Rivoli Finance

Market Review

JULY · 2025

Foreword

The fifth edition of Rivool Finance’s Market Review marks a new chapter in how investors engage with Brazil’s economic transformation. In a world shaped by volatility and opportunity, this edition provides a sharp yet comprehensive lens on macroeconomic trends, commodity cycles, currency pressures, and Brazil’s evolving role in the global financial arena. But beyond analysis, it reveals how blockchain technology and real asset tokenization are not only reshaping traditional markets — they are unlocking new pathways to access private credit with greater transparency, security, and efficiency.

At the core of this transformation lies Brazil’s agribusiness sector — resilient, dynamic, and chronically underserved by conventional financing structures. This review highlights how Rivool Finance is bridging global capital to real opportunities through smart infrastructure, permissionless protocols, and tokenized credit assets. By enabling streamlined exposure to high-yield, collateral-backed instruments, we are making private credit not just more accessible, but smarter.

At Rivool, we believe the future of finance is decentralized, inclusive, and deeply connected to the real economy. This Market Review is more than a publication — it's a call to action for investors ready to explore a new frontier of private credit. Welcome to a world where innovation meets impact, and capital flows where it creates lasting value.

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The Brazilian fiscal situation in 2025 shows, once again, the absence of structural advances in the control of mandatory spending, the recurrent dependence on extraordinary revenues to meet formally established fiscal targets, and the maintenance of a trajectory of public indebtedness that is heading in a worrying direction, compromising the credibility and sustainability of fiscal policy in the medium term. Although the achievement of the goals is being formally pursued, such an effort rests on specific measures, accounting maneuvers, and discretionary cuts, without concrete signs of structural fiscal consolidation having been seen so far. On the other hand, it is observed that the government is exerting some degree of restraint, albeit modest, in an attempt to prevent the situation from getting out of control entirely. This movement, although insufficient, deserves careful monitoring.

Recent Fiscal Results: Primary and Nominal

Brazil started 2025 with a significant improvement in the primary result compared to 2024. In the first four months, the Central Government, including the Treasury, Social Security, and Central Bank, accumulated a primary surplus of BRL 73.9 billion, more than double the amount recorded in the same period in 2024 (BRL 34.3 billion). In April alone, a surplus of BRL 17.7 billion was recorded, thanks to revenues increasing in real terms by ~5% year-over-year and expenses growing by ~2.3% year-over-year.

This performance reflects rising managed revenues (including federal taxation, such as corporate income tax and imports) and restraint on discretionary spending at the beginning of the year. In fact, the January-February bimester showed a surplus of BRL 54.2 billion, against BRL 21.2 billion in the same period of 2024, driven by extraordinary collection (taxation of exclusive funds, regularization of assets, etc.) and lower execution of non-mandatory expenses (budget delay, lower payment of income transfer assistance programs, and court-ordered payments in advance in 2024).

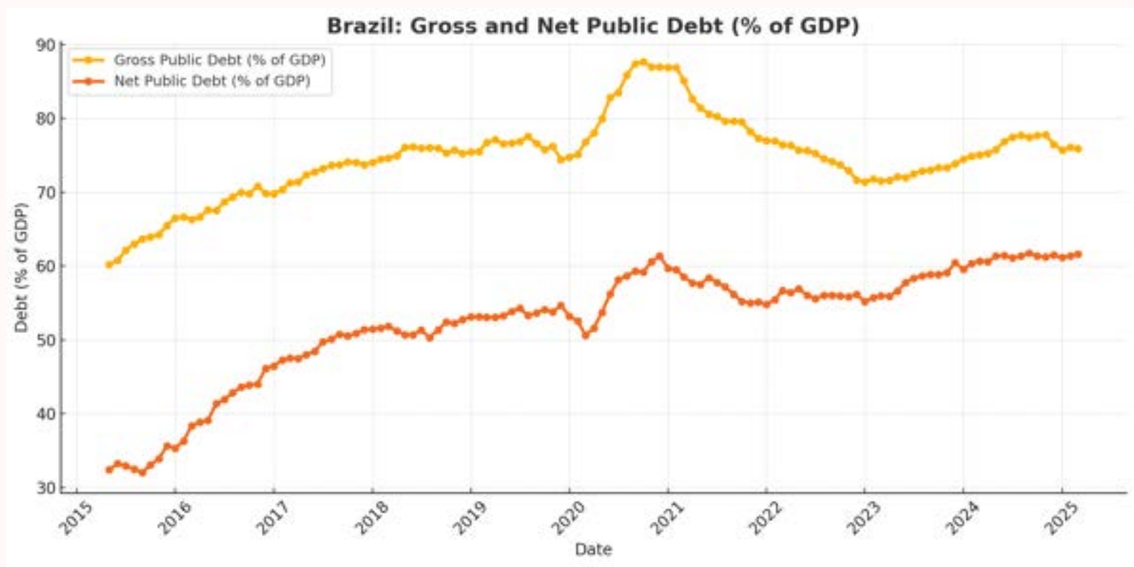
Despite the substantial primary surplus in the cumulative index up to April, the nominal result (which includes interest) remains in deficit due to the heavy cost of debt. In March, for example, the consolidated public sector paid BRL 75.2 billion in nominal interest, compared to BRL 64.2 billion in March 2024. In the 12 months to March 2025, interest rates reached 7.8% of GDP, resulting in a nominal deficit of approximately 7.92% of GDP (BRL 948.5 billion) over the same period. In other words, the improvement in the primary deficit (of only approximately 0.1% of GDP in the 12 months up to March) was offset by the increase in the interest bill, maintaining the result high and stable at around 8% of GDP.

Gross and Net Debt as a Percentage of GDP

The General Government Gross Debt (GGGD) stood at approximately 76% of GDP at the beginning of 2025. In March, it reached 75.9% of GDP (BRL 9.1 trillion), with a slight decrease compared to February (76.1%). This reduction was primarily due to nominal GDP growth, net debt redemption, and exchange rate appreciation, which partially offset the interest incorporated in the month. Compared to a year earlier, gross debt showed a slight decline, standing at approximately 76.5% of GDP at the end of 2024, indicating stability or a marginal decrease until March 2025.

The Public Sector Net Debt (PSND) has been gradually increasing, reflecting the accumulated interest. In March, the PSND reached 61.6% of GDP (BRL 7.4 trillion), representing an increase of 0.2 percentage points (pp.) from the previous month and 0.1 pp. from the same period last year. In the first quarter, the exchange rate appreciation of around 7% helped to hold down the net debt (-0.9 p.p.), as well as the primary surplus for the period (-0.7 p.p.). However, the appropriate nominal interests (+1.6 p.p. in the year) exerted upward pressure.

Although relatively stable in the short term, the projections indicate an increase in public debt in the coming years if the current trend persists. The IMF, for example, estimates that the overall gross debt will rise from 87.3% of GDP in 2024 to 92.0% in 2025 and reach a level close to 96% in 2026, near the peak of the pandemic. These IMF projections employ a broad definition of debt and express concern about a potential return to high levels of debt. The Independent Fiscal Institution (IFI) – using the official concept (GGGD) – projects gross debt of 79.8% of GDP in 2025 and 84.0% in 2026, signaling an upward trajectory. Both institutions warn of the unsustainability of this dynamic, given that the current fiscal framework is insufficient to halt the growth of debt. In short, Brazilian public debt remains on an upward trend as a proportion of GDP, unless there is additional fiscal effort.



Impacts of Trumponomics on Brazil

As a major commodity exporter and an important trading partner of both the US and China, Brazil has been affected by the new tariff policy across multiple sectors. In 2024, the US was the second-largest destination for Brazilian agribusiness, behind only China, absorbing approximately 9.43 million tons of Brazilian agribusiness exports, valued at USD 12.1 billion (7.4% of the total exports by the sector). Thus, the imposition of a general tariff of 10% on Brazilian products reduced Brazil's competitiveness in this strategic market.

In parallel, however, the US-China trade confrontation has opened opportunities for Brazil to gain market share where the Americans have lost ground, especially in China, the leading buyer of Brazilian commodities. The impacts for Brazil can be divided into two major groups: (1) gains for sectors that can meet the demand previously met by the US, resulting in trade diversion in favor of Brazil, and (2) losses for sectors whose exports to the US become less viable or face competition from US domestic production.

Favored sectors (trade diversion in favor of Brazil): Brazilian agribusiness was identified by several analysts as a significant indirect beneficiary of the conflict between the two countries. Soybeans are the emblematic case. China has traditionally imported huge volumes of U.S. soybeans, but with tariffs of 25% (in the 2018 trade war) and now above 100% in 2025, Chinese purchases of U.S. soybeans have plummeted. That has forced China to increase imports from Brazil further, already the world's largest exporter of the oilseed. In 2024, Brazil supplied about 71% of Chinese soybean imports. With the new trade war, it is estimated that Brazil's share could reach around 80–85%.

This redirection benefits Brazilian producers by offering better prices and incentives to expand the planted area. For example, during the previous trade war, Brazil had already developed its soybean area by 4 million hectares between 2018 and 2020, a trend that may be repeated. Corn is another favored grain: China historically relied on American corn for feed but had been diversifying, and in 2022, it enabled imports of Brazilian corn. With the tariffs on U.S. corn, China started to buy record volumes from Brazil. In addition to China, other markets such as Mexico and Japan, which imported grains from the US, may also turn more to Brazil to avoid paying more to the Americans.

In the animal protein sector, Brazilian poultry and pig farming can also reap indirect gains. China has included meat (especially pork) on the list of U.S. products subject to tariffs in response to Trump. As a result, U.S. pork has become prohibitive in China, making room for Brazil (the world's second-largest pork exporter) to increase its sales to the Chinese market. The same applies to meat: while China has not entirely banned U.S. meat, it has imposed additional tariffs and sanitary restrictions, thereby increasing the share of suppliers from South America. Brazil, already the world's largest exporter of meat, has seen its exports to China remain high, with China accounting for approximately 60% of Brazil's fresh meat exports.

It is worth noting that some Brazilian agricultural products have the potential to gain competitiveness even in the US market, thanks to the differentiated tariff structure. As mentioned, Brazil was subject "only" to the 10% tariff, while competitors of certain products suffered much higher surcharges. This created a curious situation: despite introducing a new 10% barrier, Brazil has become relatively more competitive than its rivals in the American market, particularly in specific niches.

An example is coffee: the US is the leading destination for Brazilian coffee and also imports a significant amount of robusta coffee from Vietnam. Vietnam, however, was targeted with a tariff of 46%. Thus, Vietnamese coffee has become significantly more expensive than Brazilian coffee in the US, leading to the expectation that Brazil will expand its already substantial share (Brazil accounts for approximately 16% of coffee imported by the US). Similarly, in the pulp and timber sector, Brazil competes with the EU (especially Germany and Sweden) in the U.S. market. The 20% tariff on the EU versus 10% on Brazil has favored Brazilian pulp exporters, potentially increasing sales to U.S. customers who can substitute cheaper Brazilian products for European suppliers.

Affected sectors (exposure to the U.S. market and domestic competition): On the other hand, the tariff policy brought risks and losses to Brazilian sectors that critically depend on the U.S. market or compete with U.S. products. A clear case is orange juice. The USA is the largest importer of Brazilian orange juice. In recent years, due to the decline of citrus growing in Florida (resulting from diseases such as greening), Brazil has begun to supply a large portion of American consumption. In 2024, juice accounted for almost 10% of Brazilian agribusiness revenue in the US (USD 1.04 billion), and 90% of the frozen orange juice imported by the US came from Brazil. With the additional 10% tariff, the cost of Brazilian juice in the U.S. increased significantly, as the effective tax rate jumped from 5.9% to 15.9%.

Another sensitive sector is sugarcane ethanol. The U.S. is a significant importer of Brazilian ethanol, particularly the state of California, which seeks sugarcane ethanol due to its lower carbon emissions, helping to meet environmental goals. In 2024, Brazil exported approximately 337 million liters of ethanol to the U.S., meeting about 75% of the U.S.'s ethanol imports. Trump's tariff raised the tax on Brazilian ethanol from 2.5% to 12.5%.

Source: Own elaboration.

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In industrialized meats, there is also a risk of loss. The U.S. imports products, such as canned or cooked meat and unique cuts, from Brazil, in addition to fresh meat, which has recently been released in limited quantities. Although U.S. meat production is at its lowest herd level since 1970, the tariff adds costs that could limit the competitiveness of Brazilian meat, particularly in higher-value-added segments. Although the U.S. is unable to meet its demand fully (it consumes approximately 13 million tons of meat per year and produces 12.3 million tons), imports tend to decrease slightly, with consumers paying more for the domestic product. Therefore, Brazilian meat exporters – especially those specializing in processed products and specific cuts for the American market – may experience a reduction in orders.

Additionally, Brazilian sugar may experience a slight decline in shipments to the US. Brazilian raw sugar enters the U.S. mainly via quotas with reduced tariffs. Outside the quota, there was already a high fare (33%). With the increase in tariffs, the rate rose to 43%, practically making sales outside the quota unfeasible.

Finally, although Brazil is not a major exporter of industrialized goods to the US (outside of agribusiness and essential commodities), some manufactured sectors may be indirectly affected. For example, the Brazilian footwear and apparel industry, which sought to boost sales to the U.S. by taking advantage of tariffs against Asian rivals, still faces a 10 percent tariff, as well as slowing overall U.S. demand for goods, hurt by tariff inflation. Higher-tech products, such as machinery and auto parts, in which Brazil exports modest quantities to the U.S., have also increased by 10% and may lose ground if American or Mexican manufacturers replace these imports.

The New Fiscal Framework: Rules, Goals and Compliance

In 2023, Brazil approved the new fiscal framework (Compl. Law 200/2023), replacing the old spending cap. The regime seeks to balance the accounts with dual rules of primary target and expenditure limit. The main guidelines are:

Primary result target with tolerance band:

Each year, the Central Government has a primary result target (surplus or deficit) defined in the LDO (Budget Law), and the results can fluctuate within a band of ±0.25% of GDP without constituting non-compliance. For example, for 2025, the central government's target is a zero deficit, with a tolerance of between -0.25% and +0.25% of GDP (i.e., a deficit of up to approximately BRL 31 billion or a surplus of approximately BRL 31 billion, assuming a GDP of approximately BRL 12.4 trillion). Only if the result is below the lower limit (deficit > 0.25% of GDP) will the target be considered [link]

Primary expenditure growth limit:

The expansion of expenditure is linked to revenue. If the previous year's target is met, the expenditure of the following Budget may increase by up to 70% of the actual variation in primary revenue observed. If the target is not reached, expenditure growth is limited to 50% of revenue growth. In addition, a floor and ceiling were established: regardless of revenue, expenditure may grow by at least 0.6% real per year and at most 2.5% real per year. This band guarantees some countercyclical flexibility, as spending does not fall in a recession and does not skyrocket in a boom.

Surplus compensation mechanism:

If the primary result exceeds the upper band (i.e., there is an excess surplus), up to 70% of the surplus, limited to 0.25% of GDP, can be used for additional investments in the following year:
https://portalibre.fgv.br/system/files/2024-04/claudio-amitrano.pdf. h

This aims to reward better performance, allocating part of the "bonus" exclusively to investments (in addition to the minimum floor of 0.6% of GDP already guaranteed to public investments by the framework)

Exclusions and adjustments:

Certain exceptional expenses were excluded from the expenditure limit, including the Fundeb (Basic Education Fund) and the Constitutional Fund of the Federal District. It is essential to note that costs related to precatórios (court-ordered payments) were excluded from the calculation of the primary target. That is, to meet the fiscal target, the payment of writs can be deducted from the result. This has direct implications for meeting the targets in 2024-25, given the significant volume of writs.

.Compliance in 2024

In the first year of the fiscal framework, 2024, the target set was zero primary result for the central government (±0.25% GDP). The year 2024 ended with a primary deficit of approximately BRL 43.0 billion (0.36% of GDP) for the central government. At first glance, this would exceed the approximately BRL 30 billion tolerated deficit limit. However, thanks to the deductions allowed, notably the exclusion of expenses with writs, the Treasury was able to consider the target met.

The LDO allowed for the deduction of approximately BRL 40 billion, referring to precatórios in 2024, which adjusted the result to a near balance. Thus, there was no formal default in 2024, although the actual result was slightly worse than the target's center. This "accounting gap" generated criticism of transparency, but it was provided for in the law.

Situation in 2025 (first semester)

For 2025, the LDO again established a goal of primary zero (central government), with a margin of error of ±0.25% of GDP. In other words, the government must pursue a balanced budget, but it may end up with a deficit of up to 0.25% of GDP without breaking the rule. Until May 2025, the results indicate that they are on track for compliance: the substantial surplus at the beginning of the year provides temporary comfort. Independent projections, however, suggest a challenge in the annual cumulative index. The Focus Report (market) maintained in May the expectation of a primary deficit of 0.60% of GDP in 2025 (consolidated public sector), which for the central government would also imply a slightly negative result. Even so, the Ministry of Finance and the IFI assess that the target can be met "at the margin", thanks precisely to the exclusions. The IFI projects a federal government deficit of BRL 64.2 billion in 2025 (approximately 0.5% of GDP), but states that the zero target will be met because this deficit includes spending outside the calculation, such as the precatórios. That is, according to the law's criterion, the adjusted result would be within the band.
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It is essential to note that the TCU (Public Budget Auditor) and Congress have demanded rigor in execution: the LDO/2025 obligates the government to achieve the target's center (0%) in the bimonthly evaluation reports, without using the band as an implicit target. Only in the 5th bimester (November/25) can the use of the deficit tolerance of 0.25% of GDP be officially admitted. This led to preventive contingencies in 2025 to ensure compliance. In fact, during the first two months, the Executive announced a block of approximately BRL 1.7 billion from the budget, given the initial frustration with conditional revenues. There is a special concern with uncertain revenues foreseen in the LOA 2025: approximately BRL 121.5 billion depends on measures to be approved or atypical (e.g., tax reorganization, refinances, oil revenues), including BRL 58.5 billion in "other revenues" from the Federal Revenue Service that are difficult to repeat. If part of these revenues does not materialize, the government will have to compensate by making new cuts in expenses to avoid exceeding the budget at the end of the year.

According to Santander's projections, the Brazilian fiscal scenario in the second semester of 2025 will require the federal government to block expenses between BRL 10 billion and BRL 15 billion to ensure compliance with the budgetary goals established for the year. Although the authorized expenditure limit is BRL 2.2 trillion (equivalent to 17.6% of GDP) with real growth of up to 2.5%, the bank analysts estimates an effective increase in expenditures of around 3.5%, resulting in primary expenditures of approximately BRL 2.4 trillion, approximately BRL 200 billion above the initially stipulated ceiling.

Considering additional factors, such as precatórios payments of BRL 46 billion and compensation to states of BRL 5 billion, the primary deficit could reach up to BRL 51 billion without violating the fiscal framework. However, it will still be necessary to rely on extraordinary revenues in the second semester, in addition to managing a recurring phenomenon of "pooling" resources, estimated at BRL 20 billion.

For now, no automatic sanction of the framework needed to be triggered, since this would only occur if the 2024 result had been below the floor of the band (which did not happen, after adjustments) or if 2025 was heading for a hole above 0.25% of GDP. However, if the trajectory does not improve, the restriction mechanism will become stricter in the years to come. For example, if 2025 delivered a deficit above what is allowed, as mentioned, then in 2026 the real growth in spending would be limited to 50% of the variation in revenue (lower expansion), further tightening the budget. In addition, the law provides for containment triggers during the year in the event of a threat of non-compliance with the lower limit. In practice, this translates into an additional budget contingency when projections indicate a risk of overflow.

