LUNDS UNIVERSITET

Nationalekonomiska institutionen

Analyzing Asian Countries and Industries Performance and Cross-Country Influence on Firm Multiples

May 23rd 2008

Supervisor: Hossein Asgharian

Prepared by: Sakara Saingam, 840524 – T020

Lim HooiPin, 830513 – T065

Abstract: To our knowledge, this paper first analyze firms multiples by using relative valuation and employed them as indicator of Asian market performance after 1997 Asian crisis. The observations range from year 1997 to year 2007 by defining a sample of firms in 13 industries from 10 countries located in Asia. We considered five widely used multiples in our research: Price per Sales, ROIC, EV/ EBITDA, Price per Earnings per Share (PER) and Market-to-book (PTBV) ratios. We explicitly compare yearly, countries and industries performance in Asia. We find that the Asian economies and equity markets are rather overstating and fluctuating. We attribute the result to country specific issues. Later on we examine the influence of country membership on cross countries multiples comparison. Differences in country membership could be explained by industry mixture or pure country factor in the country. Our results show that country membership is more influential but the degree of pressure on the multiples is varying.

1. Introduction

1.1 Background

Due to the rapid globalization of capital markets, there is a tremendous increase of number of company venture beyond their domestic border to exploit any floating opportunities as well as to reduce the macroeconomic exposures involved, such as geographically risks, exchange risks, political risks and etc. In recent years, domestic firms find their competitors are increasingly likely to be foreign. Today, Asian economies are the hot topic among the media and the incredible growth rate has caught the attention of investors. The recent upward trends has resulted in further acceleration of the need to evaluate the overall financial condition across companies, industries and countries, during different time period to clear the potential confusion.

Valuation is an age-old methodology in finance, however, the best valuation method still yet to determine. The most frequent used technique which serves the purpose of measuring and managing value of companies and stock is relative valuation. Practitioner and academician have gone far to popularize this method in real-world application. This is somehow ironic because the ratios of firms in different industries and different countries are not usually comparable as they operate in different nature. They encounter various different pure country factors such as political risk, accounting practices and industry factors such as operational risks, capital requirements, industry composition and competition. As a fact of matter, different approaches are needed to value firm in different industries and countries. Otherwise it could lead to a host of severe destructive decisions simply put incorrect investment or external financing decisions.

1.2 Problem Discussion

Today, numerous researches have been carry on Asian markets as they are running up as potential future world economy leader. The economy growth rate amazed investors all over the world. However there are suspicious bubbles prevailing in the markets and all kind of macroeconomic risks that caution investors' decision especially after experienced Asian crisis. Therefore, it is interesting and useful to scrutiny the performance of firms in Asian nations across various industries and years. Unfortunately, accounting based comparison among countries might not provide

soundness conclusion as country formation and industry structure are vary to each other. Therefore, where such barriers arise it is important to look at their implication on multiples evaluations. Appropriate adjustments are desired before drawing sensible multiple comparisons in order to avoid comparing apple with orange.

1.3 Purpose

The research presented here is to contribute to the literature by providing a systematic study on the significance of country and industry membership on firms multiples from the perspective of countries located in Asia. Light will be shed on the relationship of industry differences and pure country factors in explaining firms multiples with the help of regression models. Finally, how the results can be interpreted and what do they means for investors.

After all, the retrieved companies' data was range from the period of 1997 to 2007 from thirteen industries in ten Asian countries. We created five firms valuation ratios and then pooled the average of the firms multiples by year, by industries and by countries. They could later serve as the predictors of economy performance in Asian countries. There are variety of unresolved issues in comparable valuation and also a lot of other parameters that complicate the valuation process in real setting. This paper cannot address all of them neither the purpose of valuation.

1.4 Outline

The remainder of this study proceeds as follows: the next section discusses the theoretical background for this thesis; Section 3 illustrates about sample selection and data Section 4 describes our research methodology; based on five ratios calculated Section 5 presents the firms performance in the country they situated and industry they belong to specifically after 1997 crisis as well as the results on the role of country elements and industry composition on firms multiples and necessary adjustment ; followed by our concluding remarks in Section 6.

2. Theoretical Background

2.1 Valuation Framework

Before we start, to deliver clearer message for non-financial background market player, it is essential to ask couple of questions: What is value? What are you worth? Why value value? How to value? In layman's terms the objective of business valuation is to assign an intrinsic value to a company under evaluation or target company. Notwithstanding, there are many different interpretations of what "value" means as there are many different approaches to determine this value. According to the theory of objective value postulates maximum price that the (potential) buyer ready to pay for a company exactly equals the minimum price that the potential seller willing to receive. There is only one exclusive corporate value for all investors. Contrary to this there exists the theory of subjective value says that the company value is not unique due to ground that investor value companies with respect to their risk attitude, their personal tax situation and the alternative investments available to them (Wilbur, 1908) These determinants are very subjective and hence there is always a range of value.

There are myriad of reasons for performing valuations. Although this paper focuses on cross country comparison in booming towns the motivations apply everywhere and anytime. Accurate company valuation is arguably the most important tasks for every market players. According to Pratt, Reilly & Schweis (2000), among the most important reasons for performing valuations (but not limited to) can be partitioned into the following:

a) the life cycle stage of target company (including formation of the company, initial public offering (IPO), going private, diversification, cross-listing stock exchange, merger & acquisition (M&A), divestiture, restructuring, liquidation).

b) Require by government and company regulation (including tax purposes, value based management, credit rating)

c) Intention of investor (to make intelligent decision to acquire or sell whole company or shares of company.

Market analysts use several techniques to derived market values. Lately, the mainstay in financial practices is the relative valuation approach. Using this approach, typically, the true value of a company can be inferred by observing the market value of traded stock of comparable peer groups. Liu, Nissim, and Thomas's (2002) research concluded it works very well for valuing shares of publicly listed firms. In contrast, we can infer country performance or industry condition by gather the average of a group of firms multiples. The favouritism over this method is the application can be performed with less effort and in a second. Moreover, relative valuation is easier to present to clients and customers (Damodaran, 2002). While this approach is of paramount relevance in real world valuations, literature generally dislikes it and calls it a "quick and dirty method of valuation" because it's based on nothing more than casual observations of multiples. It can be a trap in identify value.

Throughout the paper we will solely rely on this method to create firms multiples used in valuing country and industry performance. The process of valuing is more complex when the comparison extends to international setting as the identity of countries or industries is different. It therefore motivates us to check on the extent to which country membership or industry membership contribute to firms multiples and make necessary adjustments. Bearing in mind that there are many reasons make adjustments are desirable but differences in industry composition as well as pure country differences, are the focus of this paper. Explanation for country-specific differences relies on factors such as culture, language, fiscal policies, political risks and accounting rules. In November 2007, The Economist magazine reported that 'the average p/e ratio in emerging markets may be distorted upwards because of a different industrial mix. Some types of businesses have consistently higher ratios, and emerging-countries tend to have more of them….International comparisons can also be blurred by different accounting conventions.

