications of the research, as well as the limitations of the study, which suggest future research directions. The organisation of this chapter is as follows. Section 7.2 presents the research summary, and Section 7.3 provides a summary of the results. Sections 7.4 and 7.5 discusses the implications and the limitations of the study, respectively. Section 7.6 presents suggestions for further research, to further enhance knowledge and understanding on the evaluation of gross spread and underpricing in the Indonesian IPO market.

7.2 Research Summary

This thesis offered a comprehensive study of the cost of going public (IPOs) in the Indonesian market. The aim was to provide evidence on 1) the characteristics and main determinants of gross spread and underpricing; 2) the relationship between gross spread and underpricing; and 3) post-listing day performance of IPOs in the Indonesian market. Seven research questions were addressed, as follows:

RQ1: What are the characteristics of IPO gross spread for Indonesian listed firms?
RQ2: What are the main determinants of IPO gross spread for Indonesian listed firms?
RQ3: What is the level of IPO underpricing for Indonesian listed firms?
RQ4: What are the main determinants of IPO underpricing for Indonesian listed firms?
RQ5: Do macroeconomic conditions and international stock markets have a role in explaining the level of IPO underpricing for Indonesian listed firms?
RQ6: What is the relationship between gross spread and underpricing of IPOs?
RQ7: What is the short-run post-listing day performance of IPOs for Indonesian listed firms?

The overall objective of this research was the evaluation of the cost of going public and IPO post-listing day performance for Indonesian listed firms. To achieve the research objective, the aims of the study were to:

1. Examine the characteristics of IPO gross spread for Indonesian listed firms.
2. Measure the impact of determinants of IPO gross spread for Indonesian listed firms.
3. Measure the level of IPO underpricing for Indonesian listed firms.
4. Measure the impact of determinants of IPO underpricing for Indonesian listed firms.

5. Measure the impact of macroeconomic conditions and international stock markets on the level of IPO underpricing for Indonesian listed firms.
6. Examine whether gross spreads and underpricing are substitutes or complements.
7. Examine the short-run post-listing day performance of IPOs for Indonesian listed firms.

The data used in this study comprised 150 IPO firms listed on the IDX from 2007–2016. The chosen period of study was from the beginning of 2007, because information associated with gross spread and offer price have been available in the prospectuses of companies only since then. This was a result of BAPEPAM-LK, the Financial Services Authority of Indonesia, mandating that gross spread and offer price information had to be disclosed in a firm's prospectus. The prospectuses were collected from The Indonesia Capital Market Institute, and the other data were collected from prospectuses and IDX databases.

The relationship between gross spread, underpricing, and the determinants of gross spread and underpricing was examined under 1) OLS regression model; and 2) panel regression. In the panel data analysis, the data were arranged into three panels by industry, firm size and IPO offer size. After evaluation of gross spread, underpricing and the determinants of gross spread and underpricing, the relationship between gross spread and underpricing was identified. The 2SLS regression model was adopted to identify the relationship between the two IPO costs. The last evaluation of cost of IPOs in this study was that of post-listing day performance of IPOs, where the IPO firms were evaluated up to 20 days after listing.

7.3 Summary of Results

This section presents a summary of the results on the: 1) characteristics and main determinants of gross spread and underpricing; 2) relationship between gross spread and underpricing; and 3) post-listing day performance of IPOs in the Indonesian IPO market.

7.3.1 Summary of Results: Characteristic of Gross Spread

The evaluation of the direct cost of going public or gross spread revealed the mean gross spread during the sample period (2.05%). The greatest cost incurred in direct costs for this sample was management fees at 58%, followed by 23% for underwriting fees and 19% for selling fees. The proportions for underwriting and selling fees tend to move together, while the proportion for management fees fluctuated.

The data suggest that the Indonesian underwriting market does not follow the industry standard 20/20/60 division (20% management fee, 20% underwriting fee and 60% selling concession),

unlike the US (Chen & Ritter 2000; Lee 2012). The Indonesian underwriting market has a greater focus on the management fee in line with a book-building pricing strategy, by which an underwriter tries to determine the offer price of an IPO based on the demand of institutional investors to reduce information asymmetries. Management fees enable underwriters to undertake marketing campaigns, assess market conditions and organise road shows to obtain information and opinions from informed and potential investors prior to setting the offer price and IPO allocation.

