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Influence of the Investor's Short-Term Horizon on IPO Performance: An Emerging Markets Perspective

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***Keywords*— Investor Sentiment, Behavioral Finance, Country Risk, IPO.**

***Abstract*—** *The present study aimed to investigate the relationship between investor sentiment and the return on the first day of an IPO, moderated by emerging market risk factors, from 2013 to 2021. The sample included 105 companies that carried out an IPO in this period. The econometric method used was the regression analysis. As main results, it was observed that investor sentiment, measured by market variables and trading volume, positively affected returns on the first day of the IPO, even when moderated by idiosyncratic country risk factors. Thus, the research hypotheses were accepted. In addition to the debate on the influence of investor sentiment on the performance of IPOs, the theoretical contribution of the research involves the empirical expansion of the effects of country risk factors. Therefore, it was concluded that investors seek returns on the first day of the IPO, considering their sentiment towards the market and reacting positively to the risk factors of emerging markets.*

I. INTRODUCTION

Recent studies in the field of Behavioral Finance highlight a new scenario in which attention turns to the impact of investors' bounded rationality and its influence on market behavior and asset returns. For Santos (2017), investors are motivated by sentiment, contributing to the prices distancing from their fundamental value, especially when the market is optimistic. Thus, the preference for asymmetry can be understood as the behavior in which agents show a preference for asymmetric returns, not following fundamentalist indicators (Brunnermeier; Gollier; Parker, 2007).

An example of this type of behavior is underpricing in IPOs. Ibbotson (1975) defined "underpricing" as the difference between the closing price of the stock on the first trading day and the subscription price in the initial offering. When the issue price is lower than the one reached at the close of the first trading day, underpricing occurs. Rock (1986) argued that underpricing occurs due to information asymmetry between the issuer and new investors. Therefore, the share is measured at a price lower than the fair value to attract more investors.

Since then, research on underpricing has been carried out under different approaches, such as: abnormal returns (Stoll and Curley, 1970), underwriter autonomy (Baron, 1982), "hot issue" and "cold issue" (Ritter, 1984), "winner's curse" (Rock, 1986), company size (Welch, 1989), speculation (Ritter, 1991), investor attractiveness (Benveniste and Busaba, 1997), intentional underpricing to attract investors (Krigman, Shaw, and Womack, 1999), information asymmetry (ljungqvist, 2005; Green and Hwang 2012); influence of individual investors (Colaco, De Cesari and Hedge, 2017) and investor sentiment (Zainudin, Zaki, Hadi, Hussain and Kantakji, 2019; Che-Yahya and Matsuura, 2021).

However, according to Agathee, Sannasse and Brooks (2012), there is still no framework that integrates all the factors that affect underpricing. Increasingly, under the lens of theories such as signaling, agency, information asymmetry and investor sentiment, theoretical models have been developed to help in understanding underpricing. However, all this variety demonstrates the complexity involved in evaluating performance in Initial Public Offerings (IPO). The works developed usually assumed that the initial returns of an IPO were extracted from a normal distribution. Nevertheless, with the development of new research, it was observed that the IPOs prices were stabilized by their underwriters (Asquith; Jones; Kieshnick, 1998).

When investors oppose expected utility principles and are not so risk averse, they ought to prefer skewed positive yield distributions (Veras Machado *et al.*, 2020). Green and Hwang (2012) stated that IPO returns are related to a preference for asymmetry, in which IPOs with a high asymmetry expectation offered significantly higher returns on the first day. He (2012) highlighted that it is common for the underlying issue of investor sentiment to be about how investors interpret and react to news to shape their positions because it is understood as a belief about future cash flows and investment risks that cannot be justified by the facts.

Colaco, De Cesari and Hedge (2017) observed the influence of individual investors on the valuation of companies during IPOs. Thus, as observed by Veras Machado *et al.* (2020), empirical research aimed at explaining the behavior of stock prices through investor sentiment and bounded rationality, soon after an IPO issuance, is important. The diversity of approaches may be a factor that makes it difficult to reach a consensus on the metrics to evaluate the IPOs performance. Despite the existence of several studies on underpricing, there still are some gaps to make new inferences in the Brazilian stock market, essentially due to its emerging market characteristics, which differ significantly from the capital markets of developed countries, such as the USA. One of these gaps is assessing the influence of investor sentiment in its short-term horizon on the performance of companies at the time of the IPO, considering the risk factors of emerging markets. From this gap, the following research problem arises: **What is the moderating effect of country risk factors on the relationship between investor sentiment in the short term and the IPO performance in emerging markets?** To answer the problem, this study will aim to analyze the moderating effect of country risk factors in the relationship between short-term investor sentiment and the IPO underpricing performance from the companies listed on Brasil Bolsa and Balcão - B3 from January 2013 to December 2021.