3. Data Collection

This study investigated five valuation ratios constitute of three multiples based on price or capitalization, namely, these are Price/Sales per share (P/S), Price/Earnings per share (PER), and Price to book value (PTBV) and two multiples based on the company's value which are Return on Invested Capital (ROIC), and Enterprise Value to Earnings before Interest, taxes, Depreciation and Amortization (EV/EBITDA). These are the most popular multiples used by Morgan Stanley Dean Witter research except for ROIC. We chosen ROIC because it is one of the most reliable performance metrics for spotting quality investments and benchmark for comparing performance (McClure, 2008). For example, reduction in the market's ROIC signals company has much harder time allocating capital to worthwhile projects whereas increasing ROIC strongly indicates that a company is pulling ahead competitors or more effectively allocating capital investments. Additional details about the five multiples chosen in this paper are provided in the Appendix A.

Market capitalization, total net income, sales, book value of shareholder's equity, market value of debt, cash, EBITDA ,NOPAT and invested capital are extracted from the I/B/E/S database. The period under study extends from 1997 to 2007. This is the time period after the Asian financial Crisis happened. Hence, the time series multiples would tell a story of how firms perform after the crisis, in various Asian countries and different industries. We focus on the 10 major Asian countries whose stock exchange markets are actively performing and concentrate on 13 industries based on the industry importance to the countries in the study economy. Our choice to restrict to Asian countries because the economies are booming and testing of industry and country membership to so far is mainly on European countries.

Country List	Industry List
China	Automobiles and Parts
Hong Kong	Chemicals
India	Constructions
Indonesia	Electronic & Electrical Equipments
Japan	Financial Services
Malaysia	Food Producers
Singapore	General Retailers
South Korea	Household Goods and Home Constructions
Taiwan	Industrial Metals and Mining
Thailand	Industrial Transportations
	Personal Goods
	Technologies
	Travels

To conduct the analysis using comparable firms from the same industry, we searched for a reasonable industry classification scheme. The data were collected from DataStream Database. All companies in the intersection of a) the Worldscope database and b) the I/B/E/S historical database of analysts' earnings forecasts are used because of the evidence that SIC codes frequently misclassify firms (Kim and Ritter, 1999). IBES indicate that their classification is based loosely on SIC codes, but it is also subject to detailed adjustments.

From the data we obtained, there are some outliers that would lead to crucial effects on the regressions results. After observing the data, it is justifiable that these outliers are

the results from the impact of the Asian financial crisis leading to numerous critical financial events for various firms. Hence, this serves as a rational reason to eliminate these outlier firms from the data to avoid misleading regression estimations. The criteria for identifying outlier firms will be explained in more details in the methodology section. Overall, the total number of outlying companies that are removed from the data accounts for around 3.16 percent of the original data.

To facilitate the possibility of the regression estimation, we removed any firms with negative book value, non-existing price, undefined earning and accounting data that are necessary as it is meaningless to conduct analysis on these firms. Moreover, in order to minimize the variation, as a necessary precondition to be a part of an industry all companies are demanded to have at least ten firms in each industry. Furthermore, each country is expected to have observations for a minimum of five years to implement the use of a robust model.

4. Methodology

Preceding, the concept of outliers and the approach used to deal with them will be presented here. Commonly, economic and financial data are not characterized by the classical normal distribution. Awfully extreme observations can lead to a rejection of the normality assumption. Such extreme data that normally appear in the tails of the distribution will make the kurtosis to be very large. These observations are called outliers because they do not fit in with the majority of the remaining data. Outliers can have a serious effect on coefficient estimates, since by definition; OLS will receive a big penalty, in the form of an increased RSS, for points that are a long way away from the fitted line (Brooks, 2002). Dreadful results could have happened from the existence of outliers. For this paper, we based on measures such as the inter quartile range (IQR) and BoxPlot to set criteria for our data outliers. The BoxPlot determines extreme outliers are those beyond 3*IQR from the remaining of the data. Thus, if Q_1 and Q_3 are the lower and upper quartiles respectively, any observation outside the range:

$$Q_1 - k\,(Q_3 - Q_1),\ Q_3 + k\,(Q_3 - Q_1), \qquad (1)$$

were eliminated from our data sample for some constant k=3. (Robin, 2000, Outliers, 2008). To derive average yearly multiples, we combined all the firms multiples of a year, regardless which industry or country they are, and take the average on it. For average country multiples, they are counted by averaged out firms multiples across all the industries in a country whereby average industry multiples are created by taking firms multiples across different countries but in a particular sector. Summary statistics of estimation variables are calculated in order to give a preliminary picture of how the firms multiples vary over different time periods, different countries, and different industries. Next, the methodologies used in the analysis are Fama-Macbeth regression and comprehensive dummy variable regression. The advantage of a regression-based approach is that it allows us to simultaneously control for the effect of various explanatory variables.

4.1 Fama-MacBeth Regression

We implement the Fama-Macbeth regression equation independently for each country and each sector. The first analysis is to inspect the relative importance of country and

industry membership on the firm level valuation ratios. The dependent variables are the five valuation ratios (P/S, ROIC, EV/EBITDA, PER, and PTBV) of a firm at the end of the year. The explanatory variables are industry mean multiple and country mean multiple.

For each multiple, three regressions are ran according to the Fama-Macbeth method: regress firms multiples 1) on industry mean multiple only, 2) on country mean multiple only, and 3) on both industry and country mean multiples. The resulting coefficients and adjusted R-square for each regression are then compared to see how each explanatory variable affects firms multiples.

4.2 Dummy Variable Methodology

The Fama-MacBeth regressions would only provide basic information on the average effect of country and industry multiples in explaining firm multiples. There is a methodology used in Sonney (n.d) that could uplift the pure country and industry effects. The framework is very intuitively appealing to evaluate this problem. This procedure adjusts dummy variable coefficient estimates to permit them to be interpreted as deviations from average behavior.

First of all, the concept of dummy variables will be explained. Dummy variables can also be known as qualitative variables since they are commonly used to numerically represent a qualititative characteristic. Usually, dummy variables are denoted with a narrow range of integer values, mostly zero and one. They are used in the same way as other explanatory variables and the interpretation on the coefficients on the dummy variables are explained as the average variation in the values of the dependent variable for each category of the dummy variable in question. (Brook, 2002, Kennedy, 1986)

For our study, a multiple is assumed to be influenced by both country and industry effects. For example, in the case of PER the relationship equation is simply:

$$PER_{it} = \alpha_t + \beta_{jt} + \gamma_{kt} + e_{it} \qquad (2)$$

Where alpha (α_t) is the fundamental level of PER in period t, beta (β_{jt}) is the industry effect, γ_{kt} is the country effect, and e_{it} is a firm-specific error. PER is used as a specific example here, however the same approach is implemented to all of the five multiples

examined. The firm-specific errors are summed to have zero mean and a finite variance. There is a further assumption that these errors are not correlated between any companies.

