
**AN EXAMINATION FACTORS INFLUENCING UNDER-PRICING OF IPOS
ON THE LONDON STOCK EXCHANGE**

By

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Abstract

An Examination Factors Influencing Under-pricing of IPOs on the London Stock
Exchange

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The mispricing of IPOs has been widely examined in studies. According most research findings, IPOs on average, are underpriced in the short-run and correctly priced in the long-run. The purpose of this paper is to prove how the underpricing of IPOs on the London Stock Exchange is affected by issue size, firm age, systematic risk, underwriter reputation, P/E ratio, debt ratio, and ROA. Research has found the degree of underpricing on the London Stock Exchange market is 6.89744%.

The result of this research reveals that issue size, systematic risk, and debt ratio influence the underpricing of IPOs. The large volume of issue size usually contributes to a lower degree of underpricing. The systematic risk and debt ratio result to a higher degree of underpricing. Thus, there exists a positive relationship between IPOs and systematic risk & debt ratio. Actually, because of the limitation of this research, the test result may not be accurately for IPOs forecast on the London Stock Exchange.

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Chapter 1

Introduction

1.1 Background

Initial Public Offering (IPO) is defined as the first time shares sell to the general public or through a stock exchange to third-party investors. Typically, smaller, younger private companies usually issue IPOs to raise expansion capital, but IPOs are also useful for large-sized private companies for publicly traded company. For issuers, cash is an obvious reason for companies to go public. This money can be critical to hire new talents, develop new products, increase inventories, and build fundamental facilities.

IPOs can enhance the credibility of a publicly traded company. This is especially important for them to attract more clients. From a financing perspective, going public will lower the company's cost of capital. For investors, Philippe (2011) pointed out that IPOs give them the opportunity to make a significant position in a stock, something that would be in most cases more expensive and take a long time to perform in the secondary market. Additionally, for those who are interested purchasing IPOs, it could be a dangerous loss due to the unpredictable character. That explains why most firms indicate some forms of IPO discount for the first time they come to the market, which gives them appeal to other peer competitors and investors.

Several empirical studies show that investors typically achieve a relatively large abnormal return in a short-term once they invest in initial public offering shares. This

is, however, referred to IPO underpricing, and it means the difference between the first day trading price and closing market price even under the efficient market. This phenomenon does not exist for just one country but has expanded worldwide. In the 1980s, the average first-day return on initial public offerings (IPOs) was 7%. The average first-day return doubled to almost 15% during 1990-1998, before jumping to 65% during the internet bubble years of 1999-2000 and then reverting to 12% during 2001-2003 (Loughran and Ritter, 2004). Rogue (1973) attributes this phenomenon to either the inability or the reluctance of investment bankers to reoffer the shares in which they deal at market-clearing prices. On average, the risk adjusted rates of return on new issues investors bought at the offerings were significantly greater than they would be in an efficient market no matter if the holding period was two weeks, three months, or one year.

1.2 Need for Study

A number of papers consider what factors can cause the underpricing issue of initial offerings in the London Stock Exchange. In particular, the presence of venture capital firms among the IPO original shareholders, the underwriter reputation, firm-related risk factors, etc., have been identified as factors that may affect the degree of underpricing (Certo et al., 2001). Levis (1993) compares average initial returns for privatization IPOs to those of privately owned firms. Filatotchev and Bishop (2002) analyzed an integrated model of the ex-ante corporate governance development process in an IPO corporation and its subsequent impact on short-term stock market

response in the UK. Steven (2006) researched the financial performance of IPOs in the UK utility privatization firm versus the nonutility privatization firm. At the same year, Coakley, Hadass and Wood (2006) assembled a specific example of 591 IPOs issued on the London Stock Exchange to assess short run underpricing in the UK and the changing role of venture capitalists and underwriters in this respect. Ritter and Beatty (1984) testified a positive correlation between ex-ante uncertainty about an initial public offering price and its expected initial return, specializing in underwriter reputation and risk. Information asymmetry surrounding firm value leaves the IPO market subject to the classic 'lemons' or 'adverse selection' problem (Akerlof, 1970). Although IPOs underpricing has always been a 'hot issue' topic, few researchers have tested multiple factors influencing underpricing of IPOs in the UK. However, all these research studies are conducted by using the US samples. Instead, this paper examines the importance of underpricing of IPOs in the London Stock Exchange.

