

# Testing the differences of stock returns on and after the opening of emerging economies

## *Avaliação das diferenças nos lucros de ações durante e após a abertura de economias emergentes*

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### **ABSTRACT**

This study investigates the differences observed on stock returns before and after the opening of emerging markets. The stock returns from emerging and non-emerging countries were examined with the aim to identify if there is a co-integration between markets during the period of December 1975 through April 2000. In our findings we observed no significant differences during the period. We conclude therefore, that even though the process of economic liberalization had been important to the emerging countries, in the first instance, changes were not felt in the stock market as arising from the openings of the emerging economies.

**Keywords:** stock market; emerging countries; co-integration.

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## RESUMO

Este estudo investiga as diferenças observadas nos lucros de ações antes e depois da abertura de mercados emergentes. Os ganhos observados em ações de países emergentes e não-emergentes foram estudados com o objetivo de identificar se houve co-integração entre mercados durante o período de dezembro de 1975 a abril de 2000. Em nossa pesquisa, não observamos nenhuma diferença significativa durante o período. Concluimos, portanto, que apesar da importância do processo de liberalização para os países emergentes, no primeiro momento, as mudanças não foram sentidas no mercado de ações, mesmo levando-se em conta essas aberturas das economias emergentes.

**Palavras-chave:** mercado de ações; países emergentes; co-integração

## 1. INTRODUCTION

Emerging markets have as their main feature, volatility that increases investors' potential interest for entering in such markets with the aim of possibly obtaining a higher expected return. As in Mullin (1993), for instance, just from 1989 to 1992 investments in emerging markets triplicated. This fact indicated a speculative euphoria, which occurred in other financial markets around the world.

According to Jorion & Goetzmann (1999) the last 20 years of capital market history have witnessed a dramatic expansion of opportunity for global investors, led primarily by emerging markets in Asia, South America, Africa, the Middle East, and Eastern Europe. In many countries, equity markets have grown rapidly from tiny, fledgling markets with little volume and limited international participation, to important sources of capital with short but impressive track records of share price appreciation. Although the fundamental shift in the global political environment is undoubtedly a major factor in the growth of emerging markets, consideration of a longer term view is also worthwhile.

Adding to this, Mullin (1993) suggests that share's return in emerging markets are correlated to macroeconomic variables as well as the opening of the economy that is represented by the export growth rate.

Lima (1997) points out that since 1982, the emerging countries have faced a serious liquidity crisis which caused their exclusion from international financial markets. Their permanence in such market was held to ransom again by the end of 1994.

In this stand, Leal (1998) shows that the issue of links and integration among the markets has important implications for the benefits of the international diversification, considering that the more markets are close economically, the more they would tend to move together.

However, he emphasized in his article that the links in international markets indicate relationship among them, which could be highlighted through the correlation coefficient. While the financial integration has as a significant point that the price of assets (from the same risk class) will be the same in different markets. Thus, he concluded that two markets can be correlated without being integrated, since their movement in a group could be influenced by an external common factor.

Nowadays, it is possible to notice that the markets are more and more integrated. This fact can lead to the reduction of the international diversification benefits, considering that the crisis prominence in a certain country can be spread to another countries very swiftly.

Kim and Singal (2000) mentioned that the 1994 Mexican currency crisis and the recent turmoil in East Asian financial markets have prompted many academicians and politicians to question the desirability of free flow of capital for emerging economies. They cite Chile's and China's successes with restriction to capital flows. Even highly respected economists such as Joseph Stiglitz of the World Bank and Paul Krugman of MIT have championed capital controls as a way of coping with the financial crisis, perhaps heeding to their advice, Malaysia had closed its financial markets to foreign investors in September 1998 and around the same time, Taiwan announced that it was reconsidering its plans for full liberalization of capital flows in light of Asia's financial crisis as a result the same reasons..

Kim and Signal (2000) in contrast with the economists such as Merton Miller (1988) reasoned that markets are not open enough. They argue that instead of limiting access to the markets, it should be more open by removing existing constraints. Similarly, economists at the International Monetary Fund, such as Stanley Fischer and Michael Mussa, believed that currencies must be allowed to float so that markets, not governments, determining currency val-

ues. These economists are against any controls on capital flows. In fact, the Philippine central bank governor and the president declared that they would not restrain capital flows. Chile, long held up as the model of success with capital controls, eliminated a key capital restraint known as *encage* because it caused a large increase in the borrowing cost for Chilean companies.