The dummy variables are introduced into the equation (2) to generate pure effects according to each country and industry membership. The industry dummy variable I_{ij} is specified as equal to one if firm i is in industry j and zero otherwise. The country dummy variable C_{ik} is defined in the same manner as with the industry dummy. Including the dummy variables into equation (2), the relationship could be explained in this way:

$$\begin{aligned} PER_i &= \alpha + \beta_1 I_{i1} + \beta_2 I_{i2} + \ldots + \beta_3 I_{i13} \\ &+ \gamma_1 C_{i1} + \gamma_2 C_{i2} + \ldots + \gamma_{10} C_{i10} + e_i \end{aligned} \tag{3}$$

The above regression embrangles an identification problem due to the reason that a firm belongs to both one country and one industry. We could have picked one country and one industry as a benchmark to eliminate the identification problem and interpret the dummy variable coefficients as the deviations from the benchmark. However, we had decided to levy constraints that the sum of the industry dummy coefficients and also the sum of country dummy coefficients to be equal to zero. This method was described by Kennedy (1986) to be an effective way to circumvent picking an arbitrary benchmark and creating a problem in making sensible interpretation. Below are the constraints imposed on our dummy variable regression:

$$\sum_{j=1}^{13} n_j \beta_j = 0 \tag{4a}$$

$$\sum_{k=1}^{10} m_k \gamma_k = 0 \tag{4b}$$

where n_j and m_k represent the number of firms in industry j and country k respectively.

This approach gives an additional benefit where the results from the regression would be even easier and more intuitive to apprehend and interpret. The intercept is fixed as the average valuation ratio across Asian countries in the study. Therefore, the dummy variables coefficients depict the magnitude to which each country and industry deviate

from the Asian average in our sample. Least square method is used in the estimation of equation (3) subject to the constraints in equations (4a) and (4b).

5. Empirical Results

5.1 Preliminary Analysis of Firms Multiples to Infer Industry and Country Performance

In Panel A and Graph 1, it described the performance of the multiples by years. Apparently we noticed that all the multiples experienced a decline. It makes sense since there was a powerful negative shock Asian crisis started July 1997. The economy in those countries shrinks by 7.7 percent in 1998 (Janet, 2007). The currencies of crisis countries were severely depreciated relative to US dollars; stock markets and asset prices were undervalued and sharply rise in private debt (e.g., Kaufman, Krueger & Hunter, 1999, Tiwari, 2003). International investor shifted to Europe and U.S as their investment destination; foreign direct investment and lending activities were back off dramatically, it put a drag on economic growth. Furthermore, the handover of Hong Kong sovereignty on July 1, 1997 and "crony capitalism" in Indonesia worsen the economic situation (Helen, 1999). All the consequences were the causes of underperforming in the Asian stock exchange and reflected in firms multiples.

Yet, remarkably, analysts saw the signs that the economies of Asia were beginning bounce back from the slump in 1999. The achievements were attributed to different remedies and policies adopted by those countries. Indonesia, Malaysia, South Korea and Thailand were the countries most affected by the crisis. Efforts have been put on to improve banking and financial institution supervision and regulation to discipline the market, accounting transparency and governance system as well as towards achieving free float exchange rate regime and price stability; and also through capital control imposed in Thailand and Malaysia. Today, most Asian currencies have been strengthened significantly relative to the United States dollar and reappear as investment spots particularly China on the real economy as a contributing factor to ASEAN nations' growth (e.g., Hosono, 2005, Djiwandono, 2007, Janet, 2007).

There were little tremors after year 2001 and also in year 2005; we believed the implications after United States entered a recession in 2001 and Indian Ocean Earthquake Tsunami on December 26th 2004, respectively, were felt by the companies

and reflected in the firms multiples. To some point some analysts and investors commented Asian stock market is overpricing, therefore, we also find that value of the ratios are coming down to a more steady level especially price per earning ratios.

From our unpublished yearly data from all the countries, it is noteworthy to mention that China and Japan are the main drivers of the value of all the five multiples.

In Panel B, we first discuss P/S with PER since sales are less easy to manipulate as compared to earnings. Traditionally, the Japanese companies usually has a much higher P/E as a result of different accounting standard apply in the country and Japanese economy is overweighed with growth companies (Sanjeev & David, 2007). Hence, price-sales ratios would be more indicative of performance as compared to price-earnings ratios. Surprisingly, we see that the Chinese markets are trading at the highest multiples compared to the rest of the world instead of Japan. On top of that, from all the market capitalization based multiples, namely price per sales, price per earning and price to book value, China scored the highest value (3.65, 58.46 and 2.94 respectively). This is not astonishing as China is a giant orgy down the road. China's high domestic consumptions, cheaper economy resources, soft landing, continuing appreciating of the Renminbi and etc attracted tremendous foreign capital inflows into the regions. Krugman (1994) pointed out that supposes that the U.S. economy continues to grow at 2.5 percent each year China will be able to grow at 10 percent annually, by the year 2010 its economy will be a third larger in world. The recent rapid movements have prompted market players to ask: are these markets so inflated and a spectacular bust is inevitable? China dipped 49 times of average P/E ratio. But that is still low relative to the peaks reached by Taiwan (100 times earnings) and Japan (60 times) before the bubbles burst (Heather, 2007).

In 2007 press release, Credit Sussie pointed out that capital spending momentum of the corporate sector and strong demands from China accelerate earnings growth in Japan. The Japanese lofty market P/E isn't as dangerous as it looks like. One of the reasons is because Japanese accounting is far converging to U.S GAAP. Japanese companies usually reported a conservative earnings figure; another reason is that interest rates in the country is much lower, which make lower EPS more acceptable. Therefore a P/E of 47.9 times sounds reasonable.

The four Asian Tigers, Hong Kong, Korea, Singapore and Taiwan, were ranked after Japan and China. The booming economies in those countries make the equities market look promising and attracting thereby having higher value for firms stock and assets prices. “Taiwan's financial market is completely gushing” said by John Nelson of Jardine Fleming. Singapore and Malaysia are two stands out candidates to benefit from the ASEAN asset reflation theme. Recent analysis by Goldman Sachs in 2007 predicted that South Korea will become the world's third-richest country by 2025.

P/S and as well as PER of the riskier firms are low at every level of growth, at least compare to Japan who has higher proportion of mature firms. Emerging markets tend to be more vulnerable than developed markets. So it shouldn't be a surprise that firms multiples in Indonesia, India, and Thailand appear to look cheap compare to the average. One of the facts is because the investors require higher return to compensate them for greater volatility or loss of investment due to macroeconomic exposures, political instability, incompetent rulers, high corruption rate, lack of transparency in accounting practices, etc. All these pure country factors prevented upside movements of corporations. India has a great deal of growth potential but it is constrained by volatile political and economic environment where inflation and credit growth are crazy high and large deficit account. Whereas in Indonesia the risks range from six years of political and economic turmoil, a history of civil unrest, religious conflict, ineffective socio-economic system, terrified unemployment as high as 12.5% of a population of 220 million in 2007 and as a result rising crime.