1.3 Purpose of Study

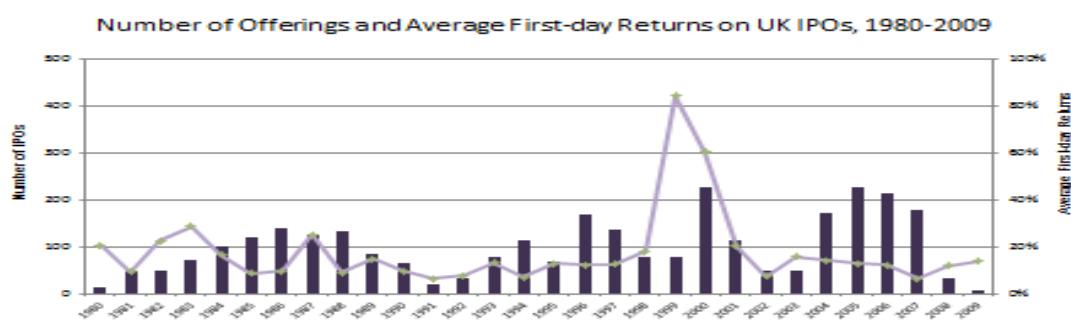
This study will examine multiple factors influencing the level of the underpricing and how those factors can affect the degree of underpricing in the London Stock Exchange. The multiple factors consist of underwriter reputation, debt ratio, firm age, issue size, market capitalization, and return on asset (ROA). This research is common nowadays; still, it has exceptional importance of IPOs to investors. As long as we incorporate more variables in the research, this in turn will facilitate a powerful means of assessing the effectiveness of information control on underpricing of IPOs based on

the actual observation of firms.

The first contribution of this study is that it fills the lacuna in the IPOs market by justifying the underpriced pressure from the UK's stance. To run an organized research, this study employs a distinctive sample of firms listed in the London Stock Exchange from 2002 to 2012. At this time frame, the average first-day gain is relatively stable within the area 12% to 18% after the bubble year happened at 1999.

Table 1.1: Numbers of Offerings and Average First-day Returns on UK IPOs,

1980-2009



Source: <http://bear.warrington.ufl.edu/ritter/ipodata.htm>

The London Stock Market does not fluctuate too much even during the financial crisis at 2008. Furthermore, from the table 1.2, it shows the average initial return of 21 countries worldwide. In the Europe IPOs market, the average initial return of the UK is 16.8% from 1960 to 2011 which ranks in the bottom 3 compared with Netherlands, Poland, Russia, Norway, Portugal, Switzerland, Sweden, and Spain. This paper will also explain why the UK market has a lower degree of under-pricing in the Europe

IPOs market.

Table 1.2: Equally Weighted Average Initial Return for 21 Countries

Country	Source	Sample Size	Time Period	Avg. Initial Return
Mexico	Aggarwal, Leal & Hernandez; Eijgenhuijsen & van der Valk	88	1987-1994	15.9%
Netherlands	Wessels; Eijgenhuijsen & Buijs; Jenkinson, Ljungqvist, & Wilhelm; Ritter	181	1982-2006	10.2%
New Zealand	Vos & Cheung; Camp & Munro; Ritter	214	1979-2006	20.3%
Nigeria	Ikoju; Achua	114	1989-2006	12.7%
Norway	Ernilsen, Pedersen & Sættem; Liden; Ritter	153	1984-2006	9.6%
Philippines	Sullivan & Unite; Ritter	123	1987-2006	21.2%
Poland	Jelic & Briston; Ritter	224	1991-2006	22.9%
Portugal	Almeida & Duque; Ritter	28	1992-2006	11.6%
Russia	Ritter	40	1999-2006	4.2%
Saudi Arabia	Al-Anazi, Forster, & Liu	76	2003-2010	264.5%
Singapore	Lee, Taylor & Walter; Dawson; Ritter	591	1973-2011	26.1%
South Africa	Page & Reyneke; Ali, Subrahmanyam & Gleason; Ritter	285	1980-2007	18.0%
Spain	Ansotegui & Fabregat; Alvarez Otera	128	1986-2006	10.9%
Sri Lanka	Samarakoon	105	1987-2008	33.5%
Sweden	Rydqvist; Schuster; Simonov; de Ridder	406	1980-2011	26.1%
Switzerland	Kunz, Drobetz, Kammermann & Walchli; Ritter	159	1983-2008	28.0%
Taiwan	Chen	1,312	1980-2006	37.2%
Thailand	Wethyavivorn & Koo-smith; Lonkani & Tirapat; Ekkayokkaya and Pengniti	459	1987-2007	36.6%
Turkey	Kiyamaz; Durukan; Ince; Kucukkocaoglu	355	1990-2011	10.3%
United Kingdom	Dimson; Levis	4,877	1959-2011	16.1%
United States	Ibbotson, Sindelar & Ritter; Ritter	12,246	1960-2011	16.8%

Source: <http://bear.warrington.ufl.edu/ritter/ipodata.htm>

This study also provides an empirical test under the structure from one of Beatty and Ritter's (1985) hypotheses. They combine several ex-ante uncertainty factors consisting of risk volatility and investment bankers' reputation in the model. However, this article will improve the evaluation factors by adding some new ones, including the issuing size, the age of the firm, debt ratio and market capitalization. Beatty and Ritter (1984) also argue that the greater the ex-ante uncertainty the greater the (expected) underpricing. This research plans to figure out whether there is an obvious difference in the level of underpricing between the tested factors in the UK.

