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Analysis of Initial Returns Rate in the IPO Market among 21 Countries

Hiromasa NAKAMURA

This thesis looks into the relationship between Initial Returns of the IPO Market and Macro-Economy in each of 21 countries, that is, Australia, Canada, China, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Mexico, New Zealand, Philippines, Poland, Singapore, South Korea, Spain, Taiwan, Thailand, U.K., and U.S. As the indexes, Macro-Economy, Nominal GDP, Real GDP, GDP per capita, Current Account, Money Supply, and CPI are selected. In addition, there are some dummy variables; for example, the cultural background of each country is considered.

JEL Classification Numbers : E44, G15, G24
Key Words : The IPO Market, Initial Return, Nominal GDP, Real GDP, GDP per Capita, Current Account, Money Supply, CPI, Macro-Economy and Econometrics

1. Introduction

In the research field of the IPO Market in the world, it seems to me that there are few which focus upon the relationship between the IPO Market and each country’s Macro-Economy because many researchers for IPOs tend to use Micro-Data of firms having to do with IPOs, though they mostly use the trend of the Stock Market on that particular index. This thesis deals with Macro-Economic Indexes; for example, Nominal GDP, Real GDP, GDP per Capita, Current Account, Money Supply, CPI, and so on, though I propose to contemplate various kinds of economic factors for the IPO Market. That is to say, they are not only Macro-Economy, but the conditions of Economic Development, Institutional Analysis, Market Structure, Law System, Tax System, History, and the Custom of People. The conclusion of this thesis focuses on the system of the IPO Market.

Numerous attempts have been made by many economists to demonstrate the performance of the IPO Market, and this thesis depends on some antecedent surveys (see 2.2 or Appendix) for Initial Returns or first-day returns in IPOs, the so-called Initial Returns Rate in IPOs. According to the foregoing studies, there is a big problem for the differential between Offering Prices and
Initial Prices, in other words, ‘underpricing’, and underwriters, especially securities companies, might get large amounts of money being left on the table in IPOs Market.\footnote{For example, Ritter, J.R. and Beatty R. (1986), Ritter, J.R. and Loughran, T. (2002), and Fukuda, A. and Serita, T. (1995).} It is unknown to us whether it is the strategy of underwriters or for some other reason. Some researchers insists on enthusiasm for IPOs; for example, the returns for long-term performances are not good,\footnote{Ritter, J.R. (1991), Loughran, T. (1993), Levis, M. (1993), Keloharju M. (1993), Aggarwal, Leal and Hernandez, Ritter and Loughran (1995).} or First-day prices are highest in the long-term performances. In Japan, this condition would be called ‘Hatsune Tenjo’ which means that Initial Prices are proofs (highest).\footnote{Hamada Y. (1998) and Hamada Y. (1999).} This thesis investigates this differential from the macro-economic point of view.

Now, we will take a close look at the data sources treated in this analysis. This analysis depends on foregoing IPO studies, so date-continuities are different from each country (see \textit{2.2 or Appendix}), and each index, with the exception of dummy variables, is the average number over the same period as IPOs’ data-term in each country, though the author sometimes makes indexes imperfectly because of data credibilities and imperfect data announcements from some governments (see \textit{2.2 or Appendix}). For this reason, this analysis might be rough; however, the direction of this thesis’ results will suggest a lot of valuable things.

2. The Model, Hypotheses and Data

In this section, the Model used in this thesis is described as well as the Hypothesis for Initial Returns Rate in the IPO Market and the data used. \textit{2.1} reveals the Model and Hypotheses, and \textit{2.2} gives the source of data in this analysis.

2.1 The Model and Hypotheses

To start, this thesis must show how to analyze Initial Returns in the IPO Market in each country. This analysis is presented using the basic linear regression model as follows:

\[
Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_n X_{in} + \epsilon_i \quad (i = 1, 2, \ldots, n)
\]

Where $Y_i$ is the average for Initial Returns of each country; $X_{i1}, X_{i2}, \cdots, X_{in}$ are explanation variables; $\beta_0$ is fragment; $\beta_1, \beta_2, \cdots, \beta_n$ are coefficients; $\epsilon_i$ is error term.
There are some hypotheses for correlation between the average of Initial Returns in the IPO Market and some indexes on each country's economy. Therefore, we focus on them here.

