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Extraordinary actions: The use of Buyback and Spread Auctions – The Brazil National Treasury Experience

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Introduction

Introduction

Our goal is to assess the main elements on BNT extraordinary actions in recent years.

- We discuss public debt management in Brazil and its idiosyncrasies, such as:
 - Raising concerns over fiscal issues
 - Ability to push a reform agenda
 - The official credit policy
 - The framework that describes the flows between BNT and the Central Bank
 - The impacts of the Covid-19 pandemic

Those idiosyncrasies led to the unusual conditions that guaranteed a very comfortable cash position even in an environment of fiscal deterioration.

Introduction

As we all know, financial and sovereign debt crisis can cause disturbances to the financial market, with important consequences to the real economy.

- Fiscal, monetary and debt management policy must all interact to guarantee a functional financial system and, simultaneously, deal with macroeconomic shocks.

Over the years the Brazil National Treasury (BNT) identified events of significant market distortions as investors reacted to economic, financial and political concerns.

- In some of those events, BNT announced extraordinary buyback or spread auctions as a tool to support markets and provide market references.

Introduction

The decision to make an extraordinary action requires a permanent follow-up on economic and financial conditions.

- Some conditions must be taken into account when planning extraordinary actions, for example:
 - The Treasury liquidity reserve.
 - Assertive communication with investors.
- During previous crisis the interest rate would go up and the BNT would issue floating bonds indexed to the overnight interest rate. Since this Bond has a very low duration it was not affected by the raising interest rates and had a high demand.
 - During the Covid crisis the interest rate was in a historic low, making the floating bond less attractive. This resulted in the BNT issuing high amounts of short maturing bonds (6 months to 1 year), raising the roll over risk and increasing the necessity of a bigger liquidity reserve.

Extraordinary Actions available for the Debt Manager

- Reduction of Scheduled Auctions Size
- Auction Cancellation
- Issuance of Floating Bonds
- Short Term Issuance
- Buy-backs
- Spread Auctions
- Exchange Auctions



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The Role of the liquidity Reserve

The Role of the liquidity Reserve

- Most of the liquidity reserve of the Brazilian debt results from:
 - The relationship structure between the BNT and the Brazil Central Bank (BCB) and;
 - The partial reversal of the Federal Government's credit policy, especially early settlement of credit operations with BNDES.
- Country has been dealing with relevant primary deficits since 2014.
- Foreign reserve accumulation began to impact BCB's result by Exchange rate volatility.
 - The depreciation of the exchange rate contributed to the BCB's balance sheet showing positive results due to the marking to market of international reserves.
 - In 2020 the international reserves were ~23% GDP.
 - The profits resulting from such depreciation were transferred to the BNT.



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Overview of Extraordinary Actions due to COVID-19

Overview of Extraordinary Actions due to COVID-19

- 2020 was marked by an unprecedented adverse shock to the world economy
 - The intensity of the crisis impacted the financial markets and brought uncertainty and volatility.
- The BNT took the following extraordinary actions:
 - Extraordinary auctions for the purchase and sale of fixed rate and inflation-linked bonds (Between March 12th and 26th).
 - Cancellation of the following traditional auctions:
 - i) Fixed rate, inflation-linked and floating bonds scheduled for March 12, 17, 19 and 26; and
 - ii) Long term fixed rate scheduled for April 2, 9 and 16.
 - Net repurchase of approximately BRL 35.6 billion.
 - Other measures taken:
 - One vertices added for floating bonds auctions: a long one maturing on jan/2026 and a short one maturing on jan/2022.
 - Floating bonds auctions weekly rather than biweekly.

Overview of Extraordinary Actions due to COVID-19

- National Congress approved Constitutional Amendment 106/2020 to support some economic policy actions while the situation of public calamity persisted.
 - Authorization for the BCB to trade in the secondary market for public and private securities.
 - Although not triggered, this provision eliminated the legal uncertainty for the monetary authority to act in the public bond market.
- By 2020 the BNT – BCB relationship had changed, and the profit / loss derived from the volatility of the external reserves was not readily available for the BNT.
 - Instead, it was deposited in a reserve account at the BCB.
 - Due to the pandemic the Brazilian authorities approved for the profit deposited in the reserve account to be transferred to the BNT, resulting in an increase of ~4,35% GDP of the liquidity reserve.