Sharma and Serapham (2010) believed that Underpricing is one of the most observed phenomena worldwide. Basically, every country, IPO issues experience some sort of underpricing. This paper tries to explore the relationship between underpricing of IPO and issue size, underwriter reputation, systematic risk, P/E ratio, ROA, and firm age. The findings of this study can be used for individual investors on deciding the IPO investment.

The content of the rest of the paper is as follow. Section 2 will summarize the evidence of IPOs underpricing. Section 3 will introduce the methodology and datacollection. Section 4 will give the hypothesis result, and the last section is the conclusions and limitations.

Chapter2

Literature Review

This chapter will explore theories and concepts that support the underpricing of IPOs. Additionally, this paper examines some theoretical findings conducted on this area. An attempt is also made to compare and contrast some of these findings.

2.1 Hypothesis of Asymmetric Information

Past researches on initial public offerings demonstrate that persistence of mispricing phenomenon can be explained by asymmetric information. An explanation for the exceptional price behavior is called 'winner's curse' which was developed by Rock in 1986. In this model, Rock defined two types of investors, including well-informed investors, who realized the true value of IPO issues, and uninformed investors, who obtained limited information to estimate the true value of IPOs. Basically, informed investors will bid on all successful IPOs and crowd out less successful IPOs. However, to raise sufficient numbers of uninformed investors participating in the IPOs market, companies usually offer a bonus or a reduction to shares.

One factor contributed to winner's curse is the issue size. The larger the size, the more information about the intrinsic value of IPOs companies will give; therefore, the less probable the existence of information asymmetry. Some recent research also supports this hypothesis. Kennedy, Sivakumar, and Vetzal (2004) studied the asymmetric information importance on the corporation and insiders. They have found that firms are worse off once IPOs are mispriced than those if IPOs are correctly priced.

However, insiders' wealth appears to be maximized. Specifically, the extent that insiders care about the underpricing of IPOs depends on how much they sell in the initial offerings. The more shares they sell the stronger the incentive to incur the costs of promoting the issue and generating the information to reduce their underpricing-related wealth losses. In their research, they include three most convincing models to confirm the asymmetric information and aftermarket IPOs, which are the entrepreneurial losses model from Habib and Ljungqvist (2001), information momentum model from Aggarwal et al. (2002) and signaling model (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989, 1996). However, the result shows that insiders seem to focus on their net assets, considering both the IPO and subsequent share sales and holdings and minimizing the impact of IPO underpricing by retaining their shares at the IPO.

2.2 Hypothesis of Ex-ante Uncertainty:

2.2.1 Underwriter Reputation and Underpricing of IPOs:

In an attempt to explain underwriter behavior, Rogue (1973) selected 250 samples from 1965 to 1969 to try several independent variables including market situation and the type of underwriter. This study was based on the quality of the underwriter. It suggested that prestigious underwriters were more demanding than non-prestigious underwriters; very prestigious underwriters normally create IPOs more attentive to intrinsic value. By running the regression test, he found an inverse relationship existing between prestigious underwriters and underpricing of IPOs. He is a leader,

for other experts who are interested in IPOs, of thoroughly exploring the area related with underwriter reputation.

Trueman and Titman (1985) also strengthened Rogue's research, and they produced a model which is relevant to the choice of investment banker type, or any outsiders who can provide information to the firm. A satisfactory quality auditor is sending a positive signal to investors. Technically, the higher the auditors' reputation, the greater confidence of investors' judgments to the firm value, and therefore, the lesser amount IPOs are underpriced.

Carter and Manaster (1990) proved that lower risk was associated with prestigious underwriters. With nonprestigious underwriters, there are higher probabilities of mispricing at initial offerings. Consequently, a relatively low first-day abnormal return is proportionate to prestigious underwriters. The same conclusion of the relationship between the prestigious investment bankers and underpricing of IPOs comes from Johnson and Miller (1988), Megginson and Weiss (1991), and Sharma and Seraphim (2010). All these same conclusions apply to the suggestion that how firms prepare IPOs may promote competition among underwriters.

