Lisbon School of Economics & Management
Universidade de Lisboa

MASTER OF SCIENCE IN
FINANCE

MASTERS FINAL WORK
PROJECT

INVESTMENT POLICY STATEMENT:
MS. SARAH S. READSUN

ANDRÉ SOLLER

JULY/24

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INVESTMENT POLICY STATEMENT FOR INDIVIDUAL INVESTORS:
MS. SARAH S. READSUN

ANDRÉ SOLLER

PROFESSOR PEDRO RINO VIEIRA

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Abstract

This Investment Policy Statement (IPS) is tailored for Ms. Sarah S. Readsun, focusing on the strategic management of her investment portfolio valued at 6 million Brazilian reais. Given Ms. Readsun's proximity to retirement and her medium to high-risk tolerance, the primary objectives of this IPS are to surpass the inflation indices, ensuring the preservation of purchasing power, and to generate a financial surplus for recurring use.

The investment philosophy adheres to a holistic approach, incorporating a mix of fixed income products, structured operations with options, and investments in international markets to capitalize on diverse financial instruments while mitigating risks through strategic asset allocation. The strategy emphasizes long-term growth and stability by optimizing asset distribution across various maturities and quality ratings, ensuring alignment with appropriate tolerance and liquidity needs.

Specifically, the portfolio is designed to allocate over 75% in Brazilian fixed income products, with a strategic emphasis on products covered by the Credit Guarantee Fund (FGC) to protect against default risks. Foreign securities and alternative investments constitute the remaining portion, providing necessary diversification and exposure to potentially higher yields.

Risk analysis within the IPS is rigorous, addressing various potential financial and operational risks. The document outlines strategies to manage market valuation risks, liquidity risks, credit risks, regulatory changes, and foreign exchange fluctuations. A key aspect of the risk management approach involves continuous monitoring and reallocation of assets to manage and mitigate risks effectively, ensuring that the portfolio's performance aligns with the set objectives and Ms. Readsun’s financial goals.

This comprehensive IPS serves not only as a roadmap for achieving targeted financial outcomes but also as a dynamic tool for adapting to changing market conditions and personal circumstances, thereby supporting Ms. Readsun's financial security as she approaches retirement.

JEL classification: G11; G23; G32; F65; E22; J26

Keywords: Asset Management; Portfolio Theory; IPS; Strategic management.

Resumo

Esta Declaração de Política de Investimento (DPI) é adaptada para a Sra. Sarah S. Readsun, concentrando-se na gestão do seu portfólio de investimentos, avaliado em 6 milhões de reais brasileiros. Dada a proximidade da Sra. Readsun à reforma e a sua tolerância ao risco de média a alta, os principais objetivos desta DPI são superar os índices de inflação, garantindo a preservação do poder de compra, e gerar um excedente financeiro para uso recorrente.

A filosofia de investimento adere a uma abordagem holística, incorporando uma mistura de produtos de renda fixa, operações estruturadas com opções e investimentos em mercados internacionais para capitalizar em diversos instrumentos financeiros, enquanto mitiga riscos através da alocação estratégica de ativos. A estratégia enfatiza o crescimento e a estabilidade a longo prazo, otimizando a distribuição de ativos através de várias maturidades e classificações de qualidade, garantindo a alinhamento com a tolerância ao risco e as necessidades de liquidez apropriadas.

O portfólio está desenhado para alocar mais de 75% em produtos de renda fixa brasileiros, com uma ênfase estratégica em produtos cobertos pelo Fundo Garantidor de Crédito (FGC) para proteger contra riscos de incumprimento. Os títulos estrangeiros e investimentos alternativos constituem a parte restante, proporcionando a diversificação necessária e exposição a rendimentos potencialmente mais elevados.

A análise de riscos aborda vários riscos financeiros e operacionais potenciais. O documento delineia estratégias para gerir riscos de avaliação de mercado, riscos de liquidez, riscos de crédito, mudanças regulatórias e flutuações cambiais. A gestão de riscos envolve o monitoramento contínuo e a realocação de ativos para gerir e mitigar eficazmente os riscos, garantindo que o desempenho do portfólio esteja alinhado com os objetivos definidos e os objetivos financeiros da Sra. Readsun.

Esta DPI abrangente serve não só como um roteiro para alcançar os resultados financeiros almejados, mas também como uma ferramenta dinâmica para adaptar-se às mudanças nas condições de mercado e circunstâncias pessoais, apoiando a cliente à medida que se aproxima da reforma.

Classificação JEL: G11; G23; G32; F65; E22; J26

Palavras-Chave: Asset Management; Portfolio Theory; IPS; Strategic management.

Acknowledgements

A I thank my daughter Sarah for the love, care, and patience she maintained, even without understanding the reasons, accepting many times my absence because "dad was at school" or "doing school work."

I thank Professor Pedro Rino for embracing the idea and guiding a project with an unconventional approach to portfolios based on stocks and other common positions, requiring extra willingness to understand the Brazilian market.

To my parents, Paulo and Marisa, and brother Felipe, for their support throughout my course and entire life. To Helga, Renata, and Eliana Stein, for their unwavering trust over the past years and hopefully for many more to come.

I thank my friend Rafael Migani, CFA, who supported me in my career transition from the beginning and guided me correctly after the initial unsuccessful attempt with the CFA towards pursuing the Master's in Finance at ISEG.

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And to all clients and future clients who have/will have placed their faith in my work to manage their money and part of their lives, thank you very much.

"*Knowledge without action is merely information*"
Unknown

Abbreviations

IPS - Investment Policy Statement

FGC - Credit Guarantee Fund

CDI - Interbank Certificate of Deposit

IPCA - Broad National Consumer Price Index (Official Brazilian Inflation Rate)

SELIC - Special System for Settlement and Custody (Official Brazilian Interest Rate)

CDB - Bank Deposit Certificate**LCA** - Agribusiness Credit Bill

LCI - Real Estate Credit Bill

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1 Introduction

Holistic Investment Portfolio Management Approach

Navigating Financial Horizons with Confidence

Welcome to a journey that transcends traditional investment approaches. In crafting our Investment Portfolio Statement, we've meticulously woven together the threads of financial acumen, strategic foresight, and a commitment to delivering tangible results. As you delve into the intricacies of our methodology, we invite you to embark on a path that not only aligns with market realities but also instills a sense of curiosity about the possibilities that lie ahead.

Our portfolio is not just managed; it's strategically rooted in the heart of Brazil, where our clients' financial realities unfold. We understand that safeguarding against currency depreciation is paramount, and thus, we focus on the Brazilian Real. Within this dynamic landscape, we carefully consider tax implications, particularly the nuances of regressive taxation. Our exploration of tax-efficient products is coupled with the assurance of the Credit Guarantee Fund (FGC), and with a pepper based on high yield products. Venturing into the diverse Brazilian financial ecosystem, we unveil unique investment opportunities offered by institutions catering to individuals without extensive credit lines.

Beyond these foundational elements, our strategy unfolds in a meticulously planned manner. From the intelligent distribution of funds across various time horizons to the tactical adjustments based on interest rate cycles, undervalued assets, and covered call strategies, each decision is a deliberate step towards achieving tangible results. Our proposal is to assist clients in navigating the turbulent waters of investments. As shown in Appendice 4, in just one day and through a single brokerage, there are more than 680 different bank fixed income products available.

As you navigate this document, you're not just witnessing financial principles in action. You're partaking in a personalized journey, where strategic acumen meets the unique dynamics of the market. This Investment Portfolio Statement is more than a roadmap; it's a promise—a promise to navigate the complexities of the financial landscape with confidence, curiosity, and a commitment to tangible success.

2 Executive Summary

2.1 Scope and Purpose

This IPS was crafted to direct the investments of Miss Sarah S. Readsun, presently valued at 6 million Brazilian reais, by leveraging the opportunities available in Brazil to capture market profitability. Its aim is to align the client's expectations regarding portfolio risk and return, as well as to parameterize, execute, and monitor the policies outlined here. This ensures that the client can pursue her personal and professional endeavors with the assurance that her investments are being effectively managed by the professionals at Raven Enhanced Investments.

To optimize the opportunities available in the market, the portfolio will primarily consist of fixed income products with various maturities, qualities, coverages, and yield rates. Additionally, it will include structured operations with options and investments abroad.

2.2 Governance

The Raven Enhanced Investments commits to managing the portfolio created only with duly qualified professionals who will be responsible for maintaining control of established parameters and providing the client with the proper monitoring of portfolio dynamics, while the client is responsible for providing the agreed-upon resources and an annual estimate of everyday and occasional liquidity needs.

2.3 Investment Return and Risk

The goal of the portfolio is to provide an investment portfolio that outperforms inflation indices and generates a financial surplus for the client to continue maintaining her investments with Raven over the years. As the portfolio has its largest portion invested in fixed income, the greatest associated risk is the mark-to-market risk associated with changes in the yield curve, a risk controlled by balancing liquidity and reallocating investments.

2.4 Risk Management

The fixed income portfolio will predominantly focus on maximizing coverage provided by the FGC (Credit Guarantee Fund) and values that are outside of this coverage will have their exposure determined by qualitative criteria. In the case of private credit products, this will involve analyzing the provided guarantees and the financial health of the companies. Operations in the stock market will be conducted through assets with appropriate liquidity and financial solidity.

3 Investment Policy Statement

3.1 Scope and Purpose

Client Profile: Miss Sarah S. Readsun is nearing retirement and possesses a medium to high risk tolerance, but she tends to lean towards a medium to low willingness to take risks. She owns her home outright and relies on additional income to cover surplus expenses. The strategy is designed to accommodate diverse needs, considering liquidity requirements for potential medical emergencies, acquisition of additional assets, and occasional needs for liquidity for tax payments and external investments.

Portfolio Limits: Currently, the client's portfolio revolves around 6 million Brazilian reais, and the structure presented here has the capacity to be maintained for values up to twice that amount if there are no changes in the FGC coverage.

Fees: In accordance with the investment policies outlined herein and reflective of client performance, the management fee will be 10% of the gross profit, payable on an annual basis. Aiming to capture real performance, for accounting purposes related to fee payment, the performance calculation will be made based on the difference in net assets between the end and the beginning of the accounting period, subtracting net deposits and adding gross withdrawals.

Structure: The structure developed in this portfolio is based on some premises that are crucial for the client's understanding, as they will guide not only what is presented here, but also the actions of the managers at Raven Investments. These managers will always strive to achieve the best balance between portfolio profitability, exploration of opportunities in the national and international fixed income market, and, primarily, active management of the portion allocated to variable income.