Investigating underpricing in the Brazilian environment is justified because, as Daily et al. (2003) argue, there is a growing interest from researchers in understanding the underpricing phenomenon not only empirically, but also through the establishment of theoretical connections. Brazil stands out in terms of relevance among emerging countries, due to the recent growth in the attractiveness of the Brazilian capital market for national and foreign investors, motivated, among other factors, by the significant reduction in interest rates on government bonds promoted by the Brazilian Central Bank in recent years.

This research will also bring theoretical contributions, as it reinforces the debate on IPO performance. The study contributes to the literature related to underpricing, particularly in the Brazilian environment, as it advances in empirical research on the relationship between investor behavior and the companies' performance in their Initial Public Offering, developing the connection established by recent literature on the subject, with the Catering Theory. The study is also justified by the importance of analyzing factors that are complementary to the Finance Classical Theory ones, such as studies that assess variables of economic-financial performance as a variable of the intrinsic value of shares. The article also contributes by offering performance assessment and comparison tools so that equity investors can evaluate their portfolios, also considering the influence of investor sentiment on the IPO performance.

In addition to this section, the article will be organized in four other ones. The second section addresses the theoretical framework, which contextualizes the underpricing phenomenon, the investor's short-term horizon and the risk factors of emerging markets. In the third part, the methodology used in the research is presented. The fourth section contains the results obtained during the research and, finally, the last section presents the final considerations.

II. THEORETICAL REFERENCE AND RESEARCH HYPOTHESES

2.1 IPO Underpricing

Underpricing is characterized and conceptualized in the literature in several ways, such as: phenomenon, anomaly, obstacle, attraction strategy in environments with high information asymmetry (Rodarte, & Camargos, 2009). Underpricing, which, according to Ibbotson (1975), is equivalent to the difference between the share price on the first day and the share issue price in the initial offering, is present in a significant number of IPOs. When the issue

price is lower than the one reached on the first trading day, underpricing occurs. To Rock (1986), underpricing occurs due to the asymmetry of information between the issuer and new investors. The stock is advertised at a lower price than fair value to attract more investors. Johnston and Madura (2009) add that the greater the information asymmetry between the company and the market, the greater the underpricing.

The first studies on underpricing in IPOs were carried out by Akerlof (1970), Stoll and Curley (1970), Logue (1973), Ibbotson (1975) and Reilly (1977). The results found in these surveys showed that stock returns on the first trading day after the IPO were positive and higher than market returns. However, when analyzing long-term returns, the authors found some lower than the market ones.

These results were also confirmed in other studies, such as Ritter (1991), Loughran and Ritter (1995), and Ritter and Welch (2002) in the American market. In Brazil, although still incipient, the analysis of stock returns in the short and long term can be found in the research by Teixeira et al. (2012), Saito and Maciel (2006), Procianoy, Cigerza (2008), Rodarte and Camargos (2013), and Kreuzberg and Rodrigues Jr (2017).

For Ritter and Welch (2002), underpricing is a natural practice, since agents who sell shares have more information than buyers. Therefore, underpricing is seen as an award offered to new investors for negotiating with agents who have more information about the business. However, when this difference in the share price is very high, what happens is the excessive loss of primary shareholders, harming the company (Leal, 2001). Thus, to Ibbotson (1975), Ritter (1984), Booth and Chua (1996), Howton, Howton and Olson (2001), Daily, Certo, Dalton and Roengpitya (2003), the most recommended indicator for measuring performance of going public is underpricing.

Recent theories, each starting from a different set of assumptions, show that idiosyncratic asymmetry may be a component that consequently impacts stock returns when inserted in prices (Brunnermeier; Parker, 2005; Huang et al., 2006; Mitton; Vorkink, 2007; Brunnermeier; Gollier; Parker, 2007). Although the understanding derived from more traditional finance theories states that the idiosyncratic asymmetry of a stock should be irrelevant, the behavior of several investors has been contrary to this concept (Boyer; Mitton; Vorkink, 2009), essentially when considering the investor sentiment, caused by the short-term horizon as advocated by catering theory.

Underpricing occurs in the IPO context. The decision to go public (Initial Public Offering – IPO) derives from the growth of companies and the need for more resources for the expansion of activities (Teixeira, Barbosa & Souza, 2012). Another motivation for entering the capital market is the opportunity to minimize the cost of capital and the possibility of increasing the reputation and publicity of companies (Modigliani & Miller, 1963; Maksimovic & Pichler, 2001).