Generally, companies with great financial perspectives enable them to hire high-quality underwriters. This will send a positive signal to the public. Market will assume that if the IPOs do not perform as well as expected, the company will recover the loss from the prestigious underwriters. Underwriters with high-quality will prevent the risk of underpricing from the beginning. By hiring prestigious underwriters, companies can protect themselves among other competitors. However,

to maintain their good reputation, underwriters should decline issuing IPOs.

2.2.2 Firm Age and underpricing of IPOs

Clark (2002) tested the relationship between the age-at-IPO of the company and the aftermarket stock performance. He categorized sample firms into high-technology firms and non-technology firms. An example of 1,234 firms meets the selection criteria during the period 1991 to 1997. From the test, the data shows a significant correlation between the age-at-IPO and IPO aftermarket performance. Specifically, high-technology firms obtain a negative relationship between the firm age and excess return, which is contrary to the nontechnology firms. However, Ritter (1991), as well as Clarkson and Merkley (1994) believed that despite the industry category, the age of the firm will affect the degree of underpricing negatively. It advocates that those long established firms will have less risk experiencing the underpricing of IPOs than those firms with short history.

2.2.3 Risk and underpricing of IPOs

One of the important observations of ex-ante uncertainty is the standard deviation of the IPO's first day return in the aftermarket. Ritter (1984) found a significant relationship between the standard deviation and the first-day average yield of IPOs. Here, the standard deviation is the overall risk which is not directly observed from IPO market. Even though Ritter conducted the experiment using the overall risk as a representative of ex-ante uncertainty, still, he preferred the use of systematic risk (beta)

over the standard deviation.

Clarkson and Thompson (1990) questioned the idea that whenever there is quite little information available regarding the issuing firms, investors will face more risks due to the lack of uncertainty of the correct parameters of their dividend distributions. They collected a sample data set of 198 IPOs within the time horizon of 1976 to 1985 and realized that the systematic risk decreased along the several periods to the time of offerings. This explains how the risk correlates with the uncertainty of firms. Since the systematic risk is a suitable proxy for ex-ante uncertainty of the IPOs, it implies that the systematic risk connects with individual risk. Therefore, a positive relationship is testified. It represents the higher the systematic risk of an IPO the higher the ex-ante uncertainty regarding its market price then the higher proportion of underpricing for that IPO.

Based on the previous research, Almisher and Kish (2000) analyzed that the accounting beta is an ex-ante proxy for uncertainty in the IPO market. They gathered 2708 companies that conducted IPOs in United States from 1990 to 1995 at NASDAQ and NASDAQ OTC. After running the regression model, they proved there is a significant, direct relationship between the accounting beta and the first day return of IPOs in the market. This crucial link cannot be ignored whether they use income before the extraordinary items or net income, or those samples trading in NASDAQ, NASDAQ OTC or both combined. Thus, accounting beta can be used as an ex-ante risk level for firms once they enter into the IPOs market.

2.2.4 Ownership Structure and Underpricing of IPOs

Stoughton and Zechner (1998), Brennan and Franks (1997), and Hill (2006) analyze different IPO mechanisms on the ownership structure and how it may affect the company post issue.

Brennan and Franks (1997) obtain a variety of 69 IPOs in the UK to examine how the ownership structure and regulation affects the outcome of offering price. The setting of the offering price is necessary because a large number of shares are allocated to the directors; together with the investment bankers. They also found that from this research a high percentage of shares owned by pre-IPO shareholders are sold at the IPO or in the following years on average. By selling IPOs in the post-IPO market, it can help investors to avoid some costs of underpricing associated with the IPO. Over 75% of underpricing costs are borne by non-directors and the costs to directors are only 0.77% of the value as a fraction of their pre-IPO holdings. In addition, the result also shows a negative relationship between the size of underpricing and the size of large blocks assembled after the IPO, which proves the consistency with the underpricing and the dissemination of outsiders.

Filatovchev and Bishop (2002) also aim at UK IPO firms and argue that executive's power and previous experience influence the choice of non-executive directors and their ownership interest in the firm. These governance factors can be used to reduce the size of underpricing.

2.2.5 Government Policy and Underpricing of IPOs

Prasad, Vozikis, and Ariff (2006) considered the impact of government policy to IPO based on the case of Malaysia in 1976. They found new shares are significantly underpriced in the short run and long run for both the pre-policy period and post-policy period. However, new shares appear to be more significantly underpriced in the post-policy period than in the pre-policy period. This, in turn, proves that government regulatory intervention can “manipulate” the offering price based on the current macroeconomic policy.