- Communication and trust between the parties: It is imperative for the success of this journey that the client understands that professional asset management operates in a programmed and strategic manner to balance various market risks that have their own dynamics and are often hidden. For example, if the client owns a leased property, even if this asset is not part of the portfolio managed by Raven, it is important that this information be communicated to the designated Manager, as the lease agreement likely includes an inflation adjustment clause. With this information to hand, the Manager can balance the portfolio's exposure to both inflationary and real estate risks. Along these lines, it is essential for the client to discuss external financial transactions with the Manager to better calibrate the entire financial situation, including the volume of funds to be liquidated.

- Financial concepts behind portfolio profitability:

  Fixed-income products: They have a predetermined return at the time of purchase, but to maintain the agreed-upon rates, it is necessary to hold the security until its maturity, with the risk of loss in early redemption.

  Interest rates: Generally, bonds are linked to inflation, have fixed rates, or are indexed to percentages of the basic interest rate. In general, they represent loans to governments, banks, or companies, and the longer the term, the higher the remuneration tends to be. Additionally, purchasing longer-term securities often entails paying lower income tax rates.

- Attributes of wealth - Concepts presented by Professor Su Choung Wei (Wei, 2024):

  Ownership: The owner uses the asset themselves.

  Enjoyment: The asset is used to generate another asset, as in the case of renting out shares where the owner loses the right to use them but gains enjoyment from the proceeds of the operation.

  Collateral: Pledge in financial transactions where the asset serves as collateral, increasing reliability and consequently lowering transaction rates.

  Assumption: It is the commitment to buy or sell a share. Through options, this commitment is remunerated.

  The presented attributes form the basis of the portfolio that will use the client's owned money to obtain enjoyment (interest) from fixed-income products, while the fixed-income products in the portfolio will be used as collateral to obtain returns through the remuneration of assumption.

3.2 Governance

The Raven Enhanced Investments commits to managing the portfolio created only with duly qualified professionals, and the main manager has no less than 10 years of experience in personnel management.

The client is responsible for providing the agreed-upon resources and an annual estimate of everyday and occasional liquidity needs.

The Raven team has developed the present IPS (Investment Policy Statement) with the perfect fit for the client's demands in mind. The client should carefully analyze it, and all doubts must be clarified before signing. If any points of concern are identified by the client, they should be transcribed in a way that makes it clear that the doubt has been resolved. To maintain expectations, the portfolio will be reassessed according to the terms of this IPS every 6 months by the portfolio manager.

In addition to the semi-annual evaluations provided for in this IPS, additional reviews of the investment strategy will be conducted in consultation between the client and the

portfolio manager in the following cases: significant changes in the client's financial or personal objectives that may impact asset allocation or risk tolerance, substantial changes in economic, political, or regulatory conditions that may significantly influence market performance or the feasibility of current investment strategies, and extraordinary events, such as changes in interest rates, extreme market volatility, or economic crises, that require an immediate reassessment of the investment strategy. The aim of these reviews is to ensure that the investment strategy remains aligned with the client's constantly evolving financial and personal objectives. The outcome of these reviews will be documented through an addendum to the IPS, which will reflect any adjustments or realignments to the investment strategy agreed upon by the parties.

Considering that all investments under Raven's responsibility are managed within the virtual brokerage environment, and these institutions only allow the movement of funds to bank accounts in the client's name, a secure system is thus created where Raven's manager cannot withdraw funds from the brokerages, as any withdrawal order is directed to the bank account to which the manager has no access. Therefore, after the signing of this IPS, a document that holds legal power as a power of attorney in front of financial institutions, allowing Raven free intervention in the client's financial investments, the client agrees to inform the institutions of the new management of the investment portfolio, indicating that their representatives should communicate directly with the designated manager. The client may or may not be copied on these communications, but under no circumstances will the institutions offer products and/or services directly to the client without the knowledge of the designated manager. The client's approval will not be required for decisions made by the manager.

Upon signing the IPS, the client agrees to grant the manager unrestricted access to the brokerage accounts so that they can analyze existing investments and execute portfolio distribution in accordance with the "Investment Design" section of this document. After the initial allocation of fixed income products, which may or may not involve the total available, depending on market conditions, the manager will monitor the fixed income portfolio monthly to ensure compliance with the established conditions. In the event of new funds, they will be reinvested according to the IPS. Every six months, the client will receive a report with updated conditions of the entire portfolio, and if necessary, the client should notify the manager to request the report with a minimum notice period of 5 business days.

In the event of a lack of products that fit the terms established here, the manager will allocate the funds to government bonds indexed to the interest rate and with daily liquidity to await better market conditions. Weekly, the manager will reassess this position.

3.3 Investment, Return and Risk Objectives

The objectives of this portfolio are the preservation of the purchasing power of capital in Brazilian Reais, using the IPCA inflation index as a metric, and allocating excess returns, real rate, for the regular use of the client. The profitability objective should be achieved by maintaining 40% of immediate liquidity of the portion designated for annual consumption and no less than 15% in total annualized liquidity.

Our portfolio aims to allocate between 75% and 85% in Brazilian fixed income products, with a maximum exposure outside the FGC of 35%, targeting a minimum real interest rate of 6.5% and seeking to achieve the goal of capturing the minimum 17.5% tax rate in this asset class. Structured operations involving stocks and options will seek to add between 1 to 2% annually to the portfolio with maximum limits of negative premium exposure of 3% of the total, and a maximum commitment limit of 35% of the total as notional for operations involving selling in variable income.

In addition to the risks mentioned, the investment portfolio will be subject to an annual loss limit of 15% of the portfolio, including cumulatively, losses from mark-to-market of fixed income products that have it and losses from structured operations. For fixed income products outside the FGC guarantee, there will be a maximum annual loss tolerance of 3% of the total. The maximum loss parameters by asset class are detailed in Table 3. If these limits are reached, all remaining assets in each class will be liquidated and reinvested in risk-free securities for position reassessment.

Structured operations will be conducted on index options or blue-chip stocks, primarily using margin instead of direct asset purchase. Direct purchase of stocks or options will be carried out using the resources obtained from the results of structures and will remain between 5% and 10% of the portfolio.

Investments abroad will be permitted and encouraged when external market conditions and exchange rates are favorable, maintaining between 15% and 25% of the total portfolio. Fixed income securities abroad will not be part of the previously established percentages of fixed income products.

Investments in cryptocurrencies, gold, and other unconventional assets will be allowed up to a maximum percentage of 5% of the portfolio.

If the Manager believes that structural changes occur in the baseline scenario, new risk and return objectives for the portfolio should be proposed.

3.4 Risk Management

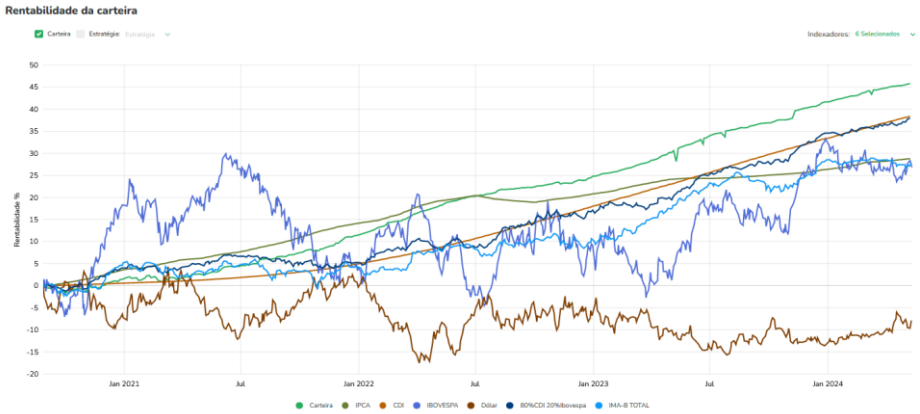
Main Portfolio

Considering that the client's resources are distributed across different investment houses due to the specificities of the products offered by each of them, the consolidated portfolio report will be generated semi-annually from the update of the Smartbrain platform (Smartbrain, 2024), which specializes in providing the necessary

reports, for example, see the available folder of supplementary documents (Supplementary, 2024).

Due to the specificities of the presented portfolio, it is not possible to find a single benchmark that provides the necessary reliability for proper comparison. However, with the automation of the management process, it is possible to present various benchmarks related to the assets in the portfolio. Therefore, in addition to the CDI, the portfolio's performance will be presented in relation to the exchange rate variation of the U.S. dollar, Ibovespa, IPCA, IMA-B (an index formed by government bonds indexed to inflation measured by IPCA) as shown in Figure 1, and a metric established through a composition of 80% CDI and 20% Ibovespa. Comparing with various benchmarks allows the manager to analyze if the portfolio's performance meets expectations compared to market averages, as well as analyzing performance by product category, allowing the manager to rebalance the portfolio to adhere to what is established in this document.

Figure 1: Performance Evaluation Chart Template



Source: https://app.smartbrain.com.br/carteira/52142, <Access on 06/17/2024>.

Since fixed income comprises the largest portion of the portfolio, it is necessary to clarify to the client the concepts involved in its proper management to achieve the highest possible profitability and the risks associated with this product category.

- For the same product, there is its value, reflected by the contracted interest rate that will be paid to the investor at the maturity of the bond. The quoted value of the same may be above or below the contracted value during the period until maturity, therefore, as a rule, the manager will assume that the bond will be held until maturity.
- Due to this fluctuation in bond pricing, the portfolio may experience depreciation that will not translate into real losses if the bond is not liquidated. Therefore, it is proposed that the portfolio be subject to a maximum depreciation of up to 15% over 1 year.
- Conversely, the Manager may purchase specific bonds for early exit to take advantage of unexpected appreciation.

- Longer-term bonds typically pay lower income tax rates and, as a rule, offer better returns.

The premise of the fixed income portfolio is to have periodic liquidity obtained through the organized staggering of bond maturities so that there are no unforeseen early redemptions, or if they do occur, there is always a bond nearing maturity that does not suffer excessive mark-to-market adjustments. Based on this premise, it is advisable for portfolio rebalancing to occur dynamically by investing in bonds that show the best potential return over their existence to counterbalance bonds experiencing losses due to mark-to-market adjustments.

As basic examples, in a scenario of rising interest rates, fixed-rate or inflation-linked bonds purchased during periods of low rates tend to depreciate. However, presently, it is advisable to purchase fixed-rate or inflation-linked bonds as they are being offered with real rates above average and are likely to appreciate in a rate cut scenario. Conversely, in an inverse scenario where interest rates are low, the supply of bonds paying a high percentage of the basic interest rate becomes more attractive as they maintain real profitability, and if the rate rises, the real yield grows above the market average.