The characteristics of gross spreads in Indonesia are different from those of other IPO markets, for example, the US, as indicated by the findings, which are inconsistent with those of previous studies. For the sub-period sample, the gross spread level in the first period (2007–2009) was higher, and this is related to low proceeds compared with proceeds in the second period. In the first period, the number of IPOs decreased due to the global financial crisis in 2008, which caused the IDX composite index to plummet to its lowest level. As a result, some firms postponed their IPOs, so that in 2009 the total number of IPOs was only 13, with gross proceeds the lowest during sample period, at only IDR 183 billion.

The results for gross spreads in SOE and non-SOE samples show that the gross spread level of SOEs is lower than non-SOEs, with proceeds higher than those for non-SOEs. The lower gross spread of SOEs compared with non-SOEs is consistent with previous studies, such as Wang and Zhou (2013) in the case of China. IPOs of SOEs are attractive for investors because government-owned firms are mostly in well-established industries, which are perceived as less risky when compared with privately owned firms from the same industry (Ritter 1984). Further, the larger size of the offering makes IPOs of SOEs more attractive for underwriters, which can be a consideration for underwriters in determining direct cost or gross spread.

In the pricing strategy sample, there is an indication that the use of a pricing strategy might not be relevant in explaining the lower gross spread of book-building compared with fixed strategy. This finding differs from that of Fernando et al. (2015), who found that gross spread book-building should be higher than fixed-price. The difference in gross spreads is related to competition in the underwriting market, especially because the choice of IPO pricing strategy in Indonesia is exogenous for Indonesian issuer firms (Hanafi 2016)—issuer firms cannot choose a pricing strategy because a book-building pricing strategy was suggested in regulations in 2000.

The results of the evaluation of clustering patterns of gross spread showed that 2% emerged as the most common spread. The second most common spread was 2.5% (12%), followed by 3% (11%). These three spreads had a total frequency of 36% of IPOs. While a gross spread of 2% emerged as the mode, data did not show a highly clustered pattern at 2% because the number of IPOs with a gross spread of 2% was only 13% of all IPOs, small compared with the high clustering patterns in

other markets. For example, as mentioned in Torstila (2003), gross spreads in the US market are clustered at 7%, accounting for 43%. In the Asia Pacific market, such as Hong Kong, India and Singapore, gross spread was clustered at 2.5%, accounting for 94.8%, 86% and 55.7%, respectively. The European market also shows a high clustering pattern, such as Belgium at 66.7%. The weaker clustering pattern in Indonesia can also be seen in the standard deviation of gross spreads, which was relatively high (0.88) compared with the US standard deviation of only 0.0045 (Lee 2012).

The result of this study indicates that the gross spread level decreased compared with gross spread level of 3.6% (Torstila 2003). This result is different from Torstila (2003) which shows that 3.5% was the mode spread, accounting for 27.3% of 11 IPO firms sample. The lower gross spread level in Indonesian IPO market can be explained by the competition hypothesis (Chen & Mohan 2002) and economies of scale (Ritter 1987) in next section 6.3.2.

7.3.2 Summary of Results: Estimation of Gross Spread

This section discusses the summary of evaluation of the relationships between gross spread and determinants of gross spread. The summary of hypothesis testing is presented in Table 7.1.

The results from the pooled regression model of sub-period 2010-2016, non-SOE, book-building strategy and all sample show that underwriter reputation is the sole significant determinant variable in explaining gross spread in the Indonesian IPO market. The relationship between gross spread and underwriter reputation is negative and significant. This indicates that more reputable underwriters have lower gross spreads than less reputable underwriters. The changing competition level might explain the lower gross spread because of the increase in number of underwriters in Indonesia over 2007–2016. The number of underwriters was relatively high, up to four–six times the total number of issuers during the sample period. The increasing number was not accompanied by an increasing number of IPOs, which may have created high competition in the underwriting market. Competition can also be a factor that restrains a high spread; however, reputable underwriters have the advantage of attracting larger transactions in all periods, reaching cost advantage or economies of scale, which result in low gross spread. Under competition, underwriters set a lower underwriting fee to compete for the underwriting business; however, underwriters can benefit from indirect compensation resulting from a high level of underpricing.