In this regards, Mathieson & Rojas-Suez (1992) Hanson (1992) evaluate that the financial opening would bring several benefits to developing countries. Such benefits could be: the external saving improvement; the possibility of risk diversification from the domestic and external investors; the strength of the financial system efficiency due to a wider competition between resident institutions and non-resident institutions; and the loss of economic policies, autonomy that would limit degrees of freedom that hampers adequate execution of policies.

This article is organized in six sections. As we have seen, the first section brought in the introductory aspects. The second section shows a brief history of emerging financial markets' and its evolution. The third section consists of brief considerations on the liberalization process in some countries. The fourth section presents the methodological approach, principal component analysis. The fifth section has the empirical results. And finally, the sixth section presents the final remarks on the focused issue.

## **2 HISTORICAL EVOLUTION OF EMERGING FINANCIAL MARKETS**

According to Lima (1997), the process of capital internationalization, which had intensified since the end of Second World War, faced deep changes with the fast development of computers and communication systems.

In the financial spectrum, in addition to the enormous simplification of the traditional operational routines, some possibilities appeared: the fast electronic transfer of funds; the geographical decentralization of the financial operations without being physical involved in a market; and, the fast access to information from several financial markets through real time processing.

As in Agllietá (1995), globalization moves through contradictory forces. On one hand, there are similar trends: a liquidity market was formed in world scale; the deregulation had spread effects; competition eliminated the separation among banks and financial agents. On the other hand, there are still different financial sys-

tems without organizational principles, which would pave way for a universal type of finances.

Lima, (1997) again, stressed the point that the Mexican's moratorium (August – 1982) had as an immediate effect the exclusion of the developing countries from the International Monetary Fund (IMF), specifically Latin American debtors. Their exclusion happened almost simultaneously and it was not so severe for the creditors because of such countries "docility" including their inability to react. Thus, IMF started all over again, that means, transactions were done almost exclusively among advanced countries.

As soon as the 1982 crisis began, while the official creditors could count on the Paris Club, the private creditors did not have any institution that would give them support in negotiations with the debtors. For that reason, the multilateral and official agencies had a crucial role to play during the process of these negotiations.

It is important to highlight that countries from the Latin America had had access to the international private credits mainly through investigated bank loans. In addition to the fact that such loans have been lent by the great international banks, they had also received support from several agents. Consequently, International Monetary Fund (IMF) imposed an economic policy that sought the adjustment of the balance of payments, by so doing reverting to the difficult position of their checks and balances that would not guarantee the result expected by the private creditors.

According to creditors, the 1982 crisis was only declared ended in 1988, once the countries were considered recovered from the main consequences of this crisis, and the Latin American risks were considered practically null

It would be wise if one say that the return of the developing countries to the International Monetary Fund was motivated by the advanced countries economic situations, that is, the IMF readjustments and restructure of the "old" debt stock of those countries and the revaluation of the European Eastern countries "potentialities".

In order not to ignore the market growth, which was provided with a greater integration, Prates (1999) suggests that Latin-American countries should implement many reforms aiming to eliminate complications introduced by a previous strategy. Some of such reforms are the following: elimination of state regulations on home markets, privatization, internal financial liberalization and external opening of the economies. The commercial and financial

economics and openings constituted central issues for changes in the development strategy.

Hanson (1992) emphasizes that the monetary stability and the fiscal balance would be preconditions so that the financial opening could become virtuous and maintainable. The main reason, which is associated to the implicit monetary vision in the IMF policies, supports the idea that the liberalization of capital flows in a high inflation context would contribute to the worsening of the instability. It is due to the fact the governmental capacity of collecting inflationary tax would be reduced, considering an alternative of taking possess of external assets as value reservation. As a consequence, the currency demand would be reduced thus affecting tax incidence "base". In order to collect the tax, the same amount would be necessary at a higher inflation rate.