Hypothesis A: GDP affects Initial Returns in the IPO Market

The definition of GDP is “gross domestic product,” and the power of production in an area might stimulate a lot of investors, so this analysis cannot ignore GDP, and there are three kinds of GDP; Nominal GDP, Real GDP, and GDP per-capita. For the purpose of this thesis, I calculate the average of Nominal GDP, Real GDP, and GDP per-capita using the same time period as the IPO date; for example, the IPO data of the United States which is used in this analysis is between 1960-2000, so the author calculates the averages of nominal GDP, real GDP, and GDP per-capita between 1960-2000. Refer to item 2.2 The Data or Appendix.

This analysis would like to endeavor to find the correlation between Macro-Economy and the IPO Market, thus some of explanation variables are ARG (the Average of Rate of Growth) - Nominal GDP, ARG-Real GDP, and ARG-GDP per Capita.

Hypothesis B: The Economic Achievement Level of Each Country affects Initial Returns in the IPO Market

Generally speaking, there are both developed countries and developing countries in the world, so each country has its own condition of the IPO Market. In this analysis, we will use dummy variables to divide countries in each economic condition.

First, there are some economic cooperative meetings in the world; for example, EU, OPEC, APEC, Davos meeting, OECD, and so on. These are somewhat criterion for economic condition of each country, so this analysis uses ‘G8 dummy’ and ‘ASEAN dummy’. Second, most economists are not able to ignore the trend of Newly Industrializing Economics, so this analysis uses ‘NIEs dummy’, as well.

Hypothesis C: The Power of Trade and Commerce in Each Country affects Initial Returns in the IPO Market

This analysis would like to examine the relationship between International-Economy and the IPO Market, as well. Investors might consider the power of trade and commerce in a country for their general prospects of the Stock Market. The author uses the indicator ‘A (the Average of) – CA / GDP (Current Account divided GDP)’.

According to multilateral comparative advantage in international eco-
nomics, we can imagine that if the product of labor injection coefficient multiplied is minimum, it means the most efficient manufacture specialization.\(^4\)

Though it doesn’t strictly mean multilateral comparative advantage, this analysis depends on ‘A—CA / GDP’ to find the correlation between multilateral comparative advantage and international marketing power and the IPO Market.

**Hypothesis D**: Currency or Inflation affects Initial Returns in the IPO Market

It is necessary for us to keep in mind that asset prices including stock prices are able to catch up with inflation speed, though this is a general theory, so this analysis places a special emphasis on the credibility of currency, Money Supply, and the Consumer Price Index (CPI).

First, as the indicator of currency credibility, three big currencies (3 BC) in the world which are the U.S. Dollar, the Euro, the Yen, are accepted as dummy variables for this analysis. We are here concerned with the correlation between currency credibility and IPO’s initial returns in a country.

Second, this analysis is intended as an investigation of the correlation between Inflation and IPO’s initial returns in a country. If there is a high inflation rate in a country, investors might think ahead to which asset prices including stock prices have a tendency of making upturn, so some explanation variables are ARG (the Average of Rate of Growth) -Money Supply, and ARG-CPI.

**Hypothesis E**: The Ethnic Character affects Initial Returns in the IPO Market

Venture Businesses are sometimes influenced by the national character of conducting business, so this thesis deals with the relationship between ethnic character and Initial Returns. It has been recognized by the most previous economists that economic activities reflect cultural beliefs and practices, not least because of the difference between farming (agricultural) people and hunting people; for example, some economists say the Japanese ways of organization and management are different from the western way. Masahiko Aoki\(^5\) says “group orientation, exemplified by such practices as the ambiguous demarcation of jobs and the sharing of responsibility and outcome within the small group, is indeed a distinctive characteristic of the Japanese factory and that this group orientation may be culturally conditioned by the collective memory of agrarian village life.” Or as James C. Abegglen and George Stalk,

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Jr. says “A phrase much used in Japan is Nihonteki keiei, or Japanese-style management, referring to what the Japanese see as considerable differences between Japanese management methods and those commonly used in the West.”

