

The relationship between observed and expected budget rule violations, business confidence and economic growth expectations in Brazil

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Abstract

Using Brazilian data from March 2003 to December 2024, this paper investigates whether observed and expected violations of the budget rule are related to business confidence and growth expectations, and whether these relationships vary across different states of sentiment. The empirical strategy combines time series analysis and quantile regression models to characterize both average and distributional patterns in the data. The results indicate that both observed and expected fiscal rule violations are associated to lower levels of business confidence, with stronger relationships emerging during periods of greater pessimism. The analysis further reveals that fiscal noncompliance tends to coincide with weaker expectations of economic growth over the subsequent 12 months, highlighting the close connection between perceptions of fiscal commitment and forward-looking expectations. Quantile regression results point to heterogeneous patterns across the distribution, particularly in lower-confidence states. Overall, the findings underscore the relevance of fiscal discipline for private-sector expectations and broader macroeconomic sentiment. The study offers insights that may be relevant for a variety of economies, including emerging and advanced European economies, which adopt similar economic policy frameworks (such as inflation targeting) and fiscal rules, but experience episodes of noncompliance.

Keywords: fiscal rule, business confidence, growth expectations, budget balance

Resumo

Utilizando dados brasileiros de março de 2003 a dezembro de 2024, este artigo investiga se violações observadas e esperadas da regra orçamentária estão relacionadas à confiança empresarial e às expectativas de crescimento econômico, bem como se essas relações variam entre diferentes estados de sentimento econômico. A estratégia empírica combina análise de séries temporais e modelos de regressão quantílica para caracterizar padrões médios e distribucionais nos dados. Os resultados indicam que tanto as violações observadas quanto as esperadas da regra fiscal estão associadas a níveis mais baixos de confiança empresarial, sendo que relações mais intensas emergem em períodos de maior pessimismo. A análise também revela que o descumprimento da regra fiscal tende a coincidir com expectativas mais fracas de crescimento econômico para os 12 meses subsequentes, destacando a estreita conexão entre as percepções de comprometimento fiscal e as expectativas voltadas para o futuro. Os resultados das regressões quantílicas apontam para padrões heterogêneos ao longo da distribuição, particularmente nos estados de menor confiança. Em conjunto, as evidências ressaltam a relevância da disciplina fiscal para as expectativas do setor privado e para o sentimento macroeconômico mais amplo. O estudo oferece insights potencialmente relevantes para diversas economias, incluindo economias emergentes e economias europeias avançadas, que adotam arcabouços de política econômica semelhantes (como o regime de metas para a inflação) e regras fiscais, mas que enfrentam episódios de descumprimento dessas regras.

Palavras-chave: regra fiscal; confiança empresarial; expectativas de crescimento; resultado orçamentário.

JEL classification: D84, E62, E66, H60, H68

Área 4 - Macroeconomia, Economia Monetária e Finanças

1. Introduction

Fiscal rules have become one of the main institutional mechanisms aimed at promoting fiscal sustainability, macroeconomic stability, and policy credibility by constraining fiscal discretion and limiting governments' incentives to generate persistent deficits and unsustainable debt trajectories (Lehtimäki, 2025). As intertemporal commitment devices, they seek to mitigate deficit bias, reduce time-inconsistency problems, improve fiscal outcomes, and enhance fiscal transparency (Milesi-Ferretti, 2003; Debrun et al., 2008; Kalan et al., 2018; Davoodi et al., 2022).¹ Consequently, fiscal rules are expected not only to discipline fiscal behavior but also to coordinate private-sector expectations regarding the future path of public finances and the broader macroeconomic environment.

Fiscal rules also play an important stabilizing role over the business cycle by limiting incentives for persistent deficits and excessive debt accumulation (Montes and Dantas, 2025). Using a sample of up to 74 countries, Badinger and Reuter (2017) show that stricter fiscal rules are associated with lower deficits, lower government bond spreads, and lower output volatility. Similarly, Brändle and Elsener (2024), in a comprehensive survey of the literature, conclude that fiscal rules are generally associated with improved fiscal performance, including stronger budget balances, lower debt levels, and reduced public spending volatility.

Despite these benefits, recent evidence indicates widespread noncompliance and recurrent fiscal rule breaches in both developed and developing economies (Kalan et al., 2018; Banin et al., 2022; Ulloa-Suarez and Valencia, 2023). Although adopting fiscal rules signals a commitment to fiscal responsibility, repeated failures to comply may undermine their credibility and effectiveness. This issue is particularly relevant in Brazil, where budget rule breaches occur in several times, representing one of the Latin American economies with high incidence of budget rule breaches (Ulloa-Suarez and Valencia, 2023). Nevertheless, the economic consequences of fiscal rule noncompliance remain relatively underexplored.

This gap is important because the effectiveness of fiscal rules ultimately depends on expectations and confidence. If the public and financial markets believe a government will adhere to its constraints, the rules anchor market expectations, lower borrowing costs, and create economic stability. On the other hand, if economic agents perceive that fiscal constraints can be repeatedly relaxed, revised, or ignored, expectations regarding debt sustainability and future economic policy may deteriorate (Montes and Acar, 2020). In forward-looking economies, firms and investors base decisions not only on current conditions but also on expectations regarding future economic activity as well as future monetary and fiscal policies. Consequently, the government's lack of commitment to fiscal targets leads to a loss of credibility, and losses in fiscal credibility may generate economically relevant effects even before an actual breach occurs (Montes and Cabral, 2025).

Business confidence constitutes a key transmission channel linking fiscal commitment and economic activity. It directly influences firms' decisions regarding investment, production, hiring, and expansion plans (Montes and Nogueira, 2022; Montes and Cabral, 2025; de Mendonça et al., 2025). Higher confidence tends to stimulate investment and employment, supporting economic growth, whereas lower confidence increases uncertainty and discourages long-term investment. As a result, fiscal commitment and expectations related to fiscal commitment may exert substantial influence on business sentiment and macroeconomic performance.

In this paper, we argue that compliance with the fiscal budget rule plays a central role in sustaining business confidence by shaping expectations regarding macroeconomic stability and policy predictability. Compliance with fiscal rules signals commitment to fiscal sustainability, reducing perceived risks and facilitating long-term planning. Greater fiscal discipline may lower concerns about future tax increases, debt monetization, and abrupt fiscal adjustments, while also contributing to lower financing costs and better

¹ Empirical evidence indicates that the adoption of fiscal rules is associated with better fiscal performance (Debrun et al., 2008; Fall et al., 2015; Reuter, 2015; Bergman et al., 2016; Combes et al., 2018; Caselli and Reynaud, 2020; Vinturis, 2021). Subsequent research has also documented that fiscal rules contribute to lower sovereign risk (Hallerberg and Wolff, 2008; Iara and Wolff, 2014; Feld et al., 2017; Thornton and Vasilakis, 2017; Afonso and Jalles, 2019), greater fiscal predictability (Luechinger and Schaltegger, 2013), lower monetary policy interest rates (Montes and Dantas, 2025), and improved economic performance and stability (Fatás and Mihov, 2006; Castro, 2011; Afonso and Jalles, 2013; Chmura, 2023).

credit conditions. Moreover, adherence to fiscal rules tends to strengthen institutional quality by enhancing policy predictability and reducing uncertainty.

Conversely, persistent noncompliance may generate significant adverse effects on business confidence. Fiscal rule violations increase uncertainty regarding the future path of public debt and fiscal policy, leading firms to assign higher probabilities to abrupt fiscal adjustments, unexpected tax increases, or changes in government spending priorities. Recurrent breaches may also signal the risk of fiscal dominance, raising concerns that monetary policy could become constrained by fiscal imbalances through higher inflation or persistently elevated interest rates. Such developments may weaken both fiscal and monetary policy credibility, increase macroeconomic volatility, and deteriorate the business environment.

In addition to observed violations, expectations of future noncompliance may also produce economically relevant associations. Because firms are forward-looking, anticipated breaches of the budget rule can influence business confidence independently of realized fiscal outcomes. However, the empirical literature has devoted limited attention to distinguishing the effects of observed violations from those associated with expectations of future noncompliance. This distinction is important because expectations may operate as a self-fulfilling mechanism capable of weakening confidence before any effective fiscal deterioration occurs.

Against this background, this study examines how observed and expected violations of the budget rule are related to business confidence in Brazil. Specifically, it addresses three questions: Is business confidence systematically related to observed violations of the budget rule? Is it also related to expectations of noncompliance? Do these relationships differ across the distribution of business confidence? To answer these questions, we employ monthly data from 2003.03 to 2024.12 and use two alternative indicators of business confidence. As a robustness exercise, we further explore whether observed and expected rule violations exhibit similar relationships with economic growth expectations, given their close connection to business confidence.

The empirical analysis is conducted using standard time series analysis as well as quantile regression models. Particularly, the use of quantile regression allows us to evaluate whether the effects of observed and expected noncompliance differ across situations characterized by greater optimism or pessimism, as well as by high or low economic growth expectations.