The assets covered by the FGC will have a maximum value, considering the expected redemption, of 4 million Brazilian reais. As the FGC covers up to 4 defaults within 4 years of up to 250,000.00 reais, there is direct coverage of 1 million. However, since the banking failure rate is considered low, with 40 institutions in 27 years (FGC, 2024), it is understood that the exposure of 4 times the total is in line with the client's risk expectation. As a risk management measure, for each bank failure in the portfolio, the amount exposed to the FGC will be reduced by 1 million reais starting from the redemption of securities until the window of recomposition of the 4 defaults is reestablished.

Private credit

Private credit securities, not covered by the FGC, will only be purchased after analysis and confirmation that they are backed by real guarantees and linked to agriculture and real estate. As these securities have a long duration, around 8 years, only those with semiannual coupon payments will be purchased. The securities will always be purchased at their minimum quote, around 50,000 reais, and no more than three securities from the same issuer will be purchased, ensuring diversification of this part of the portfolio. If available, diversification into subcategories (e.g., agriculture and livestock) and regional diversification will also be ensured. The recovery capabilities of defaulted assets offered by the title management entities will also be evaluated.

Structured operations

At least 5% of the total should be allocated as collateral for options structures, and an additional 5% of the total should be available for collateral allocation, with prior notice

to the client. These last funds should not be used in regular operations but rather considered emergency reserves.

Derivative structures will be treated as separate accounts within the portfolio and are divided into two types:

1. Structures that use investor funds for their initiation or coverage will not utilize more than 1.5% of the portfolio for this purpose, and their profitability should return to the main portfolio until the utilized capital is replenished.
2. Structures that solely use the main portfolio as collateral or assumption may either reinvest their gains to reinforce the structure, including purchasing stocks or hedging options, or transfer the returns to the main portfolio to be incorporated into it.

The payoff graph, stop limits, estimated margin control, return objectives, and management of the structure in different scenarios (stability, high, extreme high, low, and extreme low) must be detailed in writing and digitally signed before their implementation. In case of client request, they must be presented immediately. The Manager is responsible for the daily monitoring of the margins and guarantees involved in the structures, both individually and collectively.

The results of the structures will not be incorporated into the Smartbrain platform, which will be limited to only recording the acquisition of stocks without the intention of sale. The financial control of the structures will be carried out through the tabulation of the net balances of brokerage notes and taxes paid, presented alongside the control of the main account. The sum of the two reports will represent the performance result of the portfolio.

Overall

Operating as proposed, the portfolio is shielded against shocks from abrupt increases in inflation because the inflation-linked and interest rate percentage-linked securities provide coverage for such events. A drastic reduction in the real interest rate offered by the securities will also be covered by the inflation-linked and fixed-rate securities already present in the portfolio. In this scenario, the investment durations will also be reduced to avoid locking money in low-yield investments. The risk of a stock market crash is minimized due to the limited direct exposure to this risk, with vulnerability being tied to structures that have their own management. In all cases, the Manager may invest the available liquidity in government bonds linked to the interest rate to await better entry opportunities. Additionally, moments of high real interest rates will be leveraged by investing in longer-term securities, creating a dynamic portfolio adjusted to market cycles.

4 Investment Design

4.1 Investment Philosophy

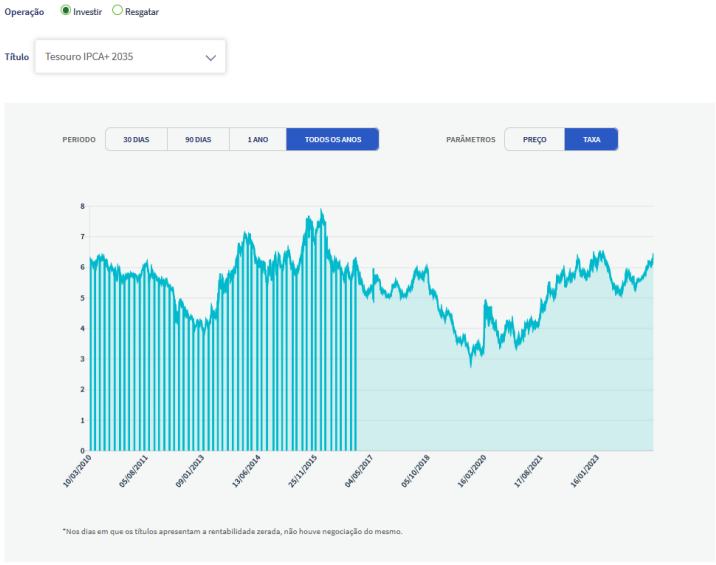
Our portfolio management strategy is primarily centered in Brazil, aligning with the reality of where most expenses are incurred. To safeguard against currency depreciation, we focus on the Brazilian Real, considering the dynamics of the SELIC rate. The proposed objectives address the inflationary scenario of the past 20 years, averaging around 5.7% per year (IBGE, 2024) with a real rate of 5.2% per year (Braga, 2023). This is illustrated in Figure 2, which shows the variation in the real rate offered by inflation-linked government bonds, and in Figure 3, which depicts the variation in Brazil's official SELIC interest rate, comprising the inflation rate plus the real rate.

Tax implications, especially regressive taxation, are carefully considered. Some kinds of products are explored for tax efficiency, and the Credit Guarantee Fund serves as a safety net, historically proving effective against defaults.

In Brazil, numerous financial institutions cater to individuals without access to extensive lines of credit, offering private bonds with elevated returns. Despite higher fees and lower guarantees, these institutions provide unique investment opportunities, covered by FGC within specified limits. The B3 website acts as a valuable resource, offering insights into institutions with products accepted as collateral in operations on the stock exchange.

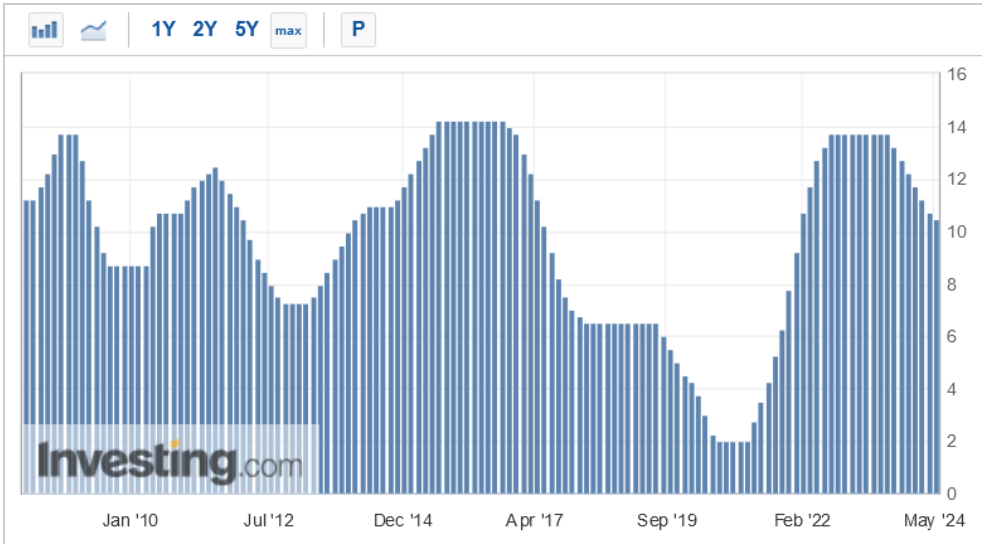
The investment strategy is predominantly **Value**, focusing on capital preservation and protection against currency depreciation, with investments in fixed income linked to the SELIC rate and products guaranteed by the FGC. There is also an emphasis on tax efficiency and exploring growth opportunities in local financial institutions, aiming for real returns above inflation, combining security with controlled growth.

Figure 2: Governmental inflation-linked Brazilian Bond IPCA+ 2035.



Source: https://www.tesourodireto.com.br/titulos/historico-de-precos-e-taxas.htm, <Access on 06/14/2024>.

Figure 3:Historical data of SELIC interest rates.



Source: https://br.investing.com/economic-calendar/brazilian-interest-rate-decision-415, <Access on 06/14/2024>.

Brazilian Interest Rates and Taxes

The base rate for investments in Brazil is the value of the Certificate of Deposit Interbank, CDI, which typically has a discount of 0.1% compared to the SELIC rate.

For fixed income products, Brazilian tax legislation employs regressive taxation. Tax rates start at 22.5% for investments with a duration of less than 180 days and decrease to 15% for investments above 720 days, opposing to tax-free products like LCA/LCI. For decision-making and simulations to make better choices, use online tools capable of capturing the differences between securities and providing profitability forecasts for the best ones. (Valor, 2024).

Credit Guarantee Fund (FGC)

The Credit Guarantee Fund acts as a crucial safety net, guaranteeing deposits and banking products for clients. The protection offered by the FGC extends exclusively to financial instruments like Certificates of Deposit (CDBs), Agricultural Credit Letters (LCAs), and Real Estate Credit Letters (LCIs). Hence, while various banking products exist, only these will be integrated into the portfolio when considering FGC coverage. The banks whose Certificates of Deposit (CDBs) are listed on the Brazilian Stock Exchange website B3 (B3, 2024), have their products accepted as collateral in stock exchange operations.

Private Credit

These are fixed income bonds issued by large companies for direct financing of agricultural, real estate, infrastructure, and other projects that require substantial financial resources. They do not come with protection from the FGC, and only those with real guarantees such as farms and already constructed buildings will be accepted into the portfolio. They have a long maturity period, ranging from 10 to 30 years in

extreme cases, but they offer semi-annual interest payments after a grace period to reduce investment risk. Since they are usually offered only to qualified investors, their issuance and liquidity are limited. Due to limitations in guarantees, liquidity, and maturity, this type of security yields higher returns compared to others and is typically tax-free, therefore characterized as high-risk credit bonds.

Currently, Galápagos WM serves as the primary distributor for this category of products (Galápagos, 2024). Their benchmark, set at IPCA + 8,5% per annum without taxes, underscores the potential returns. Galápagos has indicated the ability to introduce approximately 12 new products annually, aligning with our objective to diversify and optimize returns.

Structured operations

In the portfolio, structured operations involving options and stocks will be utilized. The strategies employed are derived from Professor Su Choung Wei's Derivatives Master Classroom course (Wei, 2024), adapted to current market scenarios, and are characterized by gains from the passage of time through the loss of value of the options sold. The Manager's objective is to use fixed-income securities within the portfolio as collateral for these structures, increasing overall profitability while managing liquidity and established exposure limits.

4.2 Strategic Asset Allocation

Strategic Approach

Regular Year Expenses: The real interest rate obtained in the previous year and allocated for the client's consumption will be calculated, and, as the securities mature, instead of being reallocated into new investments, they will be transferred to a daily liquidity fund within the client’s bank. This allows the client to independently access the resources as needed.

*High-Risk Credit Allocation***:** We propose allocating up to 35% of funds to high-risk private credit activities to generate alpha. These funds will not be designated for liquidity or daily expenses. Additionally, the semi-annual coupons will be strategically reinvested in new products or moved to daily liquidity.