For the purpose of this paper, the author judges which countries are about farming mainly and which are considered to be hunting. The criterion of farming country is
1. rice productive countries in Asia, or
2. a well-known colony in the period during World War II. So, in this thesis, the farming peoples mean the peoples of China, India, Indonesia, Japan, Korea, Thailand, Philippines, Poland, Korea, Taiwan, and Thailand. On the other hand, countries built by Anglo-Saxon typify hunting countries; for example, Australia, Canada, New Zealand, U.K., and U.S. In addition, the countries invaded by the Great Movement of German might be rooted in hunting customs; for example, France, Germany, Italy, and Spain. Mexico is a neighbor of the U.S., so it might be ingrained with hunting customs, and finally, Hong Kong and Singapore were colonies of the U.K., and they are business districts (commercial areas), so they aren’t recognized as agricultural countries in this thesis.

This hypothesis focuses the dummy variable on the distinction between Farming (Agricultural) People and Hunting People, so the author has named this dummy variable as ForH Dummy.

Because of Hypotheses A–E, this thesis must show the regression model again as follows:

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_{11} X_{11i} + \beta_{12} \text{Dummy}_{12i} + \beta_{13} \text{Dummy}_{13i} + \beta_{14} X_{14i}$$

where $X_{1i}$ is ARG-Nominal GDP, $X_{2i}$ is ARG-Real GDP, $X_{14i}$ is ARG-Money Supply, and $\text{Dummy}_{12i}$ is ForH Dummy.

2.2 The Data

Because of the hypotheses in the previous section (2.1), this analysis should include the data regarding IPOs, GDP, Current Account, Money Supply, and the CPI. The author gathered the resources for the data from some antecedent theses for IPOs among the 21 countries or from government publications. See Appendix for more details of Data Sources Information.

3. The Empirical Results

In this section, the empirical results of this analysis are described as well as the correlation coefficient matrix. 3.1 demonstrates two correlation coefficient matrices, and 3.2 reveals the result for the correlation of Initial Returns Rate with other indicators.

3.1 The Correlation Coefficient Matrix

All regression analyses will check the correlation coefficient matrix because of dealing with multicollinearities, and this thesis will show several results of regression in 3.2 ~ 3.3.

According to 2.2 or Appendix on the back of this thesis, there are only 17 countries if we include the ARG-CPI as explanation variables. So from the beginning, we have to think about the CPI-deleted model. This thesis has designated Model 1 as the CPI-included model, Model 2 as the CPI only-deleted model, and Model 3 as the model after Model 2 -dealed with multicollinearity.

We are here concerned with multicollinearities of Model 2 and Model 3, so we have to consider whether there are multicollinearities from correlation coefficient matrixes.

According to the correlation coefficient matrix of Model 2, there are possibilities of multicollinearities between ARG-GDP Per Capita and ARG-Nominal GDP (the correlation coefficient is 0.952780926), between G8 Dummy and 3 BC Dummy (the correlation coefficient is 0.883883), between G8 Dummy and ARG-Real GDP (the correlation coefficient is -0.5408749), between NIEs Dummy and A-GDP / CA (the correlation coefficient is 0.58957296), and between ForH Dummy and ARG-Real GDP (the correlation coefficient is 0.611196734). So in Model 3, this analysis will delete ARG-GDP Per Capita, G8 Dummy, NIEs Dummy, and ForH Dummy, and we have to discuss about the correlation coefficient matrix of Model 3 again. The author concludes that there is no multicollinearity on the correlation coefficient matrix of model 3.

