



## Macroeconomic environment, country risk and stock market performance: Evidence for Brazil

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### ARTICLE INFO

#### Article history:

Accepted 12 May 2012

#### JEL classification:

E44  
E58  
E63  
H63

#### Keywords:

Monetary policy  
Public debt  
Credibility  
Reputation  
EMBI  
Ibovespa

### ABSTRACT

The paper aims at providing empirical evidence about (i) the influence of macroeconomic variables and economic policies on country risk and (ii) the influence of macroeconomic variables and country risk on the main Brazilian index of the stock market (Ibovespa). The study analyzes the role that macroeconomic fundamentals plays, but also the role that the credibility of the regime of inflation targeting and the reputation of the central bank play in lessening country risk and in the improvement of the stock market performance. The empirical evidence was obtained through the application of ordinary least squares (OLS), generalized method of moments (GMM) and GMM systems. The results found suggest that monetary policy and public debt management, as well as credibility and reputation affect country risk and the performance of the Brazilian stock market.

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### 1. Introduction

Since the beginning of the 2000s, developing countries have been benefited by an extremely favorable environment in the global economy, generated by high global liquidity. Abundant global liquidity and the positive economic performance of developing countries were responsible for the lowest country risk in the history of these countries, measured by JP Morgan “Emerging Markets Bond Index Global” (EMBIG) (Rocha and Moreira, 2010). Even during the global subprime crisis, emerging countries showed greater resistance to the crisis, being the last to feel its effects. At the height of the crisis, the highest level of EMBIG was significantly lower than those recorded during the crises in Russia (1998), Brazil (1999/2002) and Argentina (2001/2002). The level of country risk in these countries quickly returned to levels below 300 basis points in mid-2009.

In Brazil, one of the most important emerging economies in the world, the country risk measured by JP Morgan reached its lowest historical value in May 2007 (142 basis points). During the global financial crisis, the country risk in Brazil did not exceed 500 basis

points and quickly returned to levels below 250 basis points in the second half of 2009. Considering the good performance of the Brazilian economy during the subprime crisis and the rapid recovery of the Brazilian stock market, it becomes important to analyze the influence of macroeconomic factors for the reduction of country risk and its importance for the performance of the stock market in Brazil.

Due to the fact that Brazil adopted the regime of inflation targeting in 1999, and since then, fiscal and monetary authorities have been doing several efforts to keep inflation under control and enhance the performance of the economy, it is important to verify if such policies provided by the fiscal and monetary authorities, after the adoption of the regime of inflation targeting, have contributed for the reduction of the country risk and for the better performance of the stock market. Thus, this paper assesses the influence of macroeconomic variables on country risk, and as a consequence the influence of country risk on the Brazilian stock market.

In this sense, considering the period from December of 2001 to September of 2010, the paper provides empirical evidence about (i) the influence of macroeconomic variables and economic policies on country risk and (ii) the influence of macroeconomic variables and country risk on the main Brazilian index of the stock market (Ibovespa). The study differs from others in the literature of determinants of country risk and stock markets performance since it analyzes the role that macroeconomic fundamentals play, but also the

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role that credibility and reputation play in lessening country risk and in the improvement of the stock market performance.

For this purpose, the paper is organized as follows: next section presents a small review of the literature concerning the influence of macroeconomic variables on country risk and on the performance of stock markets; Section 3 presents empirical evidence through the application of ordinary least squares (OLS), generalized method of moments (GMM) and GMM systems about the relation between macroeconomic variables, country risk and the main Brazilian index of the stock market (Ibovespa). The last section shows the conclusion.

## 2. The literature on the determinants of country risk and stock market performance

There are several studies that examined the relationship between country risk and the internal and external economic factors. Some argue that shocks originating in developed countries are primarily responsible for the evolution of country risk and thus emphasize the external factors (Calvo, 2002, 2005; García-Herrero and Ortíz, 2006; Kamin and von Kleist, 1999; Rozada and Yeyati, 2006). On the other hand, another part of the literature studies the effects of domestic economic fundamentals in the determination of the country risk (Arora and Cerisola, 2001; Çulha et al., 2006; Eichengreen and Mody, 2000; Kamin, 2002).

The work of Arora and Cerisola (2001) analyzed the effect of U.S. monetary policy on sovereign spreads as well as the influence of domestic macroeconomic fundamentals over the country risk. The evidence found suggests that the macroeconomic fundamentals of individual countries—such as the adoption of responsible fiscal policy—are extremely important to reduce the country risk.

Çulha et al. (2006) analyzed both short-run and long-run determinants of the sovereign spreads in a set of 21 emerging countries over the period 1998–2004. They worked with daily and monthly data, and they estimated individual regressions for countries and panel regression. The evidence showed that domestic macroeconomic variables have significant influence on the behavior of short-term country risk.