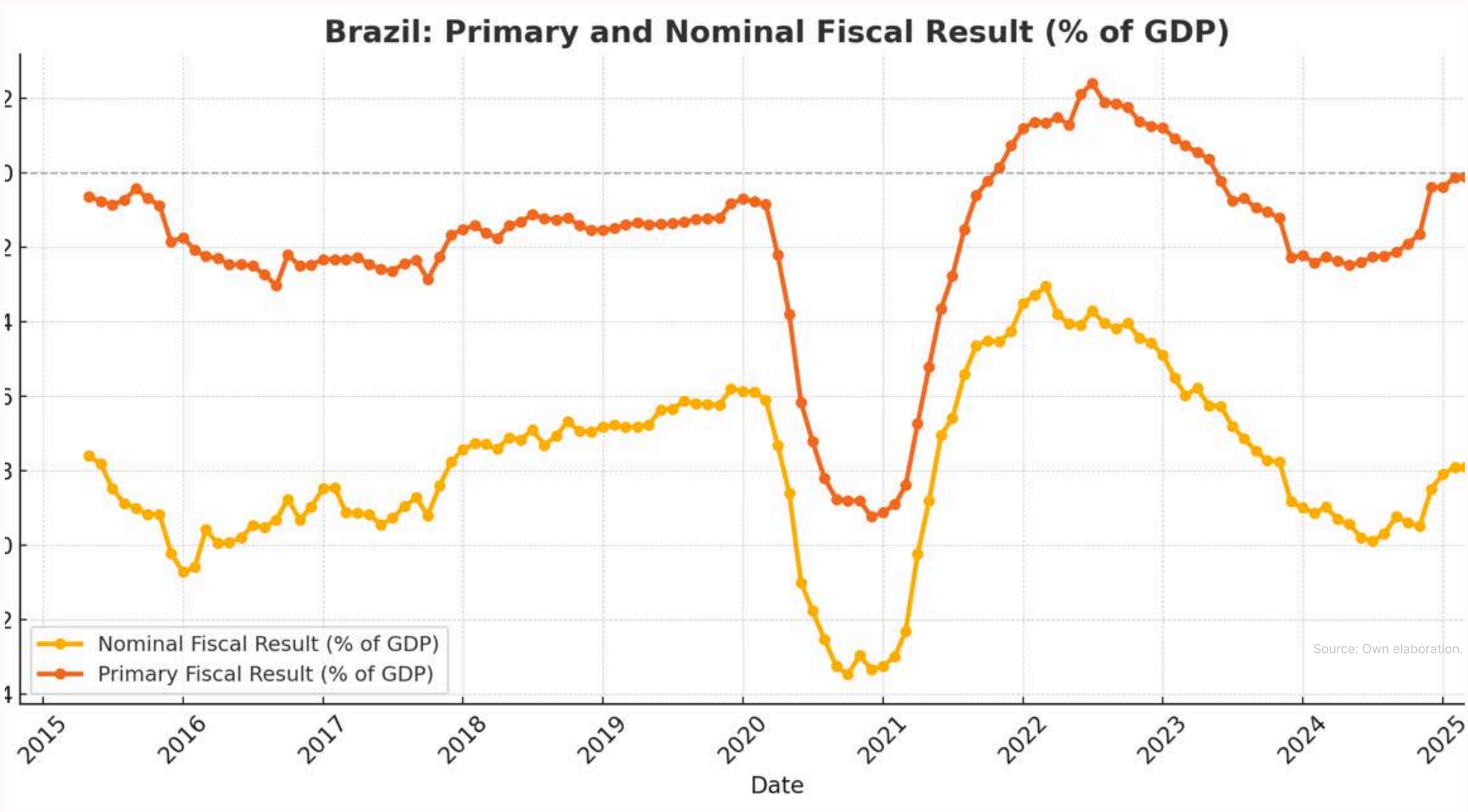
In short, until the first half of 2025, the fiscal framework has been formally complied with, with the government committed to blocking spending to aim for a zero deficit. However, this compliance depends on contingencies, reductions in investments and/or discretionary expenses, the use of permitted artifices (such as the abatement of writs), and uncertain future revenues.

The credibility of the rule is still under construction. What is certain is that the way the budget is being executed, there is no guarantee of debt stabilization. The absence of immediate severe sanctions for non-compliance (other than limiting future spending) is something that certainly weakens the commitment. Even so, the framework established a clear medium-term guideline – a growing surplus until 2026- and, in a way, brought some control. For example, the real expansion of federal spending was kept below 2% in early 2025, in line with the 2.5% ceiling.

Compliance with the 2025 fiscal target is feasible from an accounting perspective. However, it is worth noting the potential illusory nature of this "empty target." Achieving the zero primary result through contingencies and one-off rebates does not address the structural problem of continuous public debt growth. This perception is already priced into the market: although there has been a recent relief, long-term government bonds continue to offer high premiums. The real interest rates on ten-year NTN-B remain between 6% and 6.5% per year above inflation, reflecting the requirement of a risk premium by investors in the face of fiscal uncertainty.

The slope of the yield curve, in turn, reveals the expectation that real interest rates will remain elevated for a prolonged period, consistent with the perception of persistent fiscal and inflationary risks.

Given this scenario, the central question remains: by the end of 2025, will the government be able to deliver a primary deficit close to 0.5% of GDP without resorting to new accounting maneuvers or "creative accounting" strategies that exclude ordinary expenses from fiscal targets? The answer to this question will be decisive for the credibility of the fiscal framework and the behavior of domestic assets in the medium term.



Source: Central Bank of Brazil, Fiscal Statistics Report.

Exchange Rate Under Pressure

Reflecting economic policy choices

As is well known, the exchange rate serves as a thermometer of economic policy in countries like Brazil, as it reacts quickly to perceptions of risk, fiscal stability, and the credibility of economic authorities. In emerging economies, investors closely monitor fiscal and monetary policy decisions, viewing them as indicators of the country's financial sustainability. Sudden changes in market confidence are immediately reflected in the exchange rate, which absorbs the positive or negative expectations of economic agents.

The period between the end of 2024 and the beginning of 2025 illustrates precisely this mechanism: the volatile behavior and the strong depreciation of the real against the dollar instantly translated the concerns about the fiscal situation and the insufficient responses of the authorities, proving that the exchange rate is highly sensitive and capable of quickly incorporating all economic expectations.

Recent Exchange Rate Development and Volatility in 2024-2025

In 2024, the Brazilian real experienced a significant devaluation against the dollar, ending the year at BRL 6.18, representing an increase of approximately 27%. This record level was driven by substantial net capital outflows in December, reflecting the deterioration in the perception of domestic fiscal risk and the market's negative assessment of the fiscal measures adopted. The country risk measured by the 5-year CDS ended the period at 205 basis points, rising significantly during the year, while the Ibovespa accumulated a loss of more than 10%, reinforcing the risk-averse environment

Faced with this turbulent scenario, the Central Bank promoted significant exchange rate interventions to contain volatility and prevent further devaluation of the real. In December 2024, it sold approximately USD 32.6 billion to the market, adding spot operations and future repurchase lines. As a result, international reserves fell to the lowest level since February 2023. In early 2025, after a brief interruption to assess the scenario, the Central Bank resumed its preventive exchange action under the new presidency of Galípolo, carrying out additional interventions in January. These actions had a moderate effect in the short term, with a slight retreat in the dollar exchange rate after the auctions.

At the beginning of 2025, the exchange rate remained highly volatile. The dollar reached BRL 6.22 on January 2, 2025 (intraday), but closed that first trading session at BRL 6.16. Throughout January, the price fluctuated above BRL 6.0, reaching a peak of around BRL 6.16 in the following weeks. A level that reflected both the inertia of internal distrust and adverse external factors at the beginning of the year. However, at the end of January and during February, the Real began a recovery trajectory. The chart illustrates that, after reaching a peak of BRL 6.21 on January 2, 2025, the dollar exhibited a bearish bias in the following months, consistently breaking below BRL 6.00 throughout February. In March, the exchange rate approached BRL 5.70, supported by signs of more austere policies and some external relief. Daily volatility remained elevated but lower than the shock of late 2024

Monetary Policy:
Selic , Fed Funds, and Interest Rate Differential

The trajectory of interest rates in Brazil and the United States in 2025 has become a central factor influencing the exchange rate through the carry trade channel. In response to the soaring dollar and the domestic inflationary rebound, the Central Bank of Brazil reversed the monetary easing cycle that had begun in 2023 and raised the Selic rate (the basic interest rate) again in early 2025. After reducing the Selic rate to 12.75% per annum in December 2024, the Monetary Policy Committee (Copom) increased it by 0.50 percentage points in January 2025 and signaled an even more contractionary stance ahead. The Copom raised the basic interest rate to 13.25% per annum on January 29, 2025, and subsequently implemented another 1.0 percentage point increase in March, taking the Selic to 14.25%. A new growth of 0.50 percentage points (pp) occurred in May, setting the rate at 14.75% per annum (p.a.).

Actions demonstrate the priority given to stabilizing prices and exchange rates, even under the presidency recently assumed by Gabriel Galípolo at the Central Bank. In the communications, the Copom highlighted concerns about the de-anchoring of inflationary expectations and the impact of exchange rate depreciation on prices, justifying the more technical and austere stance of the monetary authority. The market expectation (Focus) began to incorporate a high Selic for a more extended period – the April projections indicated an average Selic of 15.0% in 2025, suggesting the maintenance of very high real interest rates throughout the year.

In the United States, the Federal Reserve maintained the basic interest rate (Fed Funds Rate) close to the terminal level reached in 2024 (between 5.25% and 5.50% per annum) until mid-2025. Faced with economic cooling and a gradual decline in US inflation, the Fed paused its interest rate increases at the end of 2024, sustaining high interest rates in early 2025. There was growing expectation of cuts in the Fed Funds from the end of 2025, but no reduction materialized until May.

Source: Own elaboration

Thus, the Brazil-US nominal interest rate differential widened again in 2025, increasing from about 7.5 percentage points at the beginning of the year to approximately 9.5 percentage points in May (14.75% vs. approximately 5.25%) –

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Source: Own elaboration

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Exchange Rate Under Pressure

one of the highest interest rate spreads in the world. This wide differential favors carry trade operations, where investors borrow funds in hard currency at low interest rates and invest in reais remunerated at high interest rates. The level of interest rates in Brazil made the long position in real attractive to global investors, easing the pressures of exchange rate depreciation in times of calm. Portfolio capital inflows into local fixed income were observed in early 2025, driven by the carry trade and the perception that the Selic could rise even further if the exchange rate surged again.

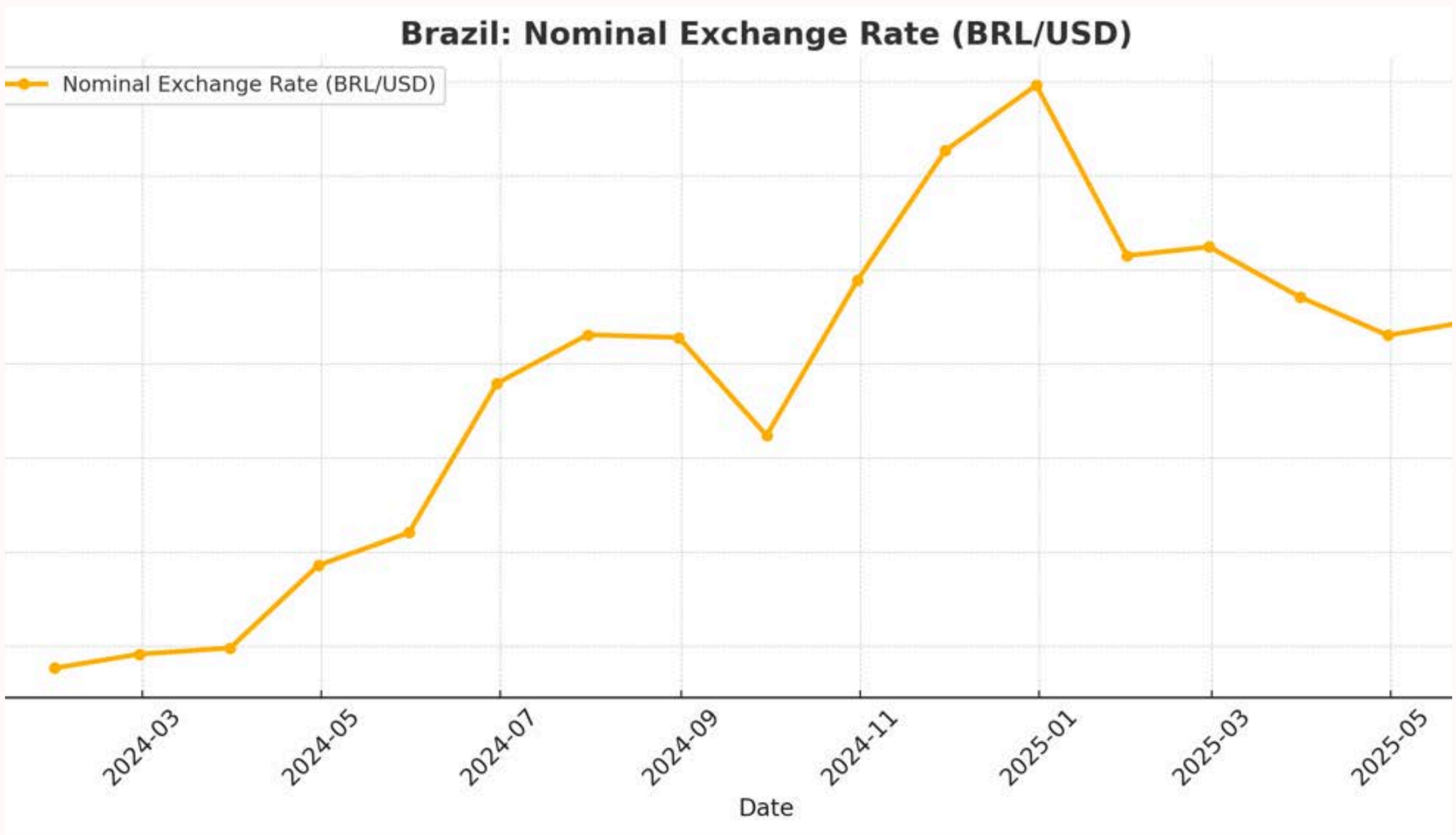
According to treasury reports, this positive flow force linked to the interest rate differential acted as a counterweight to the outflow of riskier funds, contributing to the appreciation of the Real in the first quarter.

On the other hand, the maintenance of high interest rates in the US also exerts a mixed influence on the emerging exchange rate. In a scenario of global risk aversion, such as that caused by the trade war, high interest rates in the US tend to strengthen the dollar as a traditional safe haven. However, the dynamics of 2025 introduced an atypical component: the US trade aggressiveness under the Trump administration eroded confidence in the predictability of US economic policy, leading some analysts to argue that this partially undermined the dollar's attractiveness. Thus, despite the record interest rate differential in favor of the Brazilian currency, the behavior of the exchange rate resulted from the interaction between this positive carry and the risk shocks that sometimes strengthened and sometimes weakened the dollar globally. In the balance sheet for the first semester of 2025, the appreciation of the Real prevailed, indicating that the effects of high domestic interest rates and the relative improvement in country risk outweighed the adverse external shocks.

Outlook for the Second Semester of 2025

The projections of the leading agents in the market for the exchange rate indicate an accommodation bias at a still high level, but without new triggers, except for an additional shock. The most recent Focus Report (May 2025) indicates a median of BRL 5.85 for the dollar in December 2025. This value, calculated as an expected average for December, suggests that the market anticipates the dollar oscillating within the current range (mid-BRL 5.6–5.9) in the coming months, with a slight upward trend until the end of the year. It is worth noting that the median of the Focus reached BRL 5.90 in early April, but retreated after the interventions and the improvement in mood, standing at BRL 5.85 in mid-May. International institutions also operate in a highly volatile dollar scenario, with a range of around BRL 5.80–6.00; for example, the IMF, in informal consultations, considered BRL 5.90 as the average exchange rate assumption for 2025.

However, the large banks present risk scenarios for the Brazilian exchange rate. In the base case scenario for a key domestic institution (BTG Pactual), maintaining the current course of economic policy, the dollar is projected to be around BRL 6.25 by the end of 2025. This scenario assumes low growth and difficulty in reducing spending, resulting in a slightly more depreciated real value than today. However, BTG also evaluates extremes: in a pessimistic case of sharp fiscal deterioration or loss of credibility (for example, higher-than-expected expansion of spending, maneuvers to escape the framework, or even direct interventions in the exchange rate), the dollar could exceed BRL 7.00, reaching an estimated BRL 7.10 by the end of 2025. On the other hand, in a positive shock of confidence, where the government implements credible measures to adjust and stabilize the debt, the Real could gain significant strength – projections indicate that the price could fall to close to BRL 5.20 in this very optimistic scenario.



. Brazil: Nominal Exchange Rate (BRL/USD) — Mar/2024 to May/202

Source: Central Bank of Brazil — Historical Exchange Rate Series.

An economic growth that surprises, but that may delay the cooling of inflation

Recent GDP Developments

The Brazilian economy showed robust growth in 2024, with GDP advancing 3.4% in the year. This positive result occurred despite a 3.2% decline in the value added of agriculture in 2024, reflecting adverse weather conditions that reduced the production of key crops, particularly soybeans (-4.6% year-over-year) and corn (-12.5%). On the other hand, industry grew by 3.3% and services by 3.7% in the year, indicating a broad recovery. In the last quarter of 2024, agricultural activity continued to decline slightly, but overall activity remained at a modest increase of +0.2% compared to the previous quarter.

In the first quarter of 2025, the Brazilian economy showed clear signs of acceleration. Preliminary data from the Central Bank (IBC-Br) already indicate a growth of 1.3% compared to the previous quarter, driven by the strong agricultural performance (+6.1%). These results were later confirmed by the IBGE, which announced a GDP expansion of 1.4% in the quarterly comparison and 2.9% in the cumulative index in 12 months. The performance of agriculture and livestock stood out, registering a significant growth of 12.2%, mainly due to the excellent soybean harvest.

In addition to agribusiness, other segments also supported the economic expansion, indicating more widespread growth, even amid fiscal and monetary challenges. Fixed investments rose 3.1%, while household consumption grew 1%, favored by low unemployment and rising real wages. On the other hand, the services sector advanced moderately, with a 0.3% increase, while industry showed a slight decline of 0.1%. Government spending, on the other hand, increased by 0.1%.

This initial performance positively surprised analysts, particularly given expectations of a slowdown following a previous year of substantial expansion. For the rest of 2025, projections still diverge: the Central Bank estimates growth of 1.9%, while the Ministry of Finance predicts a more optimistic scenario, with an increase of 2.4%. The financial market, on the other hand, projects an intermediate advance of 2.14%. Regardless of the forecasts, there is consensus among the projections regarding the slowdown of the Brazilian economy in 2025, since the projected growth is lower than the performances observed in previous years, which were 3.4% in 2024 and 3.2% in 2023.

Monetary Policy and Inflation

On the domestic front, two factors have dominated the economic debate: resilient inflation and the conduct of monetary policy in a delicate fiscal context. After ending 2023 close to the target's center, Brazilian inflation accelerated again in 2024, closing the year at around 4.9% (IPCA) – above the target of 3.25% and close to the ceiling of the tolerance range. In 2025, inflationary expectations remain unanchored, as the Central Bank itself acknowledges that inflation projections remain high, with a risk of exceeding the target ceiling (4.5%) again in 2025. This combination of deteriorated expectations and a heated labor market led the Copom to adopt a stricter stance. Contrary to the previous expectation of a cycle of cuts, the monetary authority summarized its decision to raise the Selic rate in early 2025.

There were six consecutive tightening meetings until May 25, culminating in the Selic rate of 14.75% per annum. In the official communication, the Central Bank justified the decision by citing the scenario of unanchored expectations, high inflationary projections, resilience of economic activity, and pressure on the labor market.

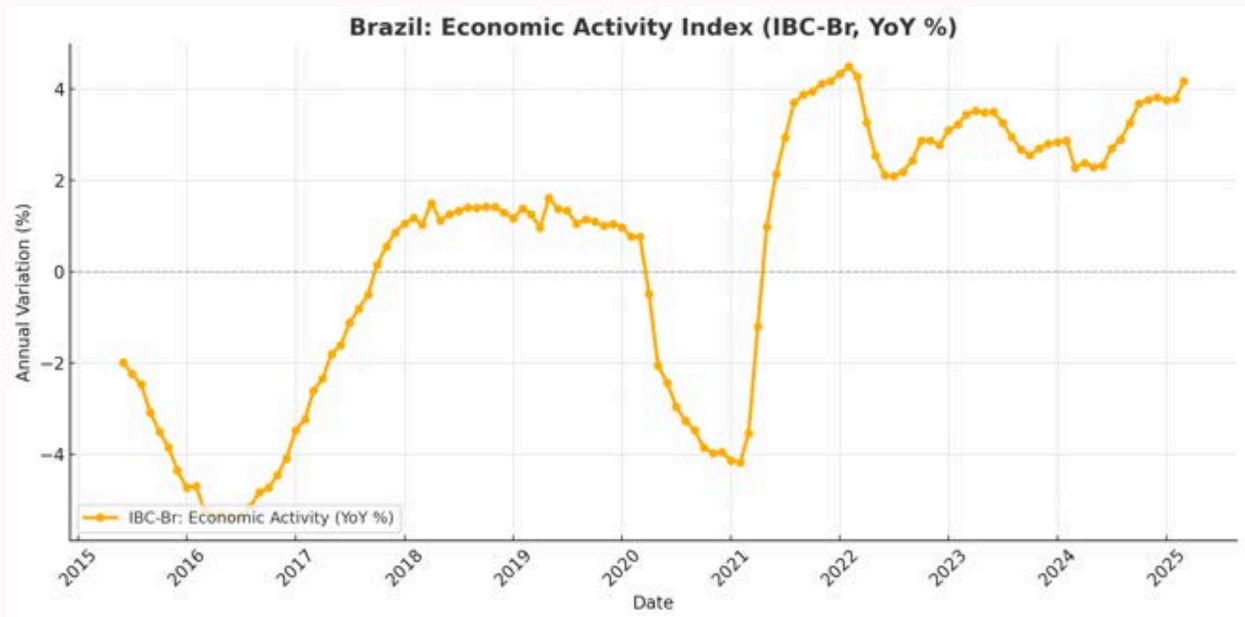
In other words, the domestic economy proved to be strong enough (thanks in part to agribusiness) to withstand high interest rates without collapsing, and the lack of confidence in fiscal adjustment and inflation convergence made it necessary to maintain a significantly contractionary monetary policy for a prolonged period. The Copom also signaled that there is no guarantee of the end of the hiking cycle, adopting a cautious stance and relying on future data.