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### Table 1. The Correlation Coefficient Matrix of Model 2

<table>
<thead>
<tr>
<th></th>
<th>ARG-Nominal GDP</th>
<th>ARG-Real GDP</th>
<th>ARG-GDP per Capita</th>
<th>G8 Dummy</th>
<th>ASEAN Dummy</th>
<th>NIEs Dummy</th>
<th>A-GDP/CA</th>
<th>3BC Dummy</th>
<th>ARG-Money Supply</th>
<th>ForH Dummy</th>
</tr>
</thead>
<tbody>
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<td>ARG-Nominal GDP</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARG-Real GDP</td>
<td>0.075250662</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARG-GDP Per Capita</td>
<td>0.95278935</td>
<td>0.007902765</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G8 Dummy</td>
<td>0.198776433</td>
<td>−0.05408749</td>
<td>0.18433058</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASEAN Dummy</td>
<td>0.057138494</td>
<td>0.402570966</td>
<td>−0.02080565</td>
<td>−0.30679</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIEs Dummy</td>
<td>0.0920732</td>
<td>0.359836915</td>
<td>0.198871805</td>
<td>−0.4</td>
<td>−0.038348249</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-GDP/CA</td>
<td>0.260067637</td>
<td>0.35703212</td>
<td>0.249420998</td>
<td>0.115792</td>
<td>−0.092934327</td>
<td>0.58857296</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3BC Dummy</td>
<td>0.261552812</td>
<td>−0.467549109</td>
<td>0.241771691</td>
<td>0.88383</td>
<td>−0.27163072</td>
<td>−0.335334</td>
<td>0.1356797</td>
<td>1</td>
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<td></td>
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<tr>
<td>ARG-Money Supply</td>
<td>−0.101495099</td>
<td>0.169825452</td>
<td>0.13871286</td>
<td>−0.46611</td>
<td>0.085760408</td>
<td>0.30843876</td>
<td>−0.0928635</td>
<td>−0.450041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ForH Dummy</td>
<td>−0.007516665</td>
<td>0.611196734</td>
<td>−0.07756355</td>
<td>−0.33472</td>
<td>0.315063019</td>
<td>−0.1217161</td>
<td>0.00288018</td>
<td>−0.258199</td>
<td>0.221770343</td>
<td>1</td>
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</tbody>
</table>

Note: This table is made by the author (Hiromasa Nakamura).

### Table 2. The Correlation Coefficient Matrix of Model 3

<table>
<thead>
<tr>
<th></th>
<th>ARG-Nominal GDP</th>
<th>ARG-Real GDP</th>
<th>ASEAN Dummy</th>
<th>A-GDP/CA</th>
<th>3BC Dummy</th>
<th>ARG-Money Supply</th>
</tr>
</thead>
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<tr>
<td>ARG-Nominal GDP</td>
<td>1</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARG-Real GDP</td>
<td>0.075250662</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASEAN Dummy</td>
<td>0.057139494</td>
<td>0.402570956</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-GDP/CA</td>
<td>0.260067637</td>
<td>0.35703212</td>
<td>−0.09293433</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3BC Dummy</td>
<td>0.261552812</td>
<td>−0.46754911</td>
<td>−0.27163072</td>
<td>0.135588</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ARG-Money Supply</td>
<td>−0.101495099</td>
<td>0.169825452</td>
<td>0.085760408</td>
<td>−0.092863</td>
<td>−0.450041</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: This table is made by the author (Hiromasa Nakamura).
3.2 The Results of Regressions

We can see the results of regressions as follows:

Model 1  \[ y = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 \text{Dummy}_{a} + \beta_5 \text{Dummy}_{a} + \beta_6 X_{3i} \]
          \[ + \beta_7 \text{Dummy}_{a} + \beta_8 X_{3i} + \beta_9 X_{3i} + \beta_{10} \text{Dummy}_{1i} + \varepsilon_i \]

Model 2  \[ y = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 \text{Dummy}_{a} + \beta_5 \text{Dummy}_{a} + \beta_6 X_{3i} \]
          \[ + \beta_7 \text{Dummy}_{a} + \beta_8 X_{3i} + \beta_{10} \text{Dummy}_{1i} + \varepsilon_i \]

Model 3  \[ y = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 \text{Dummy}_{a} + \beta_4 X_{3i} + \beta_5 \text{Dummy}_{a} + \beta_6 X_{3i} + \varepsilon_i \]