EV/EBITDA is a valuation multiple that is often used as an alternative to the PER. The advantage of using EV/EBITDA as its numerator includes the value of debt and its denominator is not influence by different taxes treatments in each countries. Again, China was ranked at the first place. From our raw data, we found that most of the companies have high enterprise value. China equity market having high stock value that lend to higher enterprise value after adding the market value of debt (refer the calculation of EV in appendix). Unexpectedly, India, Indonesia and Thailand took place after China, whereby these countries ranked lower under PS and PER ratios. This could be the effect of high leverage in these countries. India external debt as of end-December 2007 stood at $201.4 billion as compared to the level of US$ 169.7 billion at end-March

2007, Indonesia and Thailand recorded 139.14% (TD/TE) and 217.19% (TD/TE)[1] for Indonesia respectively after crisis (Bunkanwanicha, Gupta, & Rokhim 2003). On the other hand, it also revealed that indeed Japanese companies have higher earning before any adjustments. Therefore we see that Japan ranked lower under EV/EBITDA whereas it was ranked second highest under PER.

Then, we discuss about PTBV and ROIC. It is expected that countries with intensive capital industries that require more infrastructure capital (for each dollar of profit) will usually trade at lower PTBV and ROIC ratio. We considered automobiles and parts, chemicals, constructions, electronic & electrical equipments, industrial metals and mining and industrial transportations as capital intensive industries. Japan, Korea and Taiwan have lower ROIC as well as PTBV ratios compare to the rest because firms that situated in these countries are tend to be capital intensified. They are main exporter of the products from these industries in the history. China and India were ranked high under PTBV this gives some idea that investor might be paying too much for what would be left if the company went bankrupt immediately.

From Panel C, we see that different markets enjoy different overall rates of growth of earnings. Electronic and electrical equipments and technologies received higher valuation, at least higher than the average, comparing to the rest of the industries. This is consistent with the facts that Asia countries are competitive in these industries and with huge supplies to the world demands especially East Asian countries as we briefed before. GDP[2] growth was enhanced as they are becoming centre of manufacturing and leader in exporting. Moreover, they are highly situated in countries that have higher valuation ratios especially Japan, Korea and Taiwan. Besides that, travel industry is performing above average as Asian is one of the world popular tourism destinations. We suggest that the variation in firms multiples across different sectors and countries are more likely due to pure country circumstances given the facts that they are situated in emerging countries with uncertain exchange rate risks, inflation risks, interest risks, political risks (election and corruption), restless street strike and also unpredicted natural disasters like tsunami and earthquake. We will further study the importance of country membership and industry composition on firms multiples in next section.

[1] TD/TE refers to total debt to total equity.
[2] GDP means gross domestic product.

5.2 Results from the Fama-Macbeth Regressions

The resulting estimated regressions with P/S, EV/EBITDA, PER, and PTBV are quite similar in the sense that the average country effects on these firm multiples are considerably higher than the average industry effect. The country coefficient estimate of the multiples are much higher as well as the t value. This implies that pure country factors are able to explain variation in firms multiples better. On top of that, we also found that their adjusted R-square of country membership of these four multiple are greater over adjusted R-square of industry membership. It ranges from 9% to 17%. We also noticed that a higher extent to which the country and industry membership affecting P/S and PTBV by reading the adjusted R-square.

For ROIC, industry structure explained cross-sectional variance in ROIC better after controlling for country based differences. Industry R-square (11.5%) is much higher than country R-square (0.3%). When firm ROIC is regress on both factors, the result is consistent. Coefficient of industry ROIC is 0.9757 versus 0.5242. This is true as different industry required different capital infrastructure. For instant, automobiles industry has lower return on invested capital when compare to financial services industry as companies in this industry require large initial investments in capital will generally have lower return on assets.

We conclude that country membership has larger influence on firms multiples. The result is consistent with the pure country factors that we mentioned in descriptive statistic summary. All the Asian countries are facing different kind of country specific risks that reflected in the firms multiples.

5.3 Results from the Dummy Variable Approach

The results from the Fama-Macbeth regressions in the previous section imply how country membership and industry membership played variable parts in the differences of firm multiples across countries in Asia. The explanation powers of country membership and industry membership are distinctive upon the multiple in question. Nevertheless, the outcome from the Fama-Macbeth approach can only offer basic information on the average effect of country mean multiples and industry mean multiples on the deviation of firm multiples. In this section, another method would be used to analyzed and generate a more consequential results between the pure country

effects and the pure industry effects. This approach would yield an intuitive and meaningful interpretation that will be explained in more details later on in the next section.

First of all, we would take a look at what appears interestingly out of the results from each regression on each multiple individually. The average Price per Sales per Share ratio across all Asian countries is 1.70. From regression on P/S yield it shows that in average the financial services industry have the highest adjustment ratio of 1.21 and the industrial metals and mining industry have the lowest adjustment ratio of -0.84. China ranks highest with adjustment ratio of 2.16 and Japan and Korea with almost the same adjustment ratio of the lowest of -0.89. The standard deviation for adjustment ratios for the pure industry effect is 0.63 and 0.76 for pure country effect.

The average Return on Invested Capital ratio across Asia is around 7.64. The highest industry adjustment falls for industrial metals and mining of 1.22 and lowest for financial services industry and constructions industry at around the same of -1.63 and -1.60. The country adjustment ratio of the highest is for India at 5.64 and the lowest for Japan at -4.43. The standard deviation for the pure industry adjustment ratio is 2.88 and for the pure country adjustment ratio is 1.00.

The average EV/EBITDA across all Asian countries is 8.86. The results from the regression on EV/EBITDA yield a result that in average the travel industry has the highest adjustment ratio of 2.22 and the automobiles and parts industry has the lowest adjustment ratio of -1.78. China ranks highest with adjustment ratio of 9.50 and Korea with the lowest of -3.48. The standard deviation for adjustment ratios for the pure industry effect is 3.72 and 1.11 for pure country effect.

The average Price/Earnings per share ratio across Asia is around 37.50. The highest industry adjustment falls for travels industry of 8.73 and lowest for industrial metals and mining industry of -6.20. The country adjustment ratio of the highest is for China at 26.25 and the lowest for Hong Kong at -15.09. The standard deviation for the pure industry adjustment ratios is 4.22 and for the pure country adjustment ratio is 5.46.

The average Price to book value ratio across all Asian countries is 1.68. The results from the regression on PTBV yield a result that in average the technologies and travels industry have the highest adjustment ratio of around the same at 0.50 and 0.47 and the

industrial metals and mining and chemicals industry have the lowest adjustment ratio of -0.30 and -0.27. China ranks highest with adjustment ratio of 2.30 and Korea with the lowest of -0.50. The standard deviation for adjustment ratios for the pure industry effect is 0.55 and 0.83 for pure country effect.