This scenario of persistently high interest rates aims to ensure that inflation falls to the target, but it comes at a cost. Expensive and scarce credit affects the consumption of durable goods and private investment.

Monetary policy in 2025 operates under restrictions: on the one hand, it needs to fight inflation (core inflation linked to services shows rigidity), on the other hand, it cannot ignore the fragility of activity in interest-sensitive sectors.

So far, the balance of risks keeps the basic interest rate high. If there is an improvement in expectations – for example, if reforms advance and projected inflation recedes – the Central Bank can at least halt new hikes and initiate light cuts by the end of 2025. The market (Focus Bulletin) prices the Selic ending the year close to the level that was reached at the end of the first half of 2025, 14.75%, indicating no cut until December.

In summary, the domestic environment in 2025 is characterized by a strict monetary policy, necessary to break inflationary inertia, and a fiscal policy in transition, seeking to establish credibility. The interaction between the two is crucial: if the government delivers better fiscal results (reduction of the deficit and projected debt), the Central Bank will be able to ease interest rates sooner. Otherwise, high interest rates feed back into debt via financial cost, creating a vicious circle.



Trump’s tariffs: a journey towards an unknown world

The trade war initiated by the United States from 2018 to 2020 marked a significant shift in US trade policy towards protectionism, with tariffs primarily targeted at China and specific sectors, including steel and aluminum. At the height of that conflict, about 15% of American imports were subject to tariffs, involving approximately USD 380 billion in products. Tariffs reached 25% on many Chinese goods, but coverage was relatively limited compared to total U.S. trade. In 2020, a "Phase 1" deal with China was signed, partially easing tensions; however, many tariffs remained in place. President Trump's "America First" agenda can be considered a milestone in world trade, as it broke with the post-World War II tradition of gradual and multilateral trade liberalization.

In 2025, at the beginning of his second term, Donald Trump launched an unprecedented tariff package. On April 2 (dubbed "Liberation Day"), he invoked the International Emergency Economic Powers Act (IEEPA) to impose a 10% base tariff on all American imports. In addition, it announced higher "reciprocal" surcharges for countries with which the U.S. has large trade deficits.

In practice, this meant additional tariffs ranging from 11% to 50% on imports from 57 selected countries, including China (the primary target), Vietnam, Cambodia, and other Asian and European exporters. For example, China was hit with extra tariffs that raised the total tax rate to about 125% on its products, a level that practically makes its sales to the US unfeasible. The European Union faced reciprocal tariffs of 20%, Vietnam 46%, and countries such as Cambodia almost 49%. Brazil, in turn, was at the minimum level (10%).

Thus, overnight, the average effective tariff on US imports went from about 2.5% (in 2024) to 27% – the highest level since the 1930s. For comparison, during the previous trade war, the weighted average tariff was approximately 5%. In addition to the intensity, there was a time difference: while in 2018-19, tariffs were gradually escalating and some were ultimately suspended through temporary agreements, in 2025, the tariff shock was immediate and comprehensive. In the face of economic and diplomatic chaos, the Trump administration partially rolled back some measures, including a 90-day suspension of additional reciprocal tariffs for countries other than China. However, it maintained the 10% universal tariff indefinitely and reiterated that it would be a long-term policy to "rebalance" trade.

Political and Economic Motivations

Trump's stated motivations for the new tariff strategy were both economic and political-ideological. From a rhetorical point of view, he claimed that substantial trade deficits – exceeding USD 1.2 trillion in 2024 – represented a "national emergency" that was "deindustrializing" the US and threatening the country's economic and national security.

In announcing the tariffs, Trump emphasized the pursuit of "reciprocity": other countries should treat the U.S. the same way the U.S. treats them, eliminating practices considered unfair, such as higher foreign tariffs, currency manipulation, and high value-added taxes (VATs) on American products.

This mercantilist view that the trade deficit is itself an evil to be fought permeated the strategy – the White House even adopted the premise that bilateral deficits are inherently harmful and would need to be eliminated, contrary to the fundamentals of Economic Theory that deficits only reflect macroeconomic factors and are not a form of trade "cheating".

The economic theory of international trade demonstrates that trade deficits do not constitute unfair practices or forms of cheating. Classical models, such as the comparative advantage model developed by David Ricardo and later formalized in models like the Heckscher-Ohlin model, explain that countries specialize in activities in which they have superior relative efficiency, resulting in unequal but mutually beneficial trade flows. These models emphasize that, regardless of bilateral trade balances, all countries involved achieve welfare gains by consuming more and better goods and services than they could produce domestically.

However, from the perspective of economic theory, a more complacent interpretation can still be given regarding this type of policy. According to the Stolper-Samuelson theorem, tariffs tend to benefit the relatively scarce factor of production in a country, in the case of the US, less-skilled workers, by protecting industries. Indeed, politically, Trump has sought support from industrial workers who have been hurt by Chinese competition, promising to regain manufacturing jobs.

In addition, some advisers invoked the concept of "optimal tariffs," developed by the British economist Abba Lerner in the 1930s. Since the U.S. is a major importer, it could impose tariffs to improve its terms of trade, making foreign suppliers reduce their prices and thus "taxing" producers from other countries for the benefit of the U.S. Treasury. Stephen Miran, a member of Trump's Council of Economic Advisers, argued that there would be a positive optimum rate, which he estimated at around 20 percent, that would maximize revenue and favor the U.S. economy.

Trump’s tariffs: a journey towards an unknown world

This view, however, disregards a central point of Game Theory applied to international trade: the strategic reaction of other countries. In a world with multiple large players, the unilateral imposition of tariffs tends to elicit retaliatory measures, as demonstrated by Bagwell and Staiger (1999) through modeling trade tariffs as an uncooperative game with inefficient Nash equilibria. In this scenario, each country attempts to improve its terms of trade through tariffs, but the result is a protectionist escalation that reduces trade volume and generates widespread welfare losses.

Another justification for tariffs is that this additional tariff revenue could finance domestic tax cuts and domestic investments, in a logic that tariffs would replace other taxes. Peter Navarro, Trump's economic adviser, advocated for permanent tariffs to "re-industrialize" the country, despite being aware of the potential for foreign retaliation.

In short, the view within Trump's circle was that high tariffs could simultaneously:

1. stimulate domestic production and employment;
2. reduce the trade deficit;
3. strengthen national security by reducing external dependence and
4. generate tax relief through tax collection.

However, as with any economic policy, some impacts must be considered.

Domestic Impacts in the U.S.

Consumer prices and inflation: Trump's tariffs have effectively acted as a significant tax hike on imported goods, putting pressure on domestic prices. This is due to the broad scope of tariffs, with a 10% tax on all imported goods and high surcharges on key suppliers. As a result, many everyday items (from food to electronics) have become more expensive. Major retailers and manufacturers have warned of consumer pass-throughs: for example, executives at Walmart and Target warned Trump that prices in their stores would rise significantly, and consumer-goods multinationals such as PepsiCo, Procter & Gamble, Unilever and Nestlé declared that they would have to raise prices for their products in the face of rising import costs. Macroeconomic indicators have already reflected this inflationary pressure – the Federal Reserve revised its inflation projections for 2025 upward, from 2.5% to 2.7%, following the announcement of the tariffs. While it may seem like a modest adjustment, it signals a perception that tariffs would add fuel to inflation.

Economic activity: The effects on domestic economic activity were disparate, but generally negative in the aggregate. Sectors highly exposed to foreign competition, such as steel, petrochemicals, and specific basic manufacturing industries already established in the US, initially saw competitive relief with tariff protection; there is real and immediate potential to increase their domestic production. For example, the 25% tariff on imported steel has prompted local steel mills to raise prices and output.

However, for the vast majority of American industries integrated into global chains, imported inputs and components have become more expensive, compressing margins and disorganizing production lines. Automakers warned that the tariffs (10% on parts and 25% on assembled vehicles) would have a counterproductive effect.

Ford, GM, and Stellantis requested exemptions, arguing that the additional costs would disproportionately harm American companies compared to their foreign competitors.

Another example is the high-tech and healthcare sectors, which were especially concerned, as complex supply chains for medical devices and pharmaceuticals faced bottlenecks and rising costs. Surgical equipment, MRI machines, and essential drugs such as heparin were at risk of shortages or price increases.

This adverse environment was reflected in the projections. For example, the Federal Reserve cut its projection for US GDP growth in 2025 from 2.1% to 1.7%, and JPMorgan Chase bank even predicted a recession in the US within 12 months from April 2025.

Global Impacts

Trade flows and retaliation

As might be expected, the U.S. tariff initiative provoked immediate responses worldwide, drastically altering trade flows. China – the main target – retaliated in a mirrored and forceful manner, applying punitive tariffs averaging 125% on American products (including agricultural and manufactured goods). This has virtually closed the Chinese market to many U.S. exporters. In addition, China has restricted exports of essential rare earths to American high-tech industries, using its dominance in this input as a strategic weapon.

Other trading partners also have taken defensive measures: the European Union has called emergency meetings and initiated WTO disputes against the US, preparing retaliatory tariffs focused on emblematic American products. NAFTA (comprising Canada and Mexico) was initially impacted by Trump's tariffs, but received partial exemptions through trade agreements (goods under USMCA rules were exempt from the 10% tariff, but subject to quotas). Still, the mood deteriorated — traditional U.S. allies were forced to respond.

Countries such as Japan and South Korea, exporters of cars and electronics, have faced U.S. tariffs of 25 percent on automobiles and have responded with diplomatic complaints and threats to raise tariffs on U.S. agricultural products in return. Emerging economies in Asia, such as Vietnam and Thailand, which benefited from the redirection of supply chains, were surprised to be included in the list of "reciprocal" tariffs (46% for Vietnam), which led some to seek individual agreements: Vietnam even offered to eliminate all tariffs on US products if it escaped the tariffs, an attempt frustrated because Washington maintained the taxation.

Thus, an environment of global trade war was created, as it was possible to predict using Game Theory applied to international trade. In this way, international organizations have begun to incorporate this scenario into their projections. The OECD and the IMF projected a decline in trade volume growth and revised their global GDP forecasts for 2025 and 2026, explicitly citing the American tariff escalation as a risk factor. Estimates suggest that U.S. tariffs, by their scale, could reduce global trade by hundreds of billions of dollars, either through a direct reduction in U.S. imports (an estimated 71% of U.S. imports will be tariffed by 2025) or via a lower global income effect.

Global supply chains and production

A striking feature of Trump's tariff policy in 2025 was the shake-up in global value chains. After decades of integration, several products rely on inputs and production stages that are spread across multiple countries. The sudden introduction of massive tariffs disrupted these chains. U.S. imports from China plummeted as early as April — container bookings on ships from China to U.S. ports fell 64% in early April from usual, a sign of an impending collapse in the flow of goods.

Thus, globally, multinational firms have begun to reevaluate their supply strategies. "Friend-shoring" (redirecting production to allied or domestic countries) has gained strength, but this is a slow process. In the short term, the primary reaction was to utilize emergency stocks and seek alternative suppliers (e.g., importing electronics from Southeast Asia instead of China, although several of these countries are also subject to tariffs, albeit at 10% rather than 125%). Some emerging countries have tried to position themselves as new production centers free of punitive tariffs. For example, India saw an opportunity to attract electronics factories, as it was not the target of a high surcharge, having a 10% base tariff.

However, the volatility of U.S. policies, with announcements, suspensions, and changes in a short interval, has generated extreme uncertainty for international investments. Many foreign direct investment projects have been postponed or canceled, as companies have preferred to wait for clarity on the rules of the game. In essence, the search for lower tariff exposure partially relocated supply chains, benefiting some countries that were not severely affected. However, global efficiency will undoubtedly fall under this scenario.

Trump's attempt to repatriate supply chains ignores that the U.S. accounts for only approximately 15% of global trade – the rest of the world can continue to exchange inputs with each other, possibly forming blocs without the U.S. Thus, there is a risk of a technological and commercial bifurcation: supply chains excluding the US on the one hand, and US-centric chains (more expensive) on the other, with a reduction in global scale and a loss of productivity.

Foreign investment and productive relocation

The trade shock also impacted foreign direct investment (FDI) flows. In the US, one could initially expect an increase in domestic productive investments – after all, with more expensive imports, manufacturing within the country becomes relatively more attractive. Sectors such as semiconductors and batteries, also encouraged by federal subsidies, have followed plans to set up factories in the US to reduce external dependence.
However, the advantage of tariffs was accompanied by regulatory instability and the risk of retaliation, making the environment less predictable. Some international investors have pulled back: for example, European and Japanese companies have postponed expansion projects in the U.S., fearing they would be caught up in future tariff disputes.

Global Impacts

Markets and global growth

The 2025 tariff war has imposed a significant brake on the world economy. In terms of growth, institutions such as the IMF have estimated that the trade dispute could shave as much as 0.5 percentage points off global growth for the year if prolonged. Economies with a greater dependence on trade felt the impact immediately.

For example, Germany revised its GDP projection to near-zero growth in 2025, citing a decline in exports of cars and machinery to the US and China. Many emerging commodity-exporting countries faced declining demand and falling commodity prices. Oil and copper prices were pressured down amid expectations of weaker global industrial activity.

On the other hand, some agricultural goods saw price increases – soybeans and corn rose in international markets, due to redirected Chinese demand and supply concerns.

The global climate has become one of uncertainty and risk, partly reminiscent of the dynamics of the 1930s, when cascading protectionist actions deepened the crisis. The WTO warned that the U.S. tariffs violated fundamental principles of international trade.

However, the U.S. had already paralyzed the WTO's dispute settlement system since 2019, blocking appointments to the Appellate Body. Thus, the multilateral framework proved incapable of stopping the escalation of this trade war.

The world thus entered a phase marked by forced adjustments, reconfiguration of production chains, and intensification of trade frictions. This is an unprecedented move: although we have already experienced periods of more significant economic closure in the past, this is the first time that a deliberate and coordinated transition from the globalization regime to a more fragmented order has occurred.

From the perspective of the economic theory of international trade, which systematically demonstrates the welfare gains generated by specialization and the free exchange of goods, as in the Ricardian, Heckscher-Ohlin models, and in the most recent approaches with product differentiation and economies of scale, this reversal finds no technical justification.

In theoretical terms, a world with less voluntary trade cannot be expected to generate more prosperity than one in which countries cooperate and trade based on comparative advantage. We are, therefore, facing a global experiment whose potential costs, although still uncertain, tend to be high.

Rivoli Finance

Crypto, Central Banks, and the Race for Trust

Blockchain and tokenization: a primer

What is a Blockchain?

Blockchain can be compared to a shared and distributed digital ledger, which organizes information securely and transparently. This "book" is always growing, as new "pages" are added as records are validated. Each page in this book is called a block, and these blocks contain important data, such as transactions involving digital assets or even general information or facts.

An essential feature of blockchain is that once a record is validated and added to a block, it is chained to the previous block in a linear, chronological sequence. This ensures that all recorded information remains organized and protected from change, creating a reliable and immutable structure.

Like a book, where each page maintains a complete and ordered history, each block in the blockchain contains references to the previous block, forming a continuous chain. This innovative technology is widely used to record transactions in a decentralized manner, eliminating the need for a central intermediary to verify or validate the data.

Blockchain is a potentially revolutionary technology because the ledger (or database) is distributed to countless participants, known as nodes. These nodes can be spread around the world and can operate on public peer-to-peer networks, similar to the Internet, or on private and permissioned networks comparable to an intranet. Participants in these networks can be individuals, organizations, or even devices, as long as they have a smartphone or internet connection.

The Internet has transformed the way we exchange information and ideas, enabling fast, global, and accessible communication. Blockchain amplifies this transformation by adding a new dimension: the ability to transfer and exchange value – such as financial assets or data – without the need for intermediaries. This decentralized feature reduces costs, increases efficiency, and offers a previously unattainable security level.

Additionally, blockchain technology can store personal information and other data in a secure and accessible environment. For example, a smartphone can create a digital identity by interacting with other blockchain network participants. This not only reliably facilitates access to digital services but also opens doors to financial and digital inclusion for millions of people around the world. Therefore, blockchain is a tool for recording transactions and a social and economic transformation mechanism.

Blockchain technology, in turn, expands access to financial services such as credit, insurance, and stock markets. Peer-to-peer transactions are possible thanks to a distributed consensus model, in which the network's "nodes" verify, validate, and audit transactions before and after execution. This process is often faster and more secure than traditional models, in which transactions must go through intermediaries such as banks, notary offices, or courts.

One of the key features of blockchain is network connectivity, which allows multiple copies of the blockchain to be distributed among network participants. This makes it virtually impossible to alter or erase information recorded on the blockchain, as the other copies would immediately detect any attempt to modify it. The use of cryptographic hashes further enhances this security.

Cryptographic hashes use complex algorithms that create a unique "digital signature" for each information block. Any change, even a minor one, to the recorded content generates a completely different hash, making any attempt at manipulation easily detectable. This combination of decentralization, connectivity, and cryptographic security makes blockchain an extremely reliable and fraud-resistant technology.

Blockchain technology has the power to profoundly transform the financial market, creating an independent and transparent platform to establish trust and ensure the integrity of transactions. Rather than relying on intermediaries, bureaucracies, or traditional procedures, blockchain replaces these structures with four fundamental pillars: code, connectivity, community, and collaboration. These pillars enable a more agile and efficient operation, increasing transaction transparency and significantly reducing operating costs. In the financial market, this means that transfers, contracts, negotiations, and other processes can be carried out faster and more securely, eliminating traditional barriers that limit access and increase costs for consumers and businesses.

By expanding openness, accelerating operations, and reducing costs, blockchain ushers in a new era for the financial market. It democratizes access to services and promotes a more inclusive, collaborative, and innovative environment. It's a revolution that redefines how value and trust are built and exchanged.

Blockchain and tokenization: a primer

What is Tokenization?

Tokenization transforms a physical or digital asset into a digital representation called a token, which can be recorded and transferred on a blockchain. To understand this concept, it is important to understand what a token is and its evolution.

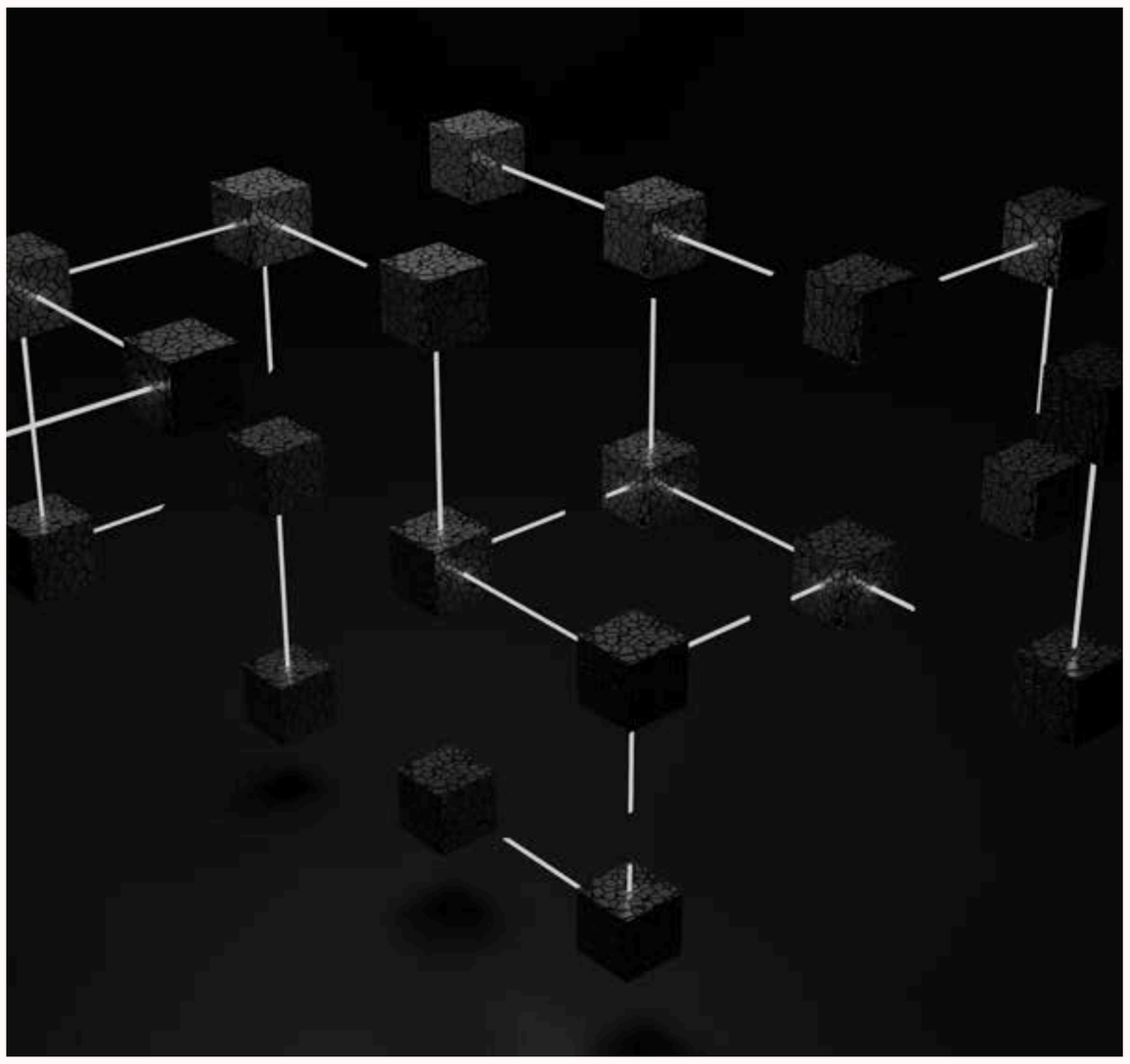
Historically, the term "token" refers to a physical object that symbolizes or represents something of value, such as the chips used in casinos or the coins issued by merchants in times of monetary scarcity. These physical tokens functioned as temporary substitutes for the currency, conferring the right to exchange for goods or services.

