

# **IPO Underpricing in Hong Kong GEM**

by

Xisheng Wang

A research project submitted in partial fulfillment of the  
requirements for the degree of Master of Finance

Saint Mary's University

Copyright Xisheng Wang 2012

Written for MFIN6669 under the direction of Dr.

Francis Boabang

Approved: Francis Boabang

Faculty Advisor

Approved: Francis Boabang

MFIN Director

Date: 31/08/2012

## **Acknowledgement**

I would like to thank Dr. Francis Boabang for all his help and advice in finishing the research paper. Moreover, I would like to express my appreciation to my family for their support, encouragement, and especially their patience during my study at Saint Mary's university.

## **Abstract**

### **IPO Underpricing in Hong Kong GEM**

By

Xisheng Wang

September 4, 2012

The paper investigates the underpricing level of GEM IPO companies which are listed in the Hong Kong stock market from 1999 to 2011. We examine some of the factors that influence IPO underpricing such as offering price, size of issue, age of the firm before going public, turnover rate in first trading day and industry type. The sample covers 102 GEM companies listed on Hong Kong stock market.

The results confirm that offer price and size of issue do influence IPO underpricing. Moreover, age of the firm before going public, turnover rate in first trading day and industry type are not statistically significant meaning that these factors do not influence IPO underpricing in Hong Kong stock market.

# Table of content

|   |    |
|---|----|
| <b>Introduction</b> .....                       | 1  |
| 1.1 Overview .....                              | 1  |
| 1.2 Background .....                            | 1  |
| 1.3 Objective .....                             | 2  |
| 1.4 Structure of this paper .....               | 2  |
| <b>Literature Review</b> .....                  | 4  |
| 2.1 Explanations of underpricing .....          | 4  |
| 2.1.1 Winner curse theory.....                  | 4  |
| 2.1.2 Agency theory.....                        | 5  |
| 2.1.3 Signaling theory .....                    | 5  |
| 2.1.4 Lawsuit Avoidance Explanation .....       | 6  |
| 2.1.5 Ownership dispersion theory.....          | 6  |
| 2.1.6 Other relevant literature.....            | 6  |
| 2.2 Hong Kong IPO underpricing .....            | 8  |
| 2.3 Reputation and underpricing theory .....    | 9  |
| <b>Data and Methodology</b> .....               | 11 |
| 3.1 Source of Data.....                         | 11 |
| 3.2 Methodology .....                           | 13 |
| <b>Analysis of Results</b> .....                | 16 |
| 4.1 Descriptive statistic of variables.....     | 16 |
| 4.2 The Result of the Regression.....           | 17 |
| 4.2.1 The size of issue .....                   | 19 |
| 4.2.2 Offer price .....                         | 20 |
| 4.2.3 Age of the Firm before Going Public ..... | 20 |
| 4.2.4 Turnover rate .....                       | 21 |
| 4.2.5 Industry type.....                        | 21 |
| 4.2.6 The error term.....                       | 22 |
| <b>Conclusion and Recommendation</b> .....      | 23 |
| 5.1 Conclusion of the Study .....               | 23 |
| 5.2 Recommendation.....                         | 24 |
| <b>References</b> .....                         | 25 |

# **Chapter 1**

## **Introduction**

### **1.1 Overview**

As is known to us, the initial public offerings( IPO) refers to going through corporate financing by individual firms, that want to list on the secondary market. Generally speaking, IPO underpricing means that the closing price of the new stock at the first trading day is often higher than issue price. A lot of research showed that IPO are underpriced all over the world market.

Over the years, Hong Kong has developed into a strong financial Centre and supports a lot of multinational companies with external financing. IPO underpricing is a common phenomenon in Hang Seng market. According to Ritter (2002), , out of a sample of 334 IPOs investigated on Hong Kong market, the equally weighted average initial return was 15.9%, compared to 15.8% for America, 35.3% for India and 164.9% for China. From these data, it can be concluded that Hong Kong IPO underpricing level is lower than other developed and developing countries.

### **1.2 Background**

GEM is short for growth enterprise market and is designed to help some enterprises which have good growth potential, but low profitability to list on the stock exchange of

Hong Kong.