Green and Hwanf (2012) found evidence that initial public offerings with a high expectation of asymmetry offered significantly higher returns on the first day. When studying the IPOs carried out in the North American market between 1997 and 2010, Loughran and McDonald (2013) report that higher levels of uncertainty promoted higher returns on their first day. Yoshinaga & Castro Junior (2012) found a negative relationship between the investor sentiment and future stock returns, suggesting a reverse pattern in them. That is, after a period of bullish sentiment, the subsequent impact of stock returns is negative. Aissia (2014) found that IPOs with high initial returns had a high idiosyncratic asymmetry influenced by the investor sentiment. For Gao, Meng and Chan (2016), if the sentiment of individual and institutional investors is positively correlated with the IPO first day in the short term, only the sentiment of individual investors is relevant in the long-term return. Bonaventura, Giudici and Vismara (2017) report a tendency for underwriters to target overvalued stocks to individual investors, capitalizing on their appetite for high returns in the early days of the IPO. Cesari and Hedge (2017) showed greater presence and attention of individual investors to the high initial valuations of companies when analyzing IPOs from 2004 to 2011 in the American market.

2.2 The Investor Sentiment and the Catering Theory

The focus of corporate decisions may turn to the short term at the expense of the long term. This action focuses on the idea that managers suffer external influences, usually from investors with a short-term investment horizon, resulting in managerial decisions that conflict with the companies performance (Stein, 1996; Bushee, 1998). Derrien, Kecskés & Thesmar (2013) argue that managers have the appropriate timing to adjust their results to keep stock prices above their fundamental value during bullish moments in the market, when stocks are expected to be overvalued.

From the studies of Stein (1996), the theoretical basis of the Catering Theory finds its propositions. In this context, managers serve the interests of investors according to their investment horizon (short or long terms). The short-term bias, characterized by short-termism, encourages investment funds to dispense with shares of companies that do not meet quarterly performance targets, leading large players to adopt the same mechanism (Phelps, 2010).

Consequently, managers have the discretion to act in search of short-term growth and current profits, whether based on context (Gryglewicz, Mayer, & Morellec, 2019) or opportunism (Terry, 2017). To Glushkov & Bardos (2012), even with the preference for time-varying growth, managers will act in favor of managerial short-termism, in an attempt to maximize the current stock price.

In periods of high sentiment, there is an opportunity for managers to boost current stock prices, inflating their earnings (Baker & Wurgler, 2011; Simpson, 2013). In the case of publicly traded companies, listed on the stock exchange, moments of market optimism are opportune to make decisions aimed at maximizing share prices (Miranda, & Veras Machado, 2020). If investors are interested in the increase in stock prices, whose reversal to the fundamental value is late, it is expected that the earnings report can be managed to avoid a decrease in earnings as it contains discretionary aspects of management, or by aversion to the disclosure of losses (Z. Zhu, Sun, & Yung, 2020).

In this context, two points are important: the opportune moment for the manager to meet market pressures and the identification of investors with a short-term investment horizon (Miranda, & Veras Machado, 2020). The identification of the opportune moment from bad pricing of assets is studied by different aspects: discretionary accruals (Polk & Sapienza, 2009), book-to-market index (Alzahrani & Rao, 2014), Tobin's Q (Zhaohui & Wensheng, 2013) and investor sentiment indexes (Baker & Wurgler, 2007; Rajgopal, Shivakumer, & Simpson, 2007; Simpson, 2013; Sibley, Wang, Xing, & Zhang, 2016; Shen, Yu, & Zhao, 2017). In this context, the investment horizon follows the tendency to meet market pressures, especially in shares of companies that have high trading volume, and are more subject to the influence of optimistic investors and market speculators.

In view of the above, we have the following research hypothesis:

H1: Short-term investor sentiment positively influences stock returns on the first day of listing companies.

The hypothesis will be tested by the following model:

$$R_{IPO} = \beta_0 + \beta_1 VN_{i,t}\lambda_{i,t} + \beta_2 SI_{i,t}\lambda_{i,t} + \beta_3 ID_{i,t}\lambda_{i,t} + \beta_4 TM_{i,t}\lambda_{i,t} + \beta_5 RV_{i,t}\lambda_{i,t} + \beta_6 PA_{i,t}\lambda_{i,t} + \beta_7 CM_{i,t}\lambda_{i,t} + \varepsilon$$

In which:

R_{IPO} : return of the first IPO day from share i on date t;

B_0 a B_7: represent the coefficients to be estimated;

$VN_{i,t}$: logarithm of the turnover average on the first month;

$\lambda_{i,t}$: the importance of the attributes;

$SI_{i,t}$: investor sentiment in the month prior to the IPO;

$ID_{i,t}$: number of years since the company was founded at the time of the IPO;

$TM_{i,t}$: company size represented by the asset Ln;

$RV_{i,t}$: percentage change in prices of share i on date t;

$PA_{i,t}$: proportion of held and offered shares;

$CM_{i,t}$: Market Return 15 days before the IPO;

ε: regression error.

2.3 Emerging Markets Risk Factors

EMBI+ (Emerging Markets Bonds Index Plus) which estimates the daily performance of emerging country debt bonds in relation to US Treasury bonds, helps investors understand the risk of investing in the country. The literature highlights that the level of investor protection and the effectiveness of corporate governance mechanisms provided by companies to market participants in countries under development are different from those observed in developed countries (Berkowitz et al., 2003; Latridis, 2012; Bao and Lewellyn, 2017).