2.2.6 Debt Financing and Underpricing of IPOs

Debt financing is one way to raise capital. When companies raise money for working capital or capital expenditure, they usually sell bonds or notes to investors. In return, investors will become creditors and receive payment periodically. However, if companies currently have more growth options, they will require more cash flows and less incentive to distribute dividends to investors.

According to Smith and Watts (1992), firms with strong growth potential require less debt financing due to some problems associated with debt financing. High-growth potential firms have less incentive to use dividends than those low-growth firms. Therefore, once they decide to go public, the market will see the riskiness. To compensate for the risk, firms will usually offer a discount to the IPOs. Thus, debt financing is positively correlated with first-day return.

2.2.7 Litigation Risk and Underpricing of IPOs

Litigation risk can be regarded as a corporation's likelihood of getting taken to court. For a corporation to go public, the cost of litigation is considerable. The settlement cost is one of the highest litigation costs. The average cost is \$7 million with a sample size of 1841 IPOs, which occupies 20% of the total proceeds. Lowry and Shu (2000) suggested that future litigation costs contribute to the underpricing of IPOs. They proved the relationship between the litigation risk and the degree of underpricing. Usually, firms with greater litigation risk tend to underprice their IPOs by a greater amount.

2.3 Hypothesis of Signaling to the market

One other factor that explains the underpricing of IPOs is signaling. The signaling model is correlated with the asymmetric information. For companies with strong prospects and higher possibilities of success, they should send clear signals to the market when they decide to go public. For companies with lower possibilities of success, the signal must be expensive in case those investors will make adverse selection in the IPOs market. Grinblatt and Hwang (1989), Allen and Faulhaber (1988) proved the existence of signaling in the IPOs market. Grinblatt and Hwang developed a signaling model with two signals, two attributes, and a continuing of signal levels and attributes types, to explain the underpricing phenomenon. In the model, issuers have better information about the company's future and profits than outside investors. The signaling model is scheduled with a function of project variance and issuer's fractional holdings reflect the true intrinsic value of the company and confirmed that

the company's intrinsic value is positively related to the underpricing of the IPO. Underpricing of the IPO is a reliable proof that shows business is doing well to investors. Only good firms are expected to recapture the loss after they send the signal to the IPOs market. The issuers of bad firms already know their expected performance and the true market value. They think it is difficult to recover the loss from underpricing. Thus, they cannot afford to signal to the IPOs market.

Cao and Shi (2001) developed their studies on the Internet bubble in 1999. Specifically, they analyzed the clustering phenomenon of underpricing of IPOs and found that the clustering is more likely to occur in economic expansion than contraction.

2.4 IPOs of Privately-Owned Companies and State-Owned Enterprises

In their study of public offering of privately-owned companies and public-owned enterprises of different countries, Dewenter and Malatesta (1997) found that IPOs of state-owned enterprise in the UK are significantly underpriced compare to their privately-owned enterprises. However, similar studies carried out in Canada and Malaysia was inconsistent with those of the UK study. In Canada and Malaysia, IPOs of privately-owned enterprise are significantly underpriced than those of state-owned enterprises. However, this does not appear to be a general tendency for privatization to be underpriced. They provide additional evidence on the determinants of privatization initial returns, indicating that initial returns are significantly higher in relatively primitive capital markets and for privatized companies in regulated

industries.

2.5 IPOs in the Long-run

Most of studies of underpricing are considered as the short-term performance. It is critical to measure the immediate market reaction once the company goes public. However, an interesting question at this point is whether IPOs are underpriced in the long-run. Goergen, Khurshed, and Mudambi (2007) tested the long-run performance of UK IPOs. They related the long-run performance of IPOs with pre-IPO financial performance of the firm as well as the managerial decisions. It was found that the percentage of equity issued and the degree of multi-nationality of a firm are the key predictors of long-run performance of IPOs. Also, small firms behave differently from large firms and lose more in the long term. These findings imply the importance of information for the perspective long term investors in new issues. Another point is the pre-IPO performance of a firm cannot predict the post-IPO performance with certainty. This study suggests that long-term investors should be cautious while deciding on the long term investment in IPO firms.

Chapter 3

Methodology and Data Collection

3.1 Introduction

In this chapter, we will discuss the details of data selection and methodology. This paper investigates the multiple factors influencing the underpricing of IPOs. The chapter attempts to develop the empirical evidence based on the conclusions we provide.

3.2 Data Collection

The sample used in this analysis consists of 176 initial public offerings listed in the London Stock Exchange from January 1, 2002 to January 1, 2012 including all industries. The primary source of data is from Bloomberg Terminal. A total of 38 IPOs were excluded from the sample because of missing the firm age, missing the first day closing price, or missing the issue size. Finally, 138 IPOs were identified to form the test sample.