Table 7.1. Summary of Hypothesis Test Results for Gross Spread and Determinants of Gross Spread in Indonesian IPO Market in 2007–2016

Dependent Variable	Independent Variable	2007-2009	2010-2016	Non-SOE	Book-building Strategy	All Sample		Panel Regression Result		
						Model 1	Model 2	Industry	Firm Size	Offer Size
GSP	UWR (H_1)	(–) NS	**(–) S**	**(–) S**	**(–) S**	**(–) S**	**(–) S**	–	–	–
	GPC (H_2)	–	–	–	–	(–) N	–	(+) NS	(–) NS	–
	OP (H_3)	(+) NS	(–) NS	(–) NS	(–) NS	–	(–) NS	(+) NS	(–) N S	**(–) S**
	FSIZE (H_4)	(–) NS	(–) NS	(–) NS	(–) NS	–	(–) NS	**(–) S**	–	(–) NS
	AGE (H_5)	**(–) S**	–	–	–	–	(–) NS	(+) NS	(+) NS	(+) NS
	PROF (H_6)	**(–) S**	(–) NS	(–) NS	(–) NS	–	(–) NS	(+) NS	(–) NS	(–) NS
	HM (H_7)	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	–	–	–

Note: The dependent variable is GSP = gross spread. UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, S = Supported, NS = not Supported.

The distribution of gross spread and proceeds shows consistency results that the lower gross spread is related to size of the IPO or gross proceeds, where IPO firms with higher proceeds have lower gross spreads. Bhagat and Frost (1986), Booth and Smith (1986), Ritter (1987) and Bae and Levy (1990) document the economies of scale associated with issue size. In line with Pugel and White (1988), the larger the offer size, the higher the fixed costs incurred in the underwriting process, which can be spread out over each offer of shares underwritten. The underwriter will, thus, demand a lower underwriting fee per share for a larger issue. This is further supported by lower search costs involved in underwriting larger issues (Logue & Lindvall 1974). The responsiveness of the gross spread to proceeds could also be indicative of a changing level of competition in the market (Chen 1999). This shows that IPOs with larger gross proceeds tend to have lower gross spreads. The result of this study consistent with past studies that have concluded that IPO size is a key determinant of gross spread, and that there is a trade-off between gross spread and proceeds (Beatty & Welch 1996; How & Yeo 2000; Torstila 2003; Zhang 2003).

The variation of gross spread also related with firm age and profitability which can be seen in the regression model result of sub-period 2007-2009. The negative coefficient of firm age and profitability indicates that older issuer firm and more profitable issuer firm tend to have lower gross spreads. This result is consistent with Ahn, Kim and Son (2007), who used firm age and profitability as proxies for risk and found that there was a negative relationship between profitability and underwriting fees. They argued that risk of underwriting profitable IPOs might be lower, because these firms will be relatively easy to sell on the market. Therefore, it is expected that more profitable firms will pay lower underwriting fees. Meanwhile, the negative relationship between firm age and gross spread indicates that investors and underwriters are more familiar with older issuing firms.

The results of regreassion model of industry panel revealed that gross spread in Indonesia appears to be related to firm size. Firm size and gross spread has a negative and significant relationship. This shows that IPOs with larger firm size tend to have lower gross spreads, which is consistent with (Pugel & White 1988; Kaserer, Mettler & Obernberger 2011). The results of panel data analysis of firm size and offer size reveal that gross spread in Indonesia appear to be related to offer price. This shows that IPOs with higher offer prices tend to have lower gross spreads. This is consistent with work of Ahn, Kim and Son (2007), Chen and Mohan (2002) and; Meoli, Signori and Vismara (2012). Chen and Mohan (2002) documented that higher quality IPOs have higher offer prices and higher offer price is associated with lower underwriter spread when they evaluate IPO firms in the US market during period 1990-1992. Underwriter will set higher offer price when they confidence about the prospect of firms, and underwriters are willing to charge lower gross

spread (Chen, Fok & Wang 2006). The negative relationship between offer price and gross spread is supported by latest study from Bajo, Barbi and Petrella (2017).