There are three main functions for GEM. First, it provides an independent market for growth companies. Second, GEM encourages the technology industries in Hong Kong to develop. Finally, GEM can assist in fund raising for venture capital investment

Hong Kong Growth Enterprise Market (HKGEM) was founded on November 15, 1999. It is completely independent new stock market separated from the main market, and also occupies an equal weight with the main market. Thus, the Main market now focuses on long established, large firms, while the GEM attracts riskier growth firms. Its purpose is to provide a channel to raise funds for emerging growth potential enterprises. Its creation will have a significant impact on the Chinese mainland and Hong Kong's economy. In the long run, Hong Kong GEM goal is to become a successful independent market – Asian NASDAQ.

### **1.3 Objective**

The paper studies a data set includes 102 companies from GEM trading on the Hang Seng index (HSI) from 1999-2011 to figure out the degree of underpricing of IPO in Hong Kong. Next, we examine the factors that influence the IPO underpricing. The level of the underpricing can be explained by independent variables which include the size of initial offerings, IPO offering price , the period between the company foundation and going public and so on.

## **1.4 Structure of this paper**

I arrange this paper structure as follows: Chapter 1 is introduction, it will mainly focus on the background of GEM, objective of the paper. Chapter 2 provides some literature review and research about this topic. This part describes the main ideas and the trend in world IPOs research. Chapter 3 will introduce data sources and methodology. This part will use regression model to analyze. Chapter 4 is analysis of results. Chapter 5 is conclusion and recommendation.

## **Chapter 2**

### **Literature Review**

Since financial economist Logue(1973) claimed that the underpricing phenomenon is called the mystery of "IPO" (puzzle), many economists and financial professors have tried to explain IPO underpricing from the traditional and behavioral finance point of view.

#### **2.1 Explanations of underpricing**

##### **2.1.1 Winner curse theory**

Rock (1986) gives the Rock model relative authoritative interpretation, known as the "winners curse" theory. The theory is that investors can be divided into two kinds: informed and non-informed. Investors who lack information usually worry about that their average yield will be lower than the average level of income. It may lead to adverse selection. Therefore, the shares in the IPO need to be issued at a discount, in order to attract investor who lack information and provide certain benefits. Alternatively, uninformed investors will give up on participating IPOs if they lose a lot of money consistently.

Beatty and Ritter(1986) extended Rock's model. They show that there is relationship between the IPOs discount rate and IPO uncertainty. They believe that the higher



uncertainty surrounding the IPO, the greater costs that investors access to information, the discount rate is necessary to increase. The extensive literature on this assumption in most countries supports this view, and thus become one of the most definite explanations in IPOs discount theories.

### **2.1.2 Agency theory**

Baron (1982) put forward the agency theory, as the underwriters of investment banking with information about the capital markets and distribution pricing. The goal of issuing firm is to maximize the issuing revenue. Moreover, underwriters need to maximize the underwriting fees and depress the issuing price. When the issuer is difficult to monitor the level of effort of the agent, they could improve the success rate of underwriting activities by IPO underpricing.

Furthermore, Loughran and Ritter (2002) said that after further studying the agency relationship between listed companies and investment banks, they find that underwriters may deliberately low pricing issue. As a result, more money are put aside, then sold these shares to clients, and obtains benefit from the customers.

### **2.1.3 Signaling theory**

Alien (1989), Grinblatt (1989) and Welch, (1989) claimed signaling theory in the 1980s. The hypothesis is that investors go for estimation according to average valuation for both low and high quality companies, due to lack of understanding of the real situation

of the company's internal capital markets. It is obviously not conducive to high quality. As the basis of adverse selection, high-quality companies want to express a signal by using IPO underpricing. They would like to show they have ability to make high pricing in the capital increase and issuance in the future to compensate for the loss of the underpricing. Therefore, it can stimulate investors to invest, while the low-quality company did not dare to do so. The signal hypothesis theory is considered to be quite explanatory among theories.