<table>
<thead>
<tr>
<th>Explanation Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \alpha )</td>
<td>-172.694</td>
<td>-16.2152</td>
<td>-59.8992</td>
</tr>
<tr>
<td></td>
<td>(-3.16)</td>
<td>(-0.29)</td>
<td>(-1.61)</td>
</tr>
<tr>
<td></td>
<td>&lt;0.025&gt;</td>
<td>&lt;0.778&gt;</td>
<td>&lt;0.130&gt;</td>
</tr>
<tr>
<td>ARG-Nominal GDP</td>
<td>-36.1579*</td>
<td>-7.6099</td>
<td>-0.022516</td>
</tr>
<tr>
<td></td>
<td>(-1.88)</td>
<td>(-0.72)</td>
<td>(-0.165)</td>
</tr>
<tr>
<td></td>
<td>&lt;0.118&gt;</td>
<td>&lt;0.491&gt;</td>
<td>&lt;0.871&gt;</td>
</tr>
<tr>
<td>ARG-Real GDP</td>
<td>20.57794***</td>
<td>21.83615***</td>
<td>19.13802***</td>
</tr>
<tr>
<td></td>
<td>(3.172)</td>
<td>(3.096)</td>
<td>(3.388)</td>
</tr>
<tr>
<td></td>
<td>&lt;0.025&gt;</td>
<td>&lt;0.011&gt;</td>
<td>&lt;0.004&gt;</td>
</tr>
<tr>
<td>ARG-GDP Per Capita</td>
<td>38.08216*</td>
<td>8.217591</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.879)</td>
<td>(0.719)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;0.119&gt;</td>
<td>&lt;0.488&gt;</td>
<td></td>
</tr>
<tr>
<td>G8 Dummy</td>
<td>-48.7981</td>
<td>-19.9017</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.09)</td>
<td>(-0.37)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;0.326&gt;</td>
<td>&lt;0.716&gt;</td>
<td></td>
</tr>
<tr>
<td>ASEAN Dummy</td>
<td>-38.4125*</td>
<td>-52.7014*</td>
<td>-52.246*</td>
</tr>
<tr>
<td></td>
<td>(-1.88)</td>
<td>(-1.87)</td>
<td>(-1.85)</td>
</tr>
<tr>
<td></td>
<td>&lt;0.119&gt;</td>
<td>&lt;0.090&gt;</td>
<td>&lt;0.085&gt;</td>
</tr>
<tr>
<td>NIEs Dummy</td>
<td>-74.2453**</td>
<td>-95.2739**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.33)</td>
<td>(-2.23)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;0.067&gt;</td>
<td>&lt;0.050&gt;</td>
<td></td>
</tr>
</tbody>
</table>
### 3.3 Concluding Remarks of This Analysis

The author may summarize the results of this analysis as follows:

1. All explanation variables except G8 dummy react to 10% or more significant level on the Model 1, and this R square is 0.9358, so we may say that the Hypothesis A ~ E (see 2.1) are reasonable views in the IPO Market in Model 1. In particular, Real GDP and the indexes of taking Inflation into consideration have high impacts on Initial Returns. It means that real productive powers of each country might influence investors’ expectations and
might result in real profits for many IPO firms. In addition, Inflation affects Initial Returns because asset prices including stock prices are willing to catch up with Inflation same as principles of economics. Model 1 has a problem in that the sample size is very small, however, so the author attempts to analyze the averages of Initial Returns Rate again in Model 2. This analysis should cut the index of CPI because of data reliabilities, and the author is not able to increase the number of countries more than 30 on this condition.

(2) On the contrary, all explanation variables except real GDP, ASEAN dummy, and NIEs dummy do not react to 10% or more significant level in Model 2, so we have to think that the Hypothesis C̋E (see 2.1) are comparatively weak.

(3) According to Model 3 which is after the transaction of multicollinearity of Model 2, the economic meanings of this research result are same as (2).

(4) According to the results of ASEAN dummy and NIEs dummy, these always react to 10% or more significant level, but their t-values are minus and these reactions are weaker than that of ARG-Real GDP.

(5) Though ARG-Nominal GDP and ARG-GDP per capita do not react to 10% significant level on Model 2 and Model 3, ARG-Real GDP consistently reacts to 1% significant level, so we should notice this result.

(6) These results lead us to the conclusion that the Rate of Growth of Real GDP in a country and Initial Returns in the IPO market might be correlated. It seems to me that positive impetus of venture businesses, entrepreneurship, as well as productivities for manufacture makes the growth of economy in a country, so this condition might affect Initial Returns in the IPO Market.