Prates (1999) cites that during the eighties, a progressive substitution occurred to the bank credit market for the capitals' market or "direct finances" in the international scope. That market has a specific and differentiated dynamics of credit system that prevailed until the seventies. While in this system the important point was financial flows maintenance by commercial banks and central Bank, the main concern in the capitals markets is a permanent evaluation of stocks by agents. Therefore, tensions' resolution of illiquidity of the system and the debtors' default occur through assets prices, what makes the new forms of wealth maintenance intrinsically deflationary, on the contrary to the inflationary trends of credit system.

During the eighties a new system of liberalized and investigated finances was consolidated. The financial globalization that involves either the internal barriers elimination among different segments of the financial market, or the interpenetration of monetary markets and national financial markets and their integration in the globalized markets grew.

Griffith, Jones (1995) mentions that in this context of growing internationalization financial integration and predominance of negotiable titles' operations, shocks are easily transmissible from a market to another. The results are strong fluctuations in the assets price and exchange rates. Not to mention the expansion of derivative in the area of speculation in the exchange and monetary markets, due to lowest transaction costs and the hedge mechanisms.

### 3. LIBERALIZATION PROCESS

Goetzmann and Jorion (1999) argue that many of today's emerging markets are actually re-emerging markets, that is, are large enough to be included in previous databases, but for one reason or the other disappeared. China, Malaysia, India, Egypt, Poland, Romania, Czechoslovakia, Colombia, Uruguay, Chile, Venezuela and Mexico, all had equity markets in the 1920s. Many of these markets were large enough to have share price indexes reported in international publications. For various political, economic and institutional reasons, investors lost interest in these markets, which then submerged, and re-emerged only recently. Not surprisingly, performance since the last emergence is invariably higher than before emergence. This disparity has serious implications for the performance evaluation of emerging markets.

Kim and Singal (2000) mention that in Argentina, the start of monthly stock data was in January 1976 and its liberalization began with the New Foreign Investment Regime in November 1989. Under this reform, all legal limits on the type and nature of foreign investments were abolished, and a free exchange regime was introduced. Capital, dividends, and capital gains could be repatriated freely. International Finance Corporation (1990) also lists Argentina as a free market for foreign investment on December 31, 1989. In Brazil, the start of monthly stock data was in January 1976 too and the market opening was held in May 1991, as well as the foreign portfolio investment took place under Brazilian Securities & Exchange Commission (CVM) Resolution 1289, Annex II, which limited foreign portfolio investment to investments through special funds with onerous conditions. Still, in Latin America, Chile had its start of monthly stock data in January 1976 and its market opening in October 1989, in which foreign investors are restricted under law 18657 and DL 600 that requires capital to be retained for 5 years before it can be repatriated. Finally, In Mexico the start of monthly stock data was in January 1976 and the market opening was held in May 1989. Since 1989, the revision of 1973 Law promoted Mexican Investment and Regulated foreign Investment that relaxed restrictions on foreign ownership.

In another perspective, Indonesia had its start of monthly stock dated to January 1990 and its market opening in September 1989. Until December 1987 Indonesian market was closed to foreign in-



vestment, when the government introduced measures to allow foreigners to purchase shares in eight non-joint-venture companies. In contrast, Korea had its start of monthly stock data in January 1976 and its market opening in January 1992. Although the government intended to open the stock market to foreign investment in 1988, the opening was delayed due to a rapid increase in the money supply in the Korean economy. The last but not the least, the Thailand's start of monthly stock data was in January 1976 and its market opening in August 1988. According to the International Finance Corporation (1988), some restrictions existed in that country on both entry and exit of foreign capital at the end of 1987.

## 4 METHODOLOGY

### *Principal component analysis*

The purpose of this analysis is to substitute a group of correlated variables for a group of new variables, which are not correlated. Such variables are lineal combinations of the correlated ones ordered in a way that their variances decrease from first to last.