By looking at the results from the dummy variable regressions on each multiple individually, we could observe some interesting trends. China ranks with the highest country adjustment ratios for four out of the five multiples we analyzed namely P/S, EV/EBITDA, PE, and PTBV. This is consistent with our finding presented in Panel B. Would this imply an overvaluation on Chinese firms compare to other Asian companies in the stock market?

Korea and Japan rank as the lowest for country adjustment ratios; Korea with the lowest adjustments on three multiples; P/S, EV/EBITDA, and PTBV, and Japan with the lowest adjustments on two multiples; P/S, and ROIC. Travels industry ranks the highest for industry adjustment ratios for three multiples; EV/EBITDA, PE, and PTBV. Industrial metals and mining industry ranks lowest adjustments on three multiples; P/S, PE, and PTBV. It is also remarkable that there are two multiples having contradictory industry adjustment rankings. Financial services rank as the highest adjustment for P/S but lowest for ROIC. Industrial metals industry ranks as the lowest for P/S but highest for ROIC.

In a nutshell, country membership differences dominate over industry membership with substantially high country standard deviation compare to industry standard deviation. This is suggested in P/S, PE, and PTBV ratios. Country factors have significance influence on PE ratio in particular with difference of 1.2329 in its standard deviation over industry standard deviation. This result is consonance with out result in descriptive statistical analysis and Fama-Beth regression model where we found that pure country factors has significance influence on firms multiples with all the macroeconomic exposures and country specific factors given beforehand. We also mentioned that ROIC is more likely determined by industry composition. Our result in this section however is rather ambiguous in explaining EV/EBITDA and inconsistent with our findings under Fama-McBeth regression where country membership has greater influence.

5.4. Practical Implementation of Cross-Country and Cross-Industry Relative Valuation

As discussed earlier in the paper, relative valuation could provide meaningful comparison only if the firms in question are comparable firms. From all evidences and previous studies, it is certain that companies in different countries and different industries are not identical. Thus, any analysis using relative valuation alone across diverse country or industry settings are usually not acceptable. Consequences from doing so would lead to misjudgment of company values and dreadful decision-makings.

The Fama McBeth and dummy variable regressions method that pick out the pure country and pure industry effects on firm multiples could play a vital part in helping comparative assessment in various country and industry settings. As explained earlier in the methodology section, we opted for dummy variable approach in which the intercept is fixed as the average of the specific multiple across Asian countries and the sum of the industry dummy coefficients and country dummy coefficients are constrained to be equal to zero. Hence, using this method would allow us to interpret the coefficients for each country and industry dummy variables as the deviations from the multiple average in Asia.

From this interpretation, a practical achievement on relative valuation analysis across different countries and different industries could be generalized. For example, suppose that we would like to compare two firms in the same industry using P/S but one firm is located in Thailand and the other one is in Malaysia. The result from the dummy variable method proposed that country adjustment factor for Thais is -0.63 and 0.03 for Malaysian. Thais P/S ratios is lower than Malaysian P/S ratios by 0.69 (0.03 - (-0.63)). Consequently, in order to construct a comparable relative valuation analysis, we discount the P/S ratios of firms from Thailand from Asian average (1.6965) and add the constant to Malaysian P/S ratio. Therefore, P/S for Thais and Malaysian is 1.03 and 1.72 respectively.

The preceding argument could be applied in the same manner for comparing firms from different industries in the same country. For instance, in order to compare two Korean companies, one in the automobiles industry and another one in the chemicals industry, a value of 0.75 (the pure industry adjustment for automobiles and parts industry of 1.08

minus that of chemicals industry of 0.33) should be added to the ROIC multiple from the firm in chemicals industry.

The practice described above would merely serve as an initiative milestone for discovering a framework that can be implemented for making comparative analysis using relative valuation in cross-country and cross-industry. Since this paper only based the data available in merely ten countries and thirteen industries in Asia, the results are not yet complete. To facilitate a worldwide assessment of firms in today's international settings, a more comprehensive study including more countries and more industries should be investigated.

6. Conclusions

Direct comparison across country or industry using relative valuation might be too naive. Controversy in matters of valuation techniques has traditionally been heated. Thereby the practice of using relative valuation must be taken with care since different settings such as country and industry differences could lead to a misleading judgment. Comparing two firms using relative valuation analysis requires that these firms are of comparable characteristics and same fundamentals (growth rate, cost of capital and so on). The result would be a fool otherwise.

This paper examines the differences in firm multiples with a focus in Asian countries. The choices of multiples analyzed are quite variety yielding quite broad meanings. Besides, the concentrating on Asian countries also generates an understanding of performance of firms in Asia after the major Asian financial crisis.

Overall, the results are quite consensus with those in previous studies regarding the impact of country membership and industry membership on firm level multiples. In all the methods that we used we find that pure country factors are significance over pure industry factors on the five ratios examined. The dummy variable method which can be interpreted intuitively further adds as a guideline on how to compare firms that are actually not comparable in nature. The practical implementation direction given in this paper may not be as complete nor as comprehensive as possible, but this study is salient for those focusing the Asian markets. We suggest the more parameters should always be taken into account in this fast changing economy. Moreover, the outcomes on country

and industry adjustment ratios based on the average firms in Asia would also deliver insights on performances of firms in different countries and different industries. Emerging markets give attractive opportunity but country factors in these emerging should not be neglected but carefully study before any investment extended. Our study is informative to be considered for investment purposes.

References

Bhojraj, S., & David. T.Ng. (2007). *Cross-Country Differences in Firm Multiples.*

Cornell University, NY, United States.

Brooks, C. (2002). *Introductory Econometrics for Finance*. Cambridge: Cambridge University Press.

Bunkanwanicha, P., Gupta, J.P., Rokhim, R. (2003). *Debt and Entrenchment: Evidence from Thailand and Indonesia.* EFA 2004 Maastricht Meetings Paper No. 2114; EFMA 2004 Basel Meetings Paper.

Chavalier, R. (2007). *Dizzy in Boomtown.* Retrieved March 29, 2008, from http://www.economist.com/finance/displaystory.cfm?story_id=10136509#top

Copeland, T.E., Koller,T., Murrin,J. (2000). *Valuation: measuring and managing the value of companies* (4th ed.) New York: Wiley.

Damodaran, A. (2002). *Investment Valuation* (2nd ed.). New York: Wiley.

Goldman Sachs. (2005). *Economy of South Korea.*

Retrieved May 01, 2008, from http://www.guardian.co.uk/money/2007/sep/30/5

Heather, Connon. (2007, September). *Asia appeals, but beware the bubble*.

Retrieved May 15, 2008, from http://www.guardian.co.uk/money/2007/sep/30/5

Helen, Hughes. (1999, Spring). *Crony Capitalism and the East Asian Currency and financial 'Crises'*.