Although most of the published works that address the shares performance at the time of IPO focus on the American market, as it is the largest and most liquid corporate debt market in the world, there is also a growing movement to produce works on the theme in other markets, such as: Wasserfallen and Wydler (1988), who observed the phenomenon in the Swiss market, and Matsui (2006), who carried out a similar study in the Japanese market. Although still in its infancy, studies that examine the characteristics of debt securities are also growing in the Brazilian market, with a vast discussion on the impact of secondary market liquidity on asset profitability (Unterberger, 2012).

According to Ibbotson and Ritter (1995), the first study on underpricing in the stock market was documented in the SEC (Securities and Exchange Commission), in 1963. He mentions that the phenomenon of underpricing exists in all countries that have a stock market, but that the amount varies from nation to nation. Still, some seminal studies, of a descriptive nature, were pioneers in presenting elements about the financing pattern of companies in emerging markets. Among them are those by Singh (1994), Glen and Pinto (1994), and Booth, Aivazian, Demirgüç-Kunt and Maksimovic (2001). Some of these studies concluded that companies from emerging markets used equity more than

debt capital in their capital structure, even considering that the equity market in emerging countries is still developing.

In general, studies that address the capital structure of companies from emerging countries conclude that being in a particular country is an important element to explain a company's capital structure decision, for example: De Jong, Kabir and Nguyen, 2006; Jalal, 2007; Glen and Singh, 2004; and Fan, Titman and Twite, 2006. Glen and Sing (2004) observed that companies in emerging economies use less long-term debt than those based in developed markets. They found that the level of funding through debt issuance is falling over time in emerging economies. Myers (1984) proposes two approaches to dealing with capital structure: tradeoff and pecking order. For the former, the company would establish a target indebtedness and gradually move towards it, and for the latter, the company would adopt an order of preference (hierarchy) in its form of financing, prioritizing internal over external financing.

Baker and Wurgler (2011) argue that the environment of optimism predicts a hierarchy in financing decisions. According to the authors, a manager would never sell their capital at inopportune moments; however, overconfidence may reverse the hierarchy proposed by the pecking order. If overconfidence is modeled as reducing earnings risks, managers may view their debt as undervalued and too expensive as a source of capital. On the other hand, managers may perceive their actions as overvalued under the influence of optimism (Machado & Miranda, 2020).

In view of the above, we have the following research hypothesis:

H2: Emerging market risk factors positively influence on the relationship between investor sentiment in the short term and stock returns on the companies' first day of listing.

The hypothesis will be tested by the following model:

$$R_{IPO} = \beta_0 + \beta_1 VN_{i,t}\lambda_{i,t} * EMBI + \lambda_{i,t} + \beta_2 SI_{i,t}\lambda_{i,t} * EMBI + \lambda_{i,t} + \beta_3 ID_{i,t}\lambda_{i,t} + \beta_4 TM_{i,t}\lambda_{i,t} + \beta_5 RV_{i,t}\ \lambda_{i,t} + \beta_6 PA_{i,t}\ \lambda_{i,t} + \beta_7 CM_{i,t}\lambda_{i,t} + \varepsilon$$

In which:

R_{IPO} : return of the first IPO day from share i on date t;

B_0 a B_7: represent the coefficients to be estimated;

$VN_{i,t}$: logarithm of the turnover average on the first month;

$\lambda_{i,t}$: the importance of the attributes;

$SI_{i,t}$: investor sentiment in the month prior to the IPO;

EMBI+: Emerging Markets Bond Index Plus

$ID_{i,t}$: number of years since the company was founded at the time of the IPO;

$TM_{i,t}$: company size represented by the asset Ln;

$RV_{i,t}$: percentage change in prices of share i on date t;

$PA_{i,t}$: proportion of held and offered shares;

$CM_{i,t}$: Market Return 15 days before the IPO;

ε: regression error.

III. METHODOLOGY

Delimited by the research goal, which consists of evaluating the moderating effect of country risk factors on the relationship between the investor sentiment in the short term and the IPO performance from companies listed on *Brasil, Bolsa and Balcão – B3* from January 2013 to December 2021, the research can be characterized as descriptive, as proposed by Collis & Hussey (2005), since it presents the market performance of Brazilian companies at the time of listing on B3, establishing a correlation with the investor sentiment on the short-term horizon, moderated by country risk factors. With regard to the procedures adopted, the research is documentary as it collects data in documents from the Refinitiv Eikon® database, in the IPO prospectuses and in the reference forms on the B3 website. Regarding the approach to the problem, the research is quantitative because a statistical method was used for the treatment and analysis of data (Fávero and Belfiore, 2017).

