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Influence of Economic Policy Uncertainty on Accruals and Abnormal Returns

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Abstract

Purpose: To analyze the relationship between economic policy uncertainty in the Brazilian stock market and the accruals anomaly from 2010 to 2019.
Method: Time series procedures were performed using the CAPM model, including the accrual factor, in order to obtain the abnormal return. Following this step, we evaluated how the uncertainty of economic policy affected the abnormal return due to accruals, which was calculated using the panel data approach with cluster-robust standard errors.
Results and Discussion: The results suggest that economic policy uncertainty influences the abnormal returns due to accruals, indicating that stocks show higher abnormal returns in periods of greater economic policy uncertainty. When considering the volatility index, the results are reversed. In this case, increases in expected volatility can induce investors to sell stocks, reducing stock prices and, consequently, their returns. Nevertheless, rational investors could reap uncertainty premiums as prices recover.
Contributions: Economic policy uncertainty, and uncertainty in general, can be regarded as a relevant topic for academia and policymakers, as well as the analysis of the impacts of stock market returns. Moreover, this study can assist portfolio managers and investors in financial markets to improve the stability of policy implementation, avoid abnormal fluctuations in equity markets and suggest investment strategies with perspectives based on economic policy uncertainty and implied market volatility.

Keywords: Abnormal returns. Accrual Anomaly. Economic Policy Uncertainty (EPU). Implied volatility.

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Introduction

Economic policy uncertainty is often related to stock market behavior, which has been the focus of recent studies. This assumption is related to the rationale that uncertainty would delay investment decisions, and, therefore, an increase in uncertainty would harm economic prospects and could potentially threaten future profits, leading to falling stock prices (Chen & Chiang, 2020).

Thus, uncertainty is recognized as influencing the economic and financial outcomes of firms since the government's economic policy choices can impact markets significantly, which highlights the relevance of understanding the effect of uncertainty on this process (Smales, 2020). Furthermore, in environments with financial or political crises, concerns about this uncertainty are intensified, as this potentially threats investment returns (Goodell et al., 2020).

In theory, there are indications that economic policy uncertainty affects market volatility and, as a result, stock returns (Pástor & Veronesi, 2012, 2013). Empirically, this relationship has been proven in several studies that seem to point to a single direction: economic policy uncertainty reduces stock market returns (Antonakakis et al., 2013; Brogaard & Detzel, 2015; Chiang, 2019; Hillier & Loncan, 2019; Chen & Chiang, 2020; Quinteiro et al., 2020).

Research development in this field has created possibilities for the emergence of metrics to measure economic policy uncertainty, such as the Economic Policy Uncertainty (EPU) index, developed by Baker et al. (2016). EPU is based on daily news, approached from search terms and different dimensions of analysis, such as issues concerning forecast errors, inflation rates, and legislation (Baker et al., 2016).

Therefore, economic policy uncertainty may be associated with the investors' expectations of the stock market, thus correcting prices and, consequently, returns (Chen & Chiang, 2020). The investors' expectations of returns may derive from the accrual component of companies' earnings and generate biased expectations regarding the anticipation of future reversal, leading to a phenomenon called accrual anomaly (Du et al., 2020). Indeed, estimates of abnormal returns in stock prices due to accruals have been found (Moreira et al., 2019).

Given this context, it is noteworthy that since 2007 the Brazilian scenario has been marked by a series of turbulences when it comes to economic and political aspects. Among all economic and political crises, the following should be highlighted: the subprime crisis; the corruption scandals involving the "Mensalão" in 2005/2006, judged in 2012, the Lava-Jato ("Carwash") Operation triggered in 2014, in addition to fierce electoral disputes for the presidential office, with expressive rallies by the population against corruption, in 2013, the impeachment of the president of the country, in 2016, and the new elections of 2018, which changed Brazil's political circumstances (Quinteiro et al., 2020).

These events regard corruption and electoral factors involving senior government officials generate instability in Brazilian economic policy (Hillier & Loncan, 2019). Thus, given this scenario and the lack of studies adopting this approach in the Brazilian stock market (Hillier & Locan, 2019; Quinteiro et al., 2020), research addressing this correlation may assist in developing the specialized literature in the field and understanding the market reactions in largely unstable environments.

Therefore, the research question guiding this paper was: What is the relation between economic policy uncertainty and abnormal returns due to accruals anomaly in the Brazilian market? Therefore, the study analyzed the relationship between economic policy uncertainty in the Brazilian stock market and accruals anomaly from 2010 to 2019. Economic policy uncertainty was measured based on the EPU index for the Brazilian context, and the existence of an accrual anomaly in the period of analysis was additionally detected.

The results indicate the existence of an accrual anomaly in the Brazilian market during the period of analysis, showing that the accrual factor is significant in explaining the pricing of assets in different portfolios. Indeed, economic policy uncertainty showed a positive correlation with abnormal accrual return. Furthermore, a negative correlation between implied market volatility and accruals anomaly was identified, in line with the assumption that uncertainty can affect the perception of future corporate earnings.

This paper contributes to the literature by providing empirical evidence of how investors, in general, receive and understand the different components of accounting earnings in a scenario of economic policy uncertainty and higher expected market volatility. Accordingly, the results demonstrate how the market response to accounting information is a function of the context in which the information is disclosed. Investors face significant challenges when evaluating information

and its implications on the future results expected by companies, and in times of economic crisis, the focus on accounting information increases as investors seek places to anchor themselves in a scenario of extreme uncertainty and volatility.