Regarding Brazil, some studies attempted to investigate the relationship between country risk, macroeconomic variables and the domestic capital market (Andrade and Teles, 2005; Blanchard, 2005; Favero and Giavazzi, 2005; Teixeira et al., 2008).

Andrade and Teles (2005) analyzed the effect of macroeconomic policies on the Brazilian country risk in the period from January 1991 to December 2002. They used a model called Country Beta Market Model, where the country risk is a time varying coefficient. The study showed that monetary policy played a relevant role, i.e., the interest rate exerted a negative influence over the Brazilian country risk. Besides, it observed that international reserves had a negative effect over the country risk.

Favero and Giavazzi (2005) showed that, in Brazil, important financial variables, like exchange rates and domestic interest rates, fluctuated parallel to the EMBI spread over the period 1999–2003. For its turn, Blanchard (2005) estimated the probability of default of the Brazilian government by using EMBI spread data. He showed that the EMBI spread and the probability of default moved together over the 1995–2003 period.

The work of Teixeira et al. (2008) examined how the Brazilian country risk, in the period from 1992 to 2003, was influenced by some fundamental macroeconomic variables (such as GDP growth, fiscal surplus, debt Public, inflation rate, current account balance and international reserves). The results indicated that the country risk is influenced by the deviations of the domestic economic variables from their long-run tendencies in different points of time. However, if we assume that the intensity and direction of those deviations depend on external conditions, the results show that, in the long run, the external scenario has the greatest influence over the country risk. The work of Ferreira (2010) found evidence that macroeconomic fundamentals, such as current account balance as a percentage of GDP,

public debt as a percentage of GDP and international reserves, largely explain the evolution of country risk in Brazil.

Regarding the theoretical literature on the relationship between capital market and macroeconomic variables the works of Dornbush and Fischer (1980), Blanchard (1981), Hansen and Singleton (1983) and Campbell (1993) may be highlighted. Regarding the empirical literature, the works of Nelson (1976), Jaffe and Mandelkar (1976), Fama and Schwert (1977), Fama (1981), Chen et al. (1986), Poon and Taylor (1991), Gjerde and Sættem (1999), Binswanger (2000), Nieh and Lee (2001) and Kim (2003) should be highlighted.

The works of Nelson (1976), Jaffe and Mandelkar (1976) and Fama and Schwert (1977) analyzed the relationship between macroeconomic factors and stock returns in United States and concluded that macroeconomic variables influence stock returns.

Fama (1981) found evidence that real stock returns are positively related to the measures of real activity like capital expenditures and that the inflation and money supply affects the stock market returns negatively.

The work of Chen et al. (1986) examines the relationship between the market returns and macroeconomic factors. They found strong relationship between the market returns and the macro variables, such as industrial production, changes in the risk premium and the expected and unexpected inflation in United States. However, due to the fact that their theoretical assumptions are far from proposing a model consisting of all factors, Poon and Taylor (1991) argued that results of Chen et al. (1986) are spurious.

In this sense, Poon and Taylor (1991) suggested using ARIMA models to overcome this problem. For the UK economy, Poon and Taylor (1991) found no empirical evidence that the macroeconomic factors affect the stock returns. Other studies, such as Gjerde and Sættem (1999) (regarding Norway) and Binswanger (2000) (regarding US and G-7), also found no empirical evidence that the macroeconomic factors affect the stock returns.

Regarding the interaction between exchange rate and stock prices, several studies have tried to determine both the causal relations and the type of existing correlation, which still remain unresolved in both theory and practice. For instance, the work of Nieh and Lee (2001) examined the relationship between stock prices and exchange rates for G-7 countries and take the daily closing stock market indices and foreign exchange rates for the period from October 1, 1993 to February 15, 1996. They found that there is no long-run equilibrium relationship between stock prices and exchange rates for each G-7 countries. While one day's short-run significant relationship has been found in certain G-7 countries, there is no significant correlation in the United States. In turn, the work of Kim (2003) uses monthly data from January-1974 to December-1998 in the US and the empirical findings of the study reveal that S&P's common stock price is negatively related to the exchange rate.

In turn, some works have investigated the spillover effects between financial markets. Particularly, these studies focus mainly on the linkages between the US and various stock markets in industrialized countries of Europe and East Asia (e.g., Baur and Jung, 2006; Hamao et al., 1990; Lin et al., 1994). For instance, the work of Hamao et al. (1990) analyzed the short-term interdependence of prices and price volatilities across the Tokyo, London, and New York stock markets, and found that US stock returns significantly influence the markets in London and Tokyo.

## 3. Empirical evidence for the Brazilian economy

Since 1999 the Brazilian economy presents a strategy for conducting the fiscal policy focused on the decreasing of public debt/GDP ratio.<sup>1</sup> Also in 1999 the National Monetary Council determined inflation targeting as the new strategy for the monetary policy. The

<sup>1</sup> The main pillar for this strategy is the adoption of primary surpluses.

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