In the digital age, a token performs a similar function but in a virtual way. It is a digital asset that can represent money, stocks, property rights, contracts, or even physical goods, such as real estate or works of art. Unlike its physical version, the digital token is programmable, secure, and can be transferred instantly through a blockchain.

Tokens and Blockchain: The Connection

The blockchain is the environment in which tokens exist and operate. Think of it as the digital ledger that keeps all tokens organized, tracked, and secured. Each token registered on the blockchain is linked to a specific set of information, including the type of asset it represents, who owns it, and any conditions associated with its use or transfer.

Thus, the blockchain stores the tokens and allows them to be transferred securely, transparently, and efficiently. For example, when a token representing property ownership is transferred, the blockchain updates the record automatically, ensuring the transfer of value and property rights without intermediaries, such as notary offices.



Top 10 benefits of tokenization

1. Increased Liquidity for Traditionally Illiquid Assets: Tokenization allows assets such as real estate, art, or private equity to be fractionalized and traded in global markets, making them more accessible.

1. Reducing Geographic and Operational Barriers: Tokens can be traded internationally efficiently, eliminating intermediaries and regulatory barriers in many cases.

2. Ease of Ownership Transfer: Tokenization simplifies the transfer of property rights, with fast and secure transactions recorded on the blockchain.

3. Transparency and Immutability: Token transactions are recorded on a blockchain, ensuring full transparency and integrity in the history of movements.

4. Financial Inclusion and Democratization of Investments: Fractional tokens allow small investors to participate in markets previously only accessible to large institutional investors.

5. Reduced Transaction Costs: Eliminating intermediaries significantly decreases the costs associated with financial transactions and property transfers.

6. Increased Operational Efficiency: Thanks to smart contracts, transaction settlement and asset management processes have become faster and more automated.

7. 24/7 accessibility: Token markets run uninterrupted, allowing for real-time trading at any time of the day.

8. Customization and Programmability: Tokens can be programmed to include specific conditions, such as automatic dividend payments or transfer restrictions.

9. Security and Resilience: Blockchain technology protects tokens from fraud and unauthorized alterations, providing a trusted trading and asset management environment.

Tokenization has the potential to profoundly transform the financial market by democratizing access to investments, increasing the liquidity of traditionally illiquid assets, and reducing operating costs. The fragmentation of assets into digital tokens allows investors of different profiles to participate in previously restricted markets, promoting financial inclusion. In addition, integration with the blockchain ensures transparency, security, and efficiency in transactions, eliminating intermediaries and speeding up processes. By offering an accessible, secure, and global marketplace, tokenization redefines how values, rights, and properties are traded, ushering in a new era of financial innovation.

Cryptocurrencies

Cryptocurrencies have been widely recognized as an innovation with the potential to transform the global financial system by promoting greater inclusion and simplifying financial services infrastructure. However, their early popularity was marked primarily by their role as a speculative store of value rather than as an efficient medium of exchange. This scenario is changing rapidly, with initiatives by monetary authorities and private companies aimed at launching stabilized cryptocurrencies designed to function as accessible and reliable means of payment.

Central Bank Digital Currencies (CBDCs) and stablecoins have gained prominence as complementary and innovative solutions in this context. Recent examples, such as the advancement of the "digital Euro" project by the European Central Bank and the Drex project by the Central Bank of Brazil, illustrate the growing commitment of central banks to explore digital alternatives. Today, over 80% of global monetary authorities conduct studies or pilot tests related to CBDCs. At the same time, stablecoins have been launched to increase liquidity and facilitate transactions in the booming cryptocurrency market.

While the future of these initiatives—ranging from nimble fintech to large financial institutions and governments—is still uncertain, their potential impact is clear. By rethinking how money is created, distributed, and used, CBDCs and stablecoins have the ability to profoundly transform financial systems, reconciling technological innovation with economic stability.

What are Stablecoins?

Stablecoins are cryptocurrencies whose value is tied to a currency, commodity, or other financial instrument. They seek to offer price stability in a market often marked by volatility. These digital assets function as a store of value and medium of exchange, being integrated or traded with other digital assets through distributed ledger technologies (DLTs).

A core feature of stablecoins is that their transactions are carried out without the need for intermediaries to settle them, allowing payments to be completed almost instantly. In addition, stablecoins enable financial operations 24 hours a day, seven days a week, without restrictions or waiting times since they do not depend on payment facilitators. Developed to combine the benefits of cryptocurrencies, such as cryptographic security and encryption, stablecoins overcome the volatility associated with traditional decentralized cryptocurrencies.

In this context, there are four main types of stablecoins, each with specific characteristics:

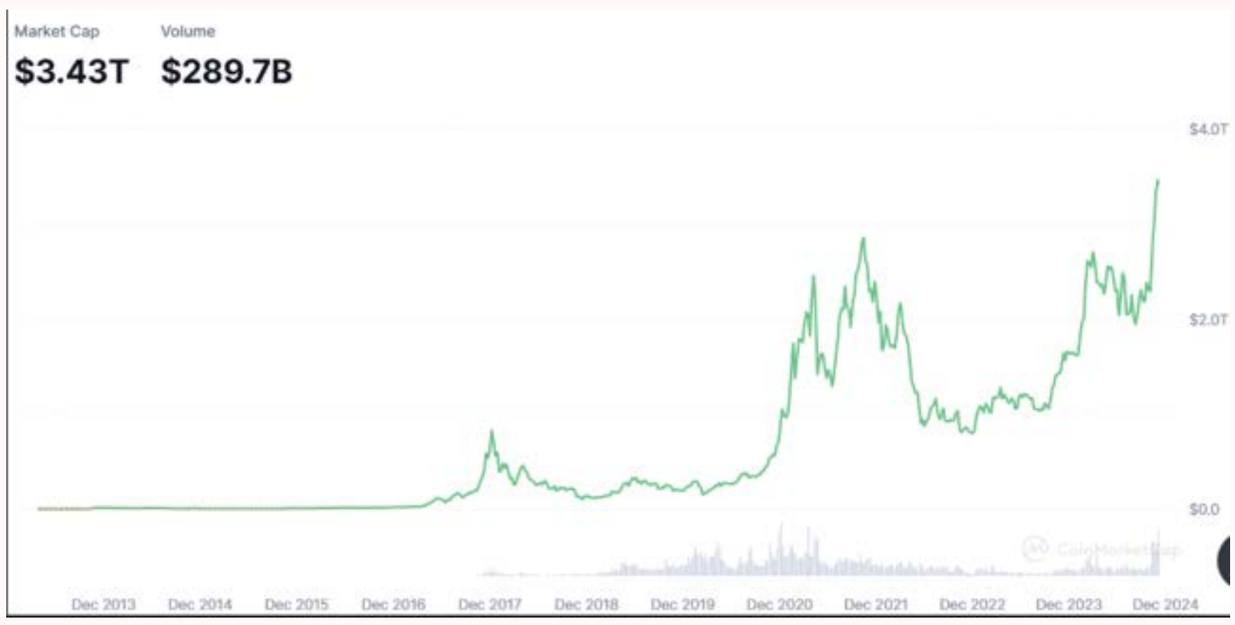
1. Fiat-Collateralized Stablecoins:
These stablecoins have their value pegged to a fiat currency, such as the US dollar, to ensure that they follow the price dynamics of that reference currency. They are usually backed by physical cash reserves held in financial institutions.

2. Crypto-Collateralized Stablecoins:
In this model, stablecoins are backed by digital asset reserves rather than cash reserves. While this decentralized approach offers an interesting alternative, it can still be susceptible to significant price fluctuations. It is common for these coins to be overcollateralized to mitigate risks, reducing the chances of total collapse.

3. Commodity-Collateralized Stablecoins:
Reserves of real assets, such as gold or oil, back these stablecoins. The value of each currency is tied to a specific unit of the underlying resource, such as a currency backed by a troy ounce of gold held in reserve.

4. Algorithmic Stablecoins:
Unlike backed models, these stablecoins do not have asset reserves. Instead, they use algorithms to adjust the supply of coins according to price fluctuations, promoting stability. An example of this mechanism is the incentive for users to sell coins when the price exceeds a predetermined value, helping stabilize the exchange rate.

Stablecoins represent a significant advance in the cryptocurrency space. They combine blockchain's security and technological innovation with the price stability necessary to expand their adoption as a means of payment and store of value.



Functionality and Limitations of Stablecoins

Stablecoins can operate as independent blocks within a digital ecosystem, integrating with smart contracts to enable payments and other automated financial services. In this model, transactions involving stablecoins can be carried out automatically once the pre-programmed conditions in the smart contract code are met, offering a completely automated and efficient solution for various applications.

Despite their advantages, stablecoins also have some limitations. As with traditional cryptocurrencies, they are distributed on decentralized networks and do not have centralized control.

This feature, while strengthening security and censorship resistance (no central authority or intermediary can unilaterally block, prevent, or alter transactions), presents significant challenges for central banks and payment system regulators. These institutions often seek greater control over the payment infrastructures available in their jurisdictions, which can conflict with the decentralized functioning of stablecoins.

This clash between decentralization and regulation raises important questions about the governance, oversight, and integration of stablecoins into traditional financial systems. The evolution of this debate will be essential in determining the role of stablecoins in a future where the boundaries between traditional and digital finance are increasingly blurred.

What are CBDCs?

Central Bank Digital Currencies (CBDCs) are an additional currency issued, monitored, and controlled by a central bank. As with fiat currencies, the supply of CBDCs is regulated by the monetary and fiscal policies of the issuing central bank. However, they differ from stablecoins and other decentralized cryptocurrencies in that they are mandatorily accepted as a means of payment throughout the market in which they are issued. In addition, CBDCs should function as a secure store of value for consumers, merchants, stakeholders, and government bodies. While they share similarities with stablecoins, such as 1:1 backing in a corresponding fiat currency, ensuring that their value is always equivalent to that of the reference currency, CBDCs have fundamental differences. Because they are exclusively digital, users need a digital wallet to store them, but not necessarily a traditional bank account to use them.

CBDCs are distinguished from other forms of cryptocurrencies in their conception and purpose. While decentralized cryptocurrencies and stablecoins often operate outside traditional financial infrastructure, CBDCs are designed to integrate with existing central banking systems. CBDCs improve and complement current payment systems, eliminating the need for new financial infrastructure. This contrasts with stablecoins, whose primary purpose is to bypass conventional payment systems.

The digital wallets required to use CBDCs are compatible with smartphones, smart devices, and wearables and function similarly to existing digital wallet services. These wallets may or may not be linked to cards or bank accounts, expanding access and facilitating the adoption of CBDCs by different user profiles.

What is Drex?

Drex is the digital version of the real, a central bank digital currency (CBDC) issued by the Central Bank of Brazil (BC) and operated on a digital platform based on distributed ledger technology (DLT). This initiative seeks to modernize and expand the reach of the national financial system by integrating money and financial assets into a single infrastructure.

With Drex, it will be possible to carry out a wide range of secure financial transactions using digital assets and smart contracts. Banks will settle these operations within the Drex Platform, which the Central Bank created. In addition to reducing operating costs related to using paper money, Drex aims to expand financial inclusion, reaching consumers connected to the digital world.

A new infrastructure for financial assets and digital money

More than just a digital currency, Drex proposes to be a comprehensive infrastructure, allowing the integration of money and tokenized financial assets, such as stocks, debentures, government bonds, and even real estate and car ownership certificates. This innovation can bring significant benefits to all participants in the financial chain, including issuers, investors, and end-users. Among the expected results are:

- Greater availability and agility in financial operations without the restrictions of banking hours.
- Reduced operational costs and increased efficiency in the use of smart contracts.
- Emergence of new financial instruments made possible by blockchain technology.

How will it work?

Access to Drex will be intermediated by financial institutions authorized by the Central Bank, such as banks, fintech, and cooperatives. Only these institutions will have direct access to the Drex issued by the Central Bank. End users—consumers and companies—will use intermediated currency versions, known as "tokenized real." The main difference between Drex and the tokenized real is in liability: Drex will be a liability to the Central Bank, while the tokenized real will be a liability to the financial institutions that operate it.

The process of using Drex will be simple:

1. The customer deposits money in a digital wallet operated by an authorized financial institution.
2. The reais are converted into Drex in a 1-to-1 ratio, allowing the customer to carry out digital transactions.
3. The receiver of the digital currency can convert it back into reais for withdrawal or other operations.

Practical applications of Drex with Smart Contracts

Drex, the Brazilian digital currency issued by the Central Bank, will enable the use of smart contracts to automate complex processes and reduce bureaucracy in various transactions. These contracts are computer programs that automatically execute the terms agreed between the parties when pre-established conditions are met, ensuring greater efficiency and safety in operations.

Practical Example: Buying and Selling Vehicles

In a traditional transaction of buying and selling a vehicle, there is a need for intermediaries, such as notary offices, to formalize the transfer of ownership, in addition to possible delays and additional costs. With the use of Drex and smart contracts, the process would be automated as follows:

1. Definition of Conditions: The parties involved establish the terms of the transaction, such as the sale price, vehicle conditions, and transfer date.
2. Smart Contract Programming: These conditions are hardcoded into a smart contract on the Drex platform.
3. Automatic Execution: Once the conditions are met — for example, payment confirmation in Drex — the smart contract automatically executes the digital transfer of vehicle ownership to the buyer and the agreed amount to the seller.

This mechanism eliminates the need for intermediaries, reduces costs, and speeds up the process by ensuring that both parties fulfill their obligations simultaneously.

Other Potential Applications of Smart Contracts with Drex

In addition to buying and selling vehicles, Drex and smart contracts can be applied in several sectors:

- Real Estate Sector: Automation of real estate buying and selling processes, where the transfer of the deed and payment occur simultaneously, increasing the efficiency and security of transactions.
- Insurance: Automatic claims processing, where the smart contract verifies compliance with the payment conditions, makes the process more transparent and agile.
- Decentralized Finance (DeFi): Facilitating lending and investing, where smart contracts automatically manage terms, payments, and collateral, reducing the need for financial intermediaries.

The integration of Drex with smart contracts represents a significant advance in the digitization and automation of financial and commercial processes in Brazil, promoting greater transparency, efficiency, and financial inclusion.

Conflicts and Complementarities between Stablecoins and CBDCs

The future of Central Bank Digital Currencies (CBDCs) and stablecoins is still being determined, marked by several open questions related to their design and implementation. Despite the fundamental differences between these technologies, both can coexist and play complementary roles in the global financial system while jockeying for space and relevance in some areas.

Conflicts and Competition

Stablecoins have been thriving as an effective tool for liquidity and store of value in the decentralized finance (DeFi) ecosystem. They enable fast transactions, arbitrage, and cross-border payments while avoiding the complexities of converting cryptocurrencies to fiat currencies on regulated platforms. This flexible model contrasts with the more comprehensive and regulated scope of CBDCs, whose objective includes the stability of the financial system and the advancement of the common good.

This duality generates potential conflicts. Central banks may consider the increasing use of stablecoins as a threat to their prerogatives, especially when large volumes of value are liquidated outside their supervision. In response, many countries accelerate CBDC projects to offer regulated and reliable alternatives.

Financial Infrastructure as a Driving Factor for CBDC and Stablecoin Adoption

A country's financial infrastructure plays a crucial role in the speed and degree of adoption of Central Bank Digital Currencies (CBDCs) and stablecoins. In different economic and technological contexts, the needs of markets, the capacity for innovation, and regulatory challenges shape the impact of these technologies on the financial system.

Advanced Infrastructure: Incremental Benefits and Challenges

In countries with robust and advanced financial systems, such as those that already have instant payment infrastructure, the incremental benefits of CBDCs may be limited in the short term. In these scenarios, where solutions such as real-time wire transfers are widely available, introducing a CBDC may need more support from financial institutions due to the cost of adapting to new technologies.

On the other hand, stablecoins can stand out in these markets by offering additional functionalities, such as interacting with smart contracts and applications in decentralized finance (DeFi). Their ability to operate on public and permissionless networks, often without restrictions on hours or intermediaries, may present particular advantages over CBDCs, especially in cross-border transactions and arbitrage.

Emerging Markets: Opportunities for Transformation

CBDCs and stablecoins have the potential to transform countries with limited or fragmented financial infrastructure. The absence of efficient payment systems creates an environment conducive to a "technological leap," similar to that seen with M-Pesa in sub-Saharan Africa or Alipay in China.

In these contexts, CBDCs can offer financial inclusion by allowing individuals to access digital money through digital wallets on smartphones without needing a traditional bank account. This approach is particularly relevant in regions with a significant unbanked population and where traditional banking infrastructure is expensive or inaccessible.

Stablecoins can also play an important role in these markets, especially where there is a need for fast and low-cost international transfers, such as remittances sent by expatriate workers. Their flexibility and affordability can fill critical gaps until CBDCs are fully deployed.

Monetary Stability and Adoption

The stability of the sovereign currency also influences the adoption of these technologies. In countries with historically unstable currencies, stablecoins often offer a more reliable alternative, functioning as both a store of value and a medium of exchange. This scenario is evident in adopting cryptocurrencies in places like El Salvador, where Bitcoin has been accepted as an official currency.

In this sense, the digital infrastructure associated with stablecoins can anticipate or complement the introduction of a CBDC, offering a basis for the development of more resilient financial ecosystems.

Technology Integration and Compatibility

Interoperability between systems is also a determining factor. Infrastructures that allow for the integration of stablecoins with public and permissionless networks have the advantage of engaging with a broader technology base and rapid adoption. CBDCs, on the other hand, are designed to operate on private and permissioned networks, require compatibility with traditional banking systems, and may face greater challenges in technological adaptation.

Regulation and Adaptation

Regulation will be crucial in defining the role of stablecoins and CBDCs. While CBDCs are naturally centralized and controlled by central banks, stablecoins may be subject to regulation by various agencies, depending on their classification. Such regulation must balance innovation and safety, creating a competitive and sustainable environment.

Conflicts and Complementarities between Stablecoins and CBDCs

Conclusion

The coexistence between stablecoins and Central Bank Digital Currencies (CBDCs) will depend on the ability of both technologies to adapt to the specific needs of the markets and fulfill their distinct missions. With their pioneering spirit in the digital ecosystem, Stablecoins stand out as an agile tool for applications such as liquidity in decentralized finance (DeFi) and smart contracts. On the other hand, CBDCs offer a long-term approach, aligned with public policy objectives such as financial inclusion and modernization of payment systems.

Despite the differences, there is room for complementarity. CBDCs can lead

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initiatives to strengthen national and international financial systems, promoting accessibility and security through digital wallets, especially for unbanked populations. Simultaneously, stablecoins will continue to play a vital role in decentralized platforms, enabling automated lending and integration with smart contracts on public networks.

The success of stablecoins and CBDCs will depend on their ability to meet user demands while facing global regulatory challenges. The coexistence of these technologies, leveraging their respective strengths and functionalities, can create a more efficient, inclusive, and resilient financial system for the future.