Therefore, this study provides evidence of the correlation between political instability and the evolution of stock market prices in the Brazilian context. Bonsall et al. (2020) reinforce that, given the investors' aversion to risks, the demand for information is amplified in scenarios characterized by a high degree of uncertainty. In this sense, this study can help investors and portfolio managers by highlighting the relevance of economic policy uncertainty and expect volatility as additional information for building portfolios.

This study has allowed us to understand the behavior of the capital market in the sample period analyzed, from 2010 to 2019. Although not covered in the study, the results offer insights and pave the way for future studies on the immediately subsequent scenario, that is, i.e., the pandemic context and the subsequent periods.

Also, it contributes to the literature on market anomalies as it specifically deals with accruals anomaly by highlighting a possible determinant for this metric. Based on this, future research will be able to unravel the scenario that followed in 2020. This is significant because if, on the one hand, we conjecture that the focus on accounting numbers will increase in an uncertain scenario, on the other hand, the increase of individuals may lead to the worsening of financial anomalies, as investors have fewer resources than institutional investors. Institutional investors, such as investment funds and pension funds, manage funds raised from a community of individuals and, therefore, typically handle large amounts of money. As such, they tend to display a higher level of information processing sophistication, and the reduction in the proportion of these agents may create a scenario conducive to the presence and amplification not only of accruals anomaly (Nallareddy & Ogneva, 2017) but of all financial anomalies as well.

2. Literature Review

Given the breadth of the discussion about the consequences of Economic Policy Uncertainty, this study concentrated on defining the key points regarding the topic, with a focus on empirical works carried out nationally and internationally.

2.1 Accruals Anomaly

The market is considered efficient in terms of the relevance of information if prices correctly reflect the available information on average and if it presents a quick response to new events by correctly incorporating new information, known as the "efficient-market hypothesis," or EMH (Malkiel & Fama, 1970). However, empirical research began to systematically identify the possibility of abnormal returns based on available information, and these phenomena came to be known as financial anomalies. A financial anomaly can be defined as an event that occurs systematically without apparent explanation (Ball, 1992; Brav & Healton, 2002; Schwert, 2003; Lafond, 2005).

Along these lines, to test the hypothesis that investors rely on accounting information without a thorough understanding of the different properties of the items comprising it, Sloan (1996) documented the phenomenon known as accrual anomaly, hence contradicting the efficient-market hypothesis (EMH). The author tested whether stock prices would reflect the different persistence between cash flow components and the accrual. Thus, the findings indicated a greater ability to predict one-period earnings ahead of cash flow components when compared to the accrual. Thus, Sloan (1996) found that a high proportion of accruals in the earnings formation would typically display negative abnormal returns in the subsequent year. These findings demonstrated that investors did not understand the different persistence of earnings components, as they fixated on the final reported earnings rather than analyzing the different implications of their components.

Subsequent studies supported by the hypothesis established by Sloan (1996) have corroborated the findings that accrual components are less persistent than cash flow components and are negatively associated with future returns, hence indicating that investors assume equal persistence to the different parts of earnings (Richardson et al., 2010).

Specifically in the Brazilian market, the still scarcely documented anomaly was analyzed by Cupertino et al. (2012). This study found signs that the persistence of the accrual is lower than the persistence of cash flows. In the authors' work, no evidence was detected that the accrual would be poorly valued by the market or even that trading strategies based on accruals would provide positive and consistent returns. To test the hypothesis postulated by Sloan (1966), Takamatsu and Fávero (2013) evaluated the ability of investors to interpret information based on accounting. To this end, the authors analyzed how different profit components would affect the future profitability of companies listed on the Brazilian stock

exchange. The results indicated that accruals were not statistically significant in explaining the behavior of future abnormal returns. Furthermore, the authors revealed the absence of the accrual anomaly in Brazil, which indicates that investors would be able to interpret and price the accounting data.

Additionally, extending the sample to the main Latin American economies, Moreira et al. (2019) aimed to analyze the accrual anomaly in the returns of the leading Latin American stock exchanges and the institutional aspects impacting such returns. The results indicate the presence of abnormal returns in the Latin American capital market, thus confirming the presence of the accrual anomaly in the returns of the analyzed companies. They also found that country-specific factors contribute to explaining the differences in returns existing between them.

In the European market, Beer et al. (2018) analyzed how the investor's sentiment can affect the accrual anomaly. The authors found that such sentiment influences the accrual pricing error, suggesting that investors should consider the impact of sentiment on portfolio performance. In other words, investors should keep in mind that periods of high optimism are typically accompanied by a high level of accruals and therefore followed by low future stock returns.

Bermpei et al. (2022) analyzed the effect of economic policy uncertainty (EPU) on the quality of financial reports of U.S. firms from 1999 to 2015 and found a positive and significant association. The results indicate that managers aim to provide third parties with a better financial position of the company when EPU is high. Thus, the authors warn that investors, analysts, creditors, and regulators should be careful about the quality of corporate financial reports in periods of high economic policy uncertainty.

2.2 Economic Policy Uncertainty and the Stock Market

The relationship between economic policy and economic outcomes has proven relevant to stock market investors and has gained strength in academia (Mbanga et al., 2019). In this context, uncertainty is a key factor that can affect investment decisions since increased uncertainty can generate a discouraging economic expectation, thus threatening future earnings and harming stock prices (Chiang, 2019; Chen & Chiang, 2020). One of the factors that can cause uncertainty is political instability, which may be associated with increases in the volatility of stock returns in the market (Pástor & Veronesi, 2012; Mnasri & Essaddam, 2020).