If available funds surpass the opportunities for investment, the excess will be redirected into highly liquid products. This proactive approach positions us to capitalize on opportunities within the secondary market.

Diversified Time Horizons Strategy and Rebalancing: To mitigate the mark-to-market effect and strategically leverage tax advantages along the long-term yield curve, the remaining funds will be intelligently distributed across various time horizons.

The allocation plan divides remaining funds into slots with varying maturity periods, including short-term and long-term investments. Within each time slot, we emphasize diversification in maturities. The overarching goal of this allocation strategy is to create

a resilient portfolio where a percentage of funds is consistently nearing redemption, thereby minimizing the mark-to-market impact. Simultaneously, most funds can capitalize on tax advantages and the favorable long-term yield curve. Following a two-year cycle, redeemed bonds incur lower taxes and can be reinvested for higher returns, ensuring liquidity over time.

It's crucial to exercise control to avoid exceeding the limits set by the FGC or the respective financial institution. Preferably, we will acquire two products from each institution with different time horizons, mitigating the risk in the event of institutional deterioration that might necessitate an early bond sale. For bonds issued by institutions listed on B3 (B3, 2024), reaching the limit of 250,000 reais is possible at the outset, with the associated risk of not covering the profit. For other institutions, the profit implied in the security must be considered within the FGC limit.

The meticulous distribution of quantities and time is at the core of this strategy, ensuring a balanced and resilient portfolio.

Tactical Approach

Interest Rate Cycles: Adjust bond time horizons based on the prevailing interest rate cycle to capitalize on higher returns in the secondary market.

Undervalued Assets: In cases of collapse where blue-chip stocks are being traded at considered low prices, fixed-income securities will be liquidated for the purchase of these assets.

Structured operations: Unlike regular operations that rely on the decay of option prices, in the event of a significant market movement, option structures will be created to take on the directional risk of stocks.

4.3 Security Selection

In general, assets are made available on electronic platforms provided by brokerage firms. However, advisors may offer products directly to the Manager in search of liquidity for assets traded in the secondary market or when prospecting new launches.

Fixed income

Liquidity selection

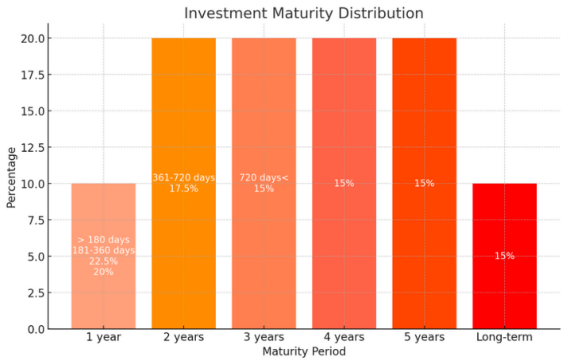
The allocation plan entails dividing the remaining funds into specific slots: 10% for investments maturing in 1 year, 20% for investments maturing in 2 years, 20% for investments maturing in 3 years, 20% for investments maturing in 4 years, 20% for investments maturing in 5 years, and a final 10% earmarked for long-term investments, Figure 4. Typically, distributors of such products offer maturities every 6 months for longer-term instruments and every 3 months for shorter-term ones. Every slot will be applied to different maturities throughout the year so that, at most, every 6 months there is a maturity of some investment. During the first two years, the

investments that mature will have a reduction in income tax according to the regressive table:

Table 1: Regressive Income Tax

Period	Aliquot
> 180 days	22,5%
181-360 days	20%
361-720 days	17,5%
720 days<	15%

Figure 4: Initial distribution of Brazilian fixed income covered by the FGC.



Considering that most of the maturing securities will be reinvested and that there is adequate liquidity from the staggered allocation of investments, there is opportunity for all reinvestments to be made above 720 days after two years, thus maximizing the fiscal benefit and taking full advantage of the higher remuneration rates offered for medium to long-term securities. Investment strategies involving allocation in longer-term securities will be accepted based on the Manager's understanding that the associated risk is lower than the offered return, and the remainder of the portfolio covers the reduced liquidity of this asset.

Cover and return selection

In a scenario of rising interest rates, fixed-rate or IPCA+ bonds purchased during periods of low rates tend to suffer depreciation. However, at present, it is advisable to purchase fixed-rate or IPCA+ bonds since they are being offered with real rates above the average and are likely to appreciate in a decline in interest rates. Conversely, in an inverse scenario where interest rates are low, the offering of bonds that pay a high percentage of the basic interest rate becomes more attractive as it maintains the real profitability, and if the rate rises, the real yield grows above the market average. Thus, at the time of investment, the momentum of the yield curve will be observed to define which index will be chosen for the investment.

Since banking institutions tend to offer their bonds in all available indexes as shown in Appendice 4, the manipulation among them falls to the Manager following the following staggered rules:

- If the difference between the returns of the private and public bonds is less than 1%, the money will be allocated in public bonds, allowing reallocations in covered private bonds at more opportune times.
- If the difference between the returns of the private bond listed as the provider of guarantee for structured operations, listed in B3 webstite (B3, 2024), and non-listed institutions is less than 1%, the money will be allocated in listed bonds.
- Prioritization for bonds that pay 7.5% or more of the real rate.
- Fixed-rate bonds, with maturity not exceeding 3 years that pay above 12% per year while guaranteeing a real rate above 6.5% at the time of application.
- Bonds with real returns above 6.5%.
- Bonds with returns superior to 115% of the CDI, or equivalent percentage (e.g., CDI+1.5%).
- Fixed-rate bonds, with maturity not exceeding 3 years, that pay above 10% per year while guaranteeing a real rate above 6.0% at the time of application.
- Bonds with real returns above 6.0%.
- Bonds with the highest percentage of available CDI or equivalent in the same index.

Private credit

Given the restricted availability of private credit securities aligning with the proposed risk profile of the portfolios, each security will undergo thorough analysis by the manager upon issuance. If it meets the predefined criteria and there is sufficient liquidity, the security will be integrated into the portfolio. Additionally, private credit funds managed by reputable asset management firms may be included in the portfolio, contingent upon adherence to the same financial constraints applied to individual securities.

4.4 Portfolio Composition and Portfolio Analysis

Portfolio Composition Percentages and Returns

In this chapter, we explore the potential forecasts for the portfolio and how they align with the proposed objectives. Firstly, Table 2 presents the limits of each asset class to obtain the portfolio composition. Subsequently, Table 3 shows the "Real Yield Expected" column, which provides individualized performance expectations and risks for each asset class over an average period of 3 to 5 years, based on realistic market averages.

Table 2: Portfolio Composition

Asset Class	Allocation Percentage	Allocation Details
Brazilian Fixed Income	75-85%	- Minimum of 75% of the portfolio allocated to fixed income denominated in Brazilian reais, whether covered by the FGC or not.
FGC Guaranteed	40-85%	- Maximum nominal limit of products covered by the FGC: 4 million Brazilian reais or 35% of the portfolio.
Private Credit (Non-FGC)	0-35%	- Maximum investment per institution or fund in private credit: 150,000 reais.
Brazilian Stocks (excluding structured operations)	5-10%	- Blue-chips or index.
Foreign Fixed Income (American/European)	15-25%	- Up to 25% allocated to fixed income securities from American or European markets.
		- Convertible into the S&P500 stock index at discretion.
Unconventional Assets	0-5%	- Up to 5% allocated to various assets such as real estate funds, gold, cryptocurrencies, and others.

Table 3: Expected performance

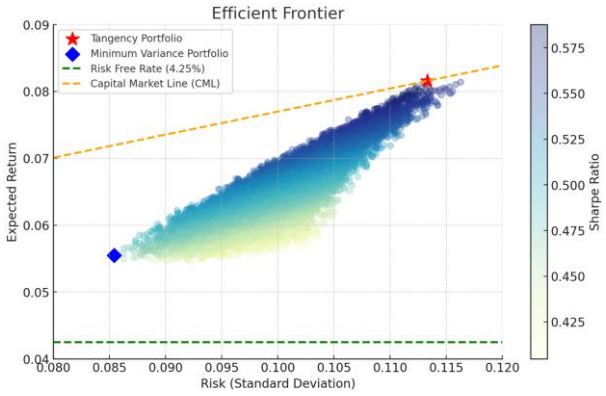
Asset Class	Real Yield Expected (%)	Risk σ (Standard Deviation %)	Tangency Portfolio %	Result
Brazilian Fixed Income[1]				
FGC Guaranteed	7	10	56,5	3.95
Private Credit (Non FGC)	8,5	17,32	21,5	1,2
Brazilian Stocks[2] *(excluding structured operations)*	4,7	30	5	0.23
Foreign Fixed Income[3] *(American/European)*	4,25	28,28	15	0.63
Unconventional Assets[4]	6	24,90	1	0.06
Structured Operations	1.5	-	-	1.44
			σ 11,33%	**8.16**

[1] Source: https://blogdoibre.fgv.br/posts/evolucao-historica-das-taxas-de-juros-reais-e-de-seus-determinantes-no-brasil, <Access on 06/17/2024>.
[2] Source: https://bvmf.bmfbovespa.com.br/indices/ResumoVariacaoAnual.aspx?Indice=IBOV&idioma=pt-br <Access on 06/17/2024>.
[3] Source: https://curvo.eu/backtest/pt/indice/sp-500 <Access on 06/17/2024>.
[4] Source: https://www.macrotrends.net/1333/historical-gold-prices-100-year-chart <Access on 06/17/2024>.

Using the provided data and complementary information in Appendice 5, the Efficient Frontier, Figure 5, and the Tangent Portfolio were derived. Raven's Manager

considers the Tangent Portfolio to be the most efficient for the client, shown in Table 3, is estimated to have a real return of 8.16%, with 6.71% from product diversification and approximately 1.5% from structured equity operations, aligning well with the proposed objectives.

Figure 5: Efficient Frontier



Nominal Distribution

In Table 4, the nominal distribution of asset classes is presented. The values for Private Credit will be reserved and applied as offers become available. The amount allocated to Brazilian Stocks will be invested in the BOVA11 ETF, which tracks the IBOVESPA index. The values designated for foreign investments will initially be distributed in U.S. Treasury bonds, taking advantage of the high rates offered, and later reallocated to an S&P 500 ETF based on the presented criteria. Due to the small percentage allocated, investments in Unconventional Assets will be entirely in certified and fractional physical gold.