Retrieved May 3, 2008, from http://www.cis.org.au/POLICY/Spr99/spr99-1.pdf

Hosono, Kaoru. (2005). *Market Discipline to Banks in Indonesia, the Republic of Korea, Malaysia, and Thailand*. Gakushuin University, Japan

Janet L, Yellen. (2007, February 6). *The Asian Financial Crisis Ten Years Later: Assessing the Past and Looking to the Future.*

Retrieved May 20, 2008, from http://www.frbsf.org/news/speeches/2007/0206.pdf

Kaufman, G.G., Krueger, TH., & Hunter, WC. (1999). *The Asian Financial Crisis: Origins, Implications and Solutions*. New York: Springer.

Kennedy, P,. (1986). *Interpreting Dummy Variables Author(s). The Review of Economics and Statistics, 68,* 1, 174-175.

Kim, M., Ritter, J.R., (1999). *Valuing IPOs. Journal of Financial Economics, 53*, 409-437.

Krugman, Paul. (1994, Nov/Dec). *The myth of Asia's miracle.* Retrieved May 11, 2008, from http://www9.georgetown.edu/faculty/mh5/class/econ102/readings/myth_of_asias-miracle.pdf

McClure, B. (2008). *Spot Quality With ROIC.* Retrieved March 20, 2008, from http://www.investopedia.com/articles/fundamental/03/050603.asp

Robin, H. (2000*). Dealing with 'Outliers': How to Maintain Your Data's Integrity.*

Retrieved April 02, 2008, from http://cc.uoregon.edu/cnews/spring2000/outliers.html

Liu, J., Nissim, D., & Thomas, J. (2002). *Equity Valuation Using Multiples. Journal of Accounting Research, 40*, 135-172.

Pablo, F. (2001). *Valuation Using Multiples. How Do Analysts Reach Their Conclusions?* IESE Business School, Spain.

Pempel, T. J. (1999). *The Politics of the Asian Economic Crisis*. Ithaca. New York: Cornell University Press.

Pratt, S., Reilly, R., & Schweis, R. (2000). *Valuing a Business* (4th ed.). New York: McGraw-Hill.

Sonney, F. (n.d). *Sector versus Country Specialization and Financial Analysts' Performance.* University of Neuchâtel and International Center FAM, Switzerland

Tiwari, Rajnish. (2003). *Post-crisis Exchange Rate Regimes in Southeast Asia: An Empirical Survey of de-facto Policies*. University of Hamburg, Germany.

Wilbur, U. (1908). *What is the Function of a General Theory of Value? The Philosophical Review, 17*(1), 42-62.

Wikipedia. (2008). *Outlier*. Retrieved April 02, 2008, from http://en.wikipedia.org/wiki/Outlier

The World Factbook. (2008). *Indonesia*. Retrieved May 18, 2008, from https://www.cia.gov/library/publications/the-world-factbook/print/id.html

Appendices

Appendix A: Multiples Description and Calculation

Multiples based on price or capitalization

1. Price Earning Ratio (PER)

   - A multiple that give an idea of what the market is willing to pay for the company's earnings.

PER = market capitalization / total net income = share price / earnings per share

2. Price to sales (P/S)

- A multiple that reflect the value placed on sales by the market

P/S = market capitalization / sales = share price / sales per share

3. Price to Book Vale (PTBV)

   - A multiple that use mainly to compare a stock's market value to its book value.

PTBV = market capitalization / book value of shareholder's equity

Multiples based on the company's value

4. Enterprise Value to EBITDA (EV/EBITDA)

   - A multiple that use for valuing company and stock relative to its historical performance.

EV/EBITDA = enterprise value / earnings before interest, tax, depreciation and amortization = (Market value of Equity + Market value of debt − Cash)/ EBITDA

5. Return on Invested Capital (ROIC)

   - A multiple that indicate how effectively a company uses the money (borrowed or owned) invested in its operations.

ROIC = Net Operating Profits after Tax (NOPAT) / Invested Capital

* Invested Capital = Total Assets less Cash - Short Term Investments - Long Term Investments - Non-Interest Bearing Current Liabilities.

Graph 1: Performance of Firms Multiples after Year 1997

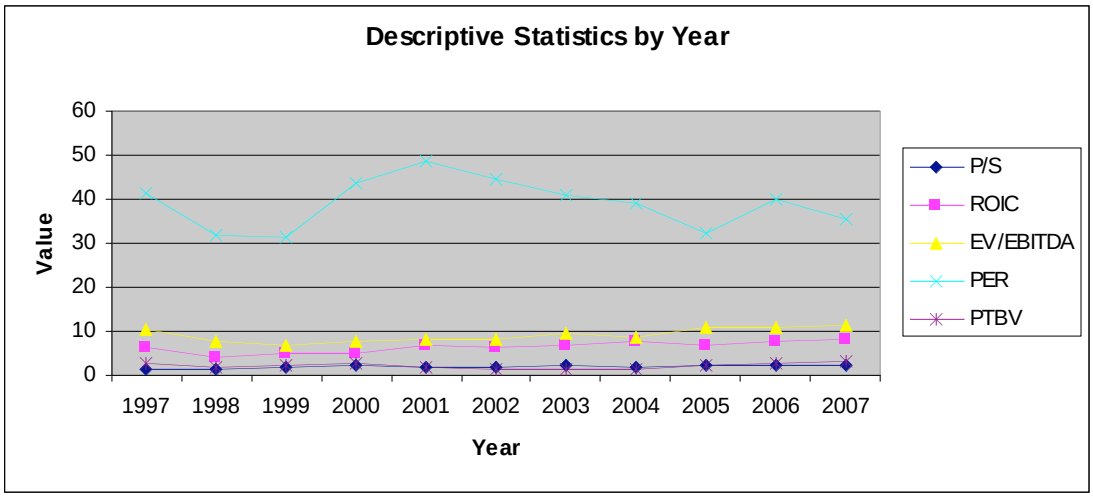

Table 1: Summary Statistics of Multiples

Panel A summarizes the performance of firms from 13 industries and 10 countries indicated by P/S, ROIC, EV/EBITDA, PER and PTBV. Since the observations were carried out after 1997 Asian crisis it provides overview of yearly performance after the tragedy. Graph 1 was attached before to complement the summary.

Panel A	**Descriptive Statistics by Year**				
	P/S	ROIC	EV/EBITDA	PER	PTBV
1997	1.4565	6.2692	10.4061	41.3233	2.8031
1998	1.4763	4.2609	7.5599	31.7425	1.8261
1999	1.6006	4.9747	6.8810	31.4210	2.1770
2000	2.4532	5.1609	7.5718	43.7606	2.7758
2001	2.0263	6.6008	8.2910	48.4137	2.0147
2002	1.7299	6.4835	8.0637	44.3914	1.3681
2003	2.1008	6.7713	9.4216	40.7230	1.5485
2004	2.0880	6.8939	10.9293	32.0703	2.3183
2005	1.9236	7.7171	8.6250	39.2872	1.3790
2006	2.1647	7.8989	10.7727	39.8693	2.6136
2007	2.4808	8.2948	11.4670	35.6188	2.9762
Mean	1.9546	6.4940	9.0899	38.9655	2.2364
Stdev	0.3560	1.2828	1.5856	5.6489	0.6353

Panel B describes the firms' performance in Asian countries through the five valuation ratios. We collected firms accounting variables from 13 industries in every country and created the average ratios to represent the health of the particular country. For instant, we combined the P/S of a group of firms in 13 industries in China to reach the average of P/S for China.