7.3.3 Summary of Results: Characteristic of Underpricing

The evaluation of direct cost of going public or underpricing revealed that the mean underpricing of the sample during 2007–2016 was 23.73%, with the total IPO offer size or proceeds amounting to IDR 718 billion. This money left on the table in nominal terms was equal to IDR 139 billion. The level of underpricing varied over time, from a low of 11.85% in 2011 to a high of 40.48% in 2008. Accrdong to industry analysis all industries experienced underpricing. Agriculture had the lowest underpricing at 8.54%, and property and real estate had the highest level at 35.41%. In a comparison of number of IPOs with gross proceeds and money left on the table (indirect cost) by year, 23 firms in the mining industry had the highest of both proceeds (IDR 1,593 billion) and money left on the table (IDR 245 billion) compared with all other industries. This result consistent with previous studies in Indonesia that first-day of trading is underpricing (Darmadi & Gunawan 2013; Joni 213; Hanafi & Setiawan 2018; Sasikirono et al. 2018; Utaminingsih 2013).

In general, the underpricing in Indonesian IPO market can be explained with the market feedback hypothesis when underwriting used book-building strategy as suggested by Jegadeesh, Weinstein and Welch (1993). Underwriters obtain information through the book-building process because market participants are better informed about the true value of the firm than the initial shareholders. Under asymmetric information, underpricing is used to compensate investors who provide information during the period prior to bidding to help determine the offer price. Underwriters issue a large number of shares at the lower price to attract uninformed investors, thus reducing the probability of loss because of an unsuccessful IPO (Bommel 2002).

When evaluation of underpricing was done for SOE and non-SOE, it showed that non-SOE IPO firms are more underpriced than SOE IPO firms. The mean of underpricing of SOEs was 17.48% and that of non-SOEs was 23.96%. In a comparison of gross proceeds and money left on the table, SOE IPO firms had the highest of both proceeds (IDR 2,360 billion) and money left on the table (IDR 282 billion) compared with non-SOE IPO firms. This indicates that SOE IPO firms paid more in indirect costs that non-SOE IPO firms, as money left on the table, equal to IDR 282 billion for SOE IPO firms, was higher than the IDR 133 billion for non-SOE IPO firms.

Government-owned firms in Indonesia may be perceived as signalling uncertainty related to future government policies, which might affect the offer price of the IPOs of SOEs. However, government-owned firms are mostly in well-established industries, which are perceived to be less risky than private owned firms from the same industry (Ritter 1984). Therefore, IPOs of SOEs are

generally underpriced, to attract more investors. Biais and Perotti (2002) explained that the government gives higher discounts for privatised IPOs, or underprice IPOs, as a positive signal of value of firms and commitment of governments to privatisation. This is line with the reasons for SOEs going public are to: (1) increase transparency, public control and independency; (2) create a better financial structure and management; (3) increase efficiency and productivity; (4) create competitive SOEs with a global orientation; (5) create a better and competitive industry structure, business environment, macroeconomic and market capacity; and (6) maintain a majority government ownership (Ministry of State-Owned Enterprises 2003). The Governments generally choose this market approach because privatisation can promote competition, increase public control, and importantly, improve efficiency (Megginson & Netter 2001). Further, privatisation can be seen as a commitment by government to reduce intervention and control over SOEs to create greater entrepreneurial opportunities and improve productivity (D'Souza et al. 2001). The result of underpricing of SOEs in Indonesia is consistent with previous research that underpricing of IPOs of SOEs is higher than that of privately owned firms (Gong & Shekhar 2001; Lam, Tan & Wee 2007; Suchard & Singh 2007).