3.3 Methodology

3.3.1 Dependent Variable

The dependent variable used in this study is the degree of underpricing (DUP). DUP is often used to examine the mispricing issue for the first trading day of IPOs. It is referred as the first day abnormal return.

$$DUP = \frac{P_{i1} - P_{i0}}{P_{i0}}$$

P_{i1} is the first day closing price of stock i

P_{i0} is the initial offering price of stock i

If DUP is positive, it means the IPO is underpriced.

If DUP is negative, it means the IPO is overpriced.

If DUP is zero, it means the IPO is correctly priced.

3.3.2 Model Specification

This paper used the Ordinary Least Square (OLS) regression to test the relationship between the underpricing of IPOs and multiple factors. The general model is used as follow:

$$DUP_i = \alpha + \sum \beta_i X_i + \varepsilon$$

Where,

- DUP is the degree of underpricing
- α is the intercept of the model
- $\sum \beta_i X_i$ is the sum of independent variables
- ε is the error term

However, to get better knowledge of underpricing of IPOs, OLS regression identifies seven variables. They represent issue size, firm age, P/E ratio, underwriter reputation, ROA, debt ratio, and systematic risk (Beta). Thus, we will run the following regression model:

$$DUP_i = \alpha + \beta_1 LNSIZE + \beta_2 LNAGE + \beta_3 RISK + \beta_4 D_i + \beta_5 PE + \beta_6 ROA + \beta_7 DEBT + \varepsilon$$

Where,

- LNSIZE represents the log of the issue size. The issue size refers total volume of the IPO and it's calculated as number of shares times the initial price at the offering date

- LNAGE represents the log of the firm age and it's calculated from the established date to the offering date
- RISK represents the systematic risk of the firm (Beta)
- D₁ represents the underwriter reputation, a dummy variable that set for "1" if the underwriter ranks in top 10 in the London Stock Exchange, and "0" otherwise

$$D_1 = \begin{cases} 1, & \text{if underwriter ranks in top 10} \\ 0, & \text{otherwise} \end{cases}$$
- PE represents the P/E ratio of the firm at the end of the year before company goes public
- ROA represents the ratio of return on asset at the end of the year before company goes public
- DEBT represents the debt ratio and it's calculated at the end of the year before company goes public

The rational question behind the equation is whether there is a significant degree of under-pricing affected by those independent variables. Based on the previous studies, the following expected hypotheses are considered:

Hypothesis 1: The issue size is negatively related to the DUP

Hypothesis 2: The firm age is negatively related to the DUP

Hypothesis 3: The systematic risk is positively related to DUP

Hypothesis 4: The underwriter reputation is negatively related to DUP

Hypothesis 5: The P/E ratio is positively related to DUP

Hypothesis 6: ROA is positively related to DUP

Hypothesis 7: The debt ratio is positively related to DUP

3.3.3 Independent Variables

Issue Size: refers to the number of shares issued at the offering date. It's a signaling variable that has been studied by many researches. They proved that the offer size has an inverse relationship with IPOs under-pricing. Specifically, the more shares company issues, the fewer probabilities IPOs are underpriced. This study transfer the issue size by using the log function and it's aiming at decrease the volatility of the issue size.

Firm Age: is defined in years, is one of the typical ex-ante uncertainty proxies influencing the degree of underpricing. Age of the firm represents the level of the maturity and it can also signal the IPO market. Usually, underwriters will choose the long established companies. It explains that a firm with longer operational years will have fewer possibilities to misprice its IPO. This study measure the age in log because the log functions follow a normal distribution. In this paper, the age is the difference between the founded year and the year the company goes public.

Underwriter Reputation:

Table 3.1: Top 20 Investment Banks In the London Stock Exchange In Terms of Numbers of Issues Managed from 2002 to 2012

JP Morgan	1
Bank of America Merrill Lynch	2
Goldman Sachs & Co	3
UBS	4
Citi	5
Credit Suisse	6

Libertas Capital Group PLC	7
Patersons Securities Ltd	8
Walker Crips Stockbrokers Ltd	9
Hybridan LLP	10
Caledonian Capital Ltd	11
InsingerTownesley	12
Nabarro Wells & Co Ltd	13
FirstEnergy Capital Corp	14
Quam Securities Co Ltd	15
Renaissance Capital Pty Ltd	16
Fairfax Financial Holdings Ltd	17
Rivington Street Corporate Finance Ltd	18
Jeffreys Henry Financial Services Ltd	19
Blue Oar Securities PLC	20

Table 1 is retrieved from Bloomberg Terminal. They rank underwriters reputation by the issue size. Here, this paper defines the underwriter reputation as dummy variable. There are 46 IPOs issued by top 10 investment banks and 93 IPOs issued by investment banks ranking below top 10.