Table 4: Distribution of investments

Asset Class	*Tangency Portfolio %*	*Nominal Values rounded*	*Asset*
Brazilian Fixed Income			
FGC Guaranteed	56,5	3,4M	Table 5
Private Credit (Non FGC)	21,5	1,3M	Galápagos products
Brazilian Stocks	5	300.000	ETF BOVA 11
Foreign Fixed Income (American/European)	15	900.000	¼ A. Treasury 1 Year* *Switch to the S&P500 after a 10% drop from the peak. ¼ A. Treasury 3 Years** **Switch to the S&P500 after a 20% drop from the peak. ¼ A. Treasury 10 Years ¼ A. Treasury 20 Years
Unconventional Assets	1	100.000	Physical Gold

To proceed with the distribution of products guaranteed by the FGC, it is necessary to outline a base scenario for the forecast of the Brazilian interest rate and inflation curve. With these data in mind, it is possible to determine the focus areas for the type of profitability to be prioritized at each moment. Currently, in June 2024, the U.S. Federal

Reserve's base rate is around 5.5% per year, and the SELIC rate is steady at 10.5%, carrying an estimated real rate of 6.79%. This makes it relatively easy to find private securities offering more than 7% real rate.

The international scenario remains tense with the FED not giving clear signals of lowering its base rate. Moreover, internal Brazilian issues do not allow the SELIC to fall from this level. The forecast for the SELIC at the end of 2024 is 10%, stabilizing at 9% from 2025 onwards with an average inflation rate of 3.5%, bringing the real rate to the historical average of 5.5% (Brasil, 2024). Thus, the opportunity was taken to invest in fixed-rate securities in the early years, as an increase in interest rates is not expected in the short term, diversifying the indexes in the medium and long term to ensure profitability, even in a scenario of increased interest rate volatility. Table 5 presents the values (*1000).

The portfolio achieved an immediate value increment over five years estimated at 1,230,000 reais, indicating an average annual gross return of 7.5%. Liquidity parameters determined in the current IPS were also maintained, 910,000 reais, and for this purpose, the values of Brazilian Stocks should also be added. Furthermore, an initial amount of 2,020,000 reais, far beyond the maximum 10% stipulated here, is available for mobilization as collateral. It is noted that investments not fully covered by the FGC are from institutions listed on the B3, in compliance with the requirements established in the IPS. Moreover, for none of the proposed investments, the limit is exceeded by more than 5%, which can be considered a residual value.

Table 5: Distribution of FGC Guaranteed Products

Year	Value	Asset	Expiration	Rate	Total Return	FGC Limit	B3 List
2024	200	CDB	2024	100% CDI	200		
	300	TD Selic+0,08	2027	100%CDI	394		yes
2025	200	Original	12/06/2025	11,83	224	yes	yes
	110	Santana	12/06/2025	113% CDI	122	yes	
	200	Andbank	04/12/2025	11,65	236	yes	
2026	200	C6 Com	12/06/2026	12,45	250	yes	
	100	Pine	12/06/2026	12,45	126	yes	yes
	100	Pine	14/12/2026	12,3	134	no	yes
	100	Pan	14/12/2026	12,17	133	yes	yes
2027	100	Pan	14/06/2027	IPCA+7,15%	129	no	yes
	100	BTG	14/06/2027	IPCA+6,85	134	yes	yes
	180	BDMG	13/12/2027	114% CDI	243	yes	
	120	Caruana	13/12/2027	111,5% CDI	169	yes	
2028	170	Fibra	12/06/2028	IPCA+7,10%	254	no	yes
	170	Daycoval	12/06/2028	IPCA+6,32%	259	yes	yes
	170	Semear	01/06/2028	112% CDI	250	yes	
	170	BMG	12/06/2028	IPCA+6,30%	247	yes	yes
	100	BTG	12/06/2028	IPCA+6,69%	147	no	yes
2029	150	Socinal	19/06/2029	112% CDI	242	yes	
	410	TD IPCA+	15/05/2029	IPCA+6,34	654		yes
	50	Caruana	11/06/2029	113% CDI	81	yes	
Total	**3400**				**4630**		**2020**
Daily liquidity	**910**						

At the time of resource reallocation, detailed analyses will be conducted considering various critical factors. The diversification of the portfolio will be assessed to ensure an adequate balance between fixed-rate and variable-rate investments, mitigating interest rate volatility. The maintenance of liquidity parameters, as stipulated in the IPS, will be verified to ensure easy access to necessary capital. Compliance with FGC coverage and IPS requirements will be strictly observed, avoiding exceeding

established limits. Risk management will involve continuous monitoring of international and domestic economic indicators for necessary portfolio adjustments. Additionally, there will be ongoing evaluation of the portfolio's performance against the projected annual return of 7%, with adjustments made to optimize returns.

Structured Operations

To achieve a profitability target of 1-2% with structured options operations, it is necessary first to design the strategy for each operation, evaluating its management and consequences. This should consider the various possible scenarios for the base stock price evolution, including margin limits, loss limits, time available for analysis and operation, and the possibility of using robots to automate the operation.

Note: 1K = 1000 units.

Strategy Development

General: All premium values mentioned will be estimated using the Black and Scholes model. References to days indicate business days until the option series expiration. Empirical evidence shows significant distortions between the market price and the Black & Scholes model, with options closer to expiration and ATM strikes showing greater distortion. However, for strategy design, a linear parameterization with B&S should be used, but favorable distortions should be taken advantage of when possible. For example, selling an ATM option above the B&S price can increase the proportion to buy coverage for the same series being traded near the parameterization value. However, this option traded above the model's value will also result in lower-than-expected profit during rollover if the next series' ATM option is traded at the B&S value.

Objective Clarity: The strategy should clearly define its objective, whether it is regular income generation, portfolio protection, accumulation of new shares in the portfolio, or acquisition or sale of shares at certain strikes. Short and medium-term forecasts should be considered depending on the need.

Liquidity Availability: Verify liquidity in the asset. For example, some assets have liquidity in ITM and ATM calls for the next six series and ATM options liquidity at regular intervals every six months or in July and December (e.g., PETR4). Others have liquidity in all series within a 10% range around the stock price but only ATM liquidity in one or two subsequent series.

Margin Management: The margin of guarantee is crucial for portfolios using options structures for income. For the uncovered sale of 1K ATM call at 119.00, B3 initially requires a margin of 50,000 reais, while for the sale of 1K ATM call at 37.00, the margin is approximately 10,000 reais. Margins vary with the asset's volatility and the spread between coverage and the sold option.

Nominal Asset Value: The nominal value of the asset impacts the premium offered for available options. For example, an asset at 119.00 has an ATM Call with 16 business days until expiration, with an estimated B&S premium of 1.96, while another asset at 37.00 has an ATM Call in the same conditions with a premium of 1.08.

Combined Points: If the objective is portfolio profitability (extracting X amount in a given time), the same result can be achieved by managing exposure margin, asset movement space, and option volumes.

For example, to obtain 10,000 reais in one-month there is two strategies:

1. Asset at 37.04: Sell 20K calls at strike 36.92 (premium 1.21) and buy 20K coverage at strike 38.17 (premium 0.66). This operation has a structural negative delta of 1.25/call or 25,000 total, with a margin call of 24.863,91 reais. No space for the stock to rise since it is an ATM call.

2. Asset at 119,14: Same bear call spread operation with 20K exposure, between strikes 121 (premium 1.00) and 123 (premium 0.44). This operation has a structural negative delta of 2.00/call or 40,000 total, with a margin call of 19.891,62 reais (B3 S. , 2024). In this scenario, there is a margin for a 1.7% increase in the stock price without compromising gains. If this same operation were with an ATM option, the margin call would be 32,963.96, and for the operation with an ITM option, the margin call would be 39,101.08. An important note: The simulations used 1K of PETR4 shares as a base, traded on the date at 37.14 reais, but for accounting purposes, the Exchange accepts them at a value of 25.96 each. This demonstrates the risk of operating at the limit of the available margin, potentially resulting in the automatic liquidation of your position due to insufficient operational limits if the market moves significantly.

Finally, by following these steps and considerations, the structured options operations can be optimized to meet the profitability target while managing risks and ensuring compliance with the IPS limits.

Here, two strategies proposed that can be applied together if they adhere to the limits established in the current IPS.

<u>BOVA11 Short Iron Butterfly</u>

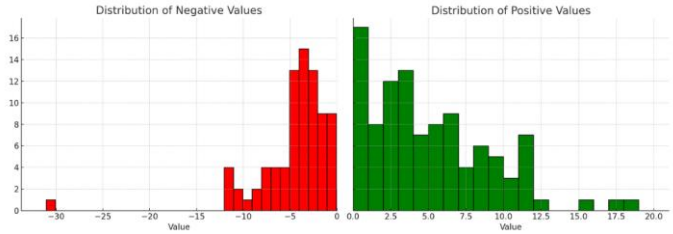
Used as the basis Class 17 of Derivatives Master Classroom (Wei, 2024) and strategy 16.18 from book "*Mercado de opções*" (SILVA, 2020).

This ETF, which tracks the IBOVESPA index, was selected because it has good option liquidity in almost all strikes within a 10% range around the base price, liquidity in up to two advanced series in ATM options, does not experience strike variations during dividend payments, and is less impacted by volatility compared to assets dependent on a single economic sector, providing more predictability in its movement.

For this asset, an operation was determined to have the potential to achieve a 2% return in very favorable scenarios, 1.5% in a mixed scenario, and in a negative scenario, to stay close to zero.

As a first step, the monthly closing variation of the entire historical series since 2009 was analyzed, yielding the following data:

Figure 6: Accumulated monthly variation data of BOVA11



Analyzing the data within one standard deviation from the mean:

Most frequent positive range: Approximately 3.15

Most frequent negative range: Approximately -4.61

Additionally, regarding the total counts:

Total number of positive values: 103

Total number of negative values: 83

Analyzing the obtained data, it is possible to observe the concentration of monthly variation results around -3% and +4%. The proportion of these results is well divided into 44% negative and 56% positive, characterizing the asset with a slight positive bias but not enough to construct a structure based on its directionality. Moreover, the 7% variation range does not allow for an operation seeking profitability in a single range.

Looking at the graph, one might infer a strategy of selling OTM options and buying ATM options, as the sold options would expire and result in the acquisition of the purchased ones. However, this type of operation would be unfeasible due to the risk involved, since breaking through the usual bands is not uncommon. For this operation to be advantageous, it would require selling many OTM options to finance the purchase of a few ATM options, creating a negative exposure far beyond the ideal.

Therefore, an inverse analysis was conducted, resulting in a structure of selling ATM options and buying slightly OTM options.

Tests were conducted to determine the optimal spread (distance between the sold and purchased option) seeking the most profitable proportions. The principle here is that the wider the spread, the more money is made during the setup; however, it also increases the associated delta risk by enlarging the "valley of death" (the structure's region where the asset price stagnates, overly affecting the sold option's price but not the coverage's price). Thus, a spread of 2.00 was established, approximately 1.6% of the asset's value, where even minimal asset movement also affects the coverage.