#### **2.1.4 Lawsuit Avoidance Explanation**

Tinic (1988) proposed that issuer discount is to give investors some interest in order to reduce their liability. This view leads to a lot of controversy: Drake and Vetsuypens (1993) found that IPOs cases indicted tend to be higher discount level, that is, the discount does not prevent the issuer from prosecution

#### **2.1.5 Ownership dispersion theory**

From the perspective of corporate ownership, the stock initial public offering exists underpricing phenomenon. In the model, the management makes investors generate excess demand on the stock and attract more small shareholders by underpricing. Thus, company's management can continue to maintain control of the firm. The researcher do the empirical analysis to show that the higher IPO underpricing, the lower dispersion of the shareholding. However, this theory cannot explain the phenomenon of long-term extensive high discount. ( Brennan, 1997)

### **2.1.6 Other relevant literature**

Ritter(1991) studies the type of industry, size and market indices about the issuing firms from 1975 to 1984. He calculated buy-and –hold returns over 3 years and cumulative average adjusted returns. From this study, he finds that growth firms underperform for 3 years after going public.

Furthermore, Fama and French's (1992) use time series regression model not only finding underperformance, but also report that investment in a portfolio weighted according to the IPO's offering size generates higher returns than that in an equally weighted portfolio of IPO firms. They made a conclusion that larger offerings over perform smaller offerings. Therefore, their results are same as Ritter,

In addition, Dewenter and Field (2001) examine listing requirement of the infrastructure firm IPOs between 1996 and first half of 1997. They find that investment banks will protect their reputations by avoiding speculative issues

Sherman and Titman (2002) showed that issuers always prefer to raising funds at least at accurate price of issue. The underwriters actually tend to maintain and acquire high quality clients.

## **2.2 Hong Kong IPO underpricing**

The paper from above tends to assess whether IPO underpricing exists from various perspectives. Next, IPO underpricing in the study of literature from 1970s to 2011 in Hong Kong will be shown as followings

The studies in Hong Kong mainly investigate IPO performance about the main board listings before GEM appears. McGuinness (1992) researches 80 Hong Kong IPOs main board from 1980 to 1990. The result reveals that underpricing level is about 18% over the period by calculating the initial excess market returns. There are 3 explanations to support the results: first is that underpricing levels have positive correlation with the levels of ex-ante uncertainty of the IPO stock. Second, initial IPO returns have positive relationship with the secondary issues of stock incidently after an IPO in a short term. Third, the IPO underpricing levels is positively and significantly related to the trend of the market before issuing.

Vong, A. P. I., & Zhao, N. (2008) do the study to examine the first-day returns of IPO listed on the Growth Enterprise Market of Hong Kong until 2005. The results show that GEM has a higher underpricing level than that of the Main Board. The higher level is due to the volatility of after-market returns, the timing effects and the location. They conclude that both the reputation of underwriters and the signaling role of underpricing have no correlation with initial excess returns.

## **2.3 Reputation and underpricing theory**

Hui, W., Zongfang, Z., and Heping, P. (2012) do the research of the underpricing effects and IPO stock's first month, first quarter return in Chinese GEM. They investigate nearly 150 listed companies in GEM and finds low reputation effects of finance intermediaries on IPO underpricing. This shows that information generation and certificate function of finance intermediaries are failed in emerging market in China.

From theories, when reputation effects occur, the higher reputation financial intermediaries, the lower IPO underpricing. However, the result is that financial intermediaries don't play a good role of signal deliver. There is less effect of reputation mechanism in china stock market. It has difference between China and mature European and U.S market. In the mature market, there is negative correlation with IPO underpricing effects. The reason mainly includes two parts, one is institutional imperfection, the other is market structure imperfection. Therefore, the author shows the reputation mechanism deficit, market function distorted, but they conclude that the factors such as underwriter, venture capitalists and accounting firm have effect on the IPO underpricing.

Another evidence is that Cheah Wai (2000) does a study on underpricing phenomenon in Hong Kong IPO market. it investigates the relationship between the reputation of underwriters and the level of underpricing. The author ranks each underwriter with either high or low reputation Moreover, he finds that low reputation underwriters underprice their IPOs is 8.40% less than high reputation. However, it is not statistically significant

and indicates that Hong Kong high reputation underwriters have a pricing behavior. The study concludes that high reputation underwriters are not more cautious and tend to be selective in underwriting IPOs, it is contrary to low reputation underwriters.

## Chapter 3

### Data and Methodology

#### 3.1 Source of Data

In this chapter, the data is collected from the database of Hong Kong stock exchange and Hong Kong GEM website. The paper selects IPOs from 1999 to 2011 in GEM. There are 102 IPOs I will analyze and get result.