The volatility of asset returns is caused by changes in asset prices, and for some years, scholars have dedicated themselves to understanding what drives these changes and why volatility is higher in some periods, such as around political events (Goodell et al., 2020).

In an environment of economic policy uncertainty, Pástor and Veronesi (2013) proposed a model in which asset price variations are influenced by different channels: economic shocks, shocks at the company level, and economic policy uncertainty shocks. According to the authors, economic policy uncertainty, as a non-diversifiable risk, would result in a risk premium (Pástor & Veronesi, 2013).

The risk premium arises when the utility functions of the government and investors are not aligned. This happens since the government utility function is scaled by a political cost function associated with policy choices, and when this political cost is too high, government policy diverges from an investor's utility-maximizing decision (Pástor & Veronesi, 2013; Goodell et al., 2020).

Thus, economic policy uncertainty concerns the ambiguity surrounding possible changes in government policy and its associated impact on corporate performance (Smales, 2020). Thus, the link between politics and the stock market assumes that changes in government leadership or policies can impact corporate decisions, whether through taxation, industry regulation, or trade policies, among other factors (Mbanga et al., 2019). Niederhoffer et al. (1970) are among the first authors to test and find the relationship between presidential elections and the stock market in an examination of the U.S. market.

In this scenario, other studies have analyzed the influence of economic policy uncertainty on abnormal stock market returns (Antonakakis et al., 2013; Brogaard & Detzel, 2015; Arouri et al., 2016; Christou et al., 2017; Chiang, 2019; Chen & Chiang, 2020). In general, they have found that economic policy uncertainty negatively impacts economic activities, leading to a drop in stock returns. By analyzing dynamic correlations between market returns, Antonakakis et al. (2013) found a consistent negative correlation between U.S. economic policy uncertainty and market returns. Brogaard and Detzel (2015) found a negative correlation between U.S. economic policy uncertainty and market returns and a positive correlation between present levels of uncertainty and future market returns.

In periods of higher volatility, Arouri et al. (2016) proved that the effect of U.S. economic policy uncertainty in

reducing stock returns is intensified. Based on a multi-country sample, Christou et al. (2017) also showed that higher levels of economic policy uncertainty negatively impact stock market returns. By analyzing the G7 countries, Chiang (2019) also found a negative relationship between uncertainty and market returns but a positive correlation when employing lagged uncertainty, thus indicating that investors demand a higher risk premium for taking on the risk of economic policy uncertainty. In addition, U.S. and other external uncertainties interfere with Chinese stock pricing, as evidenced by Chen and Chiang (2020).

A common choice in the articles listed above is the use of the EPU index (or its variation), typically as an explanatory variable for stock returns. The EPU index was developed by Baker et al. (2016) from the frequency of newspaper coverage. Indeed, the index consists of three components, namely the frequency of news stories with keywords and references to economic policy uncertainty; the number of laws about to expire; the forecast errors related to public spending and inflation rates (Baker et al., 2016). Along these lines, Baker et al. (2016) consider the EPU to be reliable, unbiased, and consistent, and so it has become a reference for quantifying economic policy uncertainty that enabled the development of other studies in the area. As previously mentioned, EPU stands for economic policy uncertainty and, therefore, opens possibilities to explore the effects of this form of uncertainty, measured by the index and related to market returns, which is the focus of this research.

As discussed in the previous section, these market returns may reflect how biased expectations of the accrual component of earnings anticipated future reversal, causing the accrual anomaly. This, in turn, arises from misanalysis by investors when it comes to the ability of accruals to impact a firm's future earnings, and the lower-than-expected persistence of this component can surprise investors (Sloan, 1996).

Based on this expectation bias, stocks of companies with high levels of accruals obtain negative abnormal returns, and those of companies with low levels of accruals obtain positive abnormal returns (DeFond & Park, 2001). Accordingly, returns based on these anomalies can be influenced by political aspects and the resulting uncertainty (Mbanga et al., 2019). As market participants are sensitive to economic policy uncertainties, it is more plausible that they hold different expectations in the presence of uncertainty to respond to possible changes in expected outcomes (Goodell et al., 2020)

In the Brazilian market, Quinteiro et al. (2020) investigated the risk of economic policy uncertainty. However, they relied on more comprehensive data, comprising the creation of portfolios from June 2009 to December 2018. The aim was to test a model for assessing economic policy uncertainty based on Fama and French's (2015) Five-Factor Model. Two metrics for economic policy uncertainty were employed in the study, namely the Economic Uncertainty Index (IIE-Br) from the Getúlio Vargas Foundation and the EPU index, developed by Baker et al. (2016). The results showed that the uncertainty factors' coefficients were significant in about 75% of the portfolios, which, in turn, indicates the possibility of using the model to understand the effects of uncertainty in the Brazilian stock market. Furthermore, the model whose risk factor was based on the EPU proxy presented better performance than the version based on the IIE-Br (Quinteiro et al., 2020).

Unlike the studies presented, the purpose of this paper is to evaluate the effects of economic policy uncertainty on abnormal returns impacted by accruals in the Brazilian stock market, with a focus on identifying whether stock returns change in uncertain environments and the magnitude of these influences.

In this sense, abnormal returns based on the accrual anomaly are expected to be reduced in situations of economic policy's greater uncertainty, pointing out that the market would have different expectations given the uncertain possibilities of future results, which allows the elaboration of hypothesis 1 of the research:

H1: Economic policy uncertainty is negatively related to the accrual anomaly.