3.1 Population and sample

Companies listed on B3 from January 2013 to December 2021 will be considered as the research population, with a sample of companies that presented all the information necessary for the research, consisting of 105. Thus, according to the defined selection criteria, the number of companies observed per year can be verified in the sample presented in Table 1.

Table 1 – Total number of IPO

Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
IPO number	10	1	1	1	10	3	5	28	46	105

Source: Research data (2022).

3.2 Data collection and research variables

The variables adopted to achieve the research goal are those identified in the literature. To measure the IPO performance, the return on the first day of the stock IPO was used as follows (Loughran and Mcdonald, 2013):

$$R_{IPO} = LN\left(\frac{PFechamento\ it}{PAberturait}\right) \quad \text{Equation 01}$$

To measure the investor sentiment, the proxies used are: the trading volume (VN) according to Aissia (2014) and the sentiment index. This way, the sentiment index (SI) was used, adapted from the model by Baker and Wurgler (2006), using the following proxies: the ratio between the number of securities traded by rising and falling stocks (NEI), the number of IPOs and Follow-on (NIPO), the ratio between the volume of shares traded in relation to the number of transactions with shares and debt (AD), the participation of individual investors in the IPO and Follow-on (InvInd), the participation of foreign investors in the IPO and Follow-on (InvEst), and the interest rate on government bonds (TJLP) to measure the attractiveness of capital, according to the following equation:

$$SI_t = NEI_t + NIPO_{t-12} + AD_t + InvInd_t + InvEst_t + \text{TJTP} \quad \text{Equation 02}$$

To measure the characteristics of emerging markets in Brazil, the Emerging Markets Bond Index Plus – EMBI+ (Brazil Risk), created by JP Morgan to estimate the daily performance of debt securities of emerging countries in relation to US Treasury bonds, will be used.

The control variables, which consider an uncertainty factor that impacts the initial returns, were used in this study according to a model adapted from Aissia (2014): company age (ID), company size (TM), which replaces the company's sector, the absolute value of the percentage change in prices (RV), proportion of held and offered shares (PA), as well as the market return inherent in the 15 days prior to the IPO date (CM).

Table 2 presents a summary of the indicators and variables used in the research.

Table 2 – Research variables

Variables	Definition	Formula	Collection	Authors
IPO Performance (dependent variable)				
Underpricing R_{IPO}	Share performance in the IPO	Equation 01	Refinitiv Eikon ® and B3	Loughran and McDonald (2013)
Investor Sentiment (independent variable)				
SI	Investor Sentiment Index	Equation 02	Refinitiv Eikon ® and B3	Baker e Wurgler (2006)
VN	Trading Volume	Average logarithm of the turnover on the first month	Refinitiv Eikon ® and B3	Aissia (2014)
Moderator variable				
EMBI+	Brazil Risk	Index calculated by JP Morgan	IPEA data	Cai *et al*. (2003)
Control Variables				
ID	Company age	Number of years from foundation to IPO	Refinitiv Eikon ® and B3	Aissia (2014)
TM	Company size	Asset LN		
RV	Percentage change in prices	△ of the share price		

PA	Proportion of held and offered shares	$\frac{Held\ shares}{Offered\ shares}$		
CM	Market Return 15 days before the IPO	△ of market return 15 days prior to IPO		

Source: Research data (2022).

3.3 Data analysis procedure

After collecting the data through the Refinitiv Eikon® database, they will be tabulated in electronic spreadsheets to perform the calculations in the Microsoft Excel® program. Due to the variations identified in the data of the companies studied, such as values on different scales in their results, the data will be normalized and the Entropy will be used to define the importance of the attributes classified as independent and control variables, according to Zeleny (1982). The model and data normalization equations, as per Tambosi et al. (2021), are shown below:

Here, $d_i = (d_i^1, d_i^2, ..., d_i^n)$ are the normalized values, in which: $d_i^k = \frac{xi^k}{xi^*}$, characterizing the D set as the i-th attribute. We define $D_i = \sum_{k=1}^{n} \frac{di^k}{di} LN\left(\frac{di^k}{di}\right)$, in which $\alpha = \frac{1}{emax} > 0$ and $e_{max} = LN(m)$. It is highlighted that $0 \leq d_i^k \leq 1$ and $d_i^k \geq 0$. In the event that all k i d are identical for a given i, in such case $\frac{di^k}{di} = \frac{1}{n}$ e $e(d_i)$ admits maximum value, that is, $e_{max} = LN(m)$. By setting $\alpha = \frac{1}{emax}$, we designate $0 \leq$ and $(d_i) \leq 1$ to all the d_i's. Such normalization is essential for comparison purposes. The total D entropy is determined by: $E = \sum_{i=1}^{n} e(di)$.