There are two steps to deal with the data. The first step is to use Excel program to summarize all the data needed and calculate. The second step is to use Stata for running the regression model.

The data collected the offering price and first day closed trading day prices for each IPO firm. The paper calculated initial return by taking the difference between first trading day and offer price divided by offer price. The initial return could measure the degree of underpricing (DUP).

The initial return of IPO is defined as:

$$DUP = IR = \frac{P1 - P0}{P0}$$

Where, P1 measure the closing price at the end of the first trading day and P0 is the offer price. IR means the initial rate of return of IPO. Then, the paper performed test of

significance on the initial return underpricing.

The higher the initial return is, the higher degree of underpricing.

If  $DUP > 0$ , then the security is underpriced.

If  $DUP < 0$ , then the security is overpriced.

If  $DUP = 0$ , then the security is fairly priced.

The paper consists of four main factors that influence initial return, there are issue size, offer price, age of the firm before going public and turnover rate in first trading day. Most of these independent variables could be found in previous studies in order to analyze the level of IPO underpricing return.

The data of issue size is collected from Hong Kong GEM's website and any other missing statistic comes from IPO company website.

For IPO offer price, this paper uses data from GEM companies' prospectus which is distributed by underwriters or brokerages to potential investors.

To measure the age of the IPO companies before going public, the paper compares IPO date and foundation date, and then goes subtraction between them. According to information symmetric theory, that is the longer the firms exist in the market, the more information can be obtained, and the lower degree of underpricing.

For turnover rate on the first trading day, this paper uses data from Great Wisdom Strategy of Investment-DTS. This program is Hong Kong trading strategy investment



platform which provides 7 \* 24 hours of uninterrupted data service to users,

### 3.2 Methodology

The paper uses least square regression model with underpricing to evaluate the degree of underpricing of GEM in Hong Kong. The dependent variable is the degree of underpricing. The independent variables have been mentioned above.

The regression model equation is expressed as follows:

$$IR_i = \alpha_0 + \beta_1 IPOSZ + \beta_2 IPOP + \beta_3 Age + \beta_4 Tur + \beta_5 D + \varepsilon_i$$

IR= initial return

IPOSZ= the log size of issue

IPOP= The IPO offer price

Age= the period between the company foundation and going public

Tur=Turnover rate in the first trading day.

$\beta_i$ = unknown parameters to be estimated

D=dummy variable, which equals 1 if the issuer is service oriented company, if zero means product company

$\alpha_0$  is constant,  $\varepsilon_i$  is error term

#### 1. IPSZ= Issue Size

Issue size equals the total shares issued in my paper. Moreover, a lot of theories predict that as the issue size decreases, the degree of underpricing will increase. The reason is that small offerings always associate with high uncertainty. Also, some investors use issue

size to evaluate the performance of IPO firms.

## 2. IPOP= IPO offer price

When firms go public in an IPO, they have to choose a lot of shares to offer and price level for those shares. A lot of evidence showed that firms do not choose their price level arbitrarily. For institutional investors, they may want high underpricing because they hope that it could compensate for their information provided. However, for retail investors, firms tend to set lower offer price in order to attract investors. Therefore, it is expected that there is negative relationship between the offer price and the degree of underpricing.

## 3. Tur=Turnover rate

Turnover rate in the first transaction day is defined as the number of shares traded in the first trading day divided by the total number of shares outstanding. The IPOs with higher first day turnover rate are underpriced more, it implies that the market are highly speculative and Hong Kong investors are more interested in the short-term investment. Therefore, the hypothesis is that turnover rate in the first trading day is positively related to the degree of IPO underpricing.

## 4. Age= age of the firms before issuing shares

Age of the firms before issuing shares means the number of years in existence before going public. A lot of previous researchers have given the evidence that the long established firms have less risk exposure surrounding the issue and less degree of IPO

underpricing as well. The reason is that the firms are operating with longer time, the more information about the companies providing for investors more accurately. Therefore, there is negative relationship between age of firms before going public and the degree of IPO underpricing as predicted.