Stablecoins and Their Impacts on Monetary Policy

The centralized model of monetary issuance, in which states have a monopoly on the creation of money, is a pillar of modern financial systems. However, this model faces severe criticism, especially in economies where inconsistent fiscal and monetary policies compromise the currency's purchasing power and increase dependence on inflationary revenues through inflationary taxation
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In addition, traditional financial intermediation often imposes high costs, such as high account maintenance fees and interest on loans, as well as barriers to access, including complex bureaucratic requirements and the exclusion of populations in remote areas. These factors limit the efficiency of the monetary system by restricting financial inclusion and raising user costs.

Faced with these problems, the use of private currencies, such as digital assets, has been widely debated as an alternative to the centralized model. Among these assets, Bitcoin was a pioneer in offering a decentralized currency based on blockchain technology. However, its high volatility and inability to handle large volumes of transactions have made it unsuitable as a direct replacement for fiat currencies. For these reasons, it was used predominantly as a store of value.

Technological evolution, however, has brought a promising solution: stablecoins. These digital currencies are designed to solve some of the limitations of traditional cryptocurrencies and offer an alternative that combines innovation and functionality for the global financial system. Stablecoins are a class of digital currencies designed to provide something that unbacked cryptocurrencies cannot: the stability of their value. This stability is achieved by linking its value to stable assets, such as fiat currencies (e.g., the U.S. dollar), commodities (e.g., gold), or a basket of financial assets.

Among the main advantages of stablecoins are:

1. Stability

Because stablecoins are assets of relatively fixed value, they offer significantly lower volatility than traditional cryptocurrencies. This makes them more suitable for use in everyday transactions and as a means of payment.

1. Scalability:

Stablecoins are designed to support a significantly higher volume of transactions than cryptocurrency networks, such as Bitcoin, enabling greater efficiency in use across global markets and digital platforms.

1. Cost Reduction:

By eliminating some of the traditional financial intermediation, stablecoins reduce transaction and brokerage costs. This makes them attractive for a wide range of applications, from cross-border payments to trading on cryptocurrency exchanges.

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Two widely used examples of stablecoins are Tether (USDT) and USD Coin (USDC). Tether has a market capitalization of approximately $135 billion, while USD Coin has a market capitalization of around $45 billion. While these figures are significant, they are still far below the trillions of dollars in circulation as fiat currencies. However, the rapid advancement of stablecoins could significantly impact monetary policy, necessitating further discussion of its implications.
Traditional monetary policy operates through the creation of bank money, which is connected to the granting of credit by commercial banks. In this model, banks generate new deposits by granting loans, which expands the monetary base and allows the Central Bank to influence the economy by adjusting interest rates and regulating credit supply through compulsory deposits.

In turn, by competing with traditional bank deposits, stablecoins can reduce the role of commercial banks as financial intermediaries, a process known as bank disintermediation. When economic agents transfer their funds from bank deposits to stablecoins, banks can lose a significant part of their deposit base, becoming more dependent on capital market financing. This reliance alters how banks react to changes in interest rates set by the Central Bank, potentially diminishing the effectiveness of monetary policies.

In addition, the impact of stablecoins on monetary policy depends on the type of remuneration and the composition of the reserves backing them. Stablecoins backed exclusively by domestic currencies would tend to have yields similar to those of bank deposits, reducing the impact on the transmission of monetary impulses. In contrast, those backed by a basket of foreign currencies or diversified assets would be less influenced by local policies, significantly weakening the Central Bank's ability to control the money supply and influence interest rates. The latter situation is comparable to using a strong foreign currency for domestic payment, known as the "dollarization" of the economy. In extreme cases, when only foreign currency is in circulation, the central bank completely loses control over its monetary policy.

Stablecoins and Their Impacts on Monetary Policy

Emerging Markets

In countries like Brazil, where governments often show little commitment to preserving the currency's purchasing power, stablecoins can play an essential role in protecting the population's economic well-being. The country's recent history is marked by high inflation and monetary instability, often resulting from governments' difficulty in achieving sustainable fiscal balances.

Stablecoins offer a robust alternative in this context, acting as a store of value and a medium of exchange that reduces citizens' exposure to the uncertainties associated with state currency. Because they are pegged to stable assets, such as the U.S. dollar, these digital currencies can protect individuals against the effects of fiscal and monetary policies that prioritize revenue generation through inflationary taxation. This phenomenon has already been observed in countries such as Venezuela, where the population has turned to cryptocurrencies to preserve their purchasing power amid hyperinflation.

Therefore, adopting stablecoins could significantly affect fiscal and monetary management in countries like Brazil. By migrating their demand from state currency to more reliable private assets, citizens reduce their inflationary tax payments and the effectiveness of monetary policies conducted by the Central Bank. This phenomenon becomes especially relevant in contexts of high inflation or high inflationary expectations when confidence in the local currency is severely compromised.

Ultimately, stablecoins can offer Brazilians a reliable alternative for preserving value, conducting transactions, and fostering an environment of greater accountability in economic policies. This potential, however, depends on proper regulations that ensure the transparency and stability of digital currency use in the financial system.

The growth of stablecoins has led to significant regulatory efforts at the global level, as exemplified by the Markets in Crypto-Assets (MiCA) initiative in the European Union, which aims to establish clear guidelines for the issuance and use of these digital currencies. In parallel, central banks worldwide have responded to the advancement of stablecoins by developing Central Bank Digital Currencies (CBDCs), which are digital versions of fiat currencies issued by central banks. In Brazil, Drex, the Central Bank's CBDC initiative, exemplifies this trend, intending to modernize the payment system and expand financial inclusion. .

Costs and benefits

While CBDCs can bring advantages, they also present problems similar to stablecoins, especially concerning bank disintermediation. However, stablecoins and CBDCs can be seen as solutions to strengthen citizens' economic protection, acting as reliable stores of value and mediums of exchange in unstable economies.

However, its large-scale adoption has both benefits and costs. On the one hand, it offers a more reliable alternative to state money, reducing governments' ability to finance public deficits through the inflation tax. On the other hand, its widespread use can significantly limit the effectiveness of traditional monetary policies, restricting central banks' ability to control the money supply and, consequently, to respond effectively to economic fluctuations.

For these reasons, there is a need for a broad debate on the impacts of these innovations on the local and global economic balance. Clear and comprehensive regulations must ensure transparency, security, and the integration of these new technologies into the financial system, while avoiding risks to stability and maximizing the benefits they bring to modernized economies.

Trust and Stability: The Role of Regulation in the Future of Stablecoins

lTraditional monetary systems, based on the centralized issuance of currency and the intermediation of commercial banks, play a key role in the global economy. However, their stability depends intrinsically on the trust of the participants. History and economic theory show that crises of confidence can trigger bank runs, events in which the mass withdrawal of funds depletes the system's liquidity and compromises its viability. Well-known episodes, such as the Great Depression and the 2008 financial crisis, exposed these vulnerabilities.

At the same time, the rise of cryptocurrencies, particularly stablecoins, has brought a new dynamic to the financial landscape. Stablecoins, designed to offer greater price stability than conventional cryptocurrencies, have been gaining relevance as payment alternatives and stores of value. However, despite their promises to revolutionize the financial market, stablecoins are not immune to the risks of speculative attacks and "money runs." These events occur when holders of the asset attempt to sell it simultaneously, causing its value to drop abruptly, often leading it to values close to zero. An example of this was the collapse of the algorithmic stablecoin TerraUSD (UST) in 2022.

In the case of the 2008 crisis, the collapse of Lehman Brothers, until then one of the largest investment banks in the United States, unleashed a wave of panic in global financial markets. This bankruptcy was the culmination of a broader crisis that originated in the subprime mortgage market, characterized by the granting of subprime loans and the securitization of these assets into complex financial instruments. When delinquencies in the real estate sector increased, the devaluation of these assets quickly compromised the liquidity and solvency of financial institutions worldwide.

The perception that the banking system was structurally fragile led to a crisis of confidence that paralyzed credit markets, requiring massive interventions by central banks and governments to prevent the total collapse of the financial system.

In the collapse of the algorithmic stablecoin TerraUSD (UST) in 2022, the dynamics differed, but it also involved an abrupt loss of confidence. UST relied on an algorithmic model that sought to maintain its peg to the dollar through automatic supply and demand mechanisms mediated by the LUNA token. However, this system was not backed by real reserves, such as fiat assets or tangible collateral, making it vulnerable to external shocks and speculative attacks. When confidence in the model was shaken, investors began to liquidate UST and LUNA in massive quantities, creating a downward spiral.

This dynamic has made clear the limitations of purely algorithmic models and reinforced the need for more robust and transparent frameworks to ensure the stability of stablecoins. As in the 2008 crisis, the lack of confidence was the primary catalyst.

Traditional Monetary Systems instruments

Traditional monetary systems have a series of regulatory mechanisms designed to prevent crises of this type and mitigate their impacts. One of the pillars of this structure is deposit insurance, which protects account holders against losses in the event of bank failure. This mechanism reduces the incentive for mass withdrawals, as depositors are assured that their funds are protected up to a specific limit.

Another central element for confidence in the financial system is the central bank's role as lender of last resort, an essential function for monetary and financial stability. During periods of crisis, central banks can provide emergency liquidity to distressed financial institutions, preventing short-term liquidity problems from turning into solvency crises. This action not only prevents the immediate collapse of individual institutions but also curbs systemic panic, restoring confidence in the market.

The relevance of this mechanism was evident during the 2008 financial crisis. As the credit market became paralyzed and large financial institutions faced severe difficulties, central banks worldwide implemented extraordinary measures to prevent a global collapse. The Fed, for example, established multiple emergency credit programs, significantly expanded the monetary base, and lowered interest rates to historic lows. In addition, it coordinated actions with other major central banks, such as the European Central Bank (ECB) and the Bank of Japan, injecting trillions of dollars into financial markets through repo operations, currency swaps, and acquisitions of troubled assets. These measures helped stabilize markets, restore liquidity, and prevent a more severe global financial system collapse. This demonstrates that the ability to act as a lender of last resort is an indispensable pillar of the monetary system's resilience.

Additionally, ongoing regulatory oversight ensures that banks maintain sufficient levels of capital and liquidity to weather economic shocks. Rules such as those in the Basel Accords require banks to keep enough reserves to absorb potential losses, thereby reducing the likelihood of insolvency. Combined with monitoring and rapid response systems, these measures help identify risks before they become widespread crises.

Stablecoins instruments

In turn, stablecoins still lack robust instruments to prevent crises and ensure stability in times of tension. Despite their promise of price stability, by pegging their value to underlying assets such as fiat currencies, commodities, or cryptocurrencies, these digital currencies face problems in terms of transparency and trust. The collapse of TerraUSD (UST) in 2022 is a clear example of the consequences of such vulnerabilities.

Trust and Stability: The Role of Regulation in the Future of Stablecoins

Another emblematic case that highlights the weaknesses of stablecoins occurred with Tether (USDT), the largest stablecoin by market capitalization. In 2022, Tether faced a coordinated speculative attack by hedge funds, which sought to profit from a potential loss of USDT's peg against the U.S. dollar. These funds carried out short-selling operations, betting on the devaluation of the stablecoin. While Tether has managed to maintain its peg and demonstrated resilience, the episode has made it clear that stablecoins, even if widely used, are also subject to speculative shocks.

In the case of stablecoins, the leading risk factor is the lack of clarity about the reserves that guarantee their peg. Issuers often fail to provide sufficient information about the composition, liquidity, or location of these assets, which fuels suspicion. When investors begin to doubt a stablecoin's ability to honor large withdrawals, it can generate a chain reaction of mass withdrawals, leading to a loss of peg. This risk is exacerbated by the interconnectedness of the crypto asset market, where stablecoins are widely used as a medium of exchange and collateral in smart contracts, thereby amplifying the impact of a crisis.

Furthermore, the lack of a clear regulatory and enforcement framework exacerbates the risks associated with stablecoins. While traditional financial systems rely on decades of experience accumulated by central banks and regulators in crisis management, the stablecoin market operates in a decentralized environment, often beyond the reach of conventional supervisory mechanisms. This regulatory gap makes it challenging to implement effective measures to contain crises and increases investors' exposure to systemic failures, especially in high-volatility scenarios.

Regulation challenges

Recognizing these challenges, the European Union has recently implemented the Markets in Crypto-Assets Regulation (MiCA), which aims to address the issues of stablecoins through a traditional command-and-control approach. This regulation sets strict requirements, including the need for prior authorization to operate in the European market, regular audits, greater transparency about the reserves that back these currencies, and the submission of risk management plans. In addition, to mitigate risks to financial stability and the payment system, MiCA limits the use of stablecoins as a means of payment when they reach significant circulation levels.

MiCA had already significantly impacted the stablecoin market before it came into force. Tether, for example, announced the discontinuation of its euro-pegged stablecoin, EURT. Although he denies it, many believe this action is a response to new regulatory requirements. Additionally, Coinbase, one of the largest European exchanges, announced the delisting of USDT from its platform, citing compliance with the latest regulations in effect. By imposing too many restrictions, European regulation has passed the optimal point. This, in a way, keeps the debate on how to find a balance between ensuring the security of the financial system and fostering technological innovation in the crypto asset sector.

It is undeniable that stablecoins represent a promising innovation in the global financial landscape, offering solutions to problems such as the volatility of traditional cryptocurrencies and the need for faster, more cost-effective domestic and international digital transactions. However, these digital currencies are not immune to problems, including the risk of speculative runs and attacks. As in the traditional financial system, trust is central to its stability. The traditional financial system has undergone decades of evolution and refinement to deal with crises, developing mechanisms such as deposit insurance, financial safety nets, and the role of central banks as lenders of last resort. While these advances have reduced the frequency and intensity of crises, they still occur, demonstrating that even consolidated systems remain vulnerable to shocks and uncertainties.

On the other hand, the stablecoin market is still in its early stages of learning and development. As these digital currencies gain relevance, the challenge lies in identifying and implementing the best practices and frameworks that ensure their stability and security. This requires an ongoing effort to address issues such as transparency, reservation management, and user trust.

For stablecoins to reach their full potential, regulation must strike a balance between strict supervision and fostering innovation and competition. In this sense, a regulatory approach that ensures investor protection while not inhibiting technological development will be essential for the continuous improvement of this market. With a solid governance foundation and robust practices, stablecoins can consolidate as reliable financial instruments integrated into the global financial system, promoting benefits for users, issuers, and the financial ecosystem.

Cryptocurrencies and the maintenance of purchasing power: Myth or possible reality?

For a long time, the discourse was as follows: centralized currencies, issued by central banks, fail to maintain their purchasing power over time because governments use monetary issuance to collect revenue through seigniorage. This process would lead to chronic inflation and the devaluation of fiat currencies. In this scenario of population losses, people would resort to currencies issued by central banks only because of the lack of viable alternatives. On the other hand, the discourse argued that cryptocurrencies, due to their strict limits on issuance and competition, would be the libertarian solution to correct the flaws of this model, which is considered unreliable and inefficient.

This narrative gained strength with the emergence of Bitcoin and other cryptocurrencies, which promise to eliminate inflationary bias through an algorithmically controlled issuance system without the intervention of central banks or governments. The core idea is that the programmed scarcity of these coins would ensure stability to their value over time, protecting holders against the corrosive effects of inflation.

Before delving a little deeper into the subject, it is worth noting that these ideas are not new and far precede current technological innovations. In Klein's seminal paper, some 50 years ago, he argued that the risk of excessive issuance would be eliminated in a regime of competitive money production. For Benjamin Klein, each coin would be associated with a "brand" that would serve as a sign of quality, encouraging consumers to prefer the most stable currencies. This model assumes that competition between private issuers would control the money supply. At the same time, producers would have incentives to safeguard the stability of their currencies and preserve the confidence of users.

Hayek also contributed to this line of thought, arguing that competition would force private issuers of unbacked coins to maintain the purchasing power of their coins. For Friedrich Hayek, the elimination of the state monopoly on monetary issuance would not only limit inflation but also promote greater efficiency and innovation in the financial system. Following this logic, White emphasizes that competition between different currencies, including cryptocurrencies, is crucial for enhancing monetary standards. Lawrence H. White argues that decentralized systems, where currencies compete freely, tend to align issuers' incentives with users' preferences. This dynamic encourages issuers to prioritize purchasing power stability and efficiency, something often absent in systems monopolized by central banks or governments.

However, practical issues must be considered to assess the feasibility and effectiveness of these monetary competition models. The Theory is good and certainly has a strong appeal, especially for those who defend a lesser role of the State in the economy. However, several objections can be raised against the competitive model of currency production.

First, this model assumes that consumers can recognize a currency's quality and evaluate the issuer's behavior. This premise is questionable, especially considering the high information asymmetry surrounding financial markets.

Second, the assumption that the issuer of a private currency is more concerned with maintaining a high brand value for its currency than the state is also debatable. In many cases, private issuers have shorter time horizons than states. They may be more inclined to maximize short-term profits, even if doing so compromises the stability of their currencies.

In addition, limited issuance, while restricting the total amount of currency available, does not guarantee the maintenance of purchasing power. This is because excessive appreciation resulting from increased demand for a particular currency can lead users to replace it with cheaper alternatives or encourage the creation of new coins, diluting the impact of the limitation.

As highlighted by Friedman, monetary equilibrium does not necessarily lead to stable prices in the context of competitive money production. According to Milton Friedman, currency issuers in a competitive context, like producers of any other asset, seek to maximize profits by equalizing marginal costs and revenues. Considering that the marginal cost of a digital currency is close to zero — in the absence of constraints imposed by the algorithm — the equilibrium output would correspond to a level at which the marginal revenue (the inverse of the general price level, since the total revenue is equal to the ratio between the quantity of money and the price level, i.e., the real money supply) would be equal to zero. This implies that the general price level would be, or would naturally tend to be, infinite.

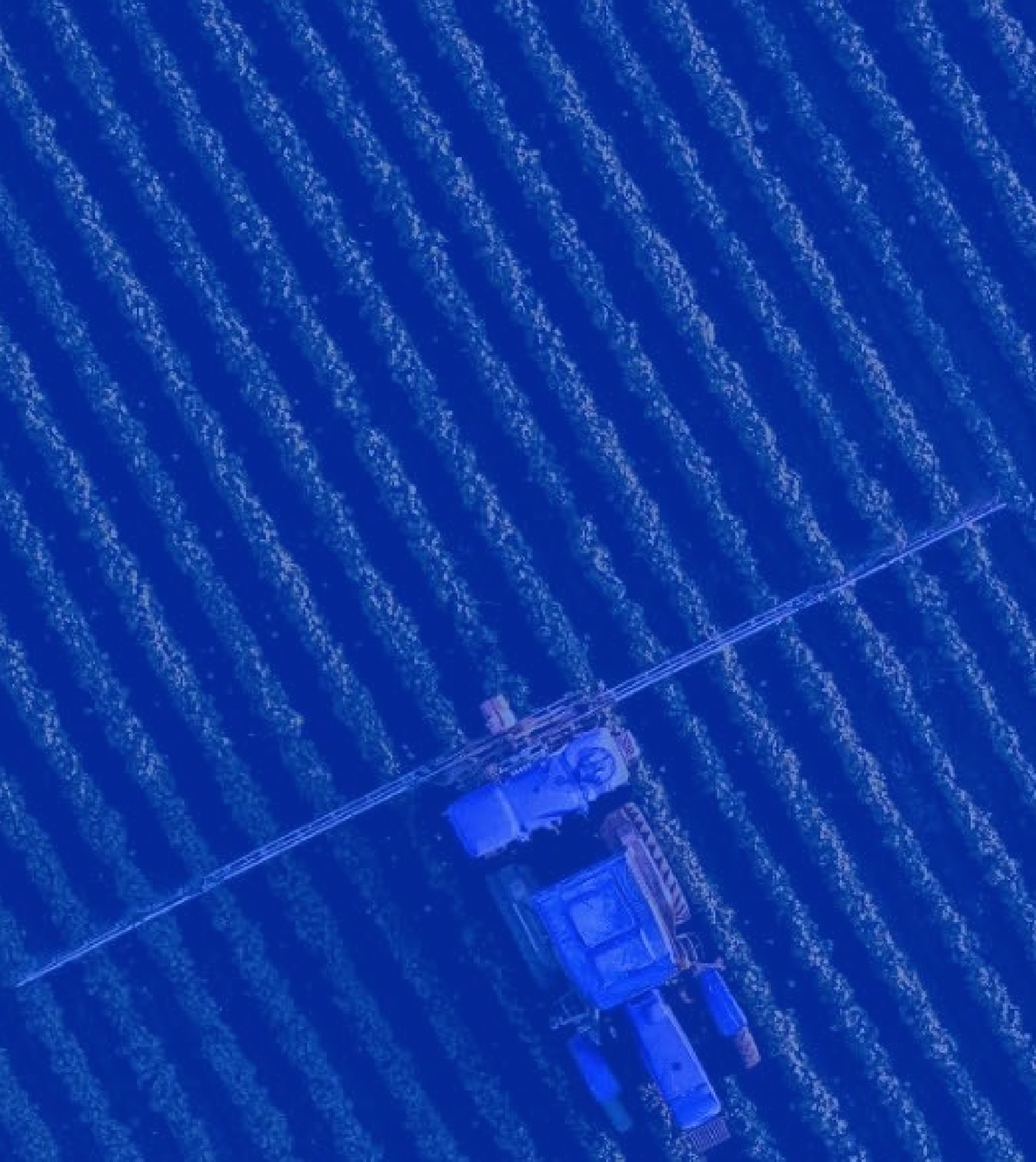
The fact is that the models of competitive production of currencies and centralized issuance by central banks have both benefits and limitations. Despite crypto's promises to mitigate inflationary risks and preserve purchasing power, the reality is that no model is immune to episodes of persistent inflation.