7.3.4 Summary of Results: Evaluation of Underpricing

This section discusses the summary of evaluation of the relationships between underpricing and determinants of underpricing. The summary of hypothesis testing is presented in Table 7.2.

In general, Shanghai Stock Exchange Index (SSE), firm size and firm age were significant in explaining underpricing in the Indonesian IPO market for both pooled regression model and panel regression model. Positive conditions of regional stock index of SSE are perceived as positive for potential investors in the Indonesian market. An increase in the SSE influences Indonesian stock indexes because investors' optimism regarding global economic conditions and influence the decision to buy stocks. The size of the firm can be used to measure the ex-ante risk of the IPO, whereby large and established firms are perceived as posing less risk than small firms. The results in this study reveal that underpricing in Indonesia appears to be significantly and negatively related to firm age, implying that older firms tend to have lower underpricing. The age of the firm shows its operating history prior to going public, which measures the ex-ante risk of the offer.

Table 7.2. Summary of Hypothesis Test Result of Underpricing and Determinant of Underpricing in Indonesian IPO Market in 2007-2016

Dependent Variable	Independent Variable	Expected Sign	2010-2016	Non-SOE	Book-building Strategy	All Sample		Panel Regression Result		
						Model 1	Model 2	Industry	Firm Size	Offer Size
UNDP	FAI (H_8)	Negative	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	**(–) S**	(–) NS	(+) NS
	WCF (H_9)	Negative	(–) NS	(–) NS	–	(–) NS	(–) NS			–
	ISS (H_{10})	Positive	(+) NS	–	(+) NS	–	(+) NS	(+) NS		(+) NS
	DR (H_{11})	Negative	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS	(–) NS
	IFR (H_{12})	Positive	(+) NS	(+) NS	(+) NS	–	(+) NS	**(+) S**		(+) NS
	FER (H_{13})	Negative	(–) NS	(–) NS	(–) NS	–	(–) NS	(–) NS	(–) NS	(–) NS
	DJI (H_{14})	Positive	–	(+) NS	(+) NS	–	(+) NS		(+) NS	(+) NS
	SSE (H_{15})	Positive	(+) NS	**(+) S**	**(+) S**	–	**(+) S**	**(+) S**	**(+) S**	**(+) S**
	UWR (H_{16})	Positive	(+) NS	(+) NS	(+) NS	(+) NS	(+) NS	–	–	–
	GPC (H_{17})	Negative	–	**(–) S**	**(–) S**	**(–) S**	**(–) S**	–	–	–
	OP (H_{18})	Negative	**(–) S**	–	–	(–) NS	(–) NS	–	(–) NS	–
	FSIZE (H_{19})	Negative	**(–) S**	**(–) S**	**(–) S**	**(–) S**	**(–) S**	(–) NS	–	**(–) S**
	FAGE (H_{20})	Negative	(–) NS	(–) NS	**(–) S**	**(–) S**	**(–) S**	(–) NS	**(–) S**	**(–) S**
	PROF (H_{21})	Negative	–	(–) NS	(–) NS	(–) NS	(–) NS		**(–) S**	**(–) S**
	HM (H_{22})	Negative	(–) NS	(–) NS	(–) NS	–	(–) NS	–	–	–

Note: The dependent variable is UNDP = underpricing, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = dummy underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = dummy hot issue market, S = supported, NS = not supported

In sub-period of 2010-2016 regression model, offer price and firm size were the main determinant of underpricing which has a negative relationship with underpricing. In non-SOE regression model the main determinant of underpricing were SSE, gross proceeds and firm size. Gross proceeds and firm size showed a negative relationship with underpricing, and the SSE showed a positive relationship with underpricing. Negative coefficient of gross proceeds indicates that the higher offer size of IPO in Indonesia, the less underpriced of IPOs. Larger IPOs are perceived to be less risky, less uncertainty and this reduces investors' perceived risk of the IPO. Significant relationship of SSE and underpricing can also be found in book-building strategy regression model, together with gross proceeds, firm size and firm age.