Considering  $D = d_{ij}$  ( $i = 1, 2, \dots, n; j = 1, 2, \dots, p$ ) the data matrix with  $p$  variables ( $x_1, x_2, \dots, x_p$ ) and whose position  $r$  is the same as the number of variables ( $r = p$ ); it is possible to determine  $y_1, y_2, \dots, y_p$  with the following properties:

1) If each  $y$  is a combination of  $p$  variables  $x$ ,

$$Y_1 = x_1 u_{11} + x_2 u_{21} + \dots + x_p u_{p1}$$

$$Y_2 = x_1 u_{12} + x_2 u_{22} + \dots + x_p u_{p2}$$

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$$Y_p = x_1 u_{1p} + x_2 u_{2p} + \dots + x_p u_{pp};$$

1 2) If the sum of the squares of the coefficients  $u_{ij}$  is as the same as 1.

$${}^p \sum (u_{ij})^2 = 1;$$

$i=1$

1 3) If the lineal combinations of variables are ordered by their variances;



$$\text{Var } y_1 > \text{Var } y_2 > \dots > \text{Var } y_p;$$

1 4) If the new  $y$  variables are not correlated among themselves.

The main idea is that the first  $k$  new  $y$  variables, which are the principal components, can cope with the most of variability of the original data, disallowing the compute  $(p-k)$  that are less important components.

It is important to mention that this analysis is just a way to get a distinguished and perhaps, a more convenient, method of expressing the same group of results.

Through a notation of matrix, it is also possible to conclude that in order to get the principal components, the data matrix (which is denoted by letter  $D$  in a generic way and possesses  $p$  variables) must be transformed in another matrix  $F$  of hypothetical non-correlated variables and whose variance declines from first to last.

In order to get the transformation,  $D$  must be post-multiplied by an orthogonal matrix  $A$ , whose columns are, in a first type of solution, the normalized auto vectors. Such auto vectors are calculated from the smallest product moment of  $D$  matrix. Then,

$$F_{(n \times p)} = D_{(n \times p)} A_{(p \times p)}$$

The columns of  $A$  are ordered in such a way that the first one is consisted of  $p$  components of the auto vector associated to the greatest value of  $D'D$ . The second column corresponds to the auto vector calculated since the second greatest value and successively.

$F$  is recognized as the matrix of factorial scores, while  $A$  is the factorial load matrix. Taking into consideration such matrices, it is possible to reconstruct the original data table or approximate it, if the components' numbers or extracted factors are  $K < p$ .

Then,

$$D_{(n \times p)} = F_{(n \times p)} A'_{(p \times p)}$$

or

$$D_{(n \times p)} = A'_{(n \times k)} A_{(k \times p)}$$

For the second equation, it is possible to indicate the difference between the approximated value and the real one as a matrix of residues  $E$  ( $n \times p$ ), which allows for the completion of the model.

## 5. EMPIRICAL RESULTS

In this section, stock returns are presented. Tests were carried out considering the main stock market of South America: Brazil, Argentina, Chile and also USA, Mexico, Japan, UK and World Stock Market.

Thus, the study tried to verify which of the markets mentioned has had difference in their stock returns before and after the financial opening in emerging economies.

In order to calculate the stock returns, the SAS software was applied.

Table 1 – Stock Markets' correlations from 1975 to 2000

STOCK MARKET	WORLD	USA	UK	JAPAN	ARGENTINA	BRAZIL	CHILE
WORLD	1,00	0,80	0,70	0,71	0,01	0,17	0,10
USA	0,80	1,00	0,51	0,26	0,04	0,14	0,09
UK	0,70	0,51	1,00	0,40	-0,03	0,13	0,06
JAPAN	0,71	0,26	0,40	1,00	-0,01	0,10	0,08
ARGENTINA	0,01	0,04	-0,03	-0,01	1,00	0,02	0,14
BRAZIL	0,17	0,14	0,13	0,10	0,02	1,00	0,10
CHILE	0,10	0,09	0,06	0,08	0,14	0,10	1,00

Through analysis of the correlation matrix, a weak correlation is verified among explanatory variables and it is relevant to highlight that there is no need to determine principal components of variables of the model. Such variables are positively associated to the stock return of the world index. The multiple linear regression analysis allows identifying each variable's influence in the world stock return composition.

$$W = 0,0314 + 0,5355 \text{ USA} + 0,1496 \text{ IUK} + 0,2828 \text{ JP} \\ (t) (2,3191) (36,9417) (13,5007) (32,9140)$$

$$R^2 (\text{adjusted}) = 94,95\% \text{ DW} = 1,95 \text{ Shapiro - Wilk} = W = 0,9825 \\ [0,3986]$$

It is important to point out that the model above emphasizes a relation among the world stock market and the independent explanatory variables (stock markets from USA, UK and Japan). The world stock market increases 53% to each unit of variation in the stock market from USA, keeping the other ones constant. The world stock

market increases 15% to each unit of variation in the stock market from UK, keeping the other ones constant. The world stock market increases 28% to each unit of variation in the stock market from Japan, keeping the other ones constant. The other stock markets: Brazil, Argentina and Chile have a very weak correlation indicating no significant participation in the international climate.