#### 5. Dummy variables- Type of firms

Type of firms is dummy variables that the value equals 1 if the issuer is service oriented company, if zero means product company in Hong Kong. A number of academic research showed that the degree of IPO underpricing has no relationship with type of firms. It is expected that the type of firms is not related to the degree of underpricing.

## Chapter 4

### Analysis of Results

#### 4.1 Descriptive statistic of variables

The sample data consists of IPO companies from GEM that are listed on the Hong Kong Stock Exchange between the period 1999 and 2011. Table 1 shows the descriptive statistics for the dependent and independent variables. It reports the sample mean, standard deviation, minimum and maximum value of the whole sample.

There is table 1 showing the data statistics as follow:

| <b>Variable</b> | <b>Sample Size</b> | <b>Mean</b> | <b>Std.dev</b> | <b>Min</b> | <b>Max</b> | <b>Median</b> |
|-----------------|--------------------|-------------|----------------|------------|------------|---------------|
| <b>IR</b>       | 102                | 0.2989571   | 0.596205       | -0.869942  | 3.1015625  | 0.1113636     |
| <b>IPOSZ</b>    | 102                | 8.051223    | 0.267563       | 7.361728   | 8.60206    | 8.082343      |
| <b>IPOP</b>     | 102                | 0.964167    | 1.569592       | 0.2        | 11         | 0.5           |
| <b>Age</b>      | 102                | 8.784314    | 10.03521       | 0          | 61         | 6             |
| <b>Tur</b>      | 102                | 16.4948     | 54.89978       | 0.01       | 543.69     | 3.97          |
| <b>D</b>        | 102                | 0.568627    | 0.497714       | 0          | 1          | 1             |

As demonstrated in the table, there are 102 GEM IPO companies listed in the sample. IR is short for initial return to measure the level of IPO companies underpricing.

IPOSZ represents the logarithm of the total shares that IPO raise. IPOP refers to the offer price when IPO company go public. Age means the gap between foundation and going public. Tur represents the turnover rate on the first trading day.

The result shows that the mean of the degree of IPO underpricing is 0.2989571. It indicates that Hong Kong stock market is a relatively mature market. The maximum of degree of IPO underpricing is 3.1015625, while the minimum of it is -0.869942. That means some IPO degree of underpricing is not positive.

Moreover, the log IPO size has a mean of 8.051223. There are 10.8 dollars difference between the minimum and maximum of offer price. It is too high. The age of Hong Kong GEM has a mean of 8.784314. The minimum age is 0, while the maximum is 61. Furthermore, the mean of turnover rate is 16.4948. The minimum is just 0.01 and the maximum is 543.69. It indicates that investors are preferred to short term investment in Hong Kong GEM.

## **4.2 The Result of the Regression**

The results of Ordinary least square regression model of IPO underpricing. In my regression model, I choose the significance level to be 5 percent. Regression was done using the model this paper discussed previous. The formula of the regression model is as

follow:

$$IR_i = \alpha_0 + \beta_1 IPOSZ + \beta_2 IPOPOP + \beta_3 Age + \beta_4 Tur + \beta_5 D + \varepsilon_i$$

As is shown below the Table 4.2, the R squared is about 12 percent and the adjust R-squared is around 8 percent. There are 6 estimated coefficients including the intercept. That means 12 percentage volatility of  $IR_i$  can be explained by independent variables of this model.

**Table 2: the regression result of model**

```

Number of obs =      102
F( 5,      96) =      2.63
Prob > F       =    0.0284
R-squared      =    0.1205
Adj R-squared  =    0.0746
Root MSE     =    .57352

```

| Source   | SS         | df  | MS         |
|----------|------------|-----|------------|
| Model    | 4.32460141 | 5   | .864920282 |
| Residual | 31.5769036 | 96  | .328926079 |
| Total    | 35.901505  | 101 | .355460445 |

| dup1          | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |           |
|---------------|-----------|-----------|-------|-------|----------------------|-----------|
| offerprice    | -.0827358 | .0379871  | -2.18 | 0.032 | -.1581395            | -.0073321 |
| ageofcompany  | -.0056314 | .00573    | -0.98 | 0.328 | -.0170053            | .0057425  |
| turnoverrate  | .0016412  | .001067   | 1.54  | 0.127 | -.0004767            | .0037591  |
| lissue        | -.518387  | .2211447  | -2.34 | 0.021 | -.9573558            | -.0794183 |
| dummyvariable | .1260216  | .117991   | 1.07  | 0.288 | -.1081886            | .3602318  |
| _cons         | 4.503114  | 1.792419  | 2.51  | 0.014 | .9451908             | 8.061038  |