3. Methodology

3.1 Sample delimitation

The study population consists of all companies listed on the Brazilian stock market. However, the sample was restricted to non-financial companies whose data were available in the Economatica database from 2010 to 2019, thus forming an unbalanced panel. The decision to base the study on data starting from 2010 is due to Brazil's convergence to international accounting standards (Gelbcke et al., 2018). In addition, it should be noted that companies with negative book equity were excluded from the sample, as in Bastos and Nakamura (2009), because this is a situation that compromises the reliability of the study's control variables depending on this figure.

3.2 Time Series Procedures

Based on time series procedures, two models with monthly data were initially estimated to determine the abnormal returns impacted by accruals in the Brazilian stock market; that is, to build the dependent variable of the final model.

Returns were calculated monthly according to the formula described in Equation

$$ret_{i,t} = log\left(\frac{P_{i,t}}{P_{i,t-1}}\right) * 100 \quad (1)$$

In which:

P: dividend-adjusted stock price; i: companies; t: time in months.

The Cash Flow Statement (DFC, in Brazilian Portuguese) approach was used to estimate the accruals, in which the accounting earnings represent the sum between the accrual and the cash flows generated by the company in each period. Therefore, the accruals were estimated by the difference between the operating earnings and the operating cash flow, according to Equation 2.

$$accrual_{i,t} = operating\ profit_{i,t} - operating\ cash\ flow_{i,t} \quad (2)$$

Since the accruals were annual, it must be noted that to determine the monthly data, according to Moreira (2018), the data was weighted by the firm's Market Value. Hence, the numerator based on the accrual was maintained but weighted by the monthly market value. Thus, to calculate abnormal returns, in the first regression, each individual asset was regressed against the original factors of the Capital Asset Pricing Model (CAPM), which establishes the expected return of a stock as a function of a risk-free return and a risk premium (Sharpe, 1964; Lintner, 1965). Formally, this relationship can be expressed according to Equation 3.

$$(ret_t - Rf_t) = \beta_0 + \beta_1(Rm_t - Rf_t) + \varepsilon_t \quad (3)$$

In which:
(*ret - Rf*): expected excess return;
(*Rm - Rf*): market risk premium;
Rf: risk-free rate (Selic);
Rm: market return;
ε: regression residual.
The second regression presented the asset excess returns against the original factors plus the accrual factor (Acc), and this relation is expressed by Equation 4. The Acc factor was estimated monthly, following the recommendations of Moreira (2018), that is, through a portfolio strategy with a long position in a low level of accruals (33% of the companies) and a short position in a high level of accruals (33% of the companies), rebalanced annually.

$$(ret_t - Rf_t) = \alpha_0 + \alpha_1(Rm_t - Rf_t) + \alpha_2 Acc_t + \varepsilon_t \quad (4)$$

Thus, to estimate abnormal returns, time series regressions were used with monthly data for each company, each year, using information from the last two years. Equations 3 and 4 resulted in an intercept, which represents the abnormal returns of the original factors and the original factors with the Acc factor for each firm in each period. The remaining information in the intercept can be interpreted as what was not explained by the factors included in the model. Thus, based on the methodology adopted by Moreira (2018), we have Equation 5:

$$\widehat{RetAnAcc_t} = \beta_0 - \alpha_0 \quad (5)$$

In which the difference of β_0 e α_0 refers to the abnormal return of that asset in that period, influenced by the Acc factor; that is, the abnormal return due to the accrual. Moreira (2018, p. 39) clarifies that if the pricing model captured all the variations of the risk factors for each asset/portfolio, the intercept would be equal to zero. Thus, the remaining information in the intercept can be interpreted as what was not explained by the risk factors included in the model. In the estimation, by firm/year, this variable is autocorrelated by construction, and this characteristic is considered in the econometric modeling.

It should be noted that the previous procedures were also applied to equally weighted portfolios to test the presence of the accrual anomaly formed from stocks ordered by the decreasing absolute values of the accrual. Accordingly, eight (8) portfolios were created, each of them consisting of the average returns of the assets selected to compose each portfolio, rebalanced annually, forming a time series.

Accordingly, the Acc factor was used to calculate the abnormal returns, to be used in the panel data analysis, and to test the Accrual anomaly in general, in this case using the GRS test (Gibbons et al., 1989).

3.3 Panel data modeling

To analyze the relation between economic policy uncertainty in the Brazilian stock market and accrual anomaly from 2011 to 2019, the data was structured in an unbalanced panel, and the original model used is presented in Equation 6:

$$\widehat{AbnRetACC}_{i,t} = \gamma_0 + \gamma_1 EPU_t + \gamma_2 Debt_{i,t} + \gamma_3 EPS_{i,t} + \gamma_4 MTB_{i,t} + \gamma_5 ROA_{i,t} + \gamma_6 Size_{i,t} + \varepsilon_{i,t} \quad (6)$$

In which:

$\widehat{AbnRetACC}_{i,t}$: corresponds to the abnormal return impacted by the accrual of firm i at time t, according to equation (5);

EPUt: uncertainty of the country's economic policy at time t;
$Debt_i$: the Debt ratio of firm i at time t;
$EPS_{i,t}$: Earnings per share of company i at time t;
$MTB_{i,t}$: Market-to-book of company i at time t;
$ROA_{i,t}$: return on assets of firm i at time t;
$SIZE_{i,t}$ size of firm i at time t
$\varepsilon_{i,t}$: error term.