This occurs in both competitive systems and state emission contexts. A free and unregulated model has significant limitations in addressing the challenges inherent in monetary management and is, therefore, not a definitive solution to the problems associated with mismanagement or inadequate state interventions.

For the monetary system to function stably, it must adopt a balanced degree of centralization and regulation. Regardless of ideological issues, it is essential to recognize that these elements play a crucial role in ensuring that technological advances bring benefits without compromising security, stability, and trust in the payment methods, which are indispensable factors for the proper functioning of the economy.

Rivool Finance

The Future of Agricultural Credit: Trends, Tokenization, and Policy



Rural credit in Brazil

The financing of agricultural activity in Brazil is supported by an increasingly diversified rural credit ecosystem, which combines public and private, traditional and innovative sources.

Historically, public banks have played a central role in providing rural credit, primarily through lines with government subsidies linked to the “Safra Plan”, Brazil’s official agricultural credit program. In recent years, however, the relevance of other modalities has expanded, such as credit unions, private banks, fintechs, trading companies, and capital market instruments. This set of sources presents varied profiles of producers and types of operations, ranging from crop costing to structuring investments and working capital for commercialization. This plurality has been fundamental in sustaining the advancement of national agribusiness in the face of a scenario marked by high costs, fiscal restrictions, and growing demands for productivity and sustainability.

Within this system, banking financial institutions — public, private, and cooperative — continue to play a preponderant role. They are responsible for most of the disbursements of formal rural credit, especially public banks, which concentrate a large part of the equalized lines, and cooperatives, whose capillarity has allowed greater financial inclusion in the countryside. These agents act not only as passers of subsidized resources but also as providers of credit at market rates, thereby expanding the volume available during periods of more significant budget constraints.

The role of financial institutions has been decisive in the expansion of rural credit in recent years, and data from the first half of 2025 indicate the continuation of this trend. In the first 11 months of the 2023/24 harvest (July 2023 to May 2024), disbursements totaled BRL 373.4 billion, representing a 13% growth compared to the same period of the previous harvest. In the 2022/23 harvest, the accumulated volume was BRL 318.7 billion, 18.6% higher than that recorded in the 2021/22 harvest.

The disaggregated data of these operations show a predominance of costing operations, reflecting the current needs for planting and cultivating crops. As of May 2024, funding totaled BRL 205.4 billion, while investment lines accounted for BRL 90.6 billion, commercialization for BRL 48.5 billion, and industrialization for BRL 28.9 billion. In other words, more than half of rural credit has been directed to working capital for crops. However, investment resources, including machinery, equipment, and infrastructure, also account for a significant share (approximately 24%). In terms of borrowers, small and medium-sized properties continued to access relevant volumes: until May 2024, BRL 54.5 billion was sourced via Pronaf (for family farming) and BRL 46.8 billion via Pronamp (for medium-sized producers). Even so, larger producers concentrated approximately 73% of the credit (BRL 272 billion) during this period, which is proportional to their share in agricultural production.

https://www.capitalnews.com.br/economia-e-agronegocio/agronegocio/credito-rural-chega-a-r-3734-bilhoes/404457

From the perspective of sources of funds, there is a growing share of financing at market rates compared to equalized lines of credit. In 2024, approximately 55% of the resources came from free sources (without subsidy), while 45% remained linked to controlled or directed sources (mandatory, subsidized rural savings, constitutional funds, etc.). This represents a slight shift from previous years, reflecting the relative reduction in subsidized credit compared to market credit.

For example, the weight of free resources increased, while that of subsidized rural savings decreased, in the 2023/24 harvest. In absolute values, however, equalized credit also grew, but at a slower pace than free lines. This movement is due, in part, to the high interest rate environment, which makes equalization more expensive, and budget restrictions for subsidized programs, leading banks and producers to seek alternatives outside the traditional Safra Plan.

The distribution of rural credit by type of financial institution reveals a change in competitive dynamics. Public banks consolidated their leadership, accounting for BRL 197.7 billion in disbursements (up 21.5% year-over-year) as of May 2022/23, thereby gaining a relative share. Banco do Brasil, the leading agent in the sector, alone released approximately BRL 176 billion during that cycle.

Credit unions also advanced strongly, releasing BRL 60.8 billion (+29.5%) in the same period, driven by their capillarity and local relationships. On the other hand, traditional private banks experienced stagnant performance, with BRL 55.7 billion (-0.9%) in rural credit, indicating caution among these institutions in the face of risk and the lower availability of targeted funding. Among development banks (e.g., BNDES), there was a significant increase (from BRL 2.74 billion to BRL 4.49 billion, +63.7%), although their total weight remains modest. This scenario reflects a shift toward a model increasingly concentrated on state-directed credit distribution, granting government entities greater control over financing.

While public policies—channeled through state-owned banks and cooperatives—are driving a sizable portion of rural credit growth, this concentration entails several drawbacks: reduced competition, potential political interference in lending decisions, inefficiencies in resource allocation, and heightened fiscal burdens. Consequently, private institutions are reevaluating their involvement in the sector amid growing concerns about profitability and risk.

In the first semester of 2025, disbursements remained at a high level. However, preliminary indicators suggest a slowdown in growth compared to previous years, possibly due to climate-related challenges and rising financial costs during the period. Even so, the demand for rural credit remains high, supported by the continuous need to finance record harvests and investments in technologies, which keeps the volume of operations at a historically high level.

2024/25 Safra Plan

Since its creation, the Safra Plan has consolidated itself as the primary public policy instrument for financing agricultural production in Brazil. Prepared annually by the federal government, it defines the volumes of rural credit available for funding, investment, and commercialization of production, while also establishing the conditions of access, including interest rates, limits per beneficiary, and sustainability criteria. The plan is divided between corporate agriculture and family farming, aiming to serve the diverse needs of rural producers in a tailored manner. By directing subsidized resources, equalizing interest rates, and structuring specific programs, the Safra Plan plays a strategic role in reducing asymmetries in access to credit, increasing productivity, and sustaining the competitiveness of Brazilian agribusiness.

In this context, the 2024/2025 cycle brought a significant amount, although below that claimed by the productive sector. BRL 400.59 billion was allocated to the so-called corporate agriculture (medium and large producers), an amount 10% higher than in the previous plan. In addition, approximately BRL 108 billion was allocated to complementary sources via LCAs to support CPR issuances, bringing the total potential to BRL 508.6 billion in agricultural financing. For family farming (Pronaf), announced separately, BRL 76 billion in rural credit was reserved, a record 6.2% above the previous plan. Together, the programmed resources of the 24/25 Crop Plan reached approximately BRL 476 billion, a volume that can be considered relevant, but considered below the BRL 565–599 billion suggested by agribusiness entities, given the growing needs of the sector.

In the design of the financing lines, the 24/25 Safra Plan maintained the traditional division between costing and commercialization (at BRL 293.3 billion, +8%) and investment (at BRL 107.3 billion, +16.5%). In other words, there was a proportionally more significant increase in investment lines, in line with the priority of promoting equipment modernization, storage, and sustainable practices. In terms of the target audience, approximately BRL 189.1 billion of the total allocated to corporate agriculture was offered at controlled interest rates, benefiting medium-sized producers via Pronamp, cooperatives, and select programs for large ones. At the same time, the remaining BRL 211.5 billion was provided at free market rates. Family producers (Pronaf), in turn, have access to fully subsidized rates within their BRL 76 billion package, which is 43% higher than that of 2022/23, underscoring the current government's priority for family farming. It is worth noting that Pronaf registered 1.7 million contracts signed in the last Safra Plan, with an 18% increase in the number of operations and a 12% increase in the volume contracted compared to the previous harvest, indicating strong demand and capillarity in this segment.

Financing conditions:

Faced with a macroeconomic scenario of high basic interest rates, the 24/25 Safra Plan set higher nominal interest rates than in previous years, generating concern in the sector. The rates for medium-sized producers (Pronamp) stood at 8% per annum for costing and commercialization, while for investments, they vary from 7% to 12% per annum, according to the program. Large producers face even higher costs on non-equalized lines, often close to or above 12% per annum. This represents an interest rate level above that desired by agribusiness entities, which pleaded for a ceiling of 9% in long-term investment lines, but is inevitable given the public budget limit.

The government allocated about BRL 16.7 billion in resources for equalization (subsidy) of rates in the 24/25 Plan (BRL 6.3 billion for corporate agriculture and BRL 10.4 billion for family), an amount insufficient to reduce charges to historical single-digit levels. As a result, most conventional investment lines remained in double-digit interest rates, something that, according to analysts, may discourage new investments by producers due to the onerous nature of credit. In contrast, Pronaf continued to offer heavily subsidized interest rates: rates vary from 0.5% to 6% p.a., and there was even a reduction in interest rates on 10 priority lines of financing (e.g., funding of essential foods from 4% to 3%, costing of socio-biodiversity from 3% to 2%, investments in sustainable practices from 4% to 3%, etc.).

By May 2025, the government reported that approximately 85% of the resources allocated to the 2024/25 Safra Plan had already been contracted by the agricultural sector, a pace similar to that of the previous year. In particular, subsidized lines were quickly depleted, reflecting the substantial pent-up demand for cheaper credit. This situation led to a temporary suspension of contracting equalized operations in early 2025 due to the exhaustion of the budget allocation. In February, it was estimated that about BRL 50 billion in subsidized resources were "blocked" awaiting the release of funds by the Treasury. Of the BRL 138.2 billion programmed in equalized lines in the current harvest, BRL 82 billion had already been disbursed so far, leaving BRL 56 billion uncovered in the current budget.

To overcome the impasse, the government issued a Provisional Measure on February 25, 2025, releasing an extraordinary credit of BRL 4.17 billion for the Safra Plan. Of this total, BRL 3.53 billion was allocated to reinforce costing, commercialization, and agricultural investment operations, and BRL 645.7 million for Pronaf lines. This emergency action, made possible by the non-timely approval of the LOA 2025, was crucial in resuming subsidized hiring before the winter crop was planted. Despite the solution, the episode generated friction between agribusiness representatives and the government. Sector leaders criticized the lack of predictability and warned that the interruption of rural credit poses a risk to the continuity of production, particularly at a time of high costs and uncertain weather. The federal government, in turn, attributed the problem to the budget delay and reaffirmed its commitment to sustain the plan within the new fiscal framework.

Other Credit Sources

Although the Safra Plan remains the backbone of agricultural financing in Brazil, its scope and capacity to meet these demands have become insufficient in light of the sector's growing needs. Fiscal limits on the granting of subsidies and the increase in the cost of equalized resources have pressured producers, especially larger ones, to seek alternatives outside the official system. In this context, private financing mechanisms have been assuming an increasingly significant role, not only as complementary sources but also as structural pathways for diversifying agricultural credit. The emergence of new instruments, backed by the capital market and digital technologies, reflects this transition and inaugurates a new stage in the relationship between agribusiness and investors.

This financial innovation environment, which combines traditional securitized instruments with state-of-the-art digital solutions, has already established itself as a complementary pillar to official rural credit. In this sense, it is interesting to evaluate how these alternatives have advanced according to the latest available information.

Agribusiness Receivables Certificates (CRA)

An Agribusiness Receivables Certificate (CRA) is a Brazilian fixed-income instrument that securitizes future cash flows from agribusiness activities, such as crop sales or rural credit contracts, through a special-purpose vehicle. Regulated by the CVM under Law No. 11.076/2004, CRAs provide ring-fenced credit enhancement, transparent reporting, and often attractive yields relative to comparable sovereign or corporate bonds. They typically carry fixed, floating, or inflation-linked coupons and mature between two and ten years. For individual investors, interest income on CRAs is exempt from Brazilian withholding tax, further enhancing their risk-adjusted returns.

CRA issuances have grown enormously. In the first semester of 2024, the volume issued reached BRL 19.3 billion, a 45% increase compared to the same period in the previous year. Interestingly, this increase occurred with fewer operations (76 issuances, compared to ~96 before), indicating that larger funding dominated the market. Large agribusiness companies – many of them publicly traded – took advantage of investors' appetite to launch voluminous CRAs, such as the issue by SLC Agrícola, which exceeded BRL 1 billion, as mentioned in a sector report. The average maturity of CRAs issued in the semester also lengthened to around 6.3 years, suggesting greater investor confidence in longer-term commitments and possibly better credit quality of issuers.

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This dynamism suggests that, despite high domestic interest rates, CRAs remain attractive due to the exemption from Income Tax for individuals and the appetite for agribusiness-backed securities, particularly from first-rate companies or structured operations with robust guarantees. In 2023, the market had already been significant, with around BRL 43.6 billion issued that year, and all indications suggest that 2024 will close with a record volume of CRAs, diversifying funding sources beyond traditional banks. For investors, these securities offer remuneration linked to the CDI or IPCA, typically with an attractive spread, considering the quality of the agribusiness names and the tax benefits.

For companies in the sector, CRAs have become a key instrument for managing working capital and extending debt, thereby reducing dependence on bank credit. It is also worth noting the concentration movement: despite the increase in total volume, the number of unique issuers did not grow at the same pace, which suggests that more prominent players are accessing the market (and possibly leaving a financing gap for medium-sized producers, who tend not to issue CRA directly).

Agribusiness Funds (Fiagro)

A FIAGRO (Agribusiness Investment Fund) is a Brazilian closed-end fund structured under CVM Instruction No. 626/2020 to channel capital into agribusiness assets, such as farmland, agribusiness receivables (CRAs), real estate, and equity interests in agricultural companies. FIAGROs pool investors' resources into a special-purpose vehicle, offering professional management, portfolio diversification across the agribusiness value chain, and liquidity through quota trading on the stock exchange. Income distributed by FIAGROs benefits from favorable tax treatment, individual investors are exempt from Brazilian withholding tax on dividends and capital gains, enhancing net returns while supporting the sector's financing needs.

After a promising start to the 2021/22 season, the Fiagros industry has experienced ups and downs in recent months. In 2024, the net inflow decelerated sharply, totaling only BRL 1.1 billion, a decline of 73.4% compared to the BRL 4.3 billion raised in 2023. This retreat, in part, reflected competition from high interest rates on government bonds and other traditional investments, which reduced the appetite for new funds, as well as some correction of expectations after the initial boom of Fiagro. Even so, Fiagros' consolidated shareholders' equity grew 19.6% in the year, reaching BRL 41.5 billion in December 2024, indicating that the stock of investments maintained an upward trend, possibly driven by the appreciation of assets and funds launched at the end of the year.

There is also a change in the mix of categories: Fiagro-FIDC (agribusiness credit rights funds, which buy receivables such as CPR, trade bills, etc.) were responsible for about 69% of 2024 funding, surpassing Fiagro-FII (agribusiness real estate funds), which had approximately 24%, and Fiagro-FIP (participation funds) with approximately 7%. In other words, investors showed a preference for fixed income and receivables funds, probably seeking lower risk and cash flow, while land or equity funds grew at a slower pace.

Interestingly, at the end of 2024 and the beginning of 2025, there were signs of recovery: December 2024 recorded issuances of BRL 1.3 billion in Fiagros (a monthly record since January 2023), and in January 2025, the level of BRL 1 billion issued was repeated. This monthly volume was 159% higher than the 2024 average and 12 times higher than January of the previous year.

The increase in supply, with seven new funds launched only in January/25, signals renewed interest, possibly favored by the expectation of future interest rate reductions and the greater familiarity of investors with the product.

Other Credit Sources

In recent months, the Fiagros sector has been showing net inflows for several consecutive months (six months until January 25) and reached BRL 42 billion in equity in January 2025 (20% above January 2024). Fiagros-FIIs continue to represent the largest share of the net worth (approximately 45-46%), now closely followed by Fiagros-FIP (approximately 40%), and then receivables (approximately 14%), given that some farmland real estate funds have grown significantly. For producers and companies, Fiagros have proven to be versatile instruments: via Fiagro-FII, investors finance the acquisition of land and rural infrastructure; via Fiagro-FIDC, entire production chains are financed (for example, by anticipating receivables from cooperatives, trading companies or resellers); and via Fiagro-FIP, agribusiness companies (private equity) are capitalized.

A recent trend is the emergence of exclusive or sectoral Fiagros: large distributors and groups, such as cooperatives and resellers, in partnership with managers, are structuring dedicated funds to finance their customers and producers. The fintech TerraMagna, for example, launched Fiagros in collaboration with ANDAV (a distributor association) and AgroGalaxy (a store chain) to provide capital to these partners, with target funds of up to BRL 200 million and BRL 500 million, respectively. In short, despite challenges (including tax uncertainties), Fiagro consolidates itself as a bridge between the capital market and agribusiness, attracting a growing base of individual investors (in addition to institutional investors) seeking exempt income and diversification backed by the field.

Fintechs, private banks, and decentralized platforms

Source: MAPA

The ecosystem of agribusiness credit fintechs has expanded rapidly, offering more agile and customized financing solutions. Companies such as TerraMagna, Traive, Nagro, and Agronow, among others, have leveraged technology (including big data, artificial intelligence, and blockchain) to mitigate information asymmetry and facilitate connections between investors and producers.

TerraMagna, considered one of the leaders in Latin America, is projected to grant more than BRL 2 billion in credit in 2024, following its achievement of BRL 1.5 billion in 2023 (30% above 2022). Its model consists of anticipating receivables and financing farmers through partnerships with input distributors, backing operations with guarantees such as crop pledges and insurance.

This and other agri-techs have been bringing the capital market closer to agribusiness, structuring funds (such as Fiagros, FIDCs) and placing institutional and individual investors to invest in pulverized rural credit portfolios.

Advantages include reduced bureaucracy, innovative risk assessment (utilizing satellite imagery, climate scores, etc.), and rapid structuring of operations. For example, Nagro obtained authorization from the Central Bank to act as a Direct Credit Society (SCD), being able to lend directly via a digital platform.

Agree Tech moved around BRL 800 million in 2024 and reported more than BRL 500 million in approved credit in the year, using digital CPRs and its marketplace (e-Agro) to connect producers to suppliers with integrated financing. These fintechs are also exploring partnerships with traditional banks and cooperatives, providing white-label technology for risk analysis and crop monitoring.

Despite the still relatively small volume compared to the banking system, the rapid growth suggests that in the coming years, they may account for a more significant share of rural credit, especially for medium-sized producers and underserved segments.

Instrument	Apr/21	Apr/22	Apr/23	Apr/24	Apr/25	Apr/25 vs 21 (%)
CPR	37,33	132,39	238,86	332,3	499,18	499,18
LCA	117,17	231,51	390,12	469,01	559,94	559,94
CDCA	10,89	21,24	30,22	32,39	34,35	34,35
CRA	51,46	72,71	103,69	138,34	155,83	155,83
FIAGRO			12,2	38,09	43,1	43,1

Default Rates and Rural Credit Risk

Rural credit is subject to several key risks, including climatic and weather-related events that can devastate yields, commodity price volatility that may erode farm revenues, production and operational risks arising from pests or input shortages, credit and counterparty risk linked to borrower insolvency, and regulatory or policy shifts that can alter financing conditions. Additionally, currency fluctuations and interest rate movements may affect the actual cost of borrowing. It is essential to closely monitor these risks to assess the quality of rural credit.

The quality of the rural credit portfolio has remained relatively stable so far in 2025, but with notable sectoral and regional differences, as well as latent risks associated with climate change and financial costs. According to data from the Central Bank and Serasa, the rural credit default rate remained low in 2024, although with a slight upward trend in some segments. Considering the rural population as a whole (individuals with agribusiness debts), approximately 7.6% were in default (debts outstanding for more than 180 days) at the end of 2024, a level practically unchanged from the previous year.

However, the worrying increase in requests for judicial reorganization is also noteworthy. In 2024, according to Serasa, the sector registered a record 1,272 requests for judicial reorganization, representing a 138% increase compared to the previous year, when 534 requests were recorded. Most of this increase was driven by individual rural producers, who saw a nearly 350% increase in applications, totaling 566 applications. Corporate producers also registered a significant increase of 152.5%, with 409 applications.

Although the absolute number of requests is still small compared to the approximately 1.4 million producers who accessed rural credit in the last two years, the percentage growth is a warning sign about the vulnerability of agribusiness about climate and cost shocks: in 2023 and 2024, producers faced a significant increase in the prices of inputs (fertilizers, defensive) and, in the case of 2023, declines in the prices of commodities such as soybeans and corn compared to the peaks of 2022. Still, most have honored their financing, possibly thanks to voluminous harvests in many regions and renegotiations.