After that, differences of stock returns from those countries are analyzed from 1975 to 2000 considering before and after the financial opening of emerging economies.

Table 2 – Difference of stock returns from 1975 to 2000

STOCK MARKET	Mean	Std. Dev	Minimum	Maximum	N
WORLD	1,009976	0,039898	0,828758	1,115690	291
USA	1,010579	0,042441	0,785384	1,129782	291
UK	1,010784	0,058588	0,782632	1,220327	291
JAPAN	1,011984	0,67028	0,805766	1,241836	291
ARGENTINA	1,043402	0,254539	0,350467	2,778603	291
BRAZIL	1,014683	0,160773	0,429445	1,569386	291
CHILE	1,019304	0,104317	0,717582	1,618728	291

Table 3 – Difference of stock returns from 1975 to 1989 (before) and 1999 to 2000 (after) the financial opening of emerging countries

STOCK MARKET	Mean (before)	Mean (after)	Difference	Std. Dev (before)	Std. Dev (after)	t- Value
WORLD	1,011111	1,008426	0,0027	0,039413	0,40662	0,566403
UK	1,012589	1,008319	0,0043	0,066645	0,045485	0,613531
USA	1,008530	1,013379	-0,0048	0,044663	0,039210	-0,962659
JAPAN	1,019693	1,001454	0,0182	0,059767	0,074807	2,310025
BRAZIL	1,009502	1,021759	-0,0123	0,159348	0,163086	-0,641792
ARGENTINA	1,056310	1,025771	0,0305	0,312074	0,141963	1,011056
CHILE	1,023368	1,013753	0,0096	0,119605	0,078940	0,776145

Through the table above, it is possible to verify that all stock markets, except for the one from Japan, have not indicated significant differences in stock returns during those periods. Despite the high level of volatility of some markets, the performances in both

periods have not had relevant change. Such fact shows that, in spite of the financial opening, the returns' performances in emerging countries kept similar to the one from previous period and with same high volatility feature.

If integration with the world markets makes the equilibrating process more efficient for stocks in emerging markets, it is reasonable to expect a drop in stock return volatility and a concomitant drop in expected returns. One may argue, however, that foreign investors are quick to react to changes in short-term economic outlook in emerging economies, making unrestricted capital flows very volatile. This volatility of capital flows may increase the volatility of the stock market.

### FINAL REMARKS

Upon considering the results of the analysis of the differences of stock return before and after the financial opening of emerging markets one may conclude that there were no significant differences of stock return during the period of December/1975 through April/2000.

It is important to mention that restricted peculiarities of national boundaries and of the socio-economic moment might reflect on a market index performance. Therefore, this issue enlightens the inferior performance of the Japanese market due to the strong recessive process faced by Japan especially during the nineties. Such point explains the significant difference of stock return only in Japan before and after the financial opening.

In the international climate, participations of emerging countries such as Brazil, Chile and Argentina were considered as slightly significant. It is important to emphasize that the financial opening and its integration can lead to systemic problems in the economies regardless of implementation of reforms. In spite of being fundamental, the adoption of safe macroeconomic policies does not guarantee capital flow maintenance.

Goetzmann and Jorion (1999) show a major caveat of our analysis, that is, it is based on a stationary model. Economies are never that simple. Global capital markets have been subject to dramatic changes during the twentieth century and many nations with brighter economics prospects in the 1920 witnessed significant drawbacks. This subsequently resulted to a failure to reward investors for their higher expectations. Investors are always willing to receive more data. This has become especially true for the application of modern

portfolio theory to the institutional asset allocation process, which requires quantitative estimates of risk and return. When long-term data series are unavailable for analysis, it has become common practice to use recent data only. The danger is that these data may not be representative of future performance. Although longer data series are of poorer quality, are difficult to obtain, and may reflect various political and economic regimes, they often paint a very different picture of emerging market performance.

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