Because the negative delta value is higher than the setup cost of each leg (joint purchase and sale of call or put), excess coverage is necessary, creating an overhedge. This makes the structure positive when a positive translocation is performed (reversing the initial structure and reopening a new one at a different strike)

and when the asset varies by more than 2%, as the counterparty structure loses value and the hedge options appreciate.

A crucial consideration in this operation is the proportion between sold and bought options. As expiration approaches, the ratio between selling ATM and buying OTM increases, causing a 200 options/K decay in coverage with each roll. This makes the structure resilient to three rolls with this decay. An exit mechanism has been designed, using the values from the last roll to move the put and call pairs away from the asset price, allowing both to expire and then restarting the cycle.

It is proposed to use 15K for each sold leg, maintaining the suggested proportion of the hedges. In this scenario, the margin call is around 30,000 reais (B3 S. , 2024).

BOVA11 Short Iron Butterfly Proposed Management

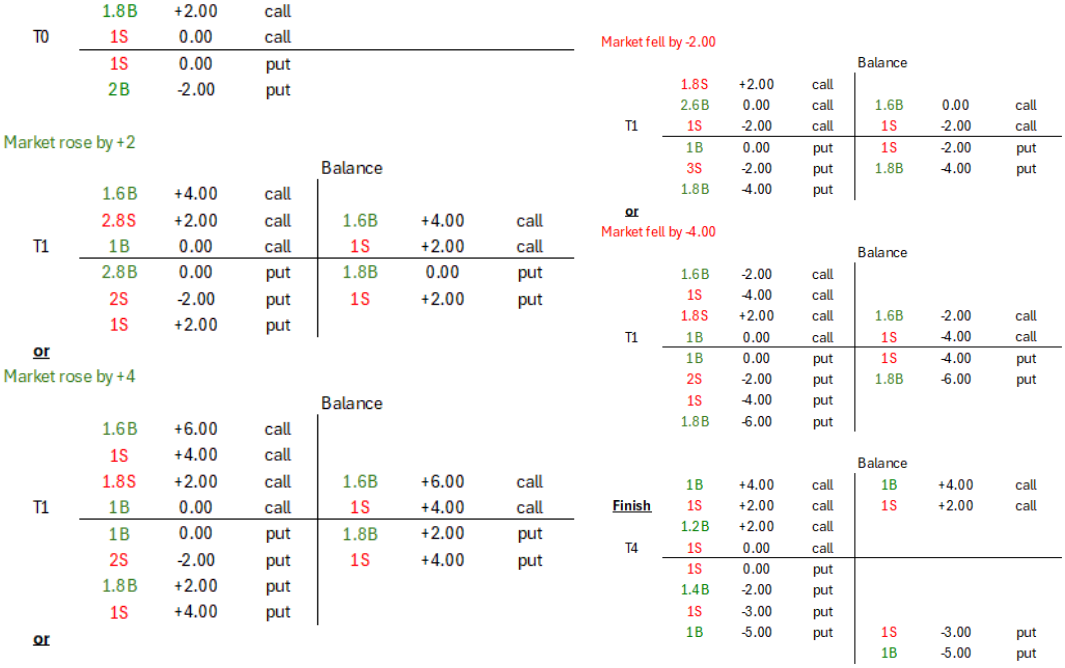


Table 15 in Appendice 5 presents tests conducted with options expiring in 23 and 43 days, utilizing B&S prices at an asset value of 119.08. These tests were part of resilience testing for the designed structure and demonstrate a pattern where translocations and rolls in significant movements of +/- 4 are profitable. Translocations within the same series in smaller movements of +/- 2 also show profitability, while rolling strategies resulted in negative outcomes. The table provides simulations for each leg, representing each pair of put and call buy and sell scenarios. Additionally, it includes total balances multiplied by 15, reflecting the proposed quantity. One limitation of the analysis is that the resulting values decrease with each roll due to reduced coverage. However, this information allows for calibration of overall profitability estimates.

The analysis of rollover was incorporated to explore potential profitability enhancements in this operation, which proved impractical due to the gains from rolling

the sold option being offset by the purchases of coverage, necessitating a reduction in coverage with each new setup. Consequently, the operation shifted its dependence from Theta to Delta, diverging from the conventional approach advocated by Professor SU, who typically advises on operations where some of the sold options remain uncovered. This adjustment was made to better align the operation with the client's risk profile.

PETR4 Straddle Long Call

The Straddle Long Call on PETR4 is proposed as a complementary opportunity to the previous main operation. This operation was chosen due to the asset's liquidity in options across multiple expirations, including ITM options. Additionally, PETR4 typically pays good and regular dividends but is significantly impacted by news releases and government interventions. This scenario regularly creates low peaks that quickly return to the original price. Thus, setting up a Straddle Long Call during these low points is an opportunity because, upon returning to the original price, the put tends to expire, and the sold call is covered by the bought call, resulting in profit. If the price doesn't return, the margin call for the put is considerably lower than for BOVA11, and the put has a positive rollover up to +5.0%, helping to eliminate exposure.

It is suggested to set up the operation after a 3% drop, as long as this drop is not mirrored by other companies in the sector, indicating the stock's own cycle. The suggested volume is 5K on each leg, with the worst-case scenario for BOVA11 and a fully uncovered 5K PETR4 puts resulting in a margin call of approximately 100,000 reais.

If the asset does not behave as described, management should follow the guidelines in Appendice 3.

T0	1S	0.00	call	1B*	0.00	call
	1S	0.00	put			

4.5 Risk Analysis

Impact: Measures the severity of the effect a risk may have on the portfolio if it materializes.

Probability: Measures the expected frequency or chance of occurrence of the risk.

Levels of Assessment

Impact

Low: Minimal impact on the overall performance of the portfolio.

Medium: Moderate impact that may require adjustments in management.

High: Significant impact, potentially resulting in substantial losses.

Probability

Low: Remote possibility of occurrence.

Medium: Occurs with some regularity.

High: Very likely to occur during the lifetime of the portfolio.

Identified Risks in the IPS

Market Valuation Risk: Changes in the yield curve can lead to depreciation of fixed-income and inflation-linked bonds before maturity.

This risk may manifest in the portfolio as a simultaneous devaluation of assets and a reduction in annual yield when interest rates rise, with this devaluation being mitigated if the strategy of holding securities until maturity is maintained, and only realized in cases of abrupt liquidity needs necessitating the premature sale of these securities. Based on the analysis of the proposed portfolio, this risk will be more pronounced in the initial years when the proportion of fixed-rate securities is higher. Conversely, in a scenario of declining interest rates, the portfolio will initially yield above-average returns, gradually declining over time. At this juncture, it is incumbent upon the Manager to assess whether selling overvalued assets to fund new investments is worthwhile, thereby enhancing generated alpha.

Liquidity Risk: Challenges in liquidating positions under adverse market conditions without significantly impacting the investment value.

This risk affects assets differently within the portfolio. If the strategy of holding fixed-income securities until maturity is maintained, this risk is mitigated. For Brazilian securities not covered by the FGC, the risk is present from inception due to their limited issuance and selling them in the secondary market incurs significant discounts. FGC-covered securities will face this risk if multiple bank failures occur simultaneously, reducing the FGC's protection margin and necessitating the immediate sale of a large portion of the portfolio. This scenario is compounded by the credit risk of multiple institutions simultaneously, indicating the presence of a structural and systemic risk in the Brazilian banking market.

For equities, the risk occurs in the event of a collapse in stock prices, requiring simultaneous portfolio liquidation during a market crash.

Physical gold inherently carries this risk due to its nature, being less liquid, and rapid sale may coincide with market valuation risk.

This risk is primary in structured operations because significant market fluctuations can push options deep into the money, making their management challenging even if profitable, often requiring holding the series until the structure's expiration through offsetting.

Credit Risk: Possibility of default on a private credit issuance, especially those not covered by the FGC.

In the portfolio, this type of risk is critical if manifested globally, making diversification across categories the most appropriate mechanism to mitigate it. For products covered by the FGC, even with this protection, it is crucial to avoid smaller banks that have higher exposure to credit risks in favor of larger ones. In this regard, considering the list of banks whose securities are accepted as collateral by B3 is important, as the institution continuously assesses each bank's default risk, providing an excellent protection mechanism at the time of investment.

For products not covered by the FGC, subdividing between real estate and agricultural investments, and within each class, for example, by region of Brazil where the company operates, is a strategy that diversifies the involved risks. For instance, a drought affecting companies in the South but not in the Midwest illustrates how this approach can reduce exposure to specific adverse events.

Regulatory Risk: Changes in laws and regulations affecting investment instruments or financial markets.

In the proposed portfolio, this risk will be monitored if any regulatory changes impact the structure or operations of the companies involved, potentially leading to a default. Additionally, it will be observed if there are changes in FGC coverage conditions or in income tax collection standards. In any scenario, this IPS should be reviewed to adjust the portfolio accordingly.

Exchange Rate Risk: Exposure to foreign currency investments may suffer from exchange rate fluctuations.

This risk is associated with investments abroad and assets priced in dollars, such as gold. If the referenced currency depreciates against the Brazilian Real, profits earned in foreign currency may not cover the currency difference, resulting in a negative investment outcome.

Conversely, there is risk in the opposite direction if the client's consumption pattern in dollar-denominated products is no longer supported by the initially proposed liquidity, leading to a liquidity crunch in the portfolio and disrupting the initial strategy.

Operational Risk: Failures in processes, systems, or internal controls.

This risk is associated with the portfolio manager potentially failing to control investments, resulting in exposures outside established parameters. The solution involves implementing work routines that include double-checking the portfolio after each transaction.

Additionally, it is a critical risk in options trading, starting from the selection of options to be invested in, as the codes are often similar and not standardized among available strikes. There is also similarity between preferred and ordinary shares, which can lead to confusion and adverse outcomes. Furthermore, manual operations carry the additional risk of quantitative buying or selling errors or typing mistakes in prices. In automated operations, there is a risk of "slippage," where the robot, due to configured

limits, encounters a market situation, usually lack of liquidity, and fails to execute an order, leaving the overall position outside established parameters. Again, the manager must have a double-check routine to mitigate this type of risk.

Table 6: Risk matrix

Risks	Probability	Impact
Market Valuation	Medium	High
Credit	Medium	High
Operational	Low	High
Exchange Rate	Medium	Medium
Regulatory	Low	Medium
Liquidity	Low	Medium

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Appendices

Appendice 1. Client's Profile (detailed)

Client Background

Name: Ms. Sarah S. Readsun
Age: 58
Occupation: Businesswoman
Current Portfolio Value: 6 million Brazilian reais
Suitability Category: Aggressive Profile

Investment Goals

Preservation of Purchasing Power: Ensuring that the investment returns surpass inflation indices to maintain the real value of her capital.