As the weight $\lambda i^{\sim}$ is oppositely concatenated to $e(d_i)$ is used $1 - e(d_i)$, instead of $e(d_i)$, and normalized to ensure that $0 \leq o\ \lambda i^{\sim} \leq 1$ e $\sum_{i=1}^{n} \lambda i \cong 1$. Thus, we have: $\lambda i^{\sim} = \frac{1}{n-E}[\ 1 - e\ (d_i)] = \frac{[1-e\ (di)]}{n-E}$.

Having established the indicators and weights to be used, the following procedure is based on testing the models that will be used to analyze the relationship between the returns on the first day of the IPO and its relationship with the variables related to the investor, emerging markets and control sentiment.

IV. RESULTS ANALYSIS

Table 3 shows the descriptive statistics for the variables used in the study, that is: mean, median, standard deviation, minimum and maximum.

Table 3 – Descriptive statistics of variables

Variables	From 2013 to 2021				
	Mean	Median	S. D.	Minimum	Maximum
RIPO	0.0900	0.0007	0.1235	-0.2555	0.6779
SI	0.6980	0.6710	1.1770	-2.6370	2.1240
VN	23.1635	22.9183	0.6223	22.3363	24.3659
RV	22.5563	20.9350	11.9664	10.2000	123.9400
ID	29.6762	24.0000	21.2958	1.0000	101.0000
TM	14.4199	14.1940	14.1940	9.0045	21.3543
PA	0.0050	0.0046	0.1087	0.000	0.5050
CM	0.1148	0.1155	0.2834	10.7195	11.7722
EMBI+	285.0000	270.0000	70.1130	146.0000	531.0000

Key: RIPO: Return on IPO; SI: Investor Sentiment Index; VN: Trading Volume; RV: Percentage Change in Prices; ID: Company Age; TM: Company Size; PA: proportion of shares held and offered; CM: Market Return; EMBI+: Brazil Risk; S. D.: Standard Deviation.

Source: Research data (2022).

As can be seen, the average return on the first day of the IPO for the companies that made up the sample was 9%, but with companies presenting up to 68%. This finding was lower than the average returns of similar studies in the North American market, such as that of Green and Hwang (2012), who found an average of 14.34% from 1975 to

2008, and the study by Lowry, Officer and Schwert (2010), who obtained an average return for the first day of the IPO of 16.6% from 1965 to 2005. Comparing with studies carried out in Brazil, this finding was higher than the average return of similar studies such as Veras Machado *et al.* (2020), who found an average return of 1.00% from 2005 to 2017. Thus, in line with previous studies, the return on the first day of the companies' listing was positive, suggesting the occurrence of Underpricing in IPO.

Loughram and McDonald (2013), when studying the behavior of the returns of the first day of IPO for North American companies from 1997 to 2010, obtained even higher returns: 34.80%. Aissia (2014), when carrying out a similar study in the French financial market, found an average return of 30.32%. The author highlights that IPO returns are related to market returns, which have increased over the years. Therefore, the difference found in the studies between the highest and lowest returns can be explained by the selected period of analysis or by intrinsic characteristics of the Brazilian stock market.

The investor sentiment index recorded more pessimistic moments at its minimum value of -2.6370 and more optimistic at its maximum value of 2.1240, with the sample showing an average sentiment more prone to optimism: 0.6980. The logarithm of the average volume in the first month after the IPO proved to be less dispersed and composed of companies with an average volume of 23.1635, close to the maximum value of 24.3659, denoting the companies' liquidity. The percentage variation of the average market return in the analyzed period was approximately 22.5% and showed greater dispersion with a standard deviation of 11.9664.

Regarding the return 15 days prior to the IPO, it is observed that companies had a return of 11.49% on average, reaching 11.77%. Considering the standard deviation of 0.2834 in relation to this average value, the returns for the 15 days prior to the IPO are dispersed. As for the age of the companies, it can be seen that the companies in the sample had an average of 30 years of existence at the time of the IPO, with the oldest company in the sample being 101 years old. Regarding the natural logarithm of assets, companies have an average size of 14.4199. Finally, it was observed that the companies held less than 0.5% of the shares in treasury, which demonstrates the characteristic of these public offerings of making all the capital offered available, while the Brazil Risk presented an average of 285 points close to the maximum value, evidencing greater risk during the period.

Table 4 – Pearson Correlation

Variables	RIPO	SI	VN	RV	ID	TM	PA	CM	EMBI+
RIPO	1	0,01**	0,049**	0,015**	0,014	0,050	0,040*	0,170	0,438*
SI		1	0,488	0,482	-0,171	-0,141	-0,034	0,476	0,594
VN			1	0,634	0,029	-0,089	0,028	0,449*	0,416
RV				1	-0,055	-0,095	0,021	0,206	0,618
ID					1	0,251	-0,105	-0,078	0,055
TM						1	-0,021	-0,189	-0,080
PA							1	-0,006	0,040
CM								1	0,389
EMBI+									1

Key: RIPO: Return on IPO; SI: Investor Sentiment Index; VN: Trading Volume; RV: Percentage Change in Prices; ID: Company Age; TM: Company Size; PA: proportion of shares held and offered; CM: Market Return; EMBI+: Brazil Risk;

Notas: Significance levels: * p<0,1, ** p<0,05, *** p<0,01.