Economic policy uncertainty is an unobservable construct. Thus, Baker et al. (2016) developed the Economic Policy Uncertainty Index (EPU proxy, originally composed of the following factors: (i) the frequency of news references related to economic policy uncertainty; (ii) the number of laws about to expire; (iii) the forecast errors with public spending and inflation rates. Thus, the index that was originally developed for the U.S. context was expanded to other economies, and, when it comes to Brazil, this index is calculated monthly, with a historical series beginning in January 1991.

For the Brazilian market, EPU is based only on the frequency of news references to the uncertainty regarding the country's economic policy, linked to the newspaper Folha de São Paulo. Through this newspaper, the index is composed of news in which the following terms: Uncertainty: "incerto" and "incerteza" (in English "uncertain", "uncertainty"); Economy: "econômico" and "economia" ("economic", "economics"); Policy: "regulação", "déficit", "orçamentos", "imposto", "banco central", "alvorada", "planalto", "congresso", "senado", "câmara dos deputados", "legislação", "lei" and "tarifa" ("regulation", deficit", "budget", "tax", "central bank", "alvorada", "planalto", "congress", "senate", "chamber of deputies", "legislation", "law", and "tariff").

Thus, to measure the economic policy uncertainty in Brazil during the analyzed period, the monthly index released was annualized according to Constantinescu et al. (2019), in which, for each period, the average EPU index from January to December was calculated according to Equation 7:

$$EPU_t = \frac{\sum_{m=1}^{12} EPU}{12} \quad (7)$$

To test the robustness of EPU, two other uncertainty-related indicators were used, the first being the Indicator of Economic Uncertainty in Brazil (IIE-Br). The indicator developed by Ferreira et al. (2019) is constituted by combining information from two uncertainty measures, namely the frequency of news with references to economic uncertainty in six major newspapers, similarly to EPU, and the dispersion of market forecasts. The other IVOL-Br indicator, proposed by Astorino et al. (2017), is an implied volatility index for the Brazilian stock market based on the daily option prices of the Bovespa index (Ibovespa) and measures the expected volatility of Ibovespa over the following two months. The IVOL-Br index increased at times of great uncertainty, is also known as the "fear index," and according to Cainelli et al. (2020), can assist in predicting future Ibovespa returns. Thus, these two indexes, available on a monthly and daily frequency, respectively, were also annualized according to the procedures indicated above.

Table 1 presents an overview of the characteristics that were considered as control variables for the study, explaining their operationalization.

Variables	Acronym	Operationalization
Debt Ratio	Debt	$\frac{Liabilities_{i,t}}{Assets_{i,t}}$
Earnings per share	EPS	$\frac{Earnings_{i,t}}{Number\ of\ Stocks_{i,t}}$
Market-to-book	MTB	$\frac{Market\ Value_{i,t}}{Equity_{i,t}}$
Return on Asset	ROA	$\frac{Operating\ profit_{i,t}}{Assets_{i,t}}$
Size	Size	$Ln(Assets_{i,t})$

PFinally, it should be noted that the following tests were performed to choose the most appropriate model for estimating panel data: Chow's F test for comparing pooled ordinary least squares and fixed effects; Breush-Pagan's Lagrange multiplier test for comparing pooled ordinary least squares and random effects; and the Hausmann test for comparing between random effects and fixed effects (Fávero, 2013).

The following assumption validation tests were performed

to verify the suitability of the proposed model: F/Wald test, Variance Inflation Factor (VIF), Wooldridge test, and modified Wald test. Given the heteroscedasticity detected in the estimated regression models, the estimation by Clustered Robust Standard Errors (Gujarati & Porter, 2011, Fávero, 2013) was applied. Additionally, to reduce the effect of outliers in the sample, the Winsor technique for outliers was used, and the model's representative variables were winsorized at 1%.

4. Results

Given that the primary objective of this research was to analyze the influence of economic policy uncertainty on abnormal returns due to accruals in the Brazilian stock market, we initially sought to prove the existence of the anomaly. To this end, time series were estimated from January 1, 2010, to December 31, 2019. The sample was segregated into eight (8) portfolios, with stocks arranged in order of magnitude of this accrual. Each portfolio was rebalanced annually, forming a time series.

Table 2 shows the results of the time series of the traditional CAPM model for the sample formerly described, with estimates for each of the portfolios. It was possible to verify the model's significance for the portfolios in question, which also had a coefficient of determination (R^2) ranging between 44 and 70%. Note that all coefficients, as well as intercepts, were significant at 1%, in addition to the F-test statistic of the model's global significance. This result points to a good fit in the application of the CAPM in this sample of the Brazilian scenario.

Table 2 – Time series for the CAPM model - 2010 to 2019

	Dependent Variable: *ret - Rf*							
	Port. 1	Port. 2	Port. 3	Port. 4	Port. 5	Port. 6	Port. 7	Port. 8
Rm-Rf	0.742***	0.731***	0.753***	0.867***	0.834***	0.742***	1.278***	0.843***
	(0.077)	(0.066)	(0.079)	(0.084)	(0.060)	(0.072)	(0.078)	(0.065)
Constant	-0.780**	-0.941***	-1.164***	-1.399***	-0.966***	-1.083***	-1.796***	-1.311***
	(0.377)	(0.323)	(0.388)	(0.412)	(0.293)	(0.352)	(0.381)	(0.320)
Obs.	119	119	119	119	119	119	119	119
R^2	0.444	0.514	0.436	0.477	0.624	0.478	0.699	0.589
Adj. R^2.	0.439	0.509	0.432	0.473	0.621	0.474	0.696	0.585
F	93.37***	123.57***	90.58***	106.78***	194.53***	107.25***	271.69***	167.43***

***sig=1%; **sig=5%; *sig=10%; Port= Portfolio

In the second stage, the time series of the CAPM model was estimated, including the accrual factor, measured using portfolios from companies with higher and lower accruals. Table 3 shows that the market returns coefficients and the intercepts remained significant at the 5% level. In addition, the accrual factor was also significant in five of the portfolios under analysis, which indicates the accrual contribution to explain the returns of the constructed portfolios.