The industry panel regression model indicated that intended use of proceeds variable, fixed asset investment, inflation rates and SSE were significant in explaining underpricing in the Indonesian IPO market for industry panel data. Fixed asset investment showed negative realtionship with underpricing, and inflation rates and SSE showed positive relationships with underpricing. Positive relationships between inflation rates and underpricing means an increase in inflation rates tends to increase underpricing.

The firm size panel regression model indicated that SSE, firm age, and profitability were significant in explaining underpricing in the Indonesian IPO market for firm size panel data. The relationship between firm age, profitability and underpricing was negative and significant with underpricing. The SSE had a positive and significant relationship with underpricing. The offer size panel regression model indicated that the SSE and all variables included in firm-specific characteristics (firm size, firm age and profitability) were significant in explaining underpricing in the Indonesian IPO market.

From the result of determinants of underpricing can be concluded that the explanation of underpricing in Indonesian IPO market are more related to positive regional market index (SSE) and firm-specific characteristic (firm size, firm age, and profitability). for both method pooled OLS regression and panel regression model. Financial performance and operating history which is used to measure the ex-ante risk of the IPO can reduced uncertainty at the IPO stage which consistent with previous studies of (Avelino 2013; Belghitar & Dixon 2012; Boudriga, Slama & Boulila 2009; Hasan, Hadael & Gorener 2013; Zouari, Boudriga & Taktak 2011).

7.3.5 Summary of Results: Relationship Between Gross Spread and Underpricing

There are three possible relationships between direct cost (gross spread) and indirect cost (underpricing): 1) an insignificant relationship between the two variables; 2) that the two variables are substitutes; or 3) that the two variables are complementary. OLS and 2SLS models were

employed to identify the relationship between gross spread and underpricing. OLS examined the relationship between gross spread and underpricing under four gross spread regression models.

The result of OLS regression model indicates that the negative relationship between gross spread and underpricing indicates that higher gross spread IPOs tend to have lower underpricing on the first day of trading. The 2SLS model showed that gross spread had a negative and significant relationship with underpricing. The negative coefficient of gross spread indicates that gross spread and underpricing are substitutes, which implies that issuer firms with low gross spreads have high underpricing. Low gross spread as a result of competition and regulation, may not be sufficient to cover the risk premium, therefore, underpricing becomes necessary. Depending on the negotiated range of the offering price, underwriters may adjust the underwriter spread to achieve an equilibrium risk premium (Chen & Mohan 2002).The result of relationship between gross spread and underpricing is supports the substitution hypothesis: that there is a negative significant relationship between gross spread and underpricing.

7.3.6 Summary of Results: Post-listing Day Performance of IPO

Post-listing day performance of IPOs for the 5th, 15th and 20th days in Indonesin stock market shows lower CARs after the listing day. The mean CARs of all sample are 23.96% at day-5 to 23.47% at day 15 and 23.31% at day-20. The post-listing day performance of Indonesian IPOs shows that IPOs were underperformed and returns of IPOs decreased from 24.11% at day-2 to 23.31% at day-20. This indicates that investors receive returns up to day-20 after listing day, however the return decreased; or the wealth of investors decreased from the first day of trading. From the post-listing day performance estimation indicates that some of the determinants are significant in explaining initial underpricing and some significant in explaining post-listing day underpricing, and it can be seen in Table 7.3.

The different determinants present in the results show the main determinants on different post-listing days. Three determinant variables of gross proceeds, firm size and firm age are the main determinants of underpricing and post-listing day performance of IPO from the first day of trading to day-20 post-listing day. Meanwhile, SSE was only a determinant variable of underpricing. The coefficient of the gross proceeds has a negative significant relationship with underpricing and CARs which means that firm with high offer size of IPO or gross proceeds are less underpriced. Further, firm size has a negative relationship with underpricing (significant at the 5%), which indicates that larger firms are less underpriced. The last result which shows significant relationship with underpricing, was the coefficient of firm age which shows a negative relationship with underpricing.