Risk: is represented by return beta. Standard deviation cannot be observed directly from the IPO market. Therefore, this study will consider only the systematic risk instead of the total standard deviation.

P/E Ratio: is observed at the end of the year before companies go public. The P/E ratio is extremely important from high-technology industries, especially during the bubble year from at 1999. IPOs are significantly underpriced with higher P/E ratio.

ROA: is calculated a year before companies go public. This is a new independent variable this paper considers. Usually, market will receive a positive signal to higher ROA. This may lead to IPOs mispricing. Thus, the research will expect ROA to have a significant relationship to IPOs.

Debt: is calculated as total debt divided by the market capitalization. If the company

is currently in the growth phase, it will need more cash. Then, the company will have less incentive to distribute dividends to shareholders and investors. The assumption under the research is to find out if there is a significant relationship between debt ratio and under-pricing of IPOs.

Chapter 4

Results Analysis

4.1 Theory:

This paper investigates factors influencing the degree of underpricing in the London Stock Exchange and the relationship between the independent variables and under-pricing of IPOs.

4.2 Empirical Results

Table 4.1: Summary of the Sample Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
pe	117	24.99338	13.64056	8.0984	78.39
ipocloseda~e	117	3.612231	7.734056	.075	70.1
ipopriceusd	117	3.506636	7.716724	.07	70
dup	117	.0689744	.148332	-.77	.54
issuesizem	117	1888.207	16843.09	.736653	182193
lnage	117	2.686838	1.235563	0	5.43
debt	117	.2036752	.2020652	.01	.82
roa	117	7.969316	8.46842	-15.46	48.85
dummy	117	.3418803	.4763799	0	1
risk	117	.4303419	.5971541	-1.2	2.25
lnsize	117	4.38081	1.916497	-.3011051	12.11282

From the STATA program, the summary of the DUP contains the mean, standard deviation, and minimum & maximum statistical numbers. The average of the DUP from the sample is 6.89744% which explains that among 117 IPOs, the average abnormal return is 6.89744%. The highest initial return of IPO is 54% and the lowest one is -77%. So this result approves the IPOs mispricing in the London Stock Exchange.

4.3 Regression Analysis Results

The estimated regression result for simple linear regression model is:

$$DUP_i = 0.0632725 + .0201096LNSIZE_i + .0014414LNAGE_i + .0471395RISK_i - .0229323DUM_i + .001671PE_i + .001972ROA_i + .1365713DEBT_i$$

Table 4.2 Regression Analysis of DUP and Independent Variables

dup	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
pe	.001671	.00109	1.53	0.128	-.0004893	.0038313
lnsize	-.0201096	.0100475	-2.00	0.048	-.0400234	-.0001957
lnage	-.0014414	.0111873	-0.13	0.898	-.0236143	.0207314
dummy	-.0229323	.037908	-0.60	0.546	-.0980648	.0522001
roa	.001972	.0019416	1.02	0.312	-.0018762	.0058202
risk	.0471395	.0253341	1.86	0.065	-.0030719	.0973509
debt	.1365713	.0769661	1.77	0.079	-.0159731	.2891156
_cons	.0632725	.0625148	1.01	0.314	-.0606297	.1871748

From the Table 4.2, it shows the result of regression analysis of DUP against the independent variables. The regression analysis proves the Hypothesis 1 that the issue size has a negative relationship with DUP at 5% significant level. Thus, the research reflects that in the London Stock Exchange, the higher volume of shares issued at the offering date, the lower the chance the IPO will be mispriced. Evidence found from the UK stock market is the Hypothesis 3. DUP in the London Stock Exchange has a positive relationship at 10% significant level. In another way saying, investors will be compensated for the systematic risk because the higher the beta the higher opportunity the IPO will be traded at discount. The last finding from this study is Hypothesis 6. At 10% significant level, the debt ratio has a positive relationship with DUP. Generally, in the London Stock Exchange market, the for UK companies with great growth potentials, they have strong incentive to spend cash rather than distribute

dividend. IPOs issued by those companies are usually underpriced as well.

However, from the regression model, STATA failed to prove the significance of the firm age, ROA, underwriter reputation, and P/E ratio. So we consider running the regression test for these four independent variables separately.