Table 3 – Time series for the CAPM model with accruals - 2010 to 2019

	Dependent Variable: *ret-Rf*							
	Port. 1	Port. 2	Port. 3	Port. 4	Port. 5	Port. 6	Port. 7	Port. 8
Rm-Rf	0.763***	0.755***	0.798***	0.835***	0.813***	0.730***	1.227***	0.833***
	(0.078)	(0.067)	(0.079)	(0.085)	(0.061)	(0.073)	(0.076)	(0.067)
Accruals	0.188	0.215*	0.408***	-0.287*	-0.191*	-0.107	-0.464***	-0.091
	(0.146)	(0.125)	(0.147)	(0.159)	(0.113)	(0.137)	(0.143)	(0.125)
Constant	-0.991**	-1.182***	-1.621***	-1.077**	-0.752**	-0.963**	-1.275***	-1.209***
	(0.410)	(0.349)	(0.412)	(0.445)	(0.318)	(0.384)	(0.399)	(0.350)
Obs.	119	119	119	119	119	119	119	119
R^2	0.452	0.526	0.471	0.492	0.633	0.481	0.724	0.591
R^2 aj.	0.442	0.518	0.462	0.483	0.627	0.472	0.719	0.583
F	47.78***	64.33***	51.73***	56.07***	100.20***	53.75***	152.32***	83.65***

Notes: ***sig=1%; **sig=5%; *sig=10%; Port = Portfolio.

Thus, the existence of the Accrual anomaly in the Brazilian stock market was verified (the GRS test rejected the hypothesis that the portfolios' intercepts are jointly equal to zero), indicating that the accrual factor contributes to explaining the returns of all portfolios built in this study, i.e., with higher or lower accrual levels. This result was also found by Moreira (2018) when studying Brazilian portfolios. The author also built eight portfolios to analyze the significance of accruals in asset pricing and found statistical significance for seven of them (Moreira, 2018).

After confirming the existence of an accrual anomaly in the Brazilian stock market, we proceeded to analyze the relationship between this anomaly and economic policy uncertainty. To this end, Table 4 shows the descriptive statistics of the variables used in the final regression model. It is noteworthy that the variables in this study, described below, were all winsorized at 1%, and the loss of one year of observations is due to the need for 24 months to estimate the abnormal return impacted by an accrual (AbnRetACC).

The final regression that evaluated the effects of economic policy uncertainty on the accrual anomaly was estimated considering the pooled model with clustered robust standard errors. The decision for the pooled model was based on the Chow, Breusch-Pagan, and Hausman F-tests. In addition, the pooled model presented problems of serial autocorrelation and heteroscedasticity in the model residuals. Thus, the final model was estimated by including as an explanatory variable the first lag of the dependent variable, with clustered robust standard errors to generate a more reliable estimate.

Table 4 – Descriptive Statistics of the study variables - 2011 to 2019

Variables	Obs.	Average	Standard Deviation	Minimum	Maximum
AbnRetACC	1,303	-2.90	14.63	-57.58	42.83
EPU	1,303	197.55	79.26	117.53	346.49
IIE-Br	1,303	106.47	8.77	92.51	117.13
IVOL-Br	1,303	23.65	2.50	20.57	29.30
Debt	1,303	2.14	11.79	-50.77	75.72
EPS	1,303	-3.33	29.92	-268.19	23.68
MTB	1,303	2.52	2.95	0.15	17.65
ROA	1,303	3.49	8.49	-28.90	32.31
Size	1,303	15.35	1.61	11.26	19.60

Notes: Obs: quantity of companies/year available in the analyzed database; AbnRetACC: abnormal return due to accruals (annualized in %); EPU: economic policy uncertainty; IIE-Br : economic uncertainty index; IVOL-Br: Ibovespa implied volatility indicator; Debt: debt/total asset (%); EPS: earnings per share; MTB: market-to-book; ROA: return on assets (%); TSize: size defined by the logarithm of Assets. Companies with a minimum of four observations were kept in the sample.

Table 5 presents the results of the final estimated regression model. The relation on which this study focused was found to be significant and positive for this sample, indicating that higher levels of economic policy uncertainty influence higher abnormal returns due to the accrual anomaly. Thus, it is found that economic policy uncertainty is a key factor for asset pricing in the stock market, but it is related to increases in abnormal returns impacted by accruals.

The expectation of the study was that an increase in this uncertainty would lead to doubts regarding the economic prospects of companies in terms of future earnings or the reversal of the accrual from previous years, hence adjusting investors' expectations. These empirical results, using EPU as a measure of uncertainty, are not consistent with Antonakakis et al. (2013), Brogaard and Detzel (2015), and Arouri et al. (2016) in the U. S. market; Chen and Chiang (2020), in the Chinese market; as well as in G7 countries (Chiang, 2019) and various other countries (Christou et al., 2017).

Furthermore, it should be noted that traditional determinants of an accrual anomaly (Moreira et al., 2019), such as return on assets, size (measured by the natural logarithm of total assets of firms), as well as the intercept and the first lag of the model were significant. Debt, earnings per share, and market-to-book, on the other hand, did not show statistical significance in this study.