Panel B	Descriptive Statistics by Country												
		Mean					Standard Deviation					No of	No of
No	Countries	P/S	ROIC	EV/EBITDA	PER	PTBV	P/S	ROIC	EV/EBITDA	PER	PTBV	Firms	Industries
1	China	3.6463	8.5047	17.9429	58.462	2.9372	3.7292	8.7485	13.6671	46.773	1.344	696	13
2	Hong Kong	1.006	6.3949	5.3435	19.112	1.4669	0.9729	6.2932	12.2395	25.146	1.095	450	13
3	India	1.2519	13.2177	9.0945	17.705	2.2178	0.9977	8.5085	9.6246	17.801	1.563	422	13
4	Indonesia	0.6846	6.5012	7.9528	17.854	1.594	0.748	8.2846	11.5346	16.548	0.79	132	13
5	Japan	1.6182	6.3733	5.731	47.909	1.3236	2.167	12.0896	12.7419	56.381	0.721	2023	13
6	Korea	1.5164	6.2482	8.7467	30.104	1.1588	2.114	14.5857	9.7367	41.221	0.98	500	13
7	Malaysia	1.5623	3.2127	8.0839	23.805	1.3212	1.9986	4.537	11.3242	38.273	1.144	409	13
8	Singapore	1.5137	8.9878	6.6721	25.378	1.6499	2.114	13.274	8.9957	30.684	1.06	295	13
9	Taiwan	2.6802	5.7603	4.8835	43.744	1.4747	4.3463	7.0667	8.5415	59.092	1.262	472	13
10	Thailand	0.7051	10.9363	9.5315	16.477	1.4835	0.8633	7.3791	13.9115	26.453	1.228	209	13
	Average	1.6185	7.6137	8.8623	37.497	1.6831	2.132	9.0767	12.1499	48.066	1.3		
	Stdev	0.9116	2.8686	3.7278	14.831	0.5301	1.2233	3.2211	1.9312	15.069	0.252		

Panel C give us a picture of performance of firms in different industries in Asian countries. We retrieved all the firms data in every specific industry from the 10 countries to calculate the industry mean. For examples, we combined all the firms P/S in Automobiles and Part industry across 10 countries to create the average P/S for Automobiles and Part industry.

Panel C	Descriptive Statistics by Industry											
		Mean					Standard Deviation					No of
No	Industries	P/S	ROIC	EV/EBITDA	PER	PTBV	P/S	ROIC	EV/EBITDA	PER	PTBV	Firms
1	AUTOMOBILES AND PARTS	1.1299	7.4161	7.4953	32.5337	1.6083	2.3096	7.3616	9.4258	38.0680	1.1389	366
2	CHEMICALS	1.3058	7.3756	9.6770	36.5378	1.6212	1.9258	6.3887	9.4749	45.6694	1.1445	505
3	CONSTRUCTIONS	1.0769	4.2788	8.5010	37.7216	1.4386	1.8256	7.6394	13.1212	48.6950	1.2957	704
4	ELECTRONIC & ELECTRICAL EQUIPMENTS	1.4455	7.0345	8.5257	38.5677	1.8223	1.9246	9.1611	12.8529	43.7069	1.3883	645
5	FINANCIAL SERVICES	3.3051	5.0407	8.8626	35.6123	1.6558	4.0724	7.0595	14.1163	48.4110	1.3390	259
6	FOOD PRODUCERS	1.2332	6.3027	8.9449	37.8203	1.5847	2.0741	7.9154	11.3398	50.7389	1.1932	488
7	GENERAL RETAILERS	1.2152	5.6351	10.1805	39.1808	1.9998	2.2653	7.7682	12.3096	45.2211	1.5314	427
8	HOUSEHOLD GOODS AND HOME CONSTRUCTIONS	0.9358	5.4487	8.4837	35.1824	1.3627	1.1080	9.4262	12.3639	46.8889	0.9327	281
9	INDUSTRIAL METALS AND MINING	0.9036	8.0371	8.7650	30.9883	1.5286	1.4588	6.9446	11.4806	45.7186	1.2167	342
10	INDUSTRIAL TRANSPORTATIONS	2.4844	6.1996	9.4190	38.3787	1.4794	3.7016	8.6273	11.9351	50.1031	1.0150	312
11	PERSONAL GOODS	1.2895	5.9036	7.2542	33.0672	1.5408	1.9855	10.3241	12.4128	46.5068	1.2918	515
12	TECHNOLOGIES	1.6970	7.0228	9.2316	41.8833	2.1486	2.2801	11.8340	13.0722	51.1219	1.4271	450
13	TRAVELS	2.3975	5.1767	10.7363	50.2817	2.1075	3.3328	8.5504	12.7522	63.5430	1.3937	313
	Average	1.5707	6.2209	8.8623	37.4973	1.6831	2.3280	6.2209	12.1499	48.0657	1.3001	
	Stdev	0.7208	1.1056	0.9644	4.8652	0.2557	0.8635	1.5124	1.3619	5.7936	0.1697	

Table 2: Regress firms multiples on country and industry multiples

This table shows the result of influence of industry and country differences on five valuation multiples (P/S, ROIC; EV/EBITDA, PER and PTBV) of firms. Using Fama-Mc-Beth estimation regression, we first regress firms multiples on industry and country membership separately and on both variables later on. We resort to coefficient and t-statistic value as the significance of their influences and R-square as explanatory power in the relationship.