Since the 1990s, many countries, including Brazil, have adopted inflation-targeting regimes and strengthened fiscal responsibility through the implementation of fiscal rules aimed at reducing discretionary fiscal policymaking (Fatás and Mihov, 2003a, 2003b). Because fiscal rules are intended to influence confidence and expectations directly, understanding the consequences of noncompliance is particularly relevant in emerging economies such as Brazil, where fiscal policy has experienced frequent shifts.

Brazil offers a particularly suitable setting for this analysis due to recurrent revisions of fiscal targets, the high incidence of rule breaches, the availability of expectation-related fiscal data, and an institutional framework shared by many emerging economies. Several factors reinforce its relevance as a case study. First, Brazil implemented the Fiscal Responsibility Law (FRL) in the early 2000s, establishing annual fiscal targets through the Budget Guidelines Law and providing more than two decades of data. Second, the government failed to meet the primary surplus target in several occasions of the period analyzed. Third, public debt declined from about 77% of GDP in January 2003 to 57% in October 2014, before rising sharply to 97% in February 2021 and remaining elevated at 87% in December 2024. Fourth, Brazil provides data on budget expectations, enabling the construction of a measure of expected fiscal rule violations. Finally, Brazil's institutional framework – characterized by inflation targeting, fiscal targets, and a floating exchange rate – is comparable to that of many developing and advanced economies, making the findings potentially informative beyond the Brazilian case. Therefore, the study offers interesting insights into various economies, including emerging and advanced European economies, which adopt similar economic policy frameworks (such as inflation targeting) and fiscal rules, but occasionally fail to comply with them.

The results indicate that periods of observed and expected violations of the budget rule are characterized by lower levels of business confidence, with more pronounced differences in the subsample excluding major external shocks. These periods also coincide with higher macroeconomic uncertainty and lower perceptions of fiscal sustainability.

The analysis further shows that similar patterns are observed for expectations regarding future economic performance. Both observed and expected fiscal rule violations are also linked to lower expected economic growth over the subsequent 12 months, together with weaker forward-looking macroeconomic expectations.

Finally, quantile regression results reveal heterogeneous patterns across the distribution of outcomes. Fiscal rule violations are more strongly related to business sentiment during more pessimistic periods and, in several cases, display more pronounced differences in growth expectations when these are relatively high. Overall, the results describe patterns in the joint behavior of fiscal rule compliance, business confidence and growth expectations.

2. Literature Review

The literature highlights the role of fiscal rules in promoting fiscal sustainability, reducing budget deficits and strengthening fiscal credibility (Heinemann, Moessinger and Yeter, 2018; Brändle and Elsener, 2024; Potrafke, 2025). However, recent research emphasizes that their effectiveness also depends on compliance with established targets.

Evidence suggests that fiscal rules may retain relevance even when violations occur. Reuter (2015) shows that episodes of non-compliance are often followed by fiscal adjustments toward prescribed limits, indicating that rules continue to serve as benchmarks for policymakers and the public. Nevertheless, the literature increasingly argues that the benefits associated with fiscal rules materialize primarily when governments effectively comply with them. Ardanaz, Ulloa-Suárez and Valencia (2024) find that favorable fiscal outcomes are concentrated in countries combining rule adoption with effective compliance, while Ulloa-Suárez and Valencia (2023) document a substantial gap between the existence of fiscal rules and their enforcement. These findings suggest that the effectiveness of fiscal frameworks is closely associated with governments' ability to honor commitments and maintain credibility (Ulloa-Suárez and Valencia, 2022; Ardanaz, Ulloa-Suárez and Valencia, 2024).

Institutional design also influences compliance. Căpraru, Pappas, and Sprincean (2025) identify a nonlinear relationship between the number of fiscal rules and compliance probability, showing that excessive rule proliferation may reduce compliance due to overlapping targets and monitoring difficulties. For developing economies, these challenges are compounded by greater macroeconomic volatility and weaker institutional environments (Montes and Marroffino, 2026). In such contexts, concerns arise that rigid fiscal constraints may limit public investment and affect broader economic performance. However, Larch and van der Wielen (2025) show that compliance with European fiscal rules is not associated with lower public investment and that compliant governments tend to preserve greater fiscal space for investment. Accordingly, Ardanaz, Ulloa-Suárez and Valencia (2024) argue that fiscal frameworks are more effective when they combine discipline with flexibility through mechanisms such as escape clauses and cyclical adjustments.

A growing body of evidence links fiscal rule compliance to sovereign risk and financial-market perceptions. Căpraru, Georgescu and Sprincean (2025) show that higher compliance with European fiscal rules is associated with lower sovereign credit default swap spreads, indicating lower perceived default risk. They also find that independent fiscal institutions contribute to improved sovereign risk assessments, particularly when supported by institutional reforms and more developed financial markets. Similar evidence is reported for emerging economies by Ardanaz, Ulloa-Suárez and Valencia (2024), who show that compliance is associated with lower sovereign spreads, improved credit ratings, and a lower probability of debt distress. López-Villavicencio and Zoumenou (2025) further demonstrate that compliance with budget balance rules contributes to fiscal stability, while the formal stringency of rules appears less important than their effective implementation. Collectively, these findings suggest that compliance influences market perceptions of fiscal sustainability and policy predictability.

The literature also identifies broader political and social dimensions of fiscal rule compliance. Baret (2023) finds that governments may alter expenditure composition to reconcile compliance with other policy objectives, potentially generating adverse consequences for social spending and inequality. The study also shows that voter preferences influence compliance decisions, indicating that non-compliance may reflect

political and social pressures. Kantorowicz (2023) argues that fiscal rules derive part of their effectiveness from the reputational costs associated with violations. His evidence shows that non-compliance leads to more negative evaluations of policymakers, suggesting that fiscal breaches have meaningful political consequences.

These studies support the view that fiscal rules function as institutional signals of governments' commitment to fiscal discipline (Reuter, 2015). Consequently, observed or anticipated violations may affect economic agents' perceptions of future fiscal conduct. The effectiveness of fiscal frameworks therefore depends not only on their formal design but also on institutional capacity to monitor, enforce, and deter repeated violations. Public responses to fiscal breaches are shaped by transparency, enforcement credibility, and the visibility of non-compliance episodes (Kantorowicz, 2023; Mair and Mosler, 2026).

Despite substantial advances in understanding the effects of fiscal rule compliance on sovereign risk, fiscal stability, and investment, relatively little attention has been devoted to expectations. Evidence for Brazil indicates that fiscal deterioration and greater fiscal opacity are associated with lower business confidence and a less favorable business environment (de Mendonça, Vereda and Dias 2025). In this context, fiscal rule violations may be interpreted as signals of weakened commitment to fiscal discipline, with implications for private-sector expectations.

Overall, the literature suggests that fiscal rule violations are associated with higher perceived risk, weaker fiscal credibility, lower policy predictability and less favorable financing conditions (Reuter, 2015; Kantorowicz, 2023; Ardanaz, Ulloa-Suárez and Valencia, 2024; Căpraru, Georgescu and Sprincean, 2025). However, existing studies have focused primarily on fiscal and financial outcomes, leaving open the question of how observed and expected violations shape business confidence and expectations regarding future economic performance, particularly in emerging economies characterized by recurring episodes of institutional flexibility and target revisions.

Against this background, this study examines the relationship between observed and expected fiscal rule violations, business confidence, and economic growth expectations in Brazil. By distinguishing between realized and expected breaches, the analysis evaluates whether agents respond only to observed non-compliance or also to the anticipation of future violations. Furthermore, the use of quantile regression allows the assessment of heterogeneous associations across different states of confidence and expectations. In doing so, the study extends the fiscal compliance literature by focusing on the expectations channel and providing evidence on the economic implications associated with fiscal policy credibility.

3. Data and methodology

To assess the effects of observed and expected breaches of the budget rule on business confidence in Brazil, this study uses monthly data from March 2003 to December 2024.²

Regarding business confidence, the study uses two indicators that capture entrepreneurs' sentiment in relation to their business and the future of the economy. The first is the Industrial Entrepreneur Confidence Index prepared by the "*Confederação Nacional da Indústria*" (CNI) (here denominated as BCI-CNI). The BCI-CNI is a leading indicator used to identify changes in trends in industrial production. The BCI-CNI ranges from 0 to 100. The BCI-CNI is constructed so that values above 50 points indicate confident entrepreneurs, while values below 50 indicate pessimism among entrepreneurs. The index is made available by the Central Bank of Brazil (CBB) in its Time Series Management System (series 7341). Since the index is on a quarterly basis, we interpolated the data in order to convert the series to a monthly frequency.

To check robustness, the second indicator is the Brazilian Business Confidence Index obtained from the Organization for Economic Cooperation and Development (here denominated as BCI-OECD). The BCI-OECD provides information on future developments, based upon opinion surveys on developments in production, orders and stocks of finished goods in the industry sector. Numbers above 100 suggest an increased confidence in near future business performance, and numbers below 100 indicate pessimism towards future performance.

² The period was defined by data availability at the time the research started.

Figure 1 shows the paths of the series of BCI-CNI and BCI-OECD from March 2003 to December 2024. It is possible to observe periods of declining business confidence, as in the Global Financial Crisis (GFC) in 2008. Furthermore, according to de Mendonça and Almeida (2019), since 2014, a combination of irresponsible policies and political scandals in the government of President Dilma Rousseff resulted in a deterioration of business confidence. It is also possible to observe a sharp decline in both indicators due to the COVID-19 pandemic, but in less than one year confidence recovered and returned to its previous level.

Figure 1 Business Confidence Indexes (BCI-CNI and BCI-OECD)

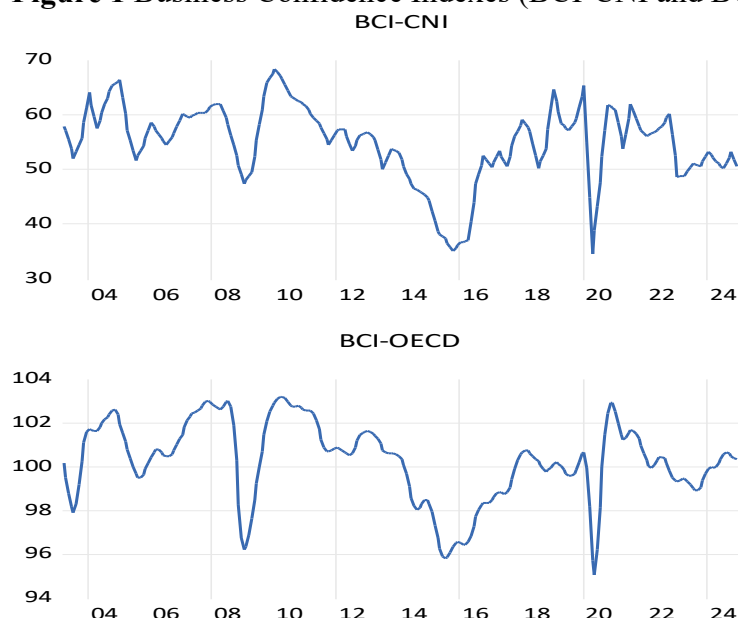


Figure prepared by the authors.

The main explanatory variables of the study are indicators capturing both observed non-compliance with the budget rule and expectations of future non-compliance with the budget rule.

The indicators are based on breaches and expected breaches of the targets set for the primary budget balance. We choose to focus on the targets set for the primary budget balance for several reasons. Among the different fiscal targets established by the Fiscal Responsibility Law (FRL), the most prominent is the primary balance, as it reflects the government's budgetary stance excluding interest payments and is central to assessing fiscal sustainability. Since 1999, Brazil's macroeconomic framework has been built around a "macroeconomic tripod" consisting of inflation targeting, a floating exchange rate regime, and primary surplus targets. Thus, the primary balance is a relevant fiscal aggregate for guiding policymakers' decisions and shaping agents' expectations regarding fiscal performance. Moreover, targets for other fiscal aggregates (such as the nominal balance, revenues, and expenditures) are not consistently defined across all years, which would result in a time series with significant data gaps.³

The indicator of non-compliance with the budget fiscal rule (hereafter referred to as BFR_violation) is constructed as follows: when the government meets or exceeds the established target, the indicator takes the value 0; when the government underperforms relative to the target, the indicator is equal to the difference between the target and the actual fiscal result. In this way, the indicator captures both the occurrence and the magnitude of the fiscal rule violation. A value of 0 indicates that the government met or exceeded the fiscal target, and thus, no violation occurred. Positive values indicate that the actual result fell short of the target, representing a fiscal rule breach. The higher the positive value, the greater the extent of the violation.

The indicator of expected non-compliance with the budget fiscal rule (hereafter referred to as E_BFR_violation) is constructed in a similar manner and follows the same interpretation. However, instead

³ The data are available in the "Fiscal Targets Annex" (*Anexo de Metas Fiscais*), which is published alongside the Budget Guidelines Law (*Lei de Diretrizes Orçamentárias – LDO*).

of using the observed primary balance, it relies on agents' expectations for the primary surplus formed 12 months earlier for the primary surplus at time t .

Equation (1) presents the BFR_violation, while equation (2) presents the E_BFR_violation.

$$\text{BFR_violation} = \begin{cases} 0 & \text{if } OPBO_t \geq \text{Target}_t \\ \text{Target}_t - OPBO_t & \text{if } OPBO_t < \text{Target}_t \end{cases} \quad (1)$$

$$\text{E_BFR_violation} = \begin{cases} 0 & \text{if } EPBO_t \geq \text{Target}_t \\ \text{Target}_t - EPBO_t & \text{if } EPBO_t < \text{Target}_t \end{cases} \quad (2)$$

where, “ Target_t ” represents the primary balance target established in the Budget Guidelines Law (BGL) for the fiscal year, “ $OPBO_t$ ” corresponds to the actually “Observed Primary Balance Outcome” (i.e., the “Primary Balance as a percentage of GDP”) measured on a twelve-month cumulative basis, and $EPBO_t$ represents the “Expected Primary Balance Outcome” formed 12 months earlier for the primary surplus at time t . Data on the “Primary Balance as a percentage of GDP” were obtained from the fiscal statistics of the Central Bank of Brazil (CBB) (series 5793). The series was multiplied by -1 so that surpluses are represented as positive values, thereby facilitating the interpretation of the results. The data on expectation of the primary surplus formed 12 months earlier for the primary surplus at time t were collected from the CBB’s Market Expectations System.⁴ Official fiscal targets were collected from the Budget Guidelines Laws and adjusted to account for legally mandated exclusions, such as amounts related to investment programs and tax exemptions (e.g., the Pilot Investment Project (*PPI*) and the Growth Acceleration Program (*PAC*)).⁵

In addition, through legal mechanisms (such as constitutional amendment proposals or provisional measures), the government may revise the fiscal target during the fiscal year. In such cases, we consider the initially established target, as highlighted by Ulloa-Suarez and Valencia (2023 and 2024), since this discretionary feature of fiscal rules in some Latin American countries may lead to an overestimation of rule compliance. As the end of the fiscal year approaches, rather than adjusting the budget when it becomes clear the target will not be met, the government may simply revise the target and artificially appear to comply. Moreover, as noted by Montes and Acar (2020) in the case of Brazil, this mechanism has been consistently used by the government when it anticipates a failure to meet the fiscal target. A notable example is Ordinary Law No. 12,377 of December 30, 2010, which reduced the fiscal target originally set in 2009 for the year 2010. During the political-economic crisis under former President Dilma Rousseff’s administration, the targets were also repeatedly revised.

Figure 2 presents the trajectories of both “BFR_violation” and “E_BFR_violation” indicators. Since some breaches of the budget rule occurred partly due to external shocks that affected economies globally – such as the Global Financial Crisis (GFC) and the COVID-19 pandemic – which required immediate and substantial fiscal policy responses from governments, we also analyze a subsample that excludes the periods associated with these shocks. Accordingly, in order to examine the relationships of interest only in relation to breaches of the budget rule that were not driven by fiscal policy responses to external shocks, we construct a subsample covering the period from December 2010 to December 2019, which does not incorporate the effects of the Global Financial Crisis and the COVID-19 pandemic. One can observe the government’s limited commitment to the fiscal budget rule. From January 2003 to December 2007, the government breached the rule, leading professional forecasters to expect fiscal adjustments over the following 12 months. However, between January and the end of 2007, these expectations deteriorated, and forecasts shifted toward anticipating further breaches of the rule. In December 2008, due to the GFC,

⁴ Since the expectations data are provided in fixed-event format, we transformed them into fixed-horizon format, following the approach commonly used in the literature (e.g., Dovern et al., 2012). This transformation was applied to all expectation variables used in the study.

⁵ Table A1 in the Appendix provides information on the established primary balance targets. It can be observed that, over time, the target has gradually loosened, becoming a primary deficit target rather than a primary surplus target from 2017 onwards.

violations of the rule intensified and were accompanied by expectations of continued non-compliance. Compliance with the fiscal rule resumed only at the end of 2010 and lasted until August 2012. From late 2012 to early 2017, both breaches of the rule and expectations of non-compliance increased substantially as a result of irresponsible fiscal policies, which contributed to the economic and institutional crisis that culminated in the impeachment of President Dilma Rousseff. Following the impeachment, a period of compliance with the rule – and expectations of compliance – prevailed until March 2020. With the onset of the COVID-19 pandemic and the need for emergency fiscal measures, breaches of the rule became necessary, and expectations adjusted accordingly. However, in June 2021 a new period of compliance and expectations of compliance with the fiscal rule emerged. After the electoral victory of President Luiz Inácio Lula da Silva in the 2022 Brazilian general election, expectations of future breaches of the budget rule began to prevail as early as December 2022. By June 2023, these breaches had become nearly as intense as those observed during the Global Financial Crisis.

Based on the graph related to the subsample (2010M12 – 2019M12), it is noteworthy to observe the perceptions of professional forecasters regarding their expectations about government behavior. Specifically, during periods in which compliance with the budget rule is observed, forecasters tend to adopt a pessimistic stance toward the government and expect that the rule will be breached in the future. Conversely, during periods in which breaches of the budget rule are observed, forecasters anticipate that the government will be compelled to implement fiscal adjustments, and therefore expect future compliance with the rule. This pattern suggests that actual breaches of the budget rule and expected breaches of the rule may exert distinct effects – potentially with different magnitudes – on business confidence.

Figure 2 Behavior of Brazil's BFR_violation and E_BFR_violation indicators

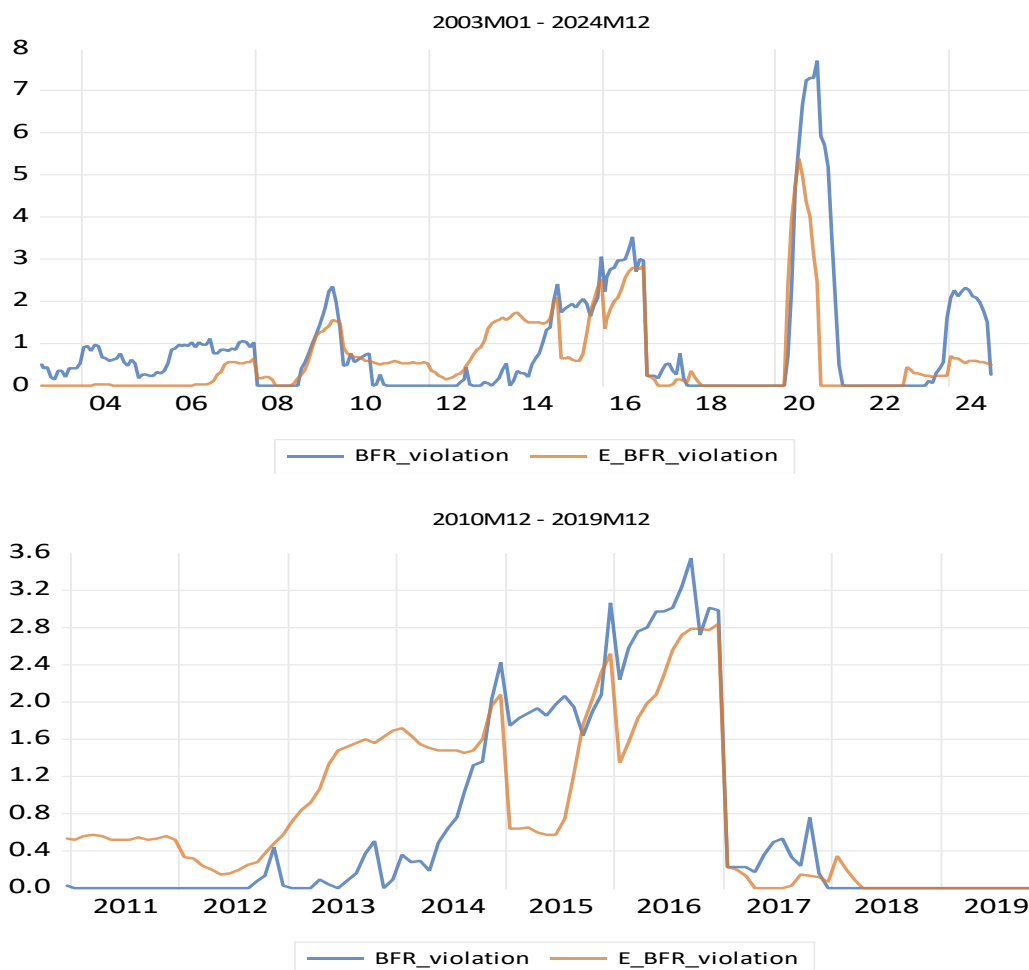


Figure prepared by the authors.

Since it is sometimes possible to observe distinct patterns in the behavior of breaches of the budget rule and in the expectations of such breaches, their effects on business confidence may also differ depending

on the period under analysis. Therefore, it is important to examine whether these relationships change when comparing the full sample (which includes periods affected by external shocks) with the subsample, which excludes those shocks.

Figure 3 presents the series for BCI-CNI and BFR_violation for both samples analyzed, as well as the corresponding scatter plots and correlations for each sample. In turn, Figure 4 displays the series for BCI-CNI and E_BFR_violation for the two samples, together with the respective scatter plots and correlation measures. Figure 3 shows negative correlations in both samples. However, the correlation is stronger in the subsample. In Figure 4, the correlations are also negative; however, there appears to be no substantial difference in magnitude between them, with the correlation observed in the subsample being only slightly higher than that in the full sample.

Figure 3 BCI-CNI and BFR_violation (correlation) – full sample and subsample

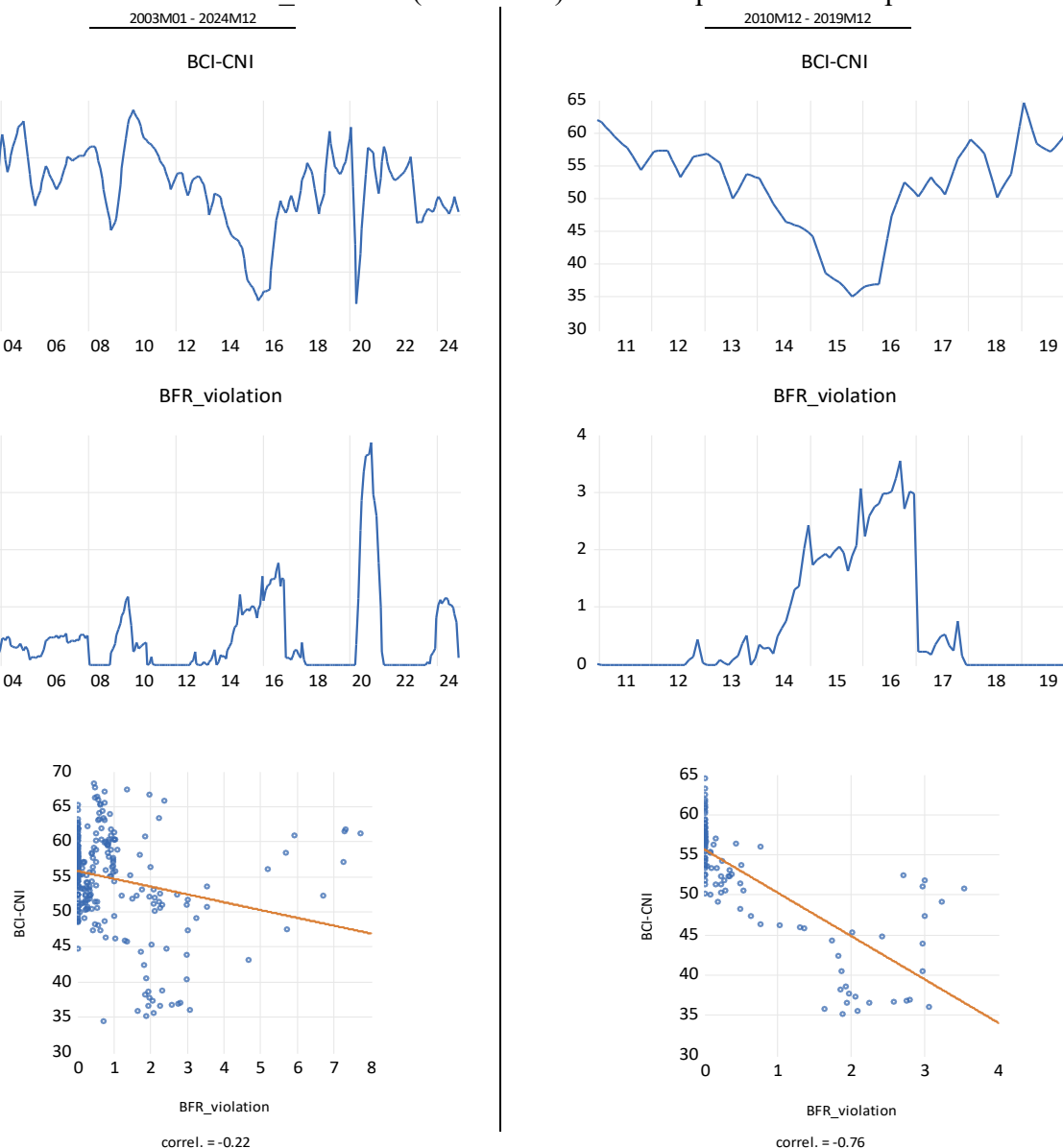


Figure prepared by the authors.

Figure 4 BCI-CNI and E_BFR_violation (correlation) – full sample and subsample

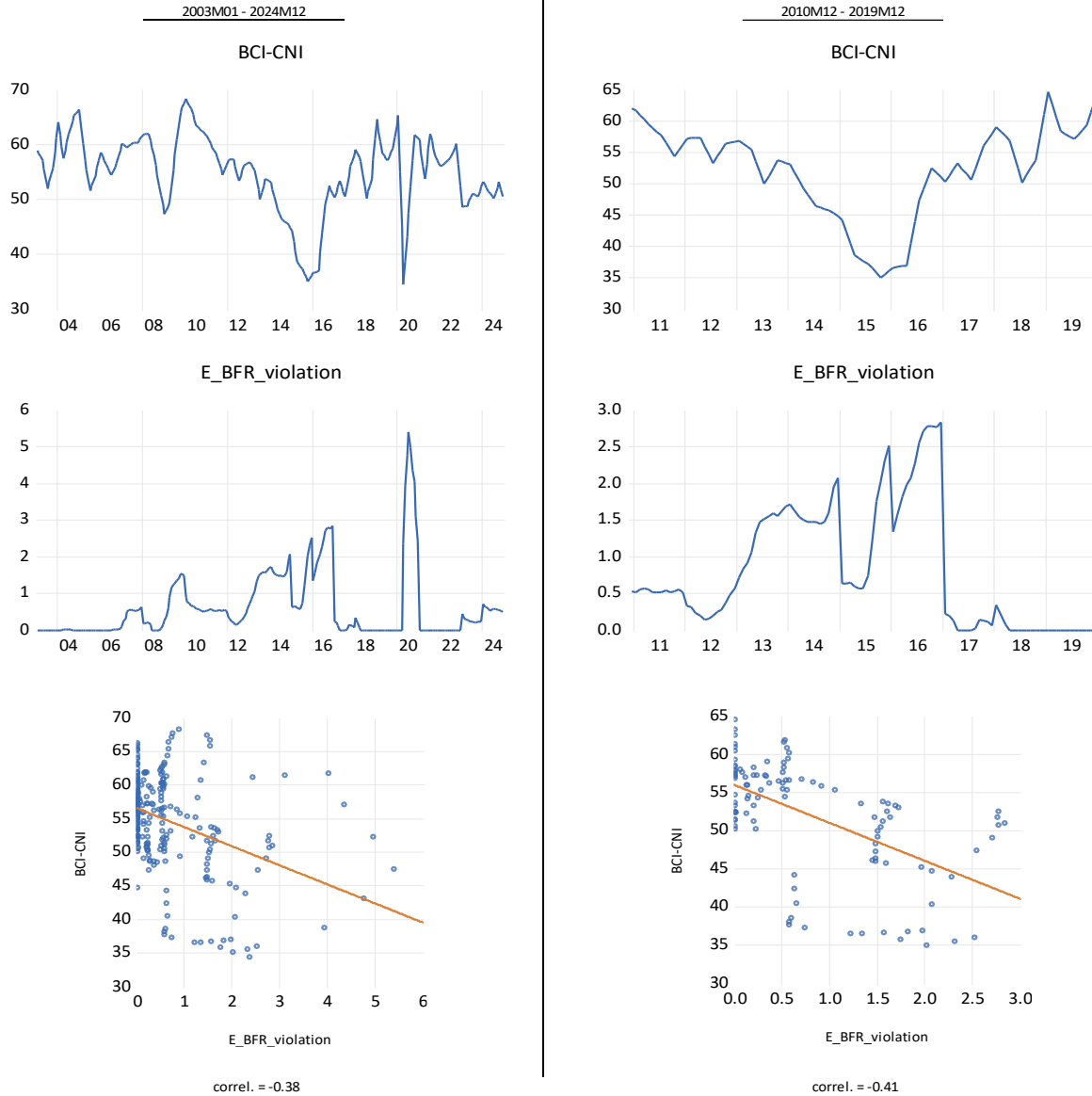


Figure prepared by the authors.

To analyze how non-compliance (and expected non-compliance) with the budgetary rule relates to business confidence, the following general equations are employed:

$$BCI_{j,t} = \alpha_{j0} + \alpha_{j1}BFR_violation_t + \alpha_{j2}X + \varepsilon_{jt} \quad (3)$$

$$BCI_{j,t} = \beta_{j0} + \beta_{j1}E_BFR_violation_t + \beta_{j2}X + \epsilon_{jt} \quad (4)$$

where, $BCI_{j,t}$ denotes the business confidence indexes at time t , with $j = 1$ (BCI-CNI) and $j = 2$ (BCI-OECD). The intercepts are represented by α_{j0} and β_{j0} . The terms α_{j1} and β_{j1} represent the parameters that captures the effects of $BFR_violation_t$ and $E_BFR_violation_t$ on the business confidence indexes, respectively. The terms ε_{jt} and ϵ_{jt} are the error terms. In turn, α_{j2} and β_{j2} denote the vectors of parameters associated with the control variables, and X represents the set of control variables that explain the behavior of the business confidence.

The choice of control variables follows studies addressing the determinants of business confidence (e.g., Atukeren et al., 2013; de Mendonça and Almeida, 2019; de Mendonça and Finn, 2020; Montes and Nogueira, 2022; de Mendonça et al., 2025). Thus, the set of control variables X is formed by: economic

activity growth rate (GROWTH)⁶, infrastructure (INFR)⁷, public debt variation (Δ DEBT)⁸, exchange rate variation (Δ EXCH)⁹, monetary policy interest rate (MPIR)¹⁰, and monetary policy credibility (MONET_CREDIBILITY)¹¹. We also include dummy variables to control for special periods that may affect business confidence: GFC is a dummy variable that captures the Global Financial Crisis (it assumes value 1 from September 2008 to March 2009, and zero otherwise); BR_CRISIS is a dummy variable that captures the period corresponding to the Brazilian fiscal and political crisis that ultimately led to the impeachment process of former President Dilma Rousseff for fiscal misconduct (it assumes value 1 from December 2015 to August 2016, and zero otherwise); and, COVID is a dummy variable that captures the pandemic period from its beginning (declared by the World Health Organization) until the Brazilian government declared the end of the public health emergency (it assumes value equal to 1 from March 2020 to April 2021, and zero otherwise). Table A2 (Appendix) presents the descriptive statistics for all series used in the study.

To check unit root and stationarity of the series, we perform Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests (Table A3, Appendix). Based on the tests, we observe that both public debt and exchange rate are I(1), and the other variables are I(0). Thus, in the regressions, the public debt and exchange rate variables are used in the first difference.

Estimates are obtained from ordinary least squares (OLS), generalized method of moments (GMM), and quantile regression. OLS and GMM estimates use the Newey-West matrix (HAC) (Newey and West, 1987) to deal with autocorrelation and heteroskedasticity problems identified. If, on the one hand, OLS estimates are susceptible to endogeneity problems, on the other hand, GMM provides consistent estimates (Wooldridge, 2001; Hall, 2005) and allows one to verify whether the results obtained by OLS are preserved. Therefore, GMM is used to deal with endogeneity problems.

In order to deal with endogeneity problems, we follow Johnston (1984) to select the instruments on GMM estimation, i.e., the instruments were dated to the period t-2 or earlier to assure the exogeneity (in the case of the dependent variables, they were dated to the period t-1 or earlier).¹² According to Cragg (1983), overidentification has an important role in the selection of instrumental variables to improve the efficiency of the estimators. Therefore, a standard J-test was performed aiming at testing this property for the validity of the overidentifying restrictions, i.e., the J-statistic indicates whether the orthogonality condition is satisfied. As can be seen in all tables, the J test validates all GMM estimates.

To investigate the existence of possible asymmetries in the relationship between non-compliance with the budget rule and business confidence, we employ quantile regression. This methodology allows the dependent variable – the BCI – to be decomposed into quantiles, making it possible to assess how the explanatory variables affect each quantile separately. In quantile regression, the focus is not on estimating the effect of the regressors on the conditional mean of the dependent variable (as in OLS), but rather on different points of its conditional distribution. Accordingly, the objective is to examine whether the effects of violations of the budget rule on the BCI are asymmetric, depending on whether the business confidence is at relatively low or high levels.

4. Results

This section presents the estimation results. First, we examine the relationship between observed budget rule violations and business confidence using both the full sample and the subsample. Next, we

⁶ This series is based on the economic activity index provided by the Central Bank of Brazil (IBC-Br). The natural logarithm was applied to the series, and the first difference was computed. A positive relationship with the BCI is expected.

⁷ This series corresponds to industrial electricity consumption (quantity, in GWh), provided by Eletrobrás and obtained from IPEADATA. It has been used as a proxy for infrastructure in previous studies (e.g., Montes and Nogueira, 2022).

⁸ For this series, we use the general government gross debt as a proportion of GDP (Series 4537) provided by the CBB. Due to the presence of a unit root, the variable is used in first differences (see tests below).

⁹ This series is the “Exchange Rate - Free - US Dollar (Sale) - end of period” (Series 3696), provided by the CBB. Due to the presence of a unit root, the variable is used in first differences.

¹⁰ Selic interest rate (series 4189) provided by the CBB.

¹¹ We use the monetary policy credibility index developed by de Mendonça (2007).

¹² The list of instruments used in each GMM estimation can be made available upon request.

analyze the relationship between expected violations and business confidence. We then assess the robustness of the results by replacing business confidence with economic growth expectations as the dependent variable. Finally, quantile regressions are employed to investigate whether the relationship between budget rule violations and the outcome variables varies across different levels of business confidence and growth expectations.

The full sample covers 2003M03–2024M12, while the subsample spans 2010M12–2019M12. The subsample excludes periods directly associated with the Global Financial Crisis and the COVID-19 pandemic, which were characterized by extraordinary fiscal responses and may have coincided with changes in the relationships under analysis. The Brazilian fiscal and political crisis of 2015–2016 is retained because it is closely related to fiscal policy conduct, institutional credibility, and expectation formation.

Overall, the results indicate that periods of budget rule violations are predominantly characterized by lower business confidence and weaker economic growth expectations. The estimated coefficients associated with observed and expected violations are mostly negative and statistically significant, pointing to systematic co-movements between fiscal slippages, uncertainty regarding fiscal sustainability, and perceptions of the macroeconomic environment. The evidence further indicates that business confidence and expectations are related not only to realized fiscal outcomes but also to expectations regarding future fiscal conduct.

4.1 Effects of observed budget rule violations on business confidence

Table 1 reports the relationship between observed budget rule violations and business confidence using the BCI-CNI and BCI-OECD indicators. Estimates are obtained through OLS and GMM; given potential endogeneity concerns, the discussion focuses on the GMM results.

The findings consistently indicate a negative relationship between budget rule violations and business confidence. The coefficients associated with BFR_violation are negative and statistically significant across all GMM specifications. For the BCI-CNI indicator, a 1% increase in budget rule violations is associated with a decrease in business confidence of approximately 0.087% in the full sample and 0.106% in the subsample. For the BCI-OECD indicator, the corresponding changes are −0.006% and −0.020%, respectively. These results describe a negative co-movement between fiscal rule violations and business confidence across specifications.

Table 1 Effects of observed budget rule violations on the BCI

Dependent variables:	BCI-CNI				BCI-OECD			
	full sample		subsample		full sample		subsample	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
GROWTH(-1)	2.434*** (0.614)	5.485*** (1.110)	0.431 (0.909)	1.114** (0.495)	0.382*** (0.086)	0.231** (0.116)	0.087 (0.095)	0.204** (0.079)
INFR(-1)	0.077 (0.134)	0.454*** (0.171)	0.758** (0.335)	0.587*** (0.151)	0.062*** (0.023)	0.051*** (0.018)	0.120*** (0.037)	0.137*** (0.025)
ΔDEBT(-1)	-0.008* (0.005)	-0.016* (0.009)	-0.000 (0.005)	0.009 (0.005)	-0.002*** (0.001)	-0.002** (0.001)	-0.001* (0.001)	-0.001*** (0.000)
MPIR(-1)	0.002 (0.003)	0.004 (0.004)	-0.003 (0.006)	-0.004 (0.003)	0.001 (0.000)	0.001 (0.000)	-0.000 (0.001)	-0.000 (0.000)
ΔEXCH(-1)	-0.199*** (0.069)	-0.179** (0.078)	-0.232** (0.093)	-0.544*** (0.076)	-0.013* (0.008)	-0.023* (0.013)	-0.008 (0.008)	-0.009 (0.008)
GFC	-0.106*** (0.037)	-0.204* (0.121)			-0.024*** (0.009)	-0.071*** (0.023)		
COVID	0.101 (0.073)	0.165*** (0.061)			0.017* (0.009)	0.018** (0.007)		
BR_CRISIS	-0.166** (0.066)	-0.244*** (0.093)	-0.013 (0.054)	-0.059*** (0.022)	-0.015** (0.006)	-0.043** (0.018)	0.006 (0.006)	0.004 (0.003)
MONET_CREDIBILITY	0.168*** (0.046)	0.178*** (0.033)	0.239*** (0.086)	0.203*** (0.038)	0.021*** (0.006)	0.021*** (0.005)	0.005 (0.011)	0.012** (0.006)
BFR_violation	-0.073** (0.028)	-0.087*** (0.020)	-0.092 (0.078)	-0.106*** (0.031)	-0.007** (0.003)	-0.006** (0.003)	-0.022** (0.009)	-0.020*** (0.005)
Observations	262	251	109	109	262	257	109	109
R-squared	0.508	0.372	0.765	0.726	0.449	0.207	0.791	0.778
Adjusted R-squared	0.488	0.346	0.746	0.704	0.427	0.175	0.774	0.760
J-statistic		28.886		19.931		30.839		17.630
p-value (J-statistic)		0.827		0.993		0.752		0.998
Instrument rank		48		47		48		47

Table prepared by the authors. Note: significance levels: ***0.01, **0.05 and *0.1. Constant omitted for parsimony.

4.2 Effects of expected budget rule violations on business confidence

Table 2 presents the relationship between expected budget rule violations and business confidence. The results indicate that expectations of future fiscal slippages are negatively related to confidence. The coefficients associated with E_BFR_violation are predominantly negative and statistically significant in the GMM specifications.

For the BCI-CNI indicator, a 1% increase in expected budget rule violations is associated with a decrease in business confidence of approximately 0.064% in the full sample and 0.036% in the subsample. For the BCI-OECD indicator, the corresponding changes are -0.011% and -0.003%, respectively.

These results describe co-movement between business confidence and both realized and expected fiscal conditions. Periods characterized by expectations of fiscal slippages are also characterized by higher uncertainty regarding fiscal sustainability and the macroeconomic environment.

Montes and Cabral (2025) report a relationship between fiscal credibility and business confidence in Brazil. Lehtimäki (2025) and Sawadogo (2024) document empirical relationships involving fiscal institutions and expectation formation. This study considers both observed and expected fiscal rule violations within a unified empirical framework.

Table 2 Effects of expected budget rule violations on the BCI

Dependent variables:	BCI-CNI				BCI-OECD			
	full sample		subsample		full sample		subsample	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
GROWTH(-1)	2.131*** (0.565)	2.596*** (0.875)	0.301 (0.927)	1.154* (0.605)	0.351*** (0.082)	0.432*** (0.134)	0.065 (0.117)	0.129* (0.075)
INFR(-1)	0.055 (0.122)	0.345** (0.154)	1.103*** (0.269)	1.227*** (0.098)	0.060*** (0.022)	0.069*** (0.021)	0.207*** (0.030)	0.226*** (0.013)
ΔDEBT(-1)	-0.009* (0.005)	-0.020** (0.008)	-0.002 (0.006)	0.001 (0.004)	-0.002*** (0.001)	-0.004*** (0.001)	-0.001* (0.001)	-0.001* (0.001)
MPIR(-1)	-0.001 (0.003)	-0.002 (0.003)	-0.007 (0.006)	-0.006*** (0.002)	0.000 (0.000)	0.001 (0.001)	-0.001 (0.001)	-0.000 (0.000)
ΔEXCH(-1)	-0.205*** (0.063)	-0.388*** (0.071)	-0.241** (0.096)	-0.475*** (0.061)	-0.014* (0.007)	-0.018 (0.013)	-0.010 (0.010)	-0.037*** (0.007)
GFC	-0.095*** (0.036)	-0.203* (0.123)			-0.023*** (0.009)	-0.062*** (0.021)		
COVID	0.031 (0.048)	0.037 (0.045)			0.010 (0.007)	0.018*** (0.007)		
BR_CRISIS	-0.176*** (0.060)	-0.323*** (0.080)	-0.033 (0.047)	-0.043** (0.018)	-0.016*** (0.005)	-0.045** (0.019)	0.002 (0.005)	-0.007** (0.003)
MONET_CREDIBILITY	0.136*** (0.044)	0.129*** (0.029)	0.342*** (0.067)	0.281*** (0.025)	0.019*** (0.006)	0.016*** (0.005)	0.026*** (0.008)	0.027*** (0.003)
E_BFR_violation	-0.086*** (0.028)	-0.064*** (0.018)	0.020 (0.049)	-0.036* (0.021)	-0.008** (0.004)	-0.011** (0.004)	0.000 (0.005)	-0.003* (0.002)
Observations	262	250	109	109	262	250	109	109
R-squared	0.512	0.409	0.745	0.712	0.447	0.179	0.700	0.650
Adjusted R-squared	0.493	0.385	0.725	0.689	0.425	0.145	0.676	0.622
J-statistic		29.098		20.145		28.708		18.785
p-value (J-statistic)		0.850		0.998		0.765		1.000
Instrument rank		49		51		46		53

Table prepared by the authors. Note: significance levels: ***0.01, **0.05 and *0.1. Constant omitted for parsimony.

Analyzing the results for the control variables in both tables 1 and 2, we observe that the control variables generally display the expected signs. Economic growth (GROWTH) is positively associated to business confidence, and infrastructure availability (INFR) improves the business environment and supports confidence. In contrast, increases in public debt (ΔDEBT) and exchange rate depreciation (ΔEXCH) reduce confidence by raising uncertainty and operating costs (Montes and Nogueira, 2022). Monetary policy credibility (MONET_CREDIBILITY) exhibits positive and significant coefficients, indicating that anchored inflation expectations contribute to macroeconomic stability and confidence.

The GFC and BR_CRISIS dummies are negative and significant, reflecting the adverse effects of the Global Financial Crisis and the Brazilian fiscal and political crisis on business sentiment.

4.3. Robustness analysis

To assess robustness, business confidence is replaced by economic growth expectations for the following 12 months (EXP_GROWTH_12).¹³ This variable is appropriate because of its strong correlation with business confidence: 0.81 with BCI-CNI and 0.86 with BCI-OECD. Moreover, growth expectations influence production, investment, and planning decisions, making them a relevant indicator of private-sector perceptions.

Table 3 presents the relationship between observed budget rule violations and growth expectations. Consistent with the business confidence results, the coefficients associated with BFR_violation are negative and statistically significant in all GMM specifications.

A 1% increase in budget rule violations is associated with a decrease in economic growth expectations of approximately 1.48% in the full sample and 1.61% in the subsample. These patterns coincide with higher perceived macroeconomic instability, lower policy predictability, and weaker growth expectations. They are also observed alongside expectations of future fiscal or monetary adjustments and lower expected economic growth.

Table 4 presents the relationship between expected budget rule violations and growth expectations. The estimates indicate that a 1% increase in expected violations is associated with a decrease in growth expectations of approximately 2.53% in the full sample and 1.004% in the subsample.

These results show that expectations of future fiscal noncompliance coincide with current economic perceptions and are accompanied by higher uncertainty regarding future policy conduct. Overall, observed and expected deviations from fiscal commitments are associated with lower growth expectations and higher perceived uncertainty regarding future macroeconomic conditions.

The robustness analysis summarizes the main empirical patterns of the paper: fiscal rule violations coincide with business confidence and growth expectations. The estimated coefficients of the control variables are broadly similar to those obtained in the business confidence models.

Table 3 Effects of observed budget rule violations on EXP_GROWTH_12

Dependent variable: EXP_GROWTH_12				
Variables	full sample		subsample	
	OLS	GMM	OLS	GMM
GROWTH(-1)	15.699** (6.258)	23.103** (10.674)	-1.700 (7.189)	17.332* (9.610)
INFR(-1)	6.332*** (1.867)	7.797*** (2.384)	13.590*** (3.284)	18.014*** (1.950)
ΔDEBT(-1)	-0.141** (0.057)	-0.262*** (0.093)	-0.097* (0.054)	-0.118* (0.064)
MPIR(-1)	0.165*** (0.040)	0.305*** (0.061)	0.046 (0.066)	0.083** (0.033)
ΔEXCH(-1)	-1.067 (0.678)	-0.430 (1.078)	-0.735 (0.719)	-0.195 (1.047)
GFC	-0.558 (0.474)	-2.604* (1.462)		
COVID	1.958*** (0.711)	5.123*** (1.223)		
BR_CRISIS	-2.475*** (0.517)	-3.678** (1.654)	-0.953*** (0.341)	-1.468*** (0.359)
MONET_CREDIBILITY	2.886*** (0.494)	3.222*** (0.565)	0.799 (0.725)	1.440*** (0.463)
BFR_violation	-0.964*** (0.256)	-1.482*** (0.359)	-2.148*** (0.672)	-1.615*** (0.280)
Observations	262	254	109	109
R-squared	0.568	0.390	0.867	0.841
Adjusted R-squared	0.551	0.365	0.856	0.829
J-statistic		29.428		17.726
p-value (J-statistic)		0.867		0.816
Instrument rank		50		33

Table prepared by the authors. Note: significance levels: ***0.01, **0.05 and *0.1. Constant omitted for parsimony.

¹³ Regarding the measure of economic growth expectations (EXP_GROWTH_12), the CBB makes available through the Focus Report daily market expectations drawn from approximately 140 institutions (mostly banks, asset managers, dealers and brokers, as well as consulting and other non-financial companies). The measure of economic growth expectations that we use are the average of all institutions' forecasts participating in the survey. We are calculating economic growth expectations for 12 months ahead. The CBB provides fixed-event forecasts for economic growth. This type of fixed event data has a bias as the period goes by and the event (end of the year) gets closer, causing a kind of "seasonality". It is to avoid the seasonal behavior inherent to expectations measures based on fixed event forecasts that some studies (e.g., Dovern et al., 2012) recur to fixed horizon forecasts, in which the forecasting horizon does not vary with the passage of time. Following Dovern et al. (2012), we convert fixed event forecasts into fixed horizon forecasts.

Table 4 Effects of expected budget rule violations on EXP_GROWTH_12

Dependent variable: EXP_GROWTH_12				
Variables	full sample		subsample	
	OLS	GMM	OLS	GMM
GROWTH(-1)	11.191* (5.748)	34.056** (14.056)	-2.023 (9.324)	24.316* (14.008)
INFR(-1)	6.071*** (1.866)	4.219* (2.309)	22.835*** (2.816)	26.336*** (1.978)
ΔDEBT(-1)	-0.172*** (0.055)	-0.147* (0.082)	-0.157** (0.073)	-0.248*** (0.087)
MPIR(-1)	0.121*** (0.040)	0.156*** (0.060)	-0.024 (0.071)	0.044 (0.041)
ΔEXCH(-1)	-1.190* (0.659)	-0.465 (0.771)	-0.930 (0.838)	-0.657 (1.553)
GFC	-0.392 (0.493)	-3.284* (1.980)		
COVID	0.985* (0.532)	2.879** (1.252)		
BR_CRISIS	-2.827*** (0.518)	-5.050** (1.996)	-1.109*** (0.407)	-1.731*** (0.516)
MONET_CREDIBILITY	2.551*** (0.529)	1.455*** (0.537)	2.090*** (0.619)	1.999*** (0.517)
E_BFR_violation	-0.832** (0.345)	-2.535*** (0.565)	-0.824* (0.434)	-1.004*** (0.303)
Observations	262	253	109	109
R-squared	0.546	0.145	0.803	0.761
Adjusted R-squared	0.528	0.110	0.787	0.742
J-statistic		23.451		17.018
p-value (J-statistic)		0.977		0.652
Instrument rank		50		29

Table prepared by the authors. Note: significance levels: ***0.01, **0.05 and *0.1. Constant omitted for parsimony

4.4 Quantile regression

Quantile regression is employed to investigate whether the associations of budget rule violations differ across distinct levels of business confidence and growth expectations. Following Koenker and Bassett (1978), the method estimates the relationship between the dependent and explanatory variables at different points of the conditional distribution. The analysis focuses on the 25th, 50th, and 75th quantiles, with particular attention to the lower (Q25) and upper (Q75) tails.

Lower quantiles represent periods of pessimism, while upper quantiles correspond to more optimistic environments. This approach allows us to assess whether fiscal rule violations have stronger effects during periods of lower confidence or weaker growth expectations.

Table 5 reports the quantile regression results for business confidence. For observed violations (BFR_violation), coefficients are negative and statistically significant in nearly all specifications. For the BCI-CNI indicator in the full sample, a 1% increase in budget rule violations is associated with decreases in confidence of 0.080% at Q25, 0.072% at Q50, and 0.054% at Q75. In the subsample, the corresponding values are 0.255%, 0.146%, and 0.096%, respectively.

The variation in coefficient magnitudes across quantiles indicates heterogeneity in the relationship between fiscal rule violations and business confidence across the distribution of sentiment. In the subsample, larger coefficient magnitudes are observed across all quantiles relative to the full sample.

The BCI-OECD results display a similar pattern. In the subsample, a 1% increase in budget rule violations is associated with decreases in confidence of 0.036% at Q25, 0.025% at Q50, and 0.018% at Q75.

Expected violations (E_BFR_violation) also present predominantly negative and statistically significant coefficients in the full sample. For the BCI-CNI indicator, a 1% increase in expected violations is associated with decreases in confidence of 0.096% at Q25, 0.071% at Q50, and 0.063% at Q75. In the subsample, coefficients are generally not statistically significant across quantiles.

Table 6 presents the quantile regression results for economic growth expectations. The coefficients associated with observed budget rule violations are negative and statistically significant across all quantiles

in both samples. In the full sample, a 1% increase in observed violations is associated with decreases in growth expectations of approximately 0.88% at Q25, 1.294% at Q50, and 1.185% at Q75. In the subsample, coefficients are larger in magnitude across specifications.

Expected violations are also associated with lower growth expectations. In the full sample, a 1% increase in expected violations is associated with decreases in growth expectations of 0.883% at Q25 and 0.702% at Q75, while the median coefficient is not statistically significant. In the subsample, larger coefficients are observed when growth expectations are relatively high.

Across quantiles, differences in coefficient magnitudes are observed for both business confidence and growth expectations. For business confidence, larger coefficients are observed in lower quantiles. For growth expectations, coefficients are negative across quantiles, with variation in magnitude across specifications.