Table 4.3: Regression Analysis of DUP and LNAGE

dup	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
lnage	-.0092784	.0111614	-0.83	0.408	-.031387	.0128303
_cons	.0939038***	.0329833	2.85	0.005	.0285703	.1592373

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The Table 4.3 explains that the firm age is not significant to the DUP in the UK stock market which is contrary from the Hypothesis 2. However, the sign shows a negative relationship, and this is inconsistent with the classical assumption. Therefore, firm age does not influence the pricing of IPOs those are trading in the London Stock Exchange.

Table 4.4: Regression Analysis of DUP and ROA

dup	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
roa	.0007568	.0016318	0.46	0.644	-.0024756	.0039892
_cons	.0629433***	.018933	3.32	0.001	.0254407	.1004458

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The P value is 0.644 and the value is extremely high at all significant level. It proves that ROA does not influence the pricing of IPO and this is not consistent with the assumption of the Hypothesis 6.

Table 4.5: Regression Analysis of DUP and Underwriter Reputation

dup	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
dummy	-.0390877	.028806	-1.36	0.177	-.0961469	.0179715
_cons	.0823377***	.016843	4.89	0.000	.0489748	.1157005

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

From Rogue’s research, he found that underwriter reputation is negatively related to the DUP. This paper defines the underwriter reputation as a dummy variable. When the underwriter ranks in top 10, it represents 1, and 0, otherwise. But the test shows a different result. Underwriter reputation is not significant to the pricing of IPO. By look upon the summary of underwriter reputation, the mean is 0.34 and the standard deviation is 0.48. This demonstrates most of IPOs trading in the London Stock Exchange are issued by underwriters those rank below top 10. Still, the underwriter reputation has an inverse relationship with DUP.

Table 4.6: Regression Analysis of DUP and P/E ratio

dup	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
pe	.0013954	.0010019	1.39	0.166	-.0005891	.0033799
_cons	.034158	.0284851	1.20	0.233	-.0222656	.0905815

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

So far, the P/E ratio is the last test variable. From the regression result, P/E ratio is not significant to DUP even if the standard deviation is extremely low. Thus, we can eliminate the data collection problem. Basically, P/E ratio does not contribute a lot to the pricing of IPOs in the London Stock Exchange market.

Chapter 5

Conclusion & Limitation

5.1 Conclusion

This study examines the degree of underpricing of IPOs in the London Stock Exchange. There are 117 companies selected during the period January 2002 to January 2012. The underpricing is observed in the London Stock Exchange with the average abnormal return of 6.89%. The result shows that IPOs have statistically significant first-day return in line with the underpricing of IPOs.

This paper investigates possible explanations to the degree of underpricing using the regression analysis. Six independent variables were regressed against the degree of underpricing, including issue size, firm age, risk, underwriter reputation, debt ratio, P/E ratio, and ROA. Among all these six factors, we identify that in the London Stock Exchange, issue size, risk, and debt ratio have significant influence to the pricing of IPOs. Specifically, companies experience lower chance of mispricing with large issue size, which is contrary to the risk and debt ratio. High risk and high percentage of debt will contribute to the degree of mispricing to those companies that go public.

Meanwhile, the sample does not prove the significance of the firm age, underwriter reputation, P/E ratio, and ROA.

Theoretically, lots of researches have proved the firm age and underwriter reputation are important factors influencing the underpricing of IPOs. This test result does not support these two hypotheses. We believe that the volatility of the UK firm age is pretty stable and most of them are established at the same year. Thus, the firm age

won't be a significant factor to influence the pricing of IPOs at UK. This paper defines the underwriter reputation focusing on the numbers of IPOs issued within the time range from 2002 to 2012. Also, we design the dummy variable as 1 if the underwriter ranks in top 10. Since over half of IPOs are written by underwriters below top 10, it leads to the rejection of the significance of underwriter reputation. However, the negative sign is consistent to the Hypothesis 4. All these results show that large companies are found to be associated with a lower degree of underpricing.

5.2 Limitation

There are several limitations that might affect the result of the research. The first one is the data collection. Due to the data missing problem and confidentiality, we are not able to get all the information needed for the regression test. In result, only limited numbers of IPOs can be collected from the market, and the conclusion of this research might be misled by this factor. The second one is the ignorance of the cost. Without IPOs issuing fees, underwriter cost and transaction cost, the degree of IPO underpricing can be enlarged. The last but not the least one is the currently macroeconomic situation in Europe. Due to the Europe sovereign debt crisis, this on-going financial crisis slows down their economic expansion. In the literature review, policy is another key factor to influence the underpricing of IPOs.

In view of the above, we suggest that in addition to the points mentioned before, future studies also consider by adding more examining independent variables, including industry category, joint effect by combining issue size and firm age together, and ownership structure.

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