There are six independent variables including the intercept. The offer price, age of company, turnover rate, size of issue is consistent with my expectation I have mentioned above. However, industry type coefficient is positive. The constant  $\alpha$  is the mean value of the initial return if all the coefficients of the explanatory variables are zero. From the table, we know that the coefficient of the constant is 4.503114, which means that the mean value of initial return is positive when all of other explanatory variables are zero.

#### 4.2.1 The size of issue

Previous evidence showed that the larger IPO can reduce the uncertainty about companies. Bigger IPO is issued by companies that has better performance and operate in their own market for several years. As expected, the sign of the coefficient is negative for the issuing size. Due to large number for size of issue, we use natural log to indicate this factor in the paper. The results of the regression model show that the t ratio for log size is -2.34, and the value of Prob.(t)= 0.021<0.05. Therefore, it suggests that the size of issue has statistically significant effect on the underpricing of IPO in GEM. Investors should take consideration in IPO size as an important factor.

#### **4.2.2 Offer price**

$\beta_2$  are parameters of offer price, known as regression coefficients and slope for the IPO offer price. From this model, the slope coefficient for IPO offer price is -0.0827358, it means that when the IPO offer price increase by 1 dollar, the initial return decrease by 0.0827358 units.

The results of the regression model shows that the t ratio for offer price is -2.18, and the value of Prob.(t)= 0.032<0.05. As a result, the offer price has statistically significant effect on the underpricing of IPO in GEM. Moreover, it is consistent with previous prediction.

#### **4.2.3 Age of the Firm before Going Public**

Generally speaking, the age of the firm before going public has a negative relationship with the underpricing effect. Age of the IPO Company shows its level of maturity. The longer firm age, the lower degree of underpricing. As a matter of fact, newly-established companies usually have higher ex ante uncertainty. The reason is that younger issuing companies have less record and financial information can be used by investor and financial analyst. It may cause increasing the extent of information asymmetry between IPO companies and investors. Therefore, more information is available for investors, the problem of asymmetric information among different group of investors become less important, and then the underpricing declines.



However; the results of the regression model illustrate that the t ratio for age of company before going public is -0.98, and the value of Prob.(t)= 0.328>0.05, so the coefficient is negative and statistically insignificant. It indicates that the age of the firm may not impact on GEM IPOs underpricing in Hong Kong stock market. It is not same as the prior expectation. This may be attributed to apparently shorter history of GEM in Hong Kong.

#### **4.2.4 Turnover rate**

From the table, we know that t ratio for turnover rate is 1.54, and the value of Prob.(t)= 0.127>0.05, so we know that the turnover rate in the first trading day is statistically insignificant for explaining the degree of IPO underpricing in Hong Kong stock market. Due to the positive coefficient for turnover rate, it means the higher turnover rate, the higher degree of underpricing. This result is not consistent with my prediction as mentioned. From the beginning of IPO, the rate of IPO underpricing has been relatively high and the newly-issued stocks have been in great demand. As a result, the turnover rates of different stocks are similar.

#### **4.2.5 Industry type**

As we can see from the table, the relationship between type of industry and the degree of IPO underpricing is positive. Moreover, Prob.(t)= 0.288>0.05, so type of industry is a statistically insignificant variable. It is identical with my previous expectation. In Hong Kong, service oriented company has dominant position in the market, it contributes to the GDP very much. Therefore, service company grows faster than product company.

Perhaps, the reason why it is not main factor to influence underpricing is investors can know equal information about IPO company in GEM before going public.

#### **4.2.6 The error term**

In our model, the error term may consists of other influenced variables such as bid-ask spread for the first trading day, reputation, aftermarket performance for stock and so on.

## **Chapter 5**

### **Conclusion and Recommendation**

#### **5.1 Conclusion of the Study**

The study examined the initial underpricing level for a sample of 102 GEM IPOs on the Hong Kong Stock Exchange from 1999 to 2011. Results have shown that not only IPO offer price, but also size of issue affect the initial return significantly. However, there are three independent variables which are not statistically significant in the model. These are age of company before going public, turnover rate on the first trading day and industry type.