Financial Surplus Generation: Generating enough returns to sustain her investments with Raven Enhanced Investments over the coming years.

Long-term Stability and Growth: Focusing on long-term growth through strategic asset allocation and risk management.

Risk Tolerance and Investment Preferences

Ms. Readsun exhibits a medium to high-risk tolerance but tends to lean towards a medium to low willingness to take risks. This balanced approach towards risk indicates that while she is open to potential higher returns, she prefers a cautious approach to mitigate significant losses.

Liquidity Needs

Potential medical emergencies

Acquisition of additional assets

Occasional liquidity is needed for tax payments and external investments.

Expected Performance

The portfolio aims to achieve a minimum real interest rate of 6.5%

Conclusion

This detailed client profile of Ms. Sarah S. Readsun is designed to guide the strategic management of her investment portfolio, ensuring long-term growth, stability, and the ability to adapt to changing market conditions and personal circumstances.

Appendice 2. Profiling Questionnair

This questionnaire aims to comply with the ANBIMA Suitability Guideline (ANBIMA, 2024).

Investor Profile Questionnaire

Investment Horizon:

In how many years do you plan to start using the funds you are investing?

(a) Less than 1 year

(b) Between 1 and 3 years

(c) More than 3 years

Liquidity Needs:

Do you foresee any significant expenses that might require withdrawals before the expected timeline?

(a) Yes

(b) No

Investment Objective:

The primary goal of your investments is:

(a) Capital protection

(b) Moderate growth

(c) Aggressive growth, accepting higher risks

Risk Tolerance:

How would you feel if your investments suffered a 10% loss in a short period?

(a) Very worried and would sell to avoid further losses

(b) A bit worried but would hold the investments

(c) Unconcerned, as it is part of seeking higher returns

Preference for Stability:

You prefer an investment strategy that:

(a) Prioritizes stability and avoids fluctuations

(b) Accepts some fluctuations for moderate growth

(c) Accepts high volatility in pursuit of high returns

Required Returns:

To achieve your financial goals, your investments need to grow:

(a) In line with inflation

(b) Slightly above inflation

(c) Significantly above inflation

Recovery from Losses:

What is your willingness to wait for potential losses to recover in a prolonged downturn in the market?

(a) Low, I prefer to avoid significant losses

(b) Moderate, I can wait for a while but not for many years

(c) High, I can wait several years to recover

Acceptance of Losses:

Are you willing to accept potential losses in pursuit of higher returns?

(a) No

(b) Yes, to a certain extent

(c) Yes, completely

Table 7: Response Matrix X Investor Profiles

Question	*Answer (a)*	*Answer (b)*	*Answer (c)*
1. Investment Horizon	Conservative (Profile 1)	Moderate (Profile 2)	Aggressive (Profile 3)
2. Liquidity Needs		Moderate (Profile 2) / Aggressive (Profile 3)	-
3. Investment Objective			
4. Risk Tolerance			
5. Preference for Stability		Moderate (Profile 2)	Aggressive (Profile 3)
6. Required Returns			
7. Recovery from Losses			
8. Acceptance of Losses			

Conservative Profile (Profile 1):

Investment Horizon: Less than 1 year

Liquidity Needs: Yes

Investment Objective: Capital protection

Risk Tolerance: Very worried and would sell to avoid further losses

Preference for Stability: Prioritizes stability and avoids fluctuations

Required Returns: In line with inflation

Recovery from Losses: Low, I prefer to avoid significant losses

Acceptance of Losses: No

Moderate Profile (Profile 2):

Investment Horizon: Between 1 and 3 years

Liquidity Needs: No

Investment Objective: Moderate growth

Risk Tolerance: A bit worried but would hold the investments

Preference for Stability: Accepts some fluctuations for moderate growth

Required Returns: Slightly above inflation

Recovery from Losses: Moderate, I can wait for a while but not for many years

Acceptance of Losses: Yes, to a certain extent

Aggressive Profile (Profile 3):

Investment Horizon: More than 3 years

Liquidity Needs: No

Investment Objective: Aggressive growth, accepting higher risks

Risk Tolerance: Unconcerned, as it is part of seeking higher returns

Preference for Stability: Accepts high volatility in pursuit of high returns

Required Returns: Significantly above inflation

Recovery from Losses: High, I can wait several years to recover

Acceptance of Losses: Yes, completely

Appendice 3. Structured Strategies

The " Derivatives Master Classroom " is an advanced options strategy course taught by the mathematician and financial consultant Su Choung Wei. The course covers over 60 strategies involving various structures created through combinations of options and correlated assets, aimed at optimizing the profitability of stock or fixed income portfolios. It introduces different concepts regarding the value and use of money and assets, the fundamentals behind options, and how integrating them can alter risks and payoffs. The course also explores both ancient and modern theories on the use of derivatives for retail and large fund operators. A key distinction of the strategies presented is that most begin with a sold position in options, with the intent to repurchase them at lower prices, contrasting the common practice among operators who typically buy options as a hedge against portfolio positions. The complete course is offered annually and includes 60 hours of video content, available on the "Mestre dos Derivativos" YouTube channel through a subscription (Wei, 2024).

The complete transcription of the 2021 videos is available at the supplementary documents fold (Supplementary, 2024).

Along with the concepts presented in section 3.1 of this document, it is understood that their understanding and the Anakha Spirals class from march/2024, as transcribed here, form the core of the course and the operations that will be used in portfolio management, in addition to the material presented here, the book "Mercado de Opções, Conceitos e Estratégias" (SILVA, 2020) will be used as a reference for options trading operations.

Anakha Spirals	**mar/24**
5 Principles	
1. Positive timing:	The passage of time must add value, so all financial operations must be positive.
2. Positive translocation:	If the operation goes wrong along the way, do you receive or pay to enter a new game? Or, the operation went well, can I stay in the game receiving?

Example of operation with positive translocation, bull spread:

T0	B 0,00/S +2,00 Market rose - translocation	call	-0,5
T1	S 0,00/B +2,00	call	0,8
T1	B 2,00/S +4,00	call	-0,4

3. The simpler and further, the better.

4. A structure is = a 1 domain element: It is necessary to know all the details of the structure to treat it as an element.

5. Volatility is natural and structural to assets. Don't control it, just understand it:

INFINITE FLY

T-1	S 0,00		call
T0	B 0,00/ 2S* 0,00/ B* 0,00	>0	call
T0 balance	2S* 0,00/ B* 0,00		call

Balance table

Time	Strike	Maturity	*	**	***	****	*****	******	Type
T-1	0,00	**1S**							call
T0	0,00	**1B**	**2S**	**1B**					call
T0	0,00		**2S**	**1B**					call
T1	0,00			**3S**	**2B**				call
T2	0,00				**4S**	**3B**			call
T3	0,00					**5S**	**4B**		call

→ If you do a put with you make a profit;

→ Same negative exposure;

→ Depending on the prices of the options, the structure starts from a debt and becomes positive, **time to dismantle.**

→ Proposal to change the unit purchased in sequence as it appears to be "getting in the way".

Balance table

Time	Strike	Maturity	*	**	***	****	*****	******	*******	Type
T-1	0,00	**1S**								call
T0	0,00	**1B**	**2S**		**1B**					call
T0	0,00		**2S**		**1B**					call
T1	0,00			**4S**	**1B**	**2B**				call
T2	0,00				**7S**	**2B**	**4B**			call
T3	0,00					**12V**	**4B**	**7B**		call
T4	0,00						**20V**	**7B**	**12B**	call

→ You must put a little money into this movement.

Explanation of why Infinite Fly works

→ When you are short the option, you are earning interest and reapplying and that is why it works.

→ It works very well in a stationary market.

→ Example with SOXL, shows exponential growth and comments from the second week onwards pockets money every rollover - **test market prices.**

INFINITE/DIAGONAL FLY

→ Use when market starts to fall.

Balance table **Stopped Market**

Time	Strike	Maturity	*	**	***	****	*****	******	*******	Type
T-1	0,00	**1S**								call
T0	0,00	**1B**								call
T0	-2,00		**2S**							call
T0	-4,00			**1B**						call
T0	-2,00		**2S**							call
T0	-4,00			**1B**						call
T1	-2,00			**2S**						call
T1	-4,00				**1B**					call

→ Roll sideways.

Balance table **Market Falling**

Time	Strike	Maturity	*	**	***	****	*****	******	*******	Type
T0	-2,00			**2S**						call
T0	-4,00				**1B**					call
T1	-2,00			**2B**						call
T1	-4,00				**4S**					call
T1	-6,00					**2B**				call
T1	-4,00				**3S**					call
T1	-6,00					**2B**				call

→ Roll for strikes below.

Balance table **Market Rising**

Time	Strike	Maturity	*	**	***	****	*****	******	*******	Type
T1	-4,00				**3S**					call
T1	-6,00					**2B**				call
T2	-2,00					**2S**				call
T2	-4,00				**3B**		**1B**			call
T2	-6,00					**2S**				call
T2	-2,00					**2S**				call
T2	-4,00						**1B**			call

→ Su got caught up in this passage, check if that's right.

→ Roll for strikes above in the same series, if you stop, roll sideways.

→ With puts it is possible to balance to improve the earning potential.

APPLICATION OF HYBRID STRUCTURES

→ You must be skeptical about the structures because they only work for a while, you must let go when they are making money.

Balance table

Time	Strike	Maturity	*	**	***	****	*****	******	*******	Type
T-1	0,00	**1S**								call
T0	0,00	**1B**	**2S**						**1B**	call
T0	0,00		**1S**							put
T0	0,00		**2S**						**1B**	call
T0	0,00		**1S**							put

→ Market rose and put expired

Balance table

Time	Strike	Maturity	*	**	***	****	*****	******	*******	Type
T0	0,00		**2V**						**1B**	call
T1	0,00		**2B**							call
T1	0,00			**4V**	**2B**				**1B**	call
T1	0,00			**1V**						put
T1	0,00			**4V**	**2B**				**1B**	call
T1	0,00			**1V**						put

→ Put can be sold after the market falls to help with rollovers.

→ It makes more sense to start small and scale than to go big.

PERPETUAL STRANGLE
REVERSE STRANGLE
STRADDLE LONG PUT
STRADDLE LONG CALL

→ Mixed structures.

→ Winning trades: 85% - 3 tips Dual: 2C/1P ou 2P/1C
15% - 2 tips Collateral: P/P, C/C, P/C

PERPETUAL STRANGLE

→ Long puts in Brazil are cheap due to the pricing policy of managers who need to be long shares, which is the same as selling puts.