Table 7.3. Summary of Post-listing Day Performance of IPO Estimates in Indonesian IPO Market in 2007-2016

Independent Variable	Underpricing	CAR		
		Day-5	Day-15	Day-20
FAI (H_8)	(–) NS	(–) NS	(–) NS	(–) NS
WCF (H_9)	(–) NS	(–) NS	(–) NS	(–) NS
ISS (H_{10})	(+) NS	–	–	–
DR (H_{11})	(–) NS	(–) NS	(–) NS	(–) NS
IFR (H_{12})	(+) NS	(+) NS	(+) NS	(+) NS
FER (H_{13})	(–) NS	(–) NS	(–) NS	(–) NS
DJI (H_{14})	(+) NS	(+) NS	(+) NS	(+) NS
SSE (H_{15})	**(+) S**	(+) NS	(+) NS	(+) NS
UWR (H_{16})	(+) NS	(+) NS	(+) NS	(+) NS
GPC (H_{17})	**(–) S**	**(–) S**	**(–) S**	**(–) S**
OP (H_{18})	(–) NS	–	–	–
FSIZE (H_{19})	**(–) S**	**(–) S**	**(–) S**	**(–) S**
AGE (H_{20})	**(–) S**	**(–) S**	**(–) S**	**(–) S**
PROF (H_{21})	(–) NS	(–) NS	(–) NS	(–) NS
HM (H_{22})	(–) NS	(–) NS	(–) NS	(–) NS

Note: The dependent variable is UNDP = underpricing and CAR day-5, day-15, and day-20, FAI = fixed asset investment, WCF = working capital financing, ISS = investment in shares of stock, DR = debt repayment, IFR = inflation rates, FER = foreign exchange rates, DJI = Dow Jones Index, SSE = Shanghai Stock Exchange Index, UWR = underwriter reputation, GPC = gross proceeds, OP = offer price, FSIZE = firm size, AGE = firm age, PROF = profitability, HM = hot issue market, S = supported, NS = not supported.

The results from four regression models show that some of the determinants are significant in explaining underpricing and post-listing day IPO performance, and there are three determinant variables are consistently as a significant determinants of underpricing since the first day of trading until twenty days after listing of the IPOs

7.4 Implications

The results of this research have implications for the Indonesian Government and issuers firms when making decisions regarding IPOs.

7.4.1 Policy Implications for the Indonesian Government

7.4.1.1 Cost of Going Public

The Indonesian Government has tried to boost the capital market and increase the number of companies listed on the stock market. To boost the capital market, the Indonesian Government provided tax incentives through Government Regulation No. 56 Year 2015 Concerning Amendment on Government Regulation No. 77 Year 2013 Concerning Reduction on Income Tax

Rate for Domestic Public Corporation Taxpayer for listed firms. Eligible firms can obtain a decrease in the income tax rate (PPh) of 5%, from 25% of corporate income (*Pajak Penghasilan* / PPh) to 20%. Listed firms have a tax incentive, if 40% of firm shares are publicly listed and traded on the stock exchange, and have at least 300 shareholders (Directorate General of Taxation 2018). Further, since 2015, the IDX has been offering a 50% discount on the IPO listing fee (IDX 2015).

The government has introduced regulations for pricing strategy, the uses of book-building pricing strategy, which has been mandatory since 2000. This is in line with the Capital Market and Financial Institutions Supervisory Agency or *Badan Pengawas Pasar Modal dan Lembaga Keuangan* (BAPEPAM-LK) Regulation No IX.A.2 (2000) on Registration of Public Offering. The uses of book-building is intended for determining the offer price of an IPO based on the demand of institutional investors to reduce information asymmetry. However, the regulation of tax deduction and pricing strategy are not effective in boosting the number of companies listed on the stock market, and the Government need to consider to make a new regulation related to cost of going public.

The evaluation of gross spread shows that the level of gross spread is relatively low and in decline, with underwriting fees close to 0% which is caused by the competition in underwriting market. The Indonesian Government have introduced a regulation in 2006 regarding disclosed information of gross spread and offer price (BAPEPAM-LK (No.SE-05/BL/2006, 29 September 2006) to anticipate competition in the underwriting market. However, the Government still needs to establish regulations on the cost of going public because many issuers in Indonesia pay an underwriter fee close to 0%. In this study, there are 61 IPO firms (40.66%) pay underwriter fee between 0.06% to 0.25%.

