

Country and Sector Factors in Emerging Markets

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The Rock Creek Group manages a large portfolio of investments in emerging markets using primarily locally based managers. The investment process requires dynamically allocating assets across managers based on the market opportunity set. In this context, an important question is the relative importance of country and sector selection. Traditionally, in emerging markets, the focus had been on country selection, as opposed to the more developed economies for which the sector selection has played a more important role. It would appear that in a more integrated global economy, sector selection should become increasingly important. This paper investigates the importance of country-specific and sector-specific factors on the public equity returns in seven large emerging markets during the past 7 years. It concludes that country-specific factors remain the most important. However, the importance of sector-specific factors has been growing over time. The relative importance of the country and sector factors is itself country dependent.

I. Introduction

The public equity returns in emerging markets are volatile. They depend on many factors, which may be grouped as:

1. Local factors which are country-specific. Examples of local or country-specific factors include political systems, economical policies, regulation, demography, natural resources, etc. Equity returns in emerging markets have traditionally been driven by local factors.
2. Global factors which are sector specific. Examples include supply/demand, global liquidity, risk aversion etc. As emerging market countries become integrated in the global economy, their equity returns are increasingly affected by global factors

In this paper, we use a simple model to quantify the importance of country-specific and sector-specific factors on emerging market equity returns and the change in their relative importance over time.

II. Data

In this study, we use the daily closing prices and dividend yield of the companies in MSCI emerging market index from January 2003 to December 2010. We also use the weight of these companies in the MSCI emerging market index as of the end of previous year.

To ensure high quality data, we restricted this study to companies from seven emerging market countries across eight sectors. The countries chosen are Brazil, China, India, Mexico, South Africa, South Korea, and Taiwan. The sectors chosen are consumer discretionary, consumer staples, energy, financials, industrial, information technology, materials, and telecommunication services.

The companies from the selected countries and sectors have a combined market capitalization that is about 65% of that of MSCI Emerging Market Index.

Our preliminary analysis suggested that there were two data issues that affected daily returns in individual countries. First, is the difference in the closing time of stock markets across countries; and second, differences in public holidays. Because economic news is constantly updated 24/7, the daily returns of individual countries or sectors may not be comparable with one another. To overcome the impact of these data issues, we decided to use weekly returns instead of daily returns in this study.

III. Model

We constructed three different return series from the weekly returns of individual companies.

1. The weighted average of the weekly returns of companies in a country i across all sectors denoted as r_i , as a proxy for local country-specific factors.
2. The weighted average of the weekly returns of companies in a sector j across all countries denoted as r_j , as a proxy for the global sector-specific factors.
3. The weighted average of the weekly returns of companies in a country i and a sector j denoted as r_{ij} .

We regress r_{ij} separately on r_i and r_j

$$r_{ij} = \alpha_i + \beta_i r_i + \epsilon_i$$
$$r_{ij} = \alpha_j + \beta_j r_j + \epsilon_j$$

The r-squared of the two linear regressions are RC_{ij}^2 , and RS_{ij}^2 . While RC_{ij}^2 is a measure of the local country-specific effect on the companies in country i and sector j , RS_{ij}^2 quantifies the global sector-specific effects on

companies in country i and sector j . The regressions are run separately for each year from 2003 to 2010.

III. Results

The weighted average of the local and global effects across countries and sectors is calculated as follows:

$$RC^2(t) = \sum_{i,j} w_{ij} RC_{ij}(t)$$

$$RS^2(t) = \sum_{i,j} w_{ij} RS_{ij}(t)$$

The weighted averages are plotted in Figure. 1, where $t = 2003, \dots, 2010$, and w_{ij} is the sum of the MSCI Emerging Market Index weights in country i and sector j .



Figure 1 : The weighted average of country and sector effects from 2003 to 2010.

On average, about 70% of the equity returns can be explained by the average returns of the country where the companies are located, and about 55% of the equity return can be explained by the average returns of the sector to which the companies belong. The country specific factor appears more important than the sector specific factor implying that country selection is more important than sector selection when investing in the emerging market.

While the effect of country-specific factors is relatively stable over the past eight years, the effect of sector specific factors is definitely increasing. The difference in explanatory power between them has significantly decreased. This shows that the global sector specific factors play a more important role in the equity returns of emerging markets as they are being integrated into the global economy. In brief, sector selection has become important when investing in emerging markets and its importance is growing.

Furthermore, the relative importance of country-specific and sector-specific factors in explaining emerging market equity returns is itself dependent on the country and sector. Table 1 shows the effects of country-specific and sector-specific factors for all seven selected countries and eight selected sectors in 2010.