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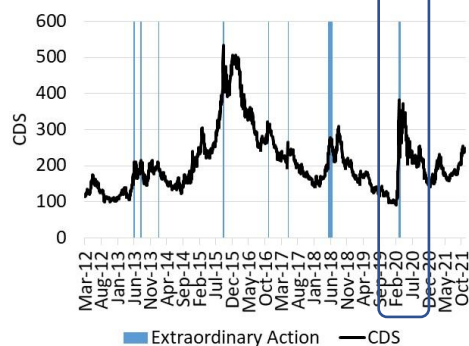
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Quantitative Analysis

Quantitative Analysis

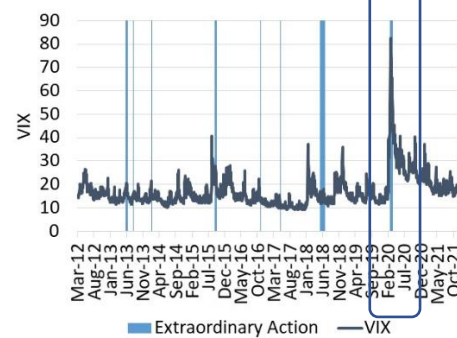
- Historical analysis indicates that extraordinary actions of BNT were associated with moments of risk aversion, but...
 - The action of economic authorities can mitigate abrupt movements in asset prices, whether government bonds or foreign currency. In other words, an event of extreme volatility may not have occurred as a result of the action of the economic authorities, despite the construction of an adverse scenario.
 - On the other hand, the constant presence of the debt manager tends to lead to strategic behavior on the part of financial market agents, which can increase the appetite for risk, confident that they will be able to count on the BNT's performance during scenarios of instability.

Chart 1 – 5-Year CDS – Brazil



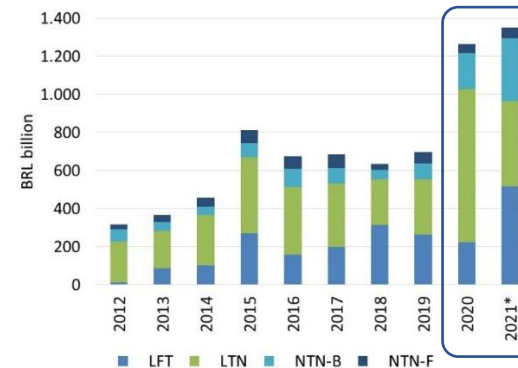
Source: Bloomberg and BNT.

Chart 2 – VIX



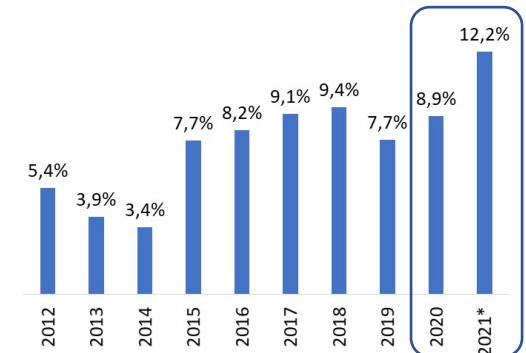
Source: Bloomberg and BNT.

Chart 3 – Domestic FPD Bond Issuance



*Year to June.
Source: BNT.

Chart 4 – Liquidity Reserve/GDP



*Year to June.
Source: BNT.

Quantitative Analysis - Regression

- In order to analyze the conditions under which the BNT performed extraordinary actions we developed two methods:
 - i) Binary econometric model, which allows evaluating how and which financial indicators were important for the performance; and
 - ii) Principal component analysis, which allows an aggregated assessment of how financial volatility behaved at the time of operation.
- It is important to emphasize that:
 - Quantitative exercises are incapable of evaluating the efficiency of the actions; and
 - The model refers to the debt manager's past analysis and is not necessarily a guide for future actions.
- 11 variables divided into 5 distinct categories, which demonstrate both domestic and external market conditions, namely: i) level of volatility; ii) lack of liquidity; iii) lack of price reference; iv) feeling of risk; and v) asset repricing.
- Analysis period: From 08/01/2013 to 11/22/2021