Table 5 – Longitudinal Estimates - Abnormal Return on Accruals and Economic Policy Uncertainty - 2011 to 2019

$$AbnRetAcc_{i,t} = \gamma_0 + \gamma_1 EPU_t + \gamma_2 Debt_{i,t} + \gamma_3 EPS_{i,t} + \gamma_4 MTB_{i,t} + \gamma_5 ROA_{i,t} + \gamma_6 Size_{i,t} + \gamma_7 AbnRetAcc_{i,t-1} + \varepsilon_{i,t}$$

Variables	Coefficient	Robust Standard Errors	P-value
EPU	0.0142***	0.0044	0.0012
Debt	0.0900	0.0569	0.1138
EPS	-0.0091	0.0184	0.6214
MTB	0.0159	0.1551	0.9184
ROA	0.2022***	0.0570	0.0004
Size	0.4798*	0.2475	0.0528
AbnRetACC(t-1)	0.4740***	0.0333	0.0000
Constant	-13.1641***	4.0658	0.0012
Validation Tests	Statistics		P-value
Number of Observation	1143		
F	F(7;1135) = 4376		0.0000
VIF Statistics	1.22		
F Chow's test	F(159; 976) = 1.01		0.4542
Breusch-Pagan test	chibar2(01) = 4.11		0.0430
Hausman test	chi2(7) = 112.34		0.0000
Autocorrelation Test	DW = 1.86		0.0100
Heteroscedasticity Test	chi2 (7) = 260.39		0.0000

Notas: EPU: economic policy uncertainty; Debt: Debt Ration; EPS: earnings per share; MTB: market-to-book; ROA: return on assets; Size: logarithm of Assets. ***sig=1%; **sig=5%; *sig=10%.

The traditional CAPM was used in the research to estimate the expected return. Later models were developed, such as the three-factor model of Fama and French (1996), which included size and book-to-market (BTM) as responsible for patterns in returns not captured by the market factor of CAPM. Although not used in the abnormal return calculation, size and book-to-market (BTM) were included as explanatory variables of the abnormal return impacted by accruals. Therefore, it was detected that uncertainty measured by the EPU index, profitability, and size was statistically significant to explain the dependent variable under analysis, that is, abnormal return due to an accrual.

Considering the results of this study, it is possible to suggest that the Brazilian political and governmental scenario may produce effects on stock returns, considering the expectation of the accrual component of the companies' results. Thus, news involving political-economic aspects, as well as possible changes in legislation or in inflation rates' forecasts, can impact investors' expectations, influencing the option to buy or sell shares, given this uncertainty factor. The results analyzed globally are contrary to the established research hypothesis since a positive relationship was found between abnormal returns from accruals and uncertainty measured by EPU. Nevertheless, the results still indicate that economic policy uncertainty does indeed influence abnormal returns due to the accrual anomaly, however generating higher abnormal returns.

4.1 Robustness Test

This section presents the analysis of the EPU's replacement in Equation 6 by the IIE-Br and IVOL-Br indicators, in addition to the first difference between the EPU and the IIE-Br. When checking the econometric robustness hypotheses, the preferable model was estimated considering pooled model compared with the results previously presented. Thus, the final model was estimated with robust standard errors clustered at the firm level (Table 6).

Table 6 – Longitudinal Estimates - Abnormal Return of Accruals and Additional Uncertainty Indicators - 2011 to 2019

$$AbnRetAcc_{i,t} = \gamma_0 + \gamma_1 II_t + \gamma_2 Debt_{i,t} + \gamma_3 EPS_{i,t} + \gamma_4 MTB_{i,t} + \gamma_5 ROA_{i,t} + \gamma_6 Size_{i,t} + \gamma_7 AbnRetAcc_{i,t-1} + \varepsilon_{i,t}$$

Explanatory Variables	(1)	(2)	(3)	(4)	(5)
ΔEPU	0.0111***				
	(0.0041)				
IIE-Br		0.0160			
		(0.0483)			
ΔIIE-Br			-0.0751		
			(0.0673)		
IIE-Brg				0.0078	
				(0.0475)	
IVOL-Br					-0.5814**
					(0.2283)
Debt	0.0926	0.0894	0.0892	0.0896	0.0904
	(0.0563)	(0.0569)	(0.0565)	(0.0569)	(0.0564)
EPS	-0.0063	-0.0069	-0.0070	-0.0067	-0.0077
	(0.0186)	(0.0183)	(0.0184)	(0.0183)	(0.0184)
MTB	0.0194	0.0048	-0.0079	0.0054	-0.0422
	(0.1558)	(0.1520)	(0.1524)	(0.1520)	(0.1490)
ROA	0.1988***	0.1959***	0.1909***	0.1953***	0.1923***
	(0.0579)	(0.0575)	(0.0570)	(0.0576)	(0.0572)
Size	0.4956**	0.4915**	0.4963**	0.4935**	0.4869**
	(0.2496)	(0.2502)	(0.2494)	(0.2505)	(0.2475)
AbnRetACC(t-1)	0.4620***	0.4569***	0.4548***	0.4566***	0.4561***
	(0.0329)	(0.0327)	(0.0323)	(0.0327)	(0.0321)
Constant	-10.5287***	-12.1126*	-10.3395***	-11.2595*	3.1710
	(3.9308)	(6.3832)	(3.9394)	(6.2815)	(6.8641)
Adjusted R2	0.206	0.202	0.204	0.202	0.206

Notes: ΔEPU: first difference of EPU; IIE-Br: indicator of Brazilian economy uncertainty; ΔIIE-Br: first difference of IIE-Br; IIE-Brg: indicator general Brazilian economy uncertainty, including news and forecast errors; IVOL-Br: Ibovespa implied volatility; Debt: Debt Ratio; EPS: earnings per share; MTB: market-to-book; ROA: return on assets; Size: log of total assets. Standard errors in parentheses. Number of observations: 1,143. Companies with a minimum of four observations were kept in the sample.
***sig=1%; **sig=5%; *sig=10%.