Table 5 Asymmetric effects of observed and expected budget rule violations on the BCI – quantile regression estimates

Dependent variable	Sample	Variable	Q25	Q50	Q75
BCI-CNI	full sample	BFR_violation	-0.080*** (0.018)	-0.072*** (0.017)	-0.054*** (0.017)
BCI-CNI	subsample	BFR_violation	-0.255** (0.113)	-0.146* (0.083)	-0.096*** (0.034)
BCI-OECD	full sample	BFR_violation	-0.009*** (0.002)	-0.009*** (0.002)	-0.005 (0.004)
BCI-OECD	subsample	BFR_violation	-0.036*** (0.009)	-0.025** (0.012)	-0.018*** (0.005)
Dependent variable	Sample	Variable	Q25	Q50	Q75
BCI-CNI	full sample	E_BFR_violation	-0.096** (0.040)	-0.071*** (0.021)	-0.063*** (0.020)
BCI-CNI	subsample	E_BFR_violation	0.015 (0.062)	0.020 (0.032)	0.014 (0.030)
BCI-OECD	full sample	E_BFR_violation	-0.009*** (0.004)	-0.002 (0.004)	-0.007* (0.004)
BCI-OECD	subsample	E_BFR_violation	0.005 (0.004)	0.001 (0.004)	-0.001 (0.004)

Table prepared by the authors. Note: significance levels: ***0.01, **0.05 and *0.1.

Table 6 Asymmetric effects of observed and expected budget rule violations on EXP_GROWTH_12 – quantile regression estimates

Dependent variable	Sample	Variable	Q25	Q50	Q75
EXP_GOWTH_12	Full sample	BFR_violation	-0.885*** (0.209)	-1.294*** (0.203)	-1.185*** (0.268)
EXP_GOWTH_12	Subsample	BFR_violation	-1.850** (0.795)	-2.535*** (0.940)	-2.029*** (0.376)
EXP_GOWTH_12	Full sample	E_BFR_violation	-0.883*** (0.335)	-0.581 (0.377)	-0.702** (0.343)
EXP_GOWTH_12	Subsample	E_BFR_violation	-0.446 (0.337)	-0.640* (0.334)	-0.805*** (0.304)

Table prepared by the authors. Note: significance levels: ***0.01, **0.05 and *0.1.

5. Concluding remarks

This study examines the relationship between observed and expected violations of the fiscal budget rule and business confidence and economic growth expectations in Brazil. Motivated by the growing incidence of fiscal rule noncompliance observed in several economies and by the limited empirical evidence on related macroeconomic patterns, the paper investigates whether fiscal rule violations are related to agents' confidence and expectations, and whether these relationships differ across distinct states of confidence and expectations. To address these questions, the analysis employs monthly data and different empirical approaches.

The evidence indicates that periods of observed and expected violations of the budget rule are characterized by lower levels of business confidence. These periods are also characterized by specific patterns in expectations about the future macroeconomic environment. In addition, periods with expectations of future violations are characterized by lower business confidence.

The robustness analysis documents that periods of fiscal rule violations are characterized by lower expectations of future economic growth. The results describe patterns in business confidence and growth expectations observed alongside fiscal rule violations. The quantile regression estimates show differences across states of confidence and growth expectations, with different coefficient magnitudes across quantiles.

The study relates to literature on fiscal rules. It considers fiscal frameworks and compliance with fiscal rules. It distinguishes between observed and expected fiscal rule violations and documents patterns involving both. The quantile regression analysis describes differences across levels of business confidence and economic expectations. The paper provides empirical evidence for Brazil, an economy with episodes of fiscal rule violations, fiscal target revisions, high public debt, and a macroeconomic framework shared by several advanced and emerging economies.

The findings also carry important policy implications. The results suggest that the effectiveness of fiscal rules depends not only on their formal adoption, but fundamentally on the governments' ability to comply with established fiscal targets over time. Persistent revisions, relaxations, and violations of fiscal rules may undermine confidence, deteriorate expectations, and weaken the macroeconomic environment even in the absence of immediate fiscal crises. Therefore, strengthening fiscal institutions, improving the enforceability of fiscal rules, and reducing political incentives for recurrent rule revisions may be essential for sustaining confidence and economic growth expectations.

Overall, the results document patterns involving fiscal rule compliance, business confidence, and macroeconomic expectations. In economies characterized by forward-looking behavior and fiscal uncertainty, such as Brazil, fiscal rule credibility is observed alongside confidence, expectations, and macroeconomic conditions. Institutional arrangements related to fiscal discipline are part of the broader empirical environment in which these patterns are observed.

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Appendix A

Table A1 Primary budget balance targets (%GDP)

Year	Law	Target
2003	Law No. 10,524 of July 25, 2002	3.75
2004	Law No. 10,707 of July 30, 2003.	4.25
2005	Law No. 10,934 of August 11, 2004	4.25
2006	Law No. 11,178 of September 20, 2005	4.25
2007	Law No. 11,439 of December 29, 2006	4.25
2008	Law No. 11,514 of August 13, 2007	3.30
2009	Law No. 11,768 of August 14, 2008.	3.30
2010	Law No. 12,017 of August 12, 2009	2.63
2011	Law No. 12,309 of August 9, 2010	2.46
2012	Law No. 12,465 of August 12, 2011	2.20
2013	Law No. 12,708 of August 17, 2012.	1.80
2014	Law No. 12,919 of December 24, 2013.	1.86
2015	Law No. 13,080 of January 2, 2015	1.20
2016	Law No. 13,242 of December 30, 2015.	0.50
2017	Law No. 13,408 of December 26, 2016	-2.11
2018	Law No. 13,473 of August 8, 2017	-1.80
2019	Law No. 13,707 of August 14, 2018	-1.75
2020	Law No. 13,898 of November 11, 2019	-1.51
2021	Law No. 14,116 of December 31, 2020	-3.21
2022	Law No. 14,194 of August 20, 2021	-2.00
2023	Law No. 14,436 of August 9, 2022	-0.66
2024	Law No. 14,791 of December 29, 2023	-0.16

Table prepared by the authors.

Table A2 Descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
BCI-OECD	100.25	100.46	103.20	95.03	1.81	262
BCI-CNI	54.83	56.00	68.30	34.50	6.89	262
BFR_violation	0.89	0.39	7.73	0.00	1.39	262
E_BFR_violation	0.61	0.22	5.40	0.00	0.93	262
GROWTH	0.001	0.001	0.04	-0.09	0.01	262
INFRAESTR_ENERG	14403.38	14499.00	17333.00	10565.00	1204.79	262
DEBT	71.97	68.59	96.73	57.07	11.31	262
EXCH	3.18	2.90	6.10	1.56	1.30	262
MONET_CREDIBILITY	0.45	0.47	1.00	0.00	0.34	262
MPIR	11.30	11.18	26.32	1.90	4.61	262
EXP_GROWTH_12	2.32	2.39	5.91	-2.99	1.76	262

Table prepared by the authors.

Table A3 Unit root and stationarity tests

Series	lag ADF	I/T	ADF test	10% crit	Band	I/T	PP test	10% crit	I/T	KPSS	1% crit	band
BCI-OECD	4	I	-2.959	-2.573	5	I	-3.314	-2.573	I	0.439	0.739	11
BCI-CNI	10	I	-3.225	-2.573	0	I	-2.239	-2.573	I	0.447	0.739	11
BFR_violation	3	I	-5.328	-2.573	9	I	-3.687	-2.573	I	0.202	0.739	11
E_BFR_violation	2	I	-4.841	-2.573	6	I	-4.031	-2.573	I	0.276	0.739	11
GROWTH	0	I	-13.060	-2.573	4	I	-12.917	-2.573	I	0.200	0.739	2
INFR	12	I/T	-2.998	-3.137	8	I/T	-3.690	-3.137	I/T	0.245	0.216	11
DEBT	12	I	-0.813	-2.573	5	I	-0.295	-2.573	I	1371	0.739	12
ΔDEBT	11	I	-3.137	-2.573	5	I	-18.402	-2.573	I	0.660	0.739	5
EXCH	1	I	0.237	-2.573	2	I	0.432	-2.573	I	1.615	0.739	12
ΔCAMBIO	0	I	-12.106	-2.573	9	I	-12.042	-2.573	I	0.606	0.739	2
MONET_CREDIBILITY	1	I	-3.491	-2.573	2	I	-2.772	-2.573	I	0.349	0.739	11
MPIR	4	I	-3.474	-2.573	11	I	-3.106	-2.573	I	0.919	0.739	12
EXP_GROWTH_12	2	I	-2.859	-2.573	7	I	-2.512	-2.573	I	0.830	0.739	12

Table prepared by the authors. Note: ADF: Choice of lag using the Schwarz Information Criterion. PP and KPSS: Band is bandwidth, selected by Bartlett kernel. “I” for intercept and “I and T” for intercept and trend. “D” denotes application of first difference to the series.