The result of our regression model also show that the R square equals to 0.1205, and the adjusted R square equals to 0.0746. R square means a statistic to test the goodness of fit of a model. It indicates that the model needs to be improved due to relatively lower number of R square, which illustrates that the chosen factors can not explain the degree of underpricing sufficiently. Just 12.05 percentage of the variation in dependent variable can be explained by explanatory variable. The remaining variation can be explained by other factors such as bid-ask spread on the first trading day, underwriter reputation, earning per share before issuing and so on.

In conclusion of our model, we know that how the factors influence the underpricing according to the sign of coefficient of parameters.

Table 3 The relationship between independent variables and DUP

| <b>Independent variables</b>               | <b>Relationship with DUP</b> |
|--|------------------------------|
| <b>Size of issue</b>                       | Negative                     |
| <b>Turnover rate</b>                       | Positive                     |
| <b>Offer price</b>                         | Negative                     |
| <b>Age of the firm before going public</b> | Negative                     |
| <b>Type of industry</b>                    | Positive                     |

Note: only size of issue and offer price has significant effect on the IPO underpricing in our model.

## 5.2 Recommendation

Since the R square is low, the model is not good for examining the factors influence underpricing. It implies that there are more variable excluded in the model, such as underwriter reputation, earning per share and so on. I need to do the further study on other independent variables in the future.

## References

- Allen, Franklin and Gerald R. Faulhaber, 1989, "Signaling by Underpricing in the IPO Market," *Journal of Financial Economics* 23, 303-324.
- Baron, David P., 1982, "A model of the Demand for Investment Banking Advising and Distribution Services for New Issues," *Journal of Finance* 37, 955-976.
- Beatty, Randolph P., and Jay R. Ritter, 1986, "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings," *Journal of Financial Economics* 15, 213-232.
- Cheah Wai ,2000. The Hong Kong IPO underpricing phenomenon and the underwriter reputation. *Otago University Research Archive*, p5.
- Cheng, W.Y., Cheung, Y.L., Po, K.K., 2004. A note on the intraday patterns of initial public offerings: evidence from Hong Kong. *J. Bus. Finance. Account.* 31 (5/6).
- Hui, W., Zongfang, Z., & Heping, P. (2012). The influence of the reputation of finance intermediaries on IPO underpricing in china growth enterprise markets (GEM). *Management Science and Engineering*, 6(1), 61-63.
- Vong, A. P. I., & Zhao, N. (2008). An examination of IPO underpricing in the growth enterprise market of hong kong. *Applied Financial Economics*, 18(19), 1539.
- Loughran, Tim, and Jay R. Ritter, 2000, "Uniformly Least Powerful Tests of Market Efficiency," *Journal of Financial Economics* 55, 361-389.
- McGuiness, P. (1992). An examination of the underpricing of initial public offerings in hong kong: 1980-90. *Journal of Business Finance & Accounting*, 19(2), 165-186.
- Morales Camargo, E. (2006). Underpricing: Lessons from bookbuilt initial public offerings in hong kong..ProQuest Dissertations and Theses, 164p.
- Ritter, J. R., 1991, "The Long-run Performance of Initial Public Offerings," *Journal of*

*Finance* 46, 3-27.

Ritter, J.R., Welch, I., 2002. A review of IPO activity, pricing, and allocations. *J. Financ.* 57, 1795–1828

Rock, Kevin. Why New Issues Are Underpriced[J ] . *Journal of Financial Economics* 1986 ,15 ,187 - 212.

Sherman, A.E.; Titman, S. (2002), “Building the IPO Order Book—Underpricing and Participation Limits with Costly Information”, *Journal of Financial Economics*, Vol. 65, No. 1, pp. 3 - 29.

Tinic, Seha M., 1988, “Anatomy of Initial Public Offerings of Common Stock,” *Journal of Finance* 43, 789-822.

Vong, A. P. I., & Zhao, N. (2008). An examination of IPO underpricing in the growth enterprise market of hong kong. *Applied Financial Economics*, 18(19), 1539. Retrieved from <http://search.proquest.com/docview/197185596?accountid=13908>