Source: Research data (2022).

Table 4 demonstrates the correlation matrix to verify the degree of association between each of the variables, helping to verify the multicollinearity of the model. The matrix generally indicated a low correlation between the variables. In the group of explanatory variables, the highest correlation recorded (in absolute terms) was between the Trading Volume (VN) and the Percentage Change in Prices (RV), with a positive coefficient (0.634). The returns on the first day of the IPO (RIPO) have a positive correlation with all independent variables, deviating from the expected relationship for the variables company age (ID) and the proportion of shares held and offered (PA).

Table 5 – Results of Model 1 Estimates

Panel A - Regression Result								
Variables	Constant	SI	VN	RV	ID	TM	PA	CM
Coefficients	-0.092	0.018**	0.476**	0.017**	0.000	0.054*	0.265***	0.238
Standard Error	0.024	0.005	0.004	0.003	0.000	0.007	0.098	0.219
t-statistic	-1.207	2.219	1.676	1.355	1.210	1.512	2.701	1.084
VIF		1.556	1.858	1.080	1.162	1.114	1.029	1.581
Panel B – Regression Adjustments								
R^2		Adjusted R^2			F-statistic		DW	
0.352		0.340			2.335 (0.038)		1.845	

Key: ***Significance at the 1% level, **Significance at the 5% level, *Significance at the 10% level

Source: Research data (2022).

The low correlation between the explanatory variables shown in Table 4 suggests evidence of an inexistent multicollinearity between the model variables. Even so, as shown in Table 5, the variance inflation factor (VIF) test was carried out to test hypothesis 1, which demonstrates the inexistence of multicollinearity problems, considering that its values, according to Hair, Black, Babin, Anderson and Tatham (2009), are between 1 and 10. It was also verified that the *Durbin-Watson* presented a value very close to 2 for the analyzed model, demonstrating that the independence of errors in the analyzed data is satisfactory and that there is no autocorrelation between the residuals (Fávero & Belfiore, 2017).

The coefficients presented in Table 5 (Panel A), with the exception of company age before at the IPO (ID), and the Ibovespa return in the 15 days prior to the IPO (CM), proved to be significant. Regarding the expected sign, the proportion of shares held in relation to those offered (PA), although with a significant coefficient, presented a positive sign, diverging from the expectation. On the other hand, the investor sentiment interest (SI) and trading volume (VN) variables proved to be statistically significant and with an expected converging sign.

Table 6 presents the results for the second regression model, which aims to test hypothesis 2. It is observed that the test (VIF) showed the absence of multicollinearity problems, considering that its values are between 1 and 10, according to Hair, et al. (2009). It was also verified that the *Durbin-Watson* presented a value very close to 2 for the analyzed model, demonstrating that the independence of errors in the analyzed data is satisfactory and that there is no autocorrelation between the residuals (Fávero & Belfiore, 2017).

Table 6 – Results of Model 2 Estimates

Panel A – Regression Result								
Variables	Constant	SI	VN	RV	ID	TM	PA	CM
Coefficients	-0.092	0.038**	0.284**	0.072**	0.000	0.048*	0.376**	0.212
Standard Error	0.024	0.005	0.004	0.003	0.000	0.007	0.098	0.219
t-statistic	-1.207	2.219	1.676	1.355	1.210	1.512	2.701	1.084
VIF		1.556	1.858	1.080	1.162	1.114	1.029	1.581
Panel B – Regression Adjustments								
R^2		Adjusted R^2			F-statistic		DW	
0.289		0.275			2.996 (0.030)		1.652	

The coefficients presented in Table 6 (Panel A), with the exception of company age before at IPO (ID) and the Ibovespa return in the 15 days prior to the IPO (CM), proved to be significant and in line with model 1. Regarding the expected sign, the proportion of shares held regarding those offered (PA), in this model with a significance of 5%, presented a positive sign, diverging from the expectation, although maintained with a significant coefficient. On the other hand, the investor sentiment interest (SI) and trading volume (VN) variables, considering the moderation of the risk factor measured by EMBI+, proved to be statistically significant and with an expected converging sign. Next, the results of Tables 5 and 6 will be commented, in line with the corresponding literature.

4.1 Discussion of Results

For the investor sentiment, measured by the sentiment index formed by market variables and trading volume, a positive and significant relationship was observed with returns on the first day of the IPO, suggesting that a favorable sentiment influences returns, in accordance with with Lee, Shleifer and Thaler (1991). These results converge with the idea that warmer market periods, whether contemporary (Volume) or past (Sentiment Index), influence IPO returns. Huang, W. *et al.* (2006) noted that there is a tendency for abnormal above-average turnover when sentiment is linked to negative experiences or when they are more pronounced, which can positively impact returns.