	Cons. Dis.		Cons. Stp.		Energy		Financials		Industrials		IT		Materials		Telecom	
Brazil	0.34	0.35	0.38	0.52	0.70	0.68	0.77	0.68	0.70	0.58	0.12	0.16	0.74	0.80	0.29	0.32
China	0.58	0.55	0.34	0.50	0.88	0.68	0.91	0.75	0.83	0.75	0.43	0.48	0.90	0.75	0.47	0.47
India	0.34	0.22	0.39	0.32	0.48	0.19	0.81	0.58	0.72	0.51	0.43	0.48	0.70	0.66	0.38	0.20
Mexico	0.42	0.18	0.49	0.45			0.43	0.09	0.36	0.15			0.84	0.69	0.61	0.42
South Africa	0.67	0.57	0.54	0.42	0.52	0.50	0.80	0.50	0.67	0.44			0.71	0.69	0.53	0.33
South Korea	0.27	0.62	0.04	0.11	0.42	0.51	0.57	0.40	0.62	0.80	0.72	0.75	0.68	0.58	0.06	0.06
Taiwan	0.72	0.40	0.33	0.29	0.32	0.36	0.70	0.52	0.74	0.64	0.91	0.92	0.68	0.53	0.00	0.05

Table 1: The country and sector effects are shown for 2010. The green numbers indicate the country effect (1st number) is larger than the sector effect (2nd number) by more than 0.05 and the red numbers indicate the sector effect is larger than the country effect by more than 0.05.

The numbers are color coded to indicate which factor is more important. In general, the numbers in the first column of each sector group is higher (and the numbers are color coded green) indicating that the country-specific

factor is more important. However, the differences between country and sector effects vary over a wide range from negative 0.35 to positive 0.34. Countries and sectors

are affected by the local and global factors in significant different ways. Two clear examples are

1. In South Korea, the equity returns for most sectors are more sensitive to global sector-specific factors than to local country-specific factors. This suggests that the South Korea equity market is more integrated to the global market than other emerging markets.
2. At the same time for all seven emerging markets analyzed in this study, the financial sector returns are more sensitive to country specific factors than sector-specific factors. This is probably because the financial sector is tightly controlled by the government in emerging markets. The performances of financial sector equities strongly depend on the governmental policy in individual countries rather than on the performance of the global financial companies.

Besides individual country-specific factors, countries within the same geographic region tend to have stronger correlation in their equity returns, suggesting common region-specific factors. We applied a hierarchical cluster analysis ⁽¹⁾ to the returns of different country-sector groups. Figure 2 shows the cluster analysis results. The cluster analysis confirms the earlier conclusion that country-specific factors remain more important. In addition, there are two regional clusters, the East Asia cluster and Latin America cluster. Figure 3 shows the cluster analysis results using mutual information ⁽²⁾ between different country-sector groups as the basis for clustering. The mutual information statistic has the advantage of ensuring that outliers do not bias results. This cluster analysis also confirms that country specific factors are important for explaining investment performance. In this analysis the East Asia cluster is clearly present. However, the Latin America cluster is less obvious.

III. Conclusion

When investing in emerging markets, country selection remains the most important decision. However, sector selection is also important, and is becoming more so as emerging markets develop and become integrated with global markets. The relative importance of country-specific and sector-specific factors in explaining equity returns in a country depends on how closely the country is integrated with global markets and on how tightly the sectors are regulated by the local governmental policies. The countries in certain regions have a strong correlation in performance to each other suggesting a strong regional interrelationship.

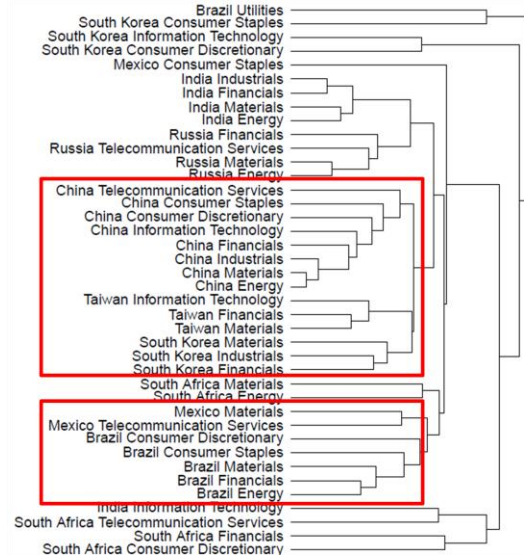


Figure 2 : The cluster analysis of correlation among different country sector groups.

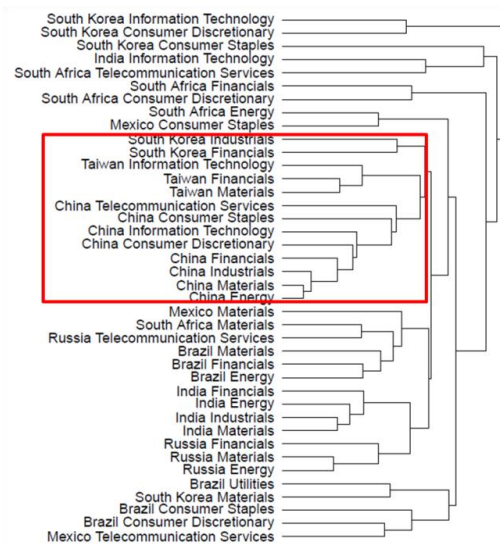


Figure 3 : The cluster analysis of mutual information among different country sector groups.

Bibliography

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2. **The Rock Creek Group.** *Mutual Information Correlation.* 2009.