T0	S*	+2.00	put	B ∞	+2.00	call
	S*	-2.00	call			

Weekly roll:

T1	S**	+2.00	put	B ∞	+2.00	call
	S**	-2.00	call			

→ In the first week the put changes to monthly, even paying the difference.

→ The other rolls pocket or invest in rolling the long call. It can be done if the paper approaches +2.00.

→ For the monthly it works very well, but it is out of fashion.

REVERSE STRANGLE

→ It's not the ideal name, but it's covered in the put.
→ Either you have the asset, or you cover upwards.
→ It has a bad strategy because it doesn't work anywhere, but in Brazil it does.

T0	S*	+2.00	put			
	S*	-2.00	call	2B ∞	-2.00	put

→ Better monthly rollover, in 3 months you usually pay off the 4 of Delta.
→ In the US, puts generally have a positive put roll even in the money. Good for Infinite Fly.

Duality and asymmetry

→ Binarization Theory: Eligible risk, the one you choose to take.
→ Does not use statistics to calibrate risk.

STRADDLE LONG PUT

	B*	4.00	call			
T0	S*	0.00	call	B ∞	0.00	put
	S*	0.00	put			

market fell a little

→ Rolls reducing.

T1				B ∞	0.00	put
	0,9S**	0.00	put			

market rose a little

→ Rolls reducing.

	0,9B**	4.00	call			
T1	0,9S**	0.00	call	B ∞	0.00	put

→ It continued until all the sold ones expired, leaving the sold put.

	C*	4.00	call			
T2	S**	0.00	call	2B ∞	0.00	put
	S**	0.00	put			

STRADDLE LONG CALL

T0	S*	0.00	call	B ∞	0.00	call
	S*	0.00	put			

market fell a little

T1	S**	0.00	call	B ∞	0.00	call

	S**	0.00	put	B ∞	0.00	put

→ Set up a long put straddle to balance the risk

market rose a little

T1	S**	0.00	call	2B ∞	0.00	call
	S**	0.00	put			

→ Set up another long call straddle
→ Principle of binary exclusion, both from spirals and from binarization theory.
→ Reasoning: If put turns to dust, expose another put SLP
If call has expired, you expose another SLC call

SHORT STRADDLE

T0	5S*	0.00	call			
	5S*	0.00	put			

→ In Brazil there is distortion between call and put because in addition to the high volume, the put is European, and the call is American.

market rose 2.00

→ To maintain the risk of the call: With the money from the rollover, you buy a HLS.
→ To maintain the risk of the put: Set up a long call straddle.

	5S**	5.00	call	5B ∞	0.00	call
	5S**	5.00	put			
T1	6S**	0.00	call	B ∞	0.00	call

market fell below 0.00

				5B ∞	5.00	call
Balance	5S**	5.00	put			
T1				B ∞	0.00	call

→ On top of the 0.00 long call, an SLP beats, keeping only the risk of the call
→ On top of the long 5.00 call, an SLP beats, keeping only the risk of the call

	5S***	5.00	put	5B ∞	5.00	call
	5S***	0.00	put	5B ∞	0.00	put
T2	6S***	0.00	call	B ∞	0.00	call

→ Point of attention to the margin call in the call as the new SLP of 5 units opened a delta of 5.00.
→ Ditto for puts since the long put does not cover the entire short put.
→ SU drew attention to scrolling templates

DUALITY AND ASYMMETRY

→ In doctrine there is the concept of asymmetry, but it generally has a cost.

→ Asymmetry provides security and gains potential.

→ The world is not completely rational.

→ The course is more related to temporal asymmetry than delta asymmetry (options OTM).

→ Duality concept: If I am already taking call risk, I can take put risk, but making this risk reasonably acceptable.

e.g.

T0	S*	0.00	put				
T1	S*	0.00	put	B**	+1.00	call	
	S*	0.00	call				

→ You pay a little, assume the delta risk, but "worse" the situation.

→ The concept of duality is opposed to the efficiency of symmetry, but without bearing the price of purchasing hedge (collateral).

→ Duality balances risk.

Anakha Dual Map

→ There are only 4 basic custody situations:
Bought in put or call
Sold in put or call

→ **Principle: I cannot increase my risk.**

→ 3 Options property:
Value
Coverage
Equivalence: Every strategy has a Binary version

→ Map does not explore equivalence

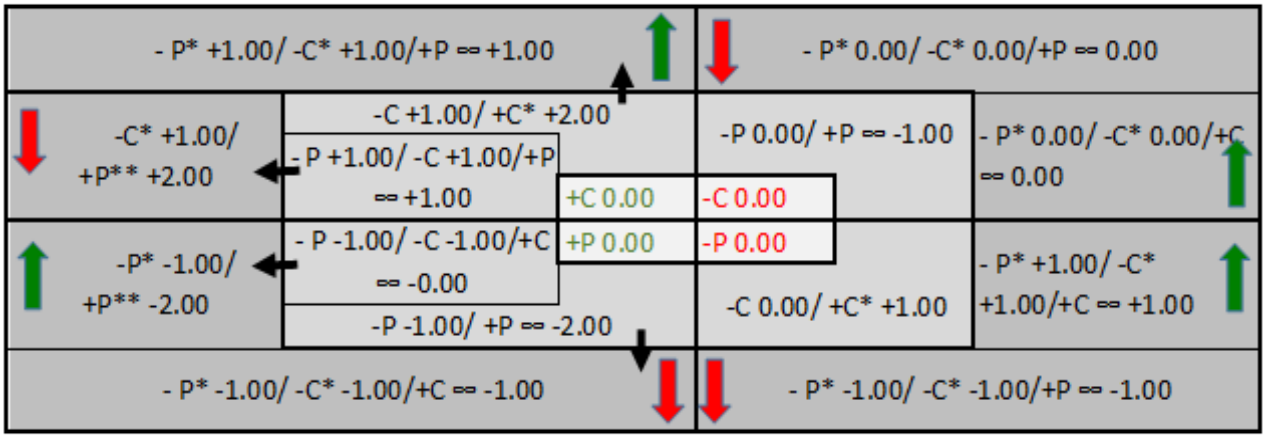
→ The original map has 4 progressions, but with the weekly options it is not necessary due to the reduction in rolling that throws the structure into one of the initial cases.

→ The concept of assets and liabilities can be misleading because managing the purchased option can be more complicated than the sold option.

→ In the purchased band, the purchased option can put together if it goes against it.

→ On the map, the long put is the element of asymmetry, as it provides coverage for a long time.

Figure 7: Anakha Dual Map



Codes:

<value>	Strike						
C	Call	P	Put	(-)	Sold	(+)	Purchased
(*)	1 series ahead						
(∞)	farthest series that you can buy with the proceeds from sales.						

Arrows

Up	Market rose
Low	Market fell
Side	Only management possibility

Colors

	Starting position
	Dual possibilities
	Management

Notes:

→ After the first handling, the situation invariably returns to one of the dual positions presented.

→ Starting from long positions, if the chosen dual is the same Type (call or put) and the market is against the position, it resets.
e.g.: +P > -P/+P and the market goes up > zero

Cardinal Equivalence

→ Binarization Theory

				CE				
T0	B	0.00	put	=				
	2S	-2.00	put		S	-4.00	put	

Structural Equivalence

→ Anakha Spirals
→ The two structures have approximately the same functionality.
→ The map basically works with diagonal lock and straddle.

DS Call	T0	S	0.00	call		B*	+1.00	call
	→	Win at the bottom						
DS Put	T0	S	0.00	put				
	→	Win high				B*	-1.00	put
SLC	T0	S	0.00	call		B***	0.00	call
		S	0.00	put				
	→	Win high						
	or							
	T0	S	0.00	call		B**	0.00	call
		S	0.00	put	B*	-1.00	put	
		B	-1.00	put				
	→	Win high						
SLP	T0	S	0.00	call				
		S	0.00	put		B ∞	0.00	put
	→	Win at the bottom						
	or							
	T0	S	0.00	call				
		S	0.00	put		B****	0.00	put
		B	-1.00	put				
	→	Reduction in coverage time						
	→	Win at the bottom						
	or							
	-	B	+1.00	call				
	T0	S	0.00	call				
		S	0.00	put		B****	0.00	put
		B	-1.00	put				
	→	Win at the bottom						

SE

SE

Asymmetric Hedge

→ It returned from the catacombs with the return of vol.

→ **In fact, Straddle H.A.**

→ Better to do it with a put because carrying the call is expensive.

	B	+4.00	call			
	S	+2.00	call			
-						
T0	S	+2.00	put			
				2B**	0.00	put

→ Wins in a downturn, has structural equivalence with the previous ones.

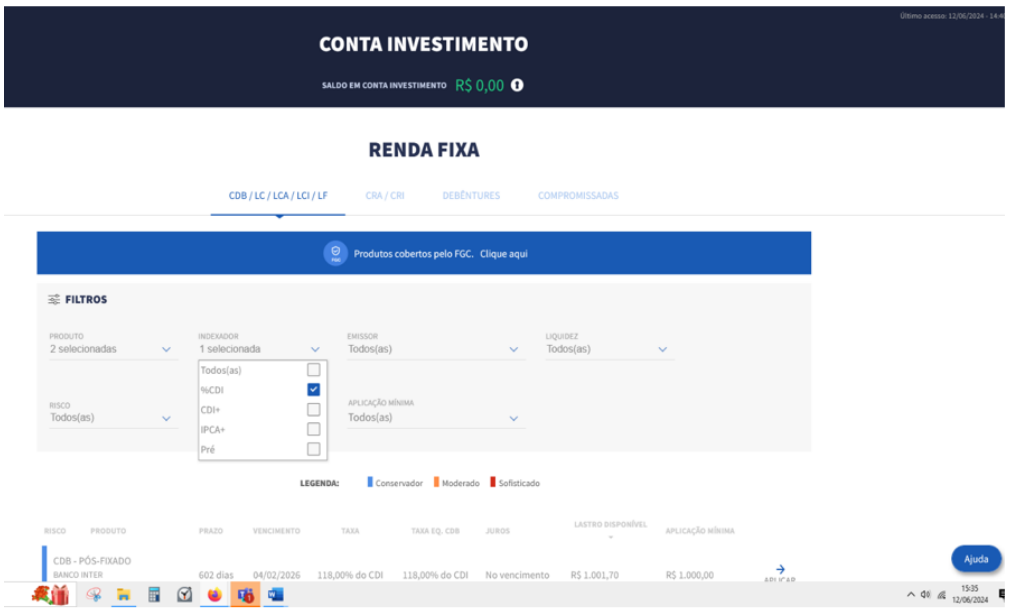
→ Potentially wins, even in a rising market.

→ **Learn to balance risk!**

→ **The world changed, the tools changed.**

Appendice 4. Examples of Fixed