Indonesian stock market need the roles of regulator in the market, because Indonesian market unlike the mature and large market which has a power to determine its own mechanism. The regulation on cost of going public is required because the low level of gross spread, as a result of the competition, might affect on underwriters and market development. The low gross spread, especially underwriting fee, might result on the quality of underwritten IPO because underwriter might not be optimal in conducting market research and the fee cannot compensate the underwriting risk. The low gross spread in turn might affect the indirect cost or level of underpricing on the first day of trading as shown in the result that the relationship between gross spread and underpricing is substitutes. The high underpricing might not meet the purposes of raising equity capital for issuer firms and they will postpone their decision to list in stock market and find another source of capital.

7.4.1.2 Macroeconomics

The evaluation of the macroeconomics environment and regional and global market index on underpricing shows that macroeconomic indicators of inflation rates and regional stock index of SSE are crucial in IPOs and aftermarket performance. Economic conditions influence the decision of firms to move to the IPO market and investors' expectations of future returns. Macroeconomics conditions affect the economic climate, thus affecting firms' decision to go public. The Government should control inflation because this is in line with the Indonesian Government policy to boost the capital market and increase the number of companies listed on the stock market.

7.4.2 Implications for Issuer Firms

The evaluation of gross spread and underpricing provide empirical evidence that issuer firms should seek highly reputable underwriters before going public. Firms play an important role in choosing a reputable underwriter for the IPO process to determine the offer price and reduce underpricing, which occurs because of information asymmetry and uncertainty about the real new stock price. Highly reputable underwriters are able to assess the value of a firm and mitigate asymmetric information and uncertainty at the IPO stage. The result of this study shows that choosing the high reputable underwriters can reduce the direct cost of IPO or the level of gross spread up to 0.38% and reduce indirect cost of IPO or the level of underpricing up to 3.38% compared with low reputable underwriters. Issuer firm also need to consider the timing of the offering between hot and cold markets because market conditions play an important role in determining the direct cost of going public and the short run performance of the IPO. Issuer firms can be charged lower fees during a hot issue market. Further, issuer firms can benefit from raising a number of successful offerings, a capital and smooth distribution of shares when they able to time their offering. The result of this study shows that issuing in a hot market can reduce the direct cost of IPO, or the level of gross spread up to 0.12% compared with issuing in a cold market. Therefore, going public in a hot period may result in an optimal IPO.

7.5 Limitations

This thesis has limitations in terms of scope of research. This study only evaluates non-financial IPO firms, because financial IPO firms have different characteristics compared with non-financial firms. For example, the use of IPO proceeds variable is different from non-financial therefore the financial industry is excluded from the sample. Further, this study had limited access to IPO data for Indonesian listed firms. For example data on gross spread have only been available in the prospectuses of companies since 2007, after the BAPEPAM-LK, the Financial Services Authority

of Indonesia, mandated that the gross spread and offer price information had to be disclosed in a firm's prospectus. As a result, the period of study is relatively short, only 10 years. In terms of methodology, this study employed a panel regression model. However, the 10 year period means that the panel regression cannot be fully performed to identify the fixed and random effect. Hene, this study only arranged the data of gross spread and underpricing into panel data and identified the relationship of determinants of gross spread and underpricing using a pooled panel regression.

7.6 Suggestions for Further Research

Previous studies have presented the importance of the study of the cost of going public and why it is useful to measure the level of direct and indirect cost of IPO, and the determinants of the costs. For further research, from an Indonesian perspective, studies can do further test on the relationship of macroeconomic factors, global and regional stock index and initial underpricing using longer period of study to increase the sample size. The use of long period studies can be used to perform panel regression to identify the fixed and random effect. An evaluation on gross and underpricing can also be compared with other stock markets, for instance with the Asian market or developing market using a comparison study which may provide further valuable insights regarding the evaluation of IPO costs in the Indonesian IPO market.

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