4. Prospectus of This Research

From what has been discussed above, we can conclude that the ARG-Real GDP affects the average of Initial Returns Rate in the IPO Market. The first thing we notice is that if a country’s growth of real GDP is high, there is a possibility of high initial returns rate in the IPO Market in this country. From this passage, we realize that most investors meaning Venture Capital Companies, Angels, Institutional Investors, fund managers of investment trust, and so on, would succeed in investing if they aim at rapidly growing countries, but we must recall that venture businesses, venture capitals, and entrepreneurship of many people would effect the strength of the economy if there is high economic growth in a country. Much like the question of the chicken and the egg, it is necessary to consider which came first: real GDP growth or venture businesses (entrepreneurship) leading the IPO Market. When creativities, entrepreneurship and adventures of many people are united, economic condition
might be growth, so returns from the securities market might go to some investors. “The one who plants and the one who waters are equal, and each will receive wages in proportion to his labor.”

While this research has shown that there is some relationship between Real GDP and initial returns rate in the IPO Market, there is the possibility that other factors affect initial returns rate. There is the possibility that ‘the ARG-Real GDP’ and ‘the average of initial returns rate in the IPO Market’ have a positive correlation. Future research should focus on gathering more accurate data, though it was hard for me to gather accurate data for developing countries because their statistics are often unreliable. I hope to revise this research.

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Appendix (for 2.2)

Australia (1976-1995)

a. The IPO data (1976-1995) is gathered from Li-Anne Woo (2000).


Canada (1971-1999)


b. Data for GDP and Current Account are gathered from Keizai Kikaku Chou [the Economic Planning Agency

8) St. Paul (55).


China (1990-2000)

a. The IPO data (1976-1995) is gathered from Tony Gu and Jing Qin (2000).


Germany (1978-1999)


Hong Kong (1980-1996)

a. The IPO data (1980-1996) is gathered from McGuinness (Professor of finance in Chinese University of Hong Kong) and Lifan Wu (California State University in Los Angeles) by Tim Laughran, Jay R. Ritter, and Kristian Rydqvist (2001).


d. Data for CPI is gathered from Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai no Chouryu [the Trend of World Economy] referenced by Census and Statistics Department-Hong Kong. However, it does not have all data for 1980-1996 either, so the author made the index of average for CPI irregularly. CPI Average Index is made of the number for 1997-1999, as well.

India (1992-1993)


Indonesia (1989-1994)


Italy (1985-2000)

a. The IPO data (1983-1998) is gathered from Working paper by Arosio, Giudici and Paleari of Politecnico di


Mexico (1987-1990)


c. Data for Money Supply (M 2) is gathered from Keizai Kikaku Chou [the Economic Planning Agency in Ja-
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d. There is no data of CPI in Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai no Chouryu [the Trend of World Economy], so Mexico is not included in the analysis of CPI. (In 3.2, Model 1 does not include Mexico.)

New Zealand (1979-1999)


c. There is no data for CPI in Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai no Chouryu [the Trend of World Economy], so New Zealand is not included in the analysis of CPI. (In 3.2, Model 1 does not include New Zealand.)

Philippines (1987-1997)


c. There is no data for CPI in Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai no Chouryu [the trend of World Economy], so Poland is not included in the analysis of CPI. (In 3.2, Model 1 does not include Poland.)
Singapore (1973-1992)


South Korea (1986-1996)


Spain (1986-1998)


d. There is no data of CPI in Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai
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no Chouryu [the Trend of World Economy], so Spain is not included in the analysis of CPI. (In 3.2, Model 1 does not include Spain.)

Taiwan (1986-1998)


c. Data for CPI is gathered from Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai no Chouryu [the Trend of World Economy] referenced by Taiwan Administration.

Thailand (1987-1997)


There are few data for 1959, so all indexes of U.K. do not include data for 1959.


d. Data for CPI is gathered from Naikakufu [Cabinet Office in government of Japan] (2002 autumn) Sekai Keizai no Chouryu [the Trend of World Economy] referenced by Department of Labor in U.S.

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