		P/S	P/S	P/S	ROIC	ROIC	ROIC	EV/EBITDA	EV/EBITDA	EV/EBITDA	PER	PER	PER	PTBV	PTBV	PTBV
Intercept	coef	0.02350	0.06061	-1.42630	1.63664	0.14720	-2.93035	0.00000	0.00000	-8.01049	0.00000	0.00000	-32.29372	0.00000	0.00000	-1.84387
	t-stat	0.45426	0.73678	-16.71034	1.68913	0.59056	-3.15762	0.00000	0.00000	-5.08639	0.00000	0.00000	-5.60732	0.00000	0.00000	-14.65555
Country P/S	coef	0.92882		0.93487												
	t-stat	33.94692		35.47184												
Industry P/S	coef		0.90427	0.92143												
	t-stat		18.55439	20.91849												
Country ROIC	coef				0.76693		0.52418									
	t-stat				4.75028		3.44247									
Industry ROIC	coef					0.98317	0.97570									
	t-stat					26.99726	26.77053									
Country EV/EBITDA	coef							1.00000		0.99493						
	t-stat							23.41859		23.35018						
Industry EV/EBITDA	coef								1.00000	0.90895						
	t-stat								5.52963	5.26644						
Country PER	coef										1.00000		0.99046			
	t-stat										23.23615		23.06834			
Industry PER	coef											1.00000	0.87077			
	t-stat											6.44814	5.87659			
Country PTBV	coef													1.00000		1.01780
	t-stat													31.66847		32.98059
Industry PTBV	coef														1.00000	1.07770
	t-stat														13.77035	16.24418
Adj R-square		0.17039	0.05770	0.23034	0.00385	0.11533	0.11705	0.09009	0.00532	0.09447	0.08957	0.00735	0.09511	0.15543	0.03349	0.19434

Table 3: Country and Industry Adjustments on Multiples

Below tables reported the results of our comprehensive dummy regression model. We used

$$V_i = \alpha + \beta_1 I_{i1} + \beta_2 I_{i2} + ... + \beta_{13} I_{i13} + \gamma_1 C_{i1} + \gamma_2 C_{i2} + ...\gamma_{10} C_{i10} + e_i$$

as the regression model. Alpha (α) represents the Asian average, Beta (β) is pure industry adjustment effect and gamma (γ) is the pure country adjustment effect, and the error (e) is firm disturbance. Pure country adjustment and industry adjustment tell how much we need to add and discount against the Asian average before we make country or industry comparison.

PS			
Asian Average	1.6965		
Pure Country Adjustment		Pure Industry Adjustment	
China	2.1591	AUTOMOBILES AND PARTS	-0.4235
Hong Kong	0.9442	CHEMICALS	-0.4979
India	0.0095	CONSTRUCTIONS	-0.3856
Indonesia	-0.1082	ELECTRONIC & ELECTRICAL EQUIPMENTS	-0.0356
Japan	-0.8942	FINANCIAL SERVICES	1.2082
Korea	-0.8936	FOOD PRODUCERS	-0.2873
Malaysia	0.0284	GENERAL RETAILERS	-0.1896
Singapore	-0.1855	HOUSEHOLD GOODS AND HOME CONSTRUCTIONS	-0.5829
Taiwan	-0.4283	INDUSTRIAL METALS AND MINING	-0.8355
Thailand	-0.6314	INDUSTRIAL TRANSPORTATIONS	0.855
		PERSONAL GOODS	-0.4257
		TECHNOLOGIES	0.118
		TRAVELS	0.8088
Standard Deviation	0.7559		0.6284

ROIC			
Asian Average	7.6412		
Pure Country Adjustment		Pure Industry Adjustment	
China	-1.4227	AUTOMOBILES AND PARTS	1.081
Hong Kong	-1.198	CHEMICALS	0.3328
India	5.643	CONSTRUCTIONS	-1.6014
Indonesia	-1.1103	ELECTRONIC & ELECTRICAL EQUIPMENTS	1.123
Japan	-4.4314	FINANCIAL SERVICES	-1.6301
Korea	0.7986	FOOD PRODUCERS	-0.0818
Malaysia	-1.6949	GENERAL RETAILERS	0.813
Singapore	1.2979	HOUSEHOLD GOODS AND HOME CONSTRUCTIONS	-0.6977
Taiwan	-1.2784	INDUSTRIAL METALS AND MINING	1.2203
Thailand	3.3962	INDUSTRIAL TRANSPORTATIONS	0.0558
		PERSONAL GOODS	-0.8197
		TECHNOLOGIES	0.7864
		TRAVELS	-0.5816
Standard Deviation	1.0015		2.8778

EV/EBITDA			
Asian Average	8.8623		
Pure Country Adjustment		Pure Industry Adjustment	
China	9.5032	AUTOMOBILES AND PARTS	-1.7833
Hong Kong	-2.8839	CHEMICALS	-0.4725
India	0.9477	CONSTRUCTIONS	-0.4399
Indonesia	-2.5838	ELECTRONIC & ELECTRICAL EQUIPMENTS	-0.2897
Japan	-0.8703	FINANCIAL SERVICES	0.571
Korea	-3.4756	FOOD PRODUCERS	0.571
Malaysia	-0.389	GENERAL RETAILERS	1.3487
Singapore	-1.91	HOUSEHOLD GOODS AND HOME CONSTRUCTIONS	0.1619
Taiwan	1.1022	INDUSTRIAL METALS AND MINING	-1.0822
Thailand	0.5593	INDUSTRIAL TRANSPORTATIONS	0.0786
		PERSONAL GOODS	-1.4954
		TECHNOLOGIES	0.6116
		TRAVELS	2.2201
Standard Deviation	1.1141		3.7173

PER			
Asian Average	37.4973		
Pure Country Adjustment		Pure Industry Adjustment	
China	26.2508	AUTOMOBILES AND PARTS	-5.6928
Hong Kong	-15.089	CHEMICALS	-3.0009
India	-12.13	CONSTRUCTIONS	-2.951
Indonesia	-1.1287	ELECTRONIC & ELECTRICAL EQUIPMENTS	-1.7832
Japan	12.2574	FINANCIAL SERVICES	2.4082
Korea	-7.8721	FOOD PRODUCERS	2.4082
Malaysia	-0.9407	GENERAL RETAILERS	-3.1343
Singapore	-4.332	HOUSEHOLD GOODS AND HOME CONSTRUCTIONS	1.6704
Taiwan	11.982	INDUSTRIAL METALS AND MINING	-6.2033
Thailand	-8.9979	INDUSTRIAL TRANSPORTATIONS	-0.2429
		PERSONAL GOODS	-2.4914
		TECHNOLOGIES	4.2755
		TRAVELS	8.7373
Standard Deviation	5.4599		4.22406

PTBV			
Asian Average	1.6831		
Pure Country Adjustment		Pure Industry Adjustment	
China	2.3013	AUTOMOBILES AND PARTS	-0.1492
Hong Kong	-0.2525	CHEMICALS	-0.2701
India	0.6475	CONSTRUCTIONS	-0.2479
Indonesia	-0.3182	ELECTRONIC & ELECTRICAL EQUIPMENTS	0.1787
Japan	-0.231	FINANCIAL SERVICES	0.0489
Korea	-0.5049	FOOD PRODUCERS	0.0489
Malaysia	-0.1699	GENERAL RETAILERS	0.3563
Singapore	-0.0887	HOUSEHOLD GOODS AND HOME CONSTRUCTIONS	-0.2309
Taiwan	-0.0693	INDUSTRIAL METALS AND MINING	-0.3049
Thailand	-0.3143	INDUSTRIAL TRANSPORTATIONS	-0.2568
		PERSONAL GOODS	-0.1424
		TECHNOLOGIES	0.5002
		TRAVELS	0.4691
Standard Deviation	0.83192		0.5504