Table 6 shows that the data do not corroborate the findings of Table 5. In the first place, the effect of the EPU, in its first difference, remains positive and significant (Model 1). The IIE-Br index that considers only news and the IIE-BRg that incorporates analysts' forecast errors, although showing a positive sign, do not present a significant correlation for this sample, indicating, unlike the EPU, that the changes in the levels of uncertainty of the Brazilian economy do not influence the generation of abnormal returns due to the Accrual anomaly (models 2 and 4). The first difference of the IIE-Br was also non-significant but with a negative sign (model 3). Finally, when we consider IVOL-Br as uncertainty, we find a negative and significant effect of this variable in relation to the generation of abnormal returns impacted by accruals (Model 5), in line with the research hypothesis. The other variables had similar behavior to that presented in table 5.

Tables 5 and 6 show that the results of the effect of uncertainty on abnormal returns impacted by accruals are conditioned to the estimation methodology of the uncertainty indicator. The EPU index that tries to measure the uncertainty of the economic policy, although limited to a single newspaper, presents a positive and significant effect, both in level and in its first difference. On the other hand, the IIE-Br that tries to measure economic uncertainty does not present a significant relationship. However, the IVOL-Br fear index has a negative and significant effect, in line with the theoretical development presented, producing an adverse effect on stock returns, considering the expectation of the accrual component of corporate results.

5. Conclusion

Risk and uncertainty are characteristics perceived as important factors for investment decisions, affecting the possible excess returns of stocks in the market. Thus, this paper presented a framework to verify the relationship between economic policy uncertainty and abnormal returns impacted by accruals in the Brazilian stock market.

The study's empirical results suggest the existence of an accrual anomaly in the Brazilian environment, and the factor arising from accruals is significant in explaining asset pricing in different portfolios, as in Moreira et al. (2019). A positive relation was found between economic policy uncertainty and the abnormal return of accrual, a result contrary to the one expected. In addition, it was possible to verify negative relation between expected volatility and an accrual anomaly, confirming the assumption that a more uncertain and volatile scenario can affect the perception of firms' future earnings.

These results are consistent with the fact that uncertainty and volatility increases can undermine firms' investment decisions and induce investors to sell stocks, reducing stock prices and hence their returns, but the result is not robust to the uncertainty indicator. Nevertheless, rational investors could reap uncertainty premiums as prices recover at later points in time. Thus, investors who buy stocks at times of high uncertainty would also be likely to receive the same uncertainty premiums.

Therefore, economic policy uncertainty is a relevant topic for academia and policymakers alike, along with the analysis of the returns' impacts on stock markets. Thus, the results found here can be useful for these policymakers and investors in financial markets to improve the stability of policy implementation and avoid abnormal fluctuations in equity markets and suggest investment strategies with perspectives based on economic policy uncertainty and expected market volatility.

It is noteworthy that, although it was not the focus of this study, the stock returns in the Brazilian market may be sensitive not only to the uncertainties of the domestic market itself but also to the uncertainties arising from other markets. This possible influence could be investigated in future studies. In addition, it is suggested that other uncertainty measures available in the literature are used, as well as other pricing models, to test the maintenance of the results.

The paper demonstrates the persistence of the anomaly documented by Sloan (1996) in the Brazilian market. Researching that analysis efficient-market hypothesis allows users to understand how the capital market works, assisting in the correct allocation of resources. The persistence of the accrual anomaly from 2010 to 2019 highlights the need to thoroughly evaluate its effect. Therefore, subsequent research that captures additional alternative proxies of accruals by disaggregating them (in the face of distinct levels of persistence) is recommended. In other words, the anomaly may be associated with a specific portion of the accrual, such as the discretionary portion, and this disaggregating may generate interesting interpretations about the effects on firms' profitability and future returns.

A key point in any study on financial anomalies is the metric used to estimate normal/abnormal returns, in which all different approaches are permeated with advantages and limitations. Therefore, the need for further studies adopting alternative proxies for the expected return given the level of risk, using other pricing models, is highlighted to test the persistence of the results using multifactor models.

The work used regression with panel data. However, it is suggested for future research, especially those comparing different countries, the use of the hierarchical linear models (HLM) approach to evaluate the characteristics of countries that do not vary over time. Thus, it could be considered that stocks within the same hierarchical strata (in this case, in the same country) tend to be more like each other than stocks randomly selected from the entire population.

In addition to economic policy uncertainties captured by the EPU index, created by Baker et al. (2016), we suggest the conduction of additional studies analyzing metrics that can capture the level of market volatility or

investor perception of risk, such as the investor sentiment index (Baker & Wurgler, 2006; Livnat & Petrovits, 2019) and indexes of investor perception about the state of the economy (Veronesi, 1999; Conrad et al., 2002).

Furthermore, the understanding of the accrual anomaly can be broadened when incorporating other documented existing phenomena, controlling, for instance, other factors such as the moment effect or the investment effect. We highlight the need for research, in the Brazilian market, on another accounting anomaly documented in the international literature, known as post-earnings-announcement drift (PEAD), as well as its interrelation with the other factors discussed above.

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