For Tian and Liu (2017), investor sentiment is the most significant factor in the relationship with IPO returns excess. Thus, the results shown in Table 5 do not reject Hypothesis 1, as there was a positive relationship between investor sentiment and the return on the first day of the IPO. These results also converge with the findings of Veras Machado *et al.* (2020), when investigating the topic in the Brazilian stock market from 2005 to 2017. As for Hypothesis 2, the variables of interest, investor sentiment (SI) and trading volume (VN), moderated by the risk factor measured by the EMBI+, had a positive and significant influence on the relationship with the IPO return, suggesting that emerging market risk factors do not mitigate the search for IPO returns in moments of optimism. Consequently, Hypothesis 2 is accepted. Li and Grunde (2022) suggest that a greater participation of individual and foreign investors is positively related to the increase in investments aimed at raising the current value of the share, observed even in companies with greater idiosyncratic risk. The authors also suggest that a greater presence of institutional investors may serve as a mechanism to reduce the degree of overinvestment caused by a greater investor sentiment.

Regarding the control variables, the relationship between the company age before at IPO (ID) and the IPO return was not significant. However, the existence of a positive and significant relationship at the level of 10% between the size of the company (TM) and the IPO return was observed. As for the proportion of shares offered and retained (PA), Ljungqvist and Wilhem (2002) state that companies sometimes offer a large number of IPOs, and this can reduce expectations of large later gains from their revenues. Therefore, the expected relationship between the proxy for the proportion of shares offered and held (PA) and the IPO returns is negative. However, in line with the studies by Veras Machado et al. (2020), although the expected sign found was different from that found for the variable referring to the proportion of shares offered and retained, there was statistical significance at the level of 1% in the first model, and 5% in the second model, suggesting that Brazilian investors, despite perceiving the excessive amount of shares issued by a given company, would not show negative expectations regarding their returns.

Regarding the control variables referring to market conditions, represented by the market return (RV) in this study, they were significant and positive. According to Assia (2014), the market return can measure the incorporation of public information into the true value of the company in the offer price during the subscription period. Regarding the market returns of the 15 days prior to the IPO (CM) date, there was no statistical significance, even with a confirmed positive relationship, indicating that this variable did not prove to be a good indicator of the behavior of the IPO return.

V. CONCLUSION

The present study aimed at the relationship between investor sentiment and stock return on the first day of an IPO, as well as analyzing the moderating effect of the country risk factors, on the relationship between investor sentiment and IPO performance at the companies listed on Brasil Bolsa e Balcão - B3 from January 2013 to December 2021. It was based on the premise that optimistic investor sentiment can positively influence the return on the first day of the IPO, evidencing underpricing. Therefore, it was expected that investors would seek higher returns on the first day of the IPO in moments of market optimism, considering their sentiment towards the market at that moment. Thus, it was expected that this search would positively affect the returns on the first day of the IPO, a fact that was confirmed in the observed empirical evidence. Consequently, it is concluded that investor sentiment positively affected IPO returns in the Brazilian scenario. In

view of the results obtained, Hypothesis H1 could not be rejected.

With regard to the moderation of emerging market risk factors, a positive relationship was expected in the relationship between investor sentiment and the return on the first day of the IPO, suggesting that a favorable sentiment would influence returns, even in market scenarios with accentuated risks characteristic of emerging economies. This fact would confirm the assumption that in warmer market periods there would be a tendency to observe an above-average trading volume and a sentiment index positively related to returns. According to the results obtained, it was observed that the volume traded and the sentiment index positively affected the IPO returns, as expected in the Brazilian emerging market scenario. Therefore, Hypothesis H2 was accepted, according to which investor sentiment moderated by emerging market risk factors positively affects first-day IPO returns for Brazilian companies.

Among the characteristics of the companies that influenced the return on the first day of IPOs, the control variable related to the proportion of shares held in relation to those offered stands out. Despite presenting statistical significance, when related to the first day's returns, the positive value of the coefficients was unexpected. The logic would be that their expectations regarding the returns on the first day of the IPO would be negative when they realize that companies are offering too many shares. Thus, it is concluded that Brazilian investors' expectations remain optimistic about the future performance of these companies, even with the large number of shares offered.

The main theoretical contribution of the study is focused on the moderation of risk factors in the relationship between investor sentiment and the return on the first day of an IPO, as it expands the study by Veras Machado *et al.* (2020), adding an idiosyncratic variable of the market studied to the results found in Brazil. Consequently, further research aimed at understanding the excess return on the first day of an IPO must consider other factors, characteristic of emerging markets.

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