When detailing by producer profile and region, it is observed where the most significant risks are. Interestingly, small family producers (Pronaf) exhibited the lowest default rate, around 6.9%, while large landowners had a default rate of about 10.2% in 2024.

Large producers, despite having greater financial capacity, tend to leverage more and are exposed to substantial losses when a crop fails or prices drop sharply, which can lead to delays. At the same time, they renegotiate larger volumes of debt. Additionally, many small producers have limited access to formal credit and often operate with their capital or through government funding programs. In contrast, large producers utilize various credit lines (such as banking and trading), which increases the statistical default probability on at least some financial commitments.

From a regional perspective, the South Region stands out for the health of its portfolio, with only 5.1% of southern producers in default, the lowest rate in the country. This partly reflects the more entrepreneurial profile of the South, as well as state support policies and strong cooperatives that aid in the financial management of farmers.

At the opposite extreme, the North (excluding Rondônia and Tocantins) had a default rate of 11.3% – the highest. States in the North and Northeast historically record higher rates, either due to more adverse weather conditions (such as droughts and precarious infrastructure) or due to the composition of the portfolio, which includes a higher weight of riskier modalities (e.g., investments in areas of lower productive stability). The Central-West, the central agricultural region, has recently experienced an increase in defaults. In 2024, the rate of arrears exceeding 90 days rose 0.7 percentage points in the Central-West, primarily driven by the increase in arrears in rural credit following localized crop problems. For example, the 2021/22 soybean harvest in Mato Grosso do Sul and Paraná suffered a severe failure due to drought, which led to defaults in 2022/23. In turn, during the 2022/23 harvest, some regions of Goiás and Mato Grosso experienced climate adversities that impacted productivity, leading to payment delays in 2024.

These events demonstrate a strong correlation between weather and default: agricultural losses due to droughts or floods create difficulties in paying the next harvest, especially if they coincide with periods of high financial costs, such as high interest rates. In this context, producers often rely on renegotiations and extensions to navigate the adverse cycle. In February 2025, for example, the CMN authorized special extensions of rural funding debts for producers in Rio Grande do Sul affected by drought, extending the repayment period by up to 5 years to relieve the cash flow of local farmers. These emergency measures, although necessary to avoid mass defaults, transfer the risk forward and require adequate provision and management from banks.

In banks and cooperatives, the quality indicators of the agrobusiness portfolio remain manageable. The Central Bank reported that the default rate (over 90 days) of rural earmarked credit increased slightly in 2024, contributing to the 0.2 percentage point increase in default rates among individuals in the country that year. However, the consolidated national default rate for individual credit ended 2024 at 3.6%, and for individual agribusiness credit at a level close to that, which is relatively low. For PJ (agribusiness companies), the default rate even decreased by 0.3 p.p. in 2024, indicating that cooperatives, trading companies, and agribusinesses kept their payments up to date.
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Projections and Trends for Rural Credit

For the second semester of 2025, several trends in the rural credit market are outlined, relevant to investors interested in opportunities in the sector. In general, a continued expansion of credit volume is expected, albeit at a moderate pace, with a possible reduction in marginal financial costs depending on the direction of monetary and fiscal policy. Below, we highlight the key points to monitor:

2025/26 Safra Plan and public policies

To be announced in mid-June or July 2025, the new Safra Plan is expected to come with a reinforced volume of resources. Entities such as the Parliamentary Front for Agriculture (FPA) have proposed approximately BRL 597–599 billion in credit for 2025/26, of which around BRL 25 billion is allocated for interest equalization. This represents a substantial increase from BRL 476 billion in the current plan, especially compared to the approximately BRL 364 billion (business) and BRL 76.7 billion (family) allocated for the 2023/24 cycle. The government signals a willingness to surpass previous amounts, acknowledging higher production costs and growing demand for financing.

Even so, fiscal availability will be the limiting factor: the approval of the fiscal framework and the primary result targets impose restrictions on the expansion of subsidies. The 25/26 Safra Plan is likely to seek additional funding through the market (e.g., increasing LCA enforceability, encouraging private banks to allocate more mandatory resources) to complement the public budget. Another expectation is the introduction of new stimuli for sustainability and technology, such as regenerative agriculture programs, solar energy lines on properties, and the expansion of RenovAgro and Inovagro (financing of agricultural technological innovation), which may gain prominence due to Brazil's international visibility as the host of COP30 in 2025.

Expanding guarantee mechanisms is also being discussed – for example, strengthening the Solidarity Guarantee Fund or other guarantee funds – to unlock credit for medium-sized producers with fewer collateral requirements.

Financing via capital markets

For capital markets, the outlook remains positive. If, on the one hand, the expected trajectory of the Selic may remain at a high level in the short term, on the other hand, there is a consensus that interest rates will retreat more decisively in 2026.

Anticipating this movement and with an eye on opportunities, investors should continue to invest in exempt agricultural securities (CRI/CRA, LCA) and Fiagro funds. With the eventual fall in the Selic rate, the cost of funding via CRA tends to reduce in nominal terms, benefiting issuers – a possible wave of refinancing of expensive debts via new issuances is even expected when the basic interest rate gives up a few percentage points.

In the second semester of 2025, specifically, the pipeline of CRA and Fiagro offers is expected to remain heated, as several structured operations in the first semester (including those by trading companies and resellers) are anticipated to reach the market after the winter harvest.

Institutional investors, including pension funds and insurance companies, have been increasing their exposure to CRAs, driven by a low historical delinquency rate and attractive spreads in investment-grade companies in the agribusiness sector. The demand from high-income individuals also remains strong, as they seek alternatives to brick-and-mortar financial institutions (FIIs) and the Stock Exchange.

Regulatory and tax reforms to watch out for

The approved Tax Reform (Constitutional Amendment No. 115/2024) and its subsequent regulations may bring vetoes that could eliminate the tax exemption for certain vehicles. For example, the government vetoed the maintenance of the exemption for dividends from Fiagro and FII in the legislation for the new CBS tax, which generated market apprehension. However, there is articulation in Congress to rescind the exemption of Fiagros and FIIs via a bill before the new rules take effect in 2026.

As for LCAs, LCIs, CRAs, and CRIs (debt securities), the initial proposal for reforming the individual income tax has not yet been disclosed; however, it is feared that the exemption of these instruments may be reviewed in a future unified tax regime. If there is an announcement of the end of the exemption for LCA/CRA from 2026, for example, there may be a rush of issuances in 2025 to take advantage of the current window and "lock" long-term exempt funding.

At the same time, if the exemption is maintained, the market will remain solid, even with more foreign players entering (via local funds), as Brazilian real interest rates are expected to remain high in the short term. Therefore, investors should closely monitor the tax outcome, as it directly affects the net return of agro instruments and, consequently, the demand for them.

Regulatory and tax changes under discussion

In addition to the aforementioned tax issue (investment exemptions), other changes may influence the rural credit market. One of them is the debate over the end of certain historical exemptions and subsidies in agribusiness, such as the exemption from credit fees. For example, there are proposals to review the IOF exemption in rural credit operations. Recently, a decree increased the IOF in specific sectors, which was later addressed in a manifesto from the private sector. Any extra taxation on credit would raise the effective cost and could be challenged.

Another discussion concerns the interest rates of the constitutional funds (FCO, FNE, FNO) that serve the North, Northeast, and Midwest regions. With the rise in the Selic rate, these rates have fallen short of the market rates, and it is being studied whether to keep them fixed or adjust them.

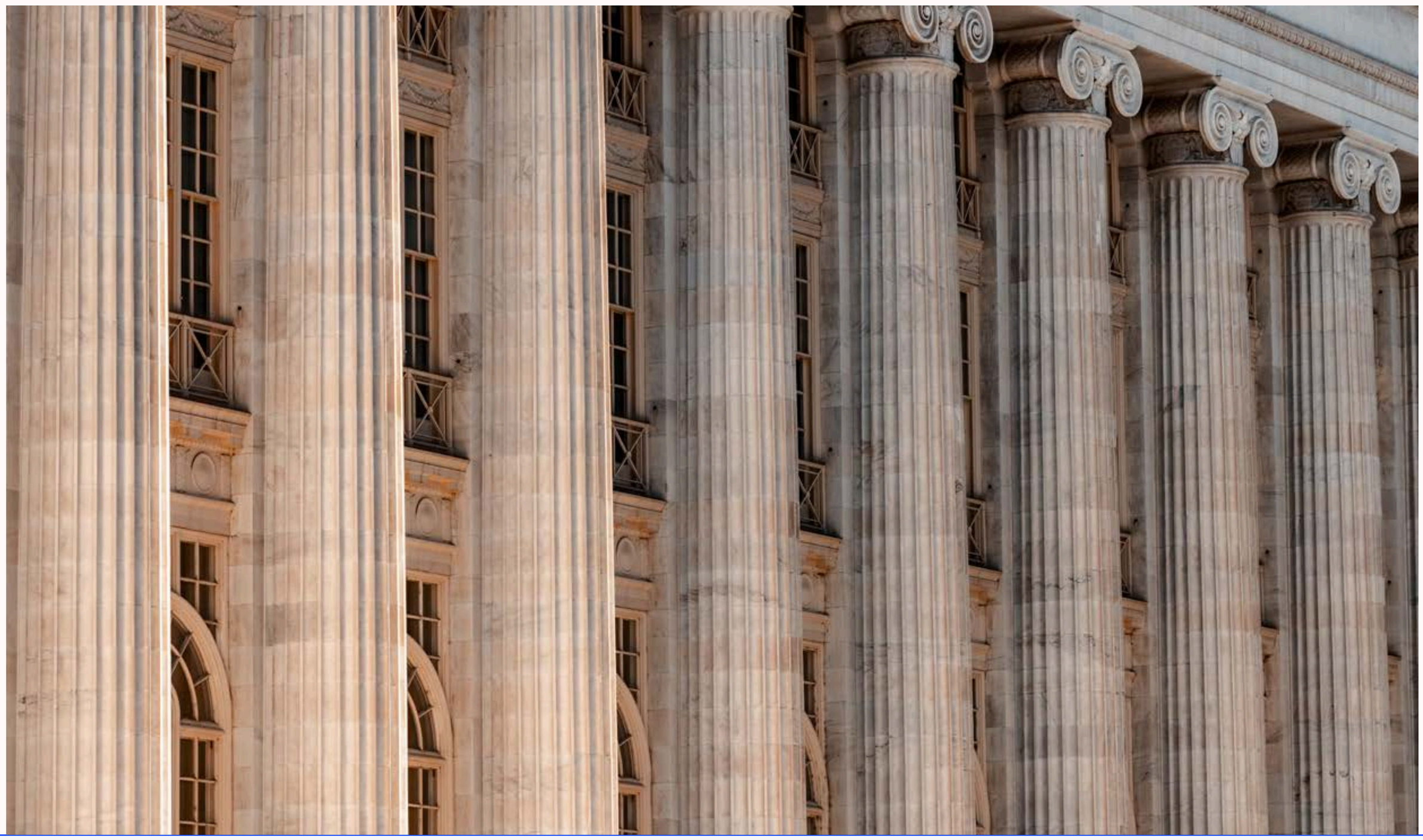
Within the scope of bank requirements, the CMN approved in September 2024 a staggered increase in rural credit requirements for banks that issue LCAs – this will come into effect gradually from 2025 (6% of the demand deposit on 25/26, rising to 10% in the following years).

This measure will compel institutions that currently operate minimally in rural credit to enter this market more actively or to purchase LCAs from those who already operate, potentially increasing the supply of resources in the system (estimated at +BRL 50 billion over 2 years).

International prudential regulations (Basel III final) are also on the radar. Rural assets are generally low-risk, but the introduction of IFRS 9 in provisions in 2025 may prompt banks to set up higher expected provisions for long-term agribusiness financing, making them more expensive.

On the positive side, there is discussion of instituting CRA as an eligible asset for banking liquidity compounds (LCR), which would increase its appeal for banks.

In summary, the regulatory framework is evolving to integrate agribusiness more fully into the modern financial system, and investors should follow these changes, as they can create new opportunities (e.g., medium-sized banks may need to purchase agribusiness credits to comply with regulations, opening up a secondary market).



Rivool Finance

The Future of Private Credit Is On-Chain

Tokenization of receivables and assets and the Rivool-Nagro project

Another emerging trend is the tokenization of agribusiness contracts and commodities through blockchain technology. In April 2024, a pioneering operation for the anticipation of "tokenized" receivables was structured: fintech AmFi, in partnership with the E-ctare platform, provided BRL 10 million in financing to producers in Minas Gerais backed by digital receivables, with a term of 3 years and a rate of CDI + 5.5%. According to AmFi, even without the tax exemption of a traditional CRA, this Debt Token structure managed to reduce the cost of capital for the producer by 17% and structuring expenses by 35%, compared to a conventional securitization. The secret lies in the operational efficiency of the blockchain platform and the possibility of fractioning and distributing risk broadly, without the regulatory constraints of a traditional CVM public offering, although respecting the requirements for registration of backing via debentures.

Following this innovative tokenization model, in 2024, Rivool Finance and Nagro launched their digital securitization operation, structuring an Agribusiness Receivables Certificate (CRA) backed by Bank Credit Notes (CCBs). The primary issuance was BRL 10.0 million, of which BRL 3.63 million has already been released directly to producers. At the same time, the balance remains in the funding to compose the private pool. This initiative extends the proposal of fractionation and risk distribution via blockchain, combining the security of backing CCBs with the flexibility of an exclusive vehicle for qualified investors. The tokenized instrument was organized into a single private pool, with an annual percentage yield (APY) of 19.16%, paid periodically to qualified investors. Although it is not open to the public, the vehicle brings together experienced investors who, since the operation began, have already been receiving the first coupon payments.

In the field, the initiative has already benefited 131 rural producers, with an average ticket of BRL 27,700 per operation. The 22 crops served range from grains, such as soybeans, corn, and rice, to coffee, beans, cocoa, and cattle, reflecting the diversification of the portfolio. Geographic coverage reaches 23 Brazilian states, ensuring both scale and dispersion of climate and market risks. In just over four months of operation, this structure has demonstrated the feasibility of combining tokenization technology with traditional rural credit, thereby expanding the supply of resources to agribusiness and offering qualified investors a risk-adjusted, high-return alternative.

In addition to receivables, agricultural products themselves are also being tokenized. A notable example was the sugarcane tokenization project conducted by the startup Finchain in collaboration with a major mill. In 2023-24, more than 20 rural producers participated, transacting more than BRL 300 million in the digital equivalent of sugarcane and sugar through the new platform. Each token represented 1 kg of sugar, registered on the blockchain (Coinbase's Base network) and tradable between producers, mills, and investors. The project enabled farmers to monetize part of their production in advance in an agile and transparent manner, and investors to access an asset with real backing (a physical commodity) in a fractional form.

The blockchain infrastructure ensured traceability and security in transactions, and the success of these pilot projects paves the way for expanding tokenization to other commodities, such as grains and coffee, as well as assets like land and machinery. Tokenization in agribusiness, although still in its infancy, has the potential to increase the liquidity of traditionally inaccessible assets, attract new financiers (including foreign investors via DeFi platforms), and reduce intermediation costs.

Regulators are closely following the development – the CVM has even authorized sandbox projects in this field – but the move seems inevitable. In summary, the convergence of financial technology (fintech), capital markets, and agribusiness is creating a wider range of credit options. On the one hand, CRAs, Fiagros, and conventional bonds are bringing urban investors to the countryside. On the other hand, fintechs and tokens are getting solutions from the field to the investor. This diversification is positive, as it relieves pressure on official sources and tends to reduce the average cost of capital in the long term, benefiting the competitiveness of Brazilian agribusiness.

Finally, the advance in the digitization of traditional instruments deserves mention. The implementation of Electronic CPR (e-CPR), a Brazilian agribusiness credit instrument that enables producers to secure financing against future crop deliveries, gained momentum in 2024. Most of the CPRs have already been issued in digital format and registered in authorized electronic systems, which speeds up the formalization of guarantees and increases lenders' confidence, thereby reducing the risk of fraud or duplicate titles. Platforms such as E-Agro enable producers to issue digital CPRs and negotiate them directly with suppliers, eliminating paperwork and facilitating connections to banks or partner funds. In addition, data sharing via Open Finance is beginning to reach agribusiness, enabling farmers' credit and productivity histories to be accessed (with their consent) by various financial agents, which favors better conditions for good payers.

In summary, technological and financial innovations have expanded access to rural credit in a decentralized manner – a trend that is expected to continue deepening in the years to come.

Rivool Finance: Facilitating Access to Credit Through Blockchain Technology

Rivool Finance emerges as an innovative platform revolutionizing the credit market by integrating CeFi, DeFi, and TradFi. With a clear mission to democratize the structuring of on-chain private credit, the company establishes a crucial bridge between global investors and investment opportunities in real-world assets (RWA), with an initial focus on Brazilian agribusiness.

Evolution of CPR Stocks

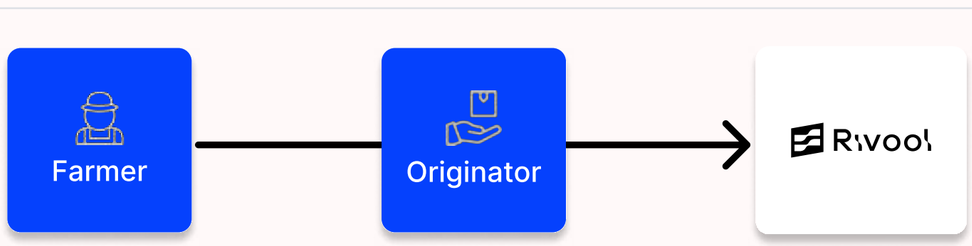
The platform operates with 2 key stakeholders in addition to Rivool's role as the technology layer that form a robust and integrated ecosystem:

1. Partner Credit Originators

These regulated and authorized entities specializing in the agricultural sector include financial institutions, consultancies, and agricultural loan providers. Acting as a strategic bridge between rural producers and the financial market, these partners register and manage credit demands on the platform to provide additional funding to their clients, democratizing access to capital for farmers and agricultural businesses with flexibility for secured and unsecured operations.

A key competitive advantage of the platform is its proprietary credit evaluation system, the "Smart Score," which automatically analyzes each registered demand. This proprietary analysis, combined with assessments from renowned third-party credit bureaus, provides a dual layer of security. It offers institutional and individual investors a comprehensive and reliable set of information to base their decisions for structuring pools and allocating investments.

Added Value: Originators expand their credit origination capacity without requiring proprietary capital, broaden their customer base, and gain a new revenue source through origination fees.

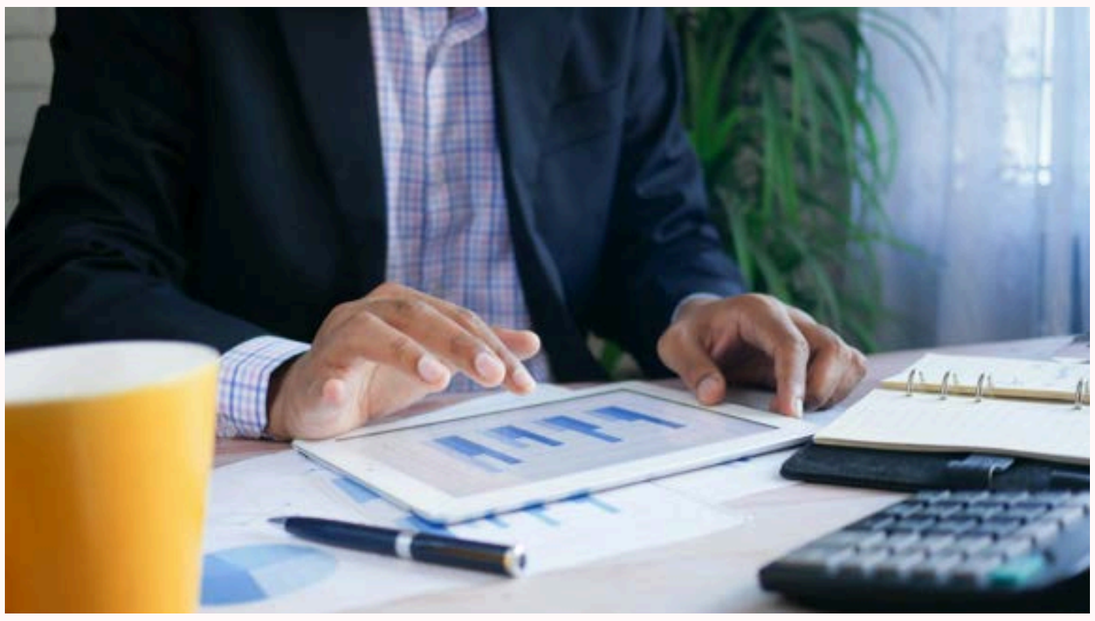


2. Institutional Investors (B2B)

This group includes companies and credit funds, family offices, portfolio managers, and hedge funds, which gain access to a complete and customizable white-label solution. Through the marketplace module, managers can create personalized investment pools based on their risk parameters or select existing pools.