Quantitative Analysis - Regression

Table 2 – Regression Results

	PROBIT	LOGIT	MQO
Daily amplitude of the short term yield curve → C	-3.74*** 0.30	-7.44*** 0.68	-0.08*** 0.02
→ AMPLITUDE_DI(-3)	37.47*** 6.81	72.16*** 14.33	5.57*** 1.16
Daily volume of the short term yield curve → VOLUME_DI(-3)	1.83*** 0.00	3.74** 0.00	0.07 0.00
→ CDS_BRAZIL(-3)	2.37*** 2.37	15.38*** 5.47	0.76*** 0.28
Embedded volatility of US dolar options → IMPLICIT_VOL_EXCHANGE_RATE(-3)	3.61*** 0.01	8.39*** 0.03	0.006 0.00
Akaike info criterion	0.19	0.20	-0.88
Schwarz criterion	0.21	0.21	-0.87
Log likelihood	106.27	103.61	
H-L Statistic	4.94	4.06	
Obs with Dep=0	1430	1430	1430
Obs with Dep=1	42	42	42
Obs Total	1472	1472	1472

Notes: Standard deviations are in parentheses. Akaike and Schwarz indicate the model's fit information criteria. LL stands for Log Likelihood. H-L Statistic of fit adequacy evaluation for binary specification. The p-value of the t-statistic is given by: * if $p < 0, 10$, ** if $p < 0.05$ and *** if $p < 0.01$.

Source: authors.

Quantitative Analysis - Regression

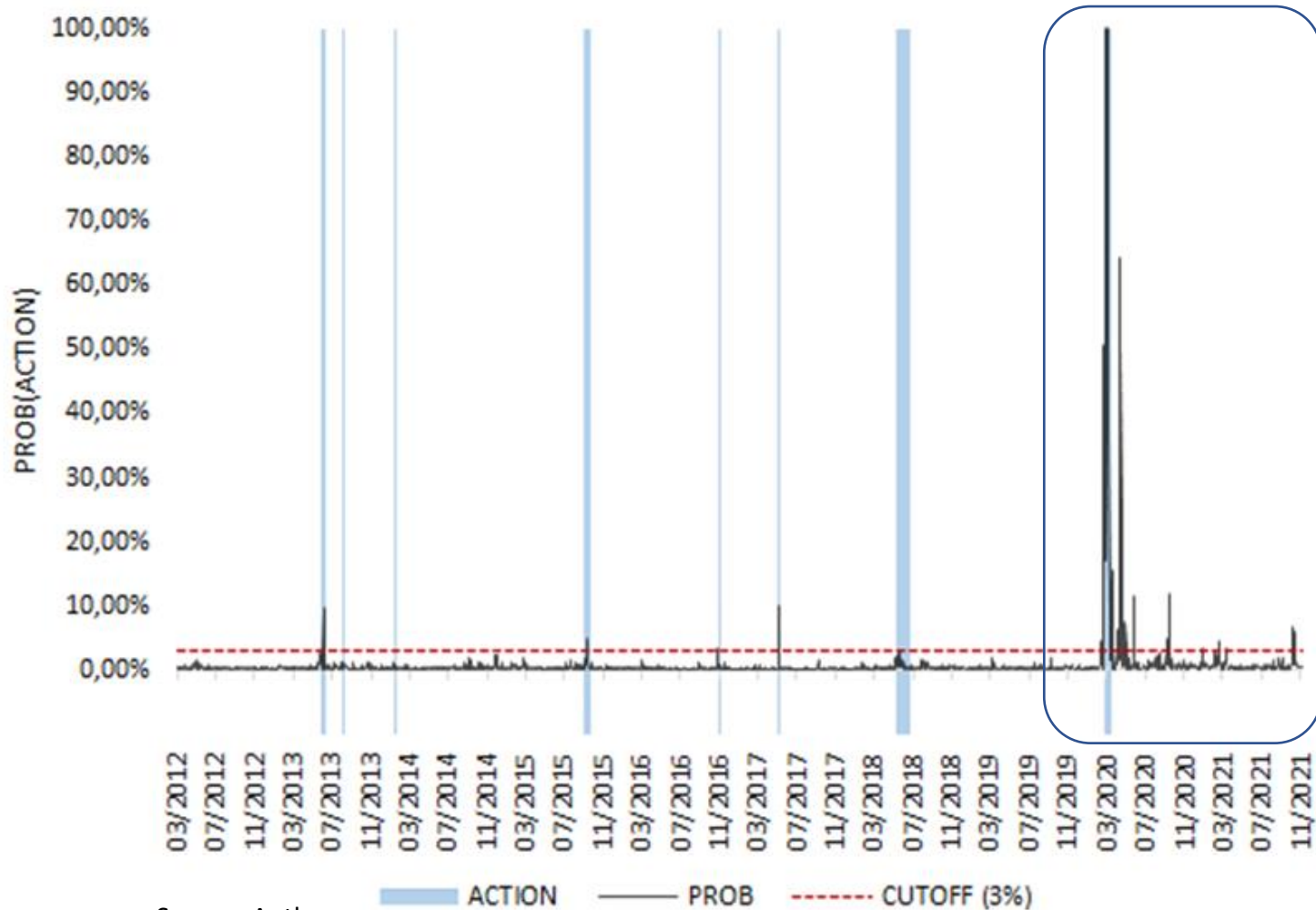
- Many other models including other variables were tested.
- To evaluate the model we chose a cut-off of 3%.
 - Historical number of extraordinary actions divided by number of auctions is approximately 3%.
 - Every time the model suggested a probability of extraordinary action higher than 3% => We would consider as an indication of extraordinary action.

Table 3 – Chosen Model (cut-off - 3,0%)

Estimated				Estimated (%)			
0	1	Total		0	1	Total	
1197	233	1430	Observed	0	81,3	15,8	97,1
8	34	42		1	0,5	2,3	2,9
1205	267	1472		Total	81,9	18,1	100,

- Total Forecast Accuracy: 83.6%
- Type II error (not predicting action when it occurs): 0.5%

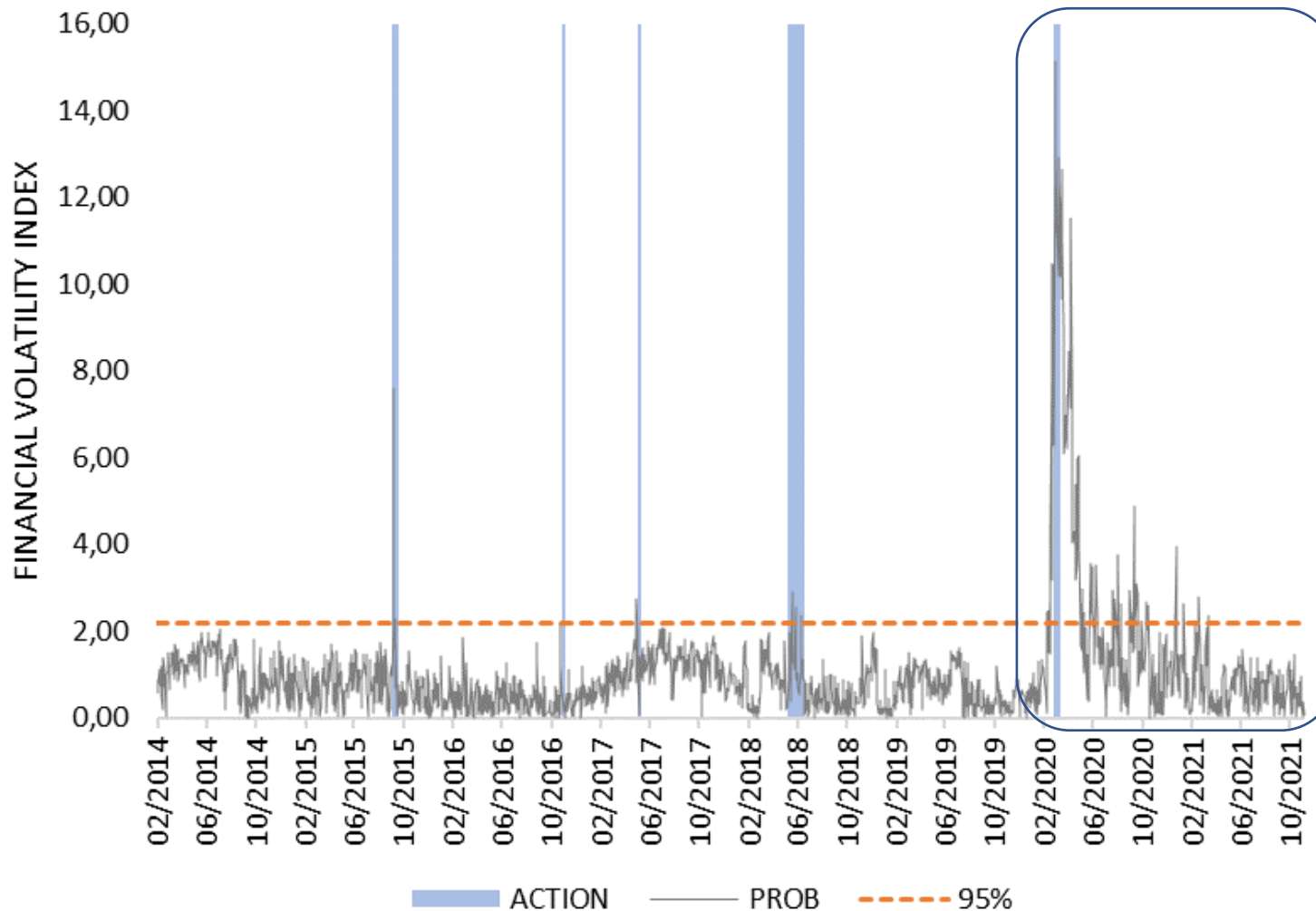
Quantitative Analysis - Regression



Source: Authors

- Model was conservative until covid crisis.
 - After that it started indicating a great number of extraordinary actions due to an increased market volatility.

Quantitative Analysis - PCA



Source: Authors

- Variations above 2 standard deviations = ad hoc criterion of high volatility.
- 70 moments of high volatility identified.
- From 2015 onwards all extraordinary actions happened in the same week as the financial volatility index stress indication.
- Model was conservative until covid crisis. After that it started indicating a great number of extraordinary actions due to an increased market volatility.



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Concluding Remarks

Concluding Remarks

- Evaluation of extraordinary actions must encompass aspects that are intrinsic to debt management but also those related to the country's macroeconomics, public finances and institutional structure.
 - In this sense, an attempt was made to highlight the role played by the official credit policy and the institutional arrangement of the relationship between the National Treasury and the BCB over the last few years as a source of financing for the TSA and for the liquidity reserve.
- The results of the quantitative analysis showed that important indicators of financial market volatility are relevant for forecasting the actions of the BNT in the public bond market.
 - Regression showed a high predictive capacity of the BNT's actions and were robust to different sets of independent variables and statistical tests.
 - Principal Components Analysis confirms the perception that moments of financial volatility were important for the decision to act of the public debt authority.
 - Models are complimentary and should be used together to better identify periods of high volatility.

Concluding Remarks

- Indicators or mechanical metrics represents only one dimension in the light of the broad spectrum related to the BNT's actions and the financing process.
 - The relationship between economic policy, as well as the interaction with different market participants, are essential conditions for decision making.
 - Financial indicators should not be the only variable analyzed.
- It should be emphasized that the actions of the BNT must be primarily focused on the development and preservation of a competitive and efficient public bond market.
 - The maintenance of the debt manager's reputation being necessary to decide whether or not to act at times of uncertainty or information asymmetry, since their actions have the potential to change the behavior of market participants and, consequently, the process of price formation of government bonds.
- Finally, it should be noted that, since the BCB cannot easily buy sovereign bonds in the primary or secondary market, the BNT must rely on a bigger liquidity reserve.



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Annex

Annex I – Quantitative Analysis

Binary Model: To assess the BNT's actions, binary models were chosen, which are frequently used in studies that assess agents' exclusive choices, suitable for situations in which the agent has only two alternatives. In the case in question, between acting or not in the government bond market.

Principal Component Analysis (PCA): a series of financial volatility was constructed from the 10 indicators evaluated and it was defined as a rule that results above the 95th percentile would be characterized as an extreme measure of risk.

Annex II – Description of Indicators

The indicators analyzed to support decision making regarding the execution of extraordinary auctions of public debt securities of this National Treasury Secretariat were grouped into 5 categories, namely:

- 1) **Volatility indicators:** The occurrence of volatility at abnormal levels that are not explained by structural factors;
- 2) **Indicators of lack of liquidity:** The lack of liquidity in the markets makes it impossible to close positions and increases the risk of agents;
- 3) **Indicators of Absence of Price References:** Make it hard or impossible to carry out negotiations in the secondary market;
- 4) **Risk sentiment indicators:** Seek to show an atypical detachment between real and nominal interest rate curves;
- 5) **Asset repricing indicators:** They seek to identify whether the market is going through a period of transitory volatility or whether the price of assets undergoes a process of change in level.

END