The environment includes an exclusive back-office module for private client registration and management, where each investor receives a unique encrypted identification. This robust security architecture ensures that neither the partner credit originators nor Rivool itself can access the institutional client base, creating a secure and private ecosystem for offering personalized on-chain diversification.

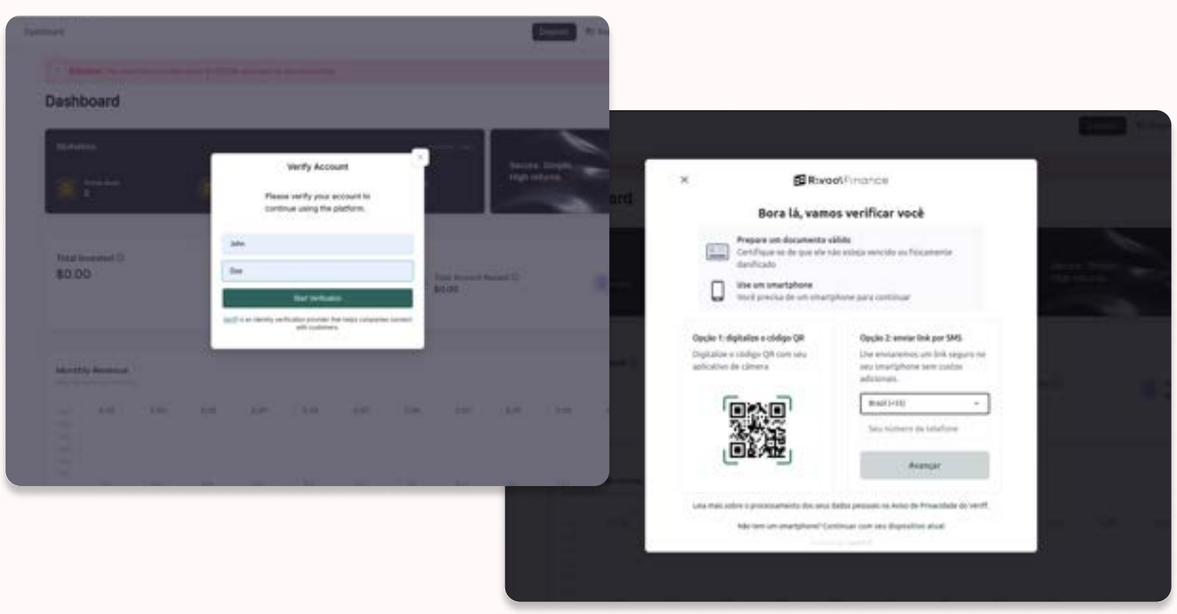
Added Value: Financial institutions can offer exclusive on-chain investment products to their clients without needing to develop their technology, maintaining their brand identity and complete control over their client base.



Rivool white label solution will revolutionize the individual investor experience in on-chain assets by removing the traditional complexities of digital investments. Through their financial institution, the investor receives a private link to register on the platform, where qualified investors undergo a simplified KYC/AML process. Once validated, users gain immediate access to an exclusive marketplace of investment pools configured specifically by their financial institution or portfolio manager.

The platform offers two investment management modalities: for users who prioritize simplicity, our wallet abstraction technology allows investments to be managed with just a username and password, facilitating buy, sell, and withdrawal operations. Alternatively, more experienced digital asset investors can opt for self-custody by connecting their wallets.
The environment includes robust analysis and monitoring tools, enabling investors to track the performance of their investments in real-time. Each asset and its collateral are regularly updated based on the pool's underlying contracts, ensuring complete transparency and control over executed investments.

Added Value: Investors gain access to tokenized real-world asset investment opportunities simply and securely, with differentiated profitability and full transparency regarding underlying assets.

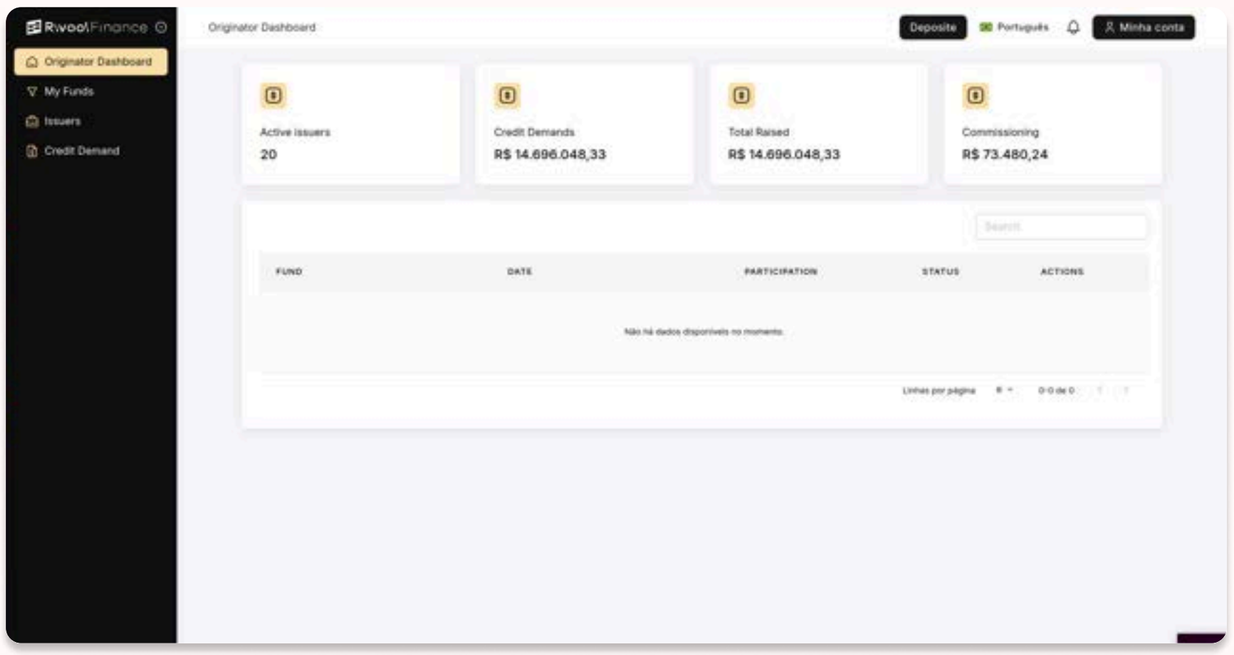


Rivool Finance: Facilitating Access to Credit Through Blockchain Technology

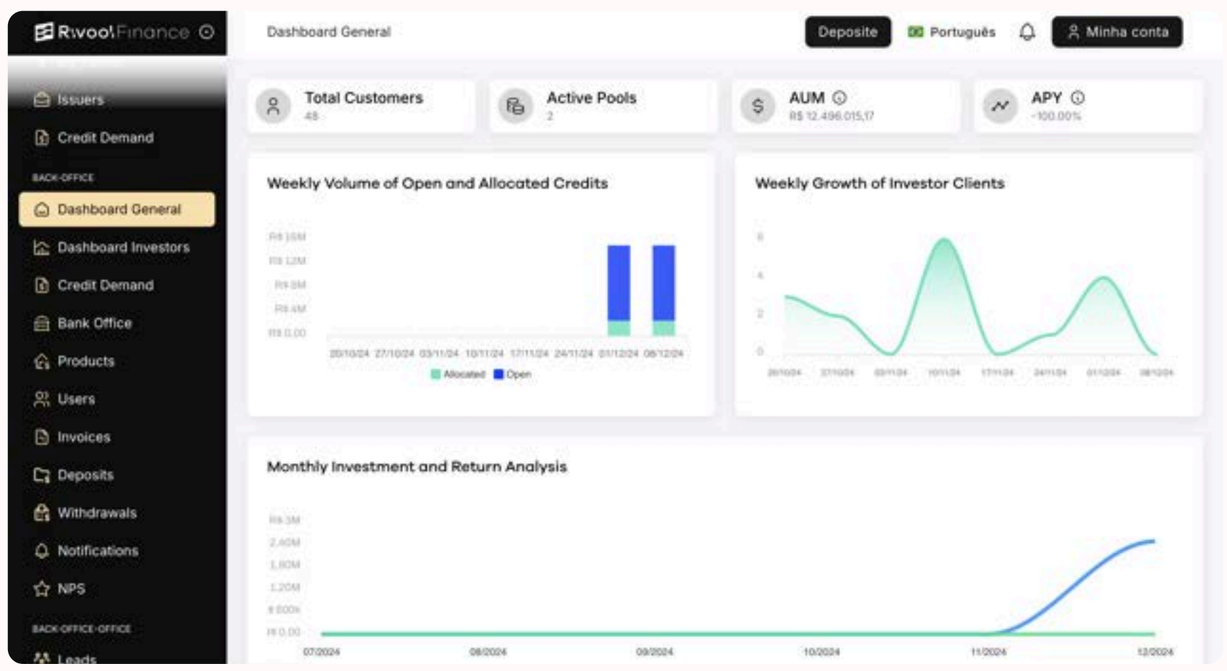
Rivool Platform - Technology and Infrastructure

As the central technological infrastructure, Rivool connects all stakeholders through three distinct areas:

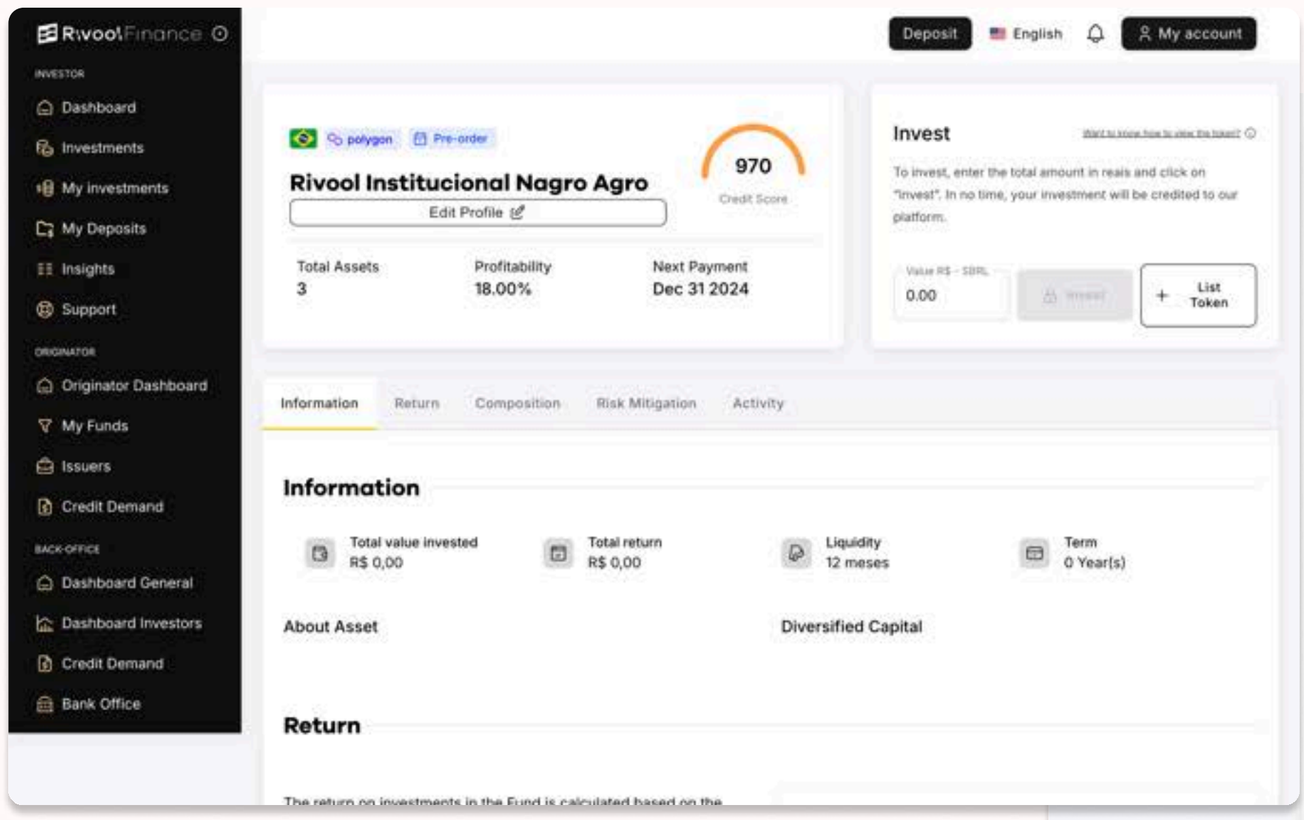
- **Originators Area:** A secure environment where accredited partners register and manage credit demands. Integrates the proprietary “Smart Score” system and external credit bureaus for comprehensive operation evaluations.

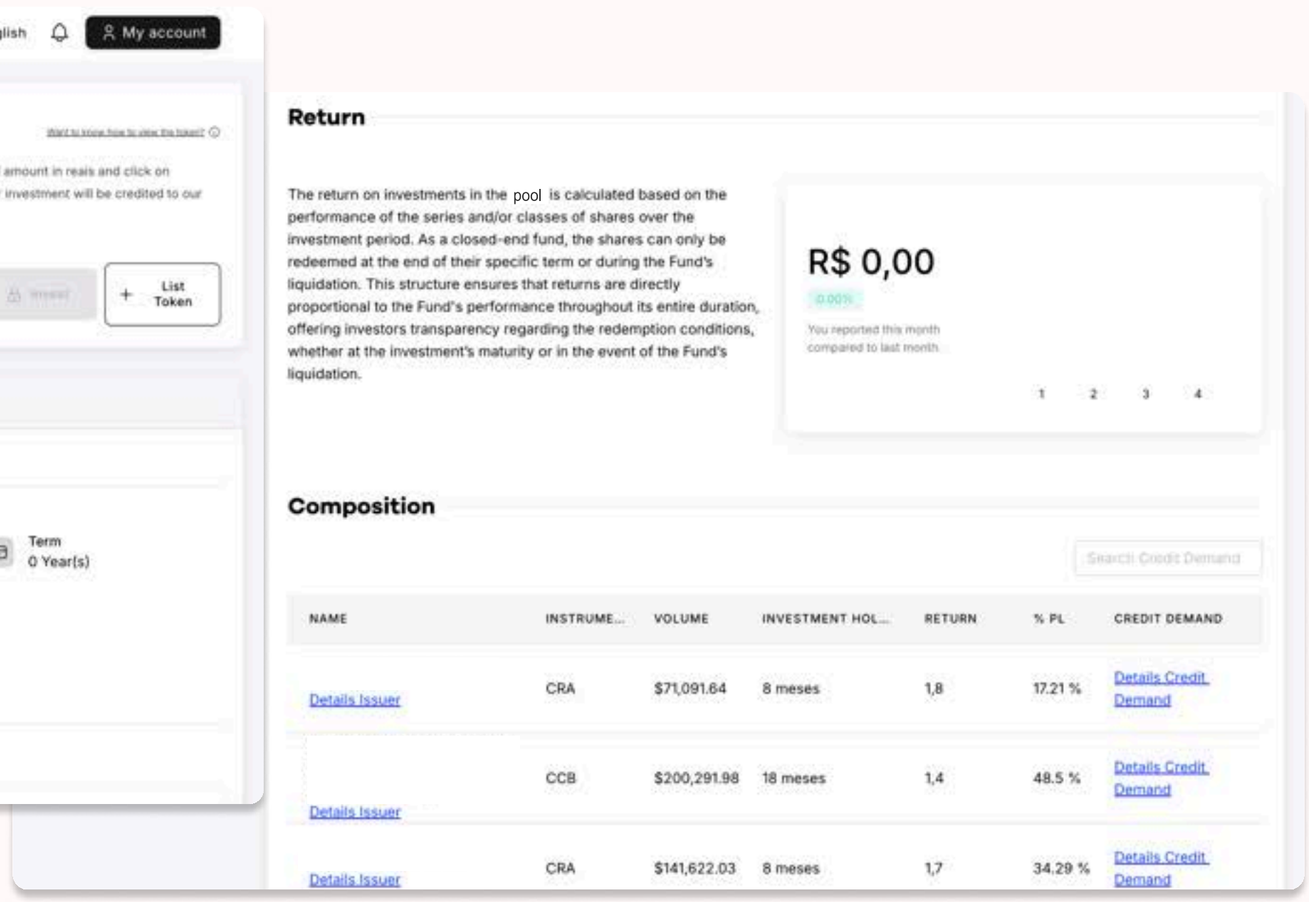


- **Portfolio Management and Back-Office:** A customizable white-label interface that enables institutional managers to create and manage personalized investment pools, defining parameters such as profitability, duration, and risk profile. Includes a back-office module for private and secure client-base management.



- **Investor Area:** An intuitive portal that simplifies access to on-chain investments, offering traditional login via wallet abstraction or integration with personal wallets for self-custody. Provides comprehensive tools for analyzing and monitoring investments.





Proof of Concept and Results

In 2024, Rivool reached a historic milestone with the launch of its MVP, demonstrating the effectiveness of its proposal through the tokenization of R$2.5 million in agricultural loans, allocated as part of a R$10 million investment pool for a private qualified investor. The success of this operation is evidenced by the robust diversification of the portfolio across three critical dimensions:

Geographic Diversification

The portfolio spans 10 Brazilian states, ensuring broad territorial coverage and minimizing regional climate risks.

Social Reach

Directly benefits 112 rural producers, democratizing access to credit and fostering agricultural development across different production scales.

Sectoral Diversification

This portfolio covers 8 sectors, including traditional commodities such as soy and corn, livestock (beef and dairy), horticulture, fruit farming, cereals, and planted forests. This variety strengthens the portfolio's resilience and demonstrates the platform's versatility in serving various agribusiness value chains.

Vision for the Future

Rivool's development strategy is structured into three main stages:

MVP for private investors in the Brazilian market (Completed).

Successfully demonstrated the feasibility of connecting private credit with investors using Web3 technology, validating the platform's value proposition and generating early traction.

Development of the white-label module for B2B partners (Ongoing).

Rivool is designing a seamless solution for traditional investors, integrating Web3 capabilities into a CeFi-friendly interface where users can choose between wallet integration or familiar Web2 credentials.

Expansion into the global DeFi market.

With a global thesis, Rivool aims to empower qualified investors worldwide to fund private credit operations, bridging the gap between institutional capital and real-world assets on a global scale.

Traditional

WEB3.0

This gradual approach underscores Rivool's commitment to creating a robust, user-centric, and scalable solution that addresses current challenges in the credit market. By seamlessly integrating innovative Web3 technologies with familiar user experiences, Rivool is laying the groundwork for a transformative shift in how private credit investments are structured, distributed, and accessed globally.

Conclusion

Rivool Finance represents a significant evolution in the credit market, offering a technological solution that benefits all ecosystem participants. Its platform facilitates access to credit for rural producers and creates new investment opportunities for institutional and individual investors, contributing to a more efficient and inclusive financial market.

For Originators: Expand your credit origination capacity and diversify your revenue streams without requiring proprietary capital. Sign up now to become a Rivool partner and start offering innovative credit solutions to your clients.

For Financial Institutions: Stand out in the market by offering exclusive on-chain investment products through our white-label solution. Contact us to learn more about our platform and begin the partnership process.

For Investors: Access tokenized real-world asset investment opportunities with differentiated profitability and transparency. Register through one of our partner institutions and start diversifying your portfolio with agribusiness assets.

Resume and Outlook

Why this can change the process of acess private capital

At Rivool we are rewriting the rules of how capital meets opportunity. Our mission was born from a profound imbalance: a high-performing, globally strategic sector — Brazilian agribusiness — constrained by outdated credit models and limited access to international capital.

From this paradox came our drive to build something transformative: a decentralized protocol capable of unlocking the full potential of private credit through blockchain, making high-quality real-world assets globally investable.

We believe in a future where technology doesn’t just automate, but empowers — where investors from any jurisdiction can deploy capital into secure, yield-generating agricultural credit, with full transparency and no friction. Rivool is that bridge: we tokenize credit assets like CRAs, CPRs, and CCBs, backed by collateral of up to 200% LTV, monitored through our proprietary SmartScore™, — all while enabling the sustainable growth of one of the world’s most vital food-producing sectors.

This is just the beginning. We envision Rivool as the backbone of a global credit ecosystem that is fair, programmable, and permissionless. We’re scaling to new geographies, integrating multichain infrastructure, and forging a future where real-world finance is no longer captive to bureaucracy, inefficiency, or exclusion. T

ogether, we are building a new paradigm. And if you're reading this, you are part of that journey.

We hope you enjoyed our market research.

For more information and to begin partnerships:

Visit **www.rivool.finance** or

contact our office at **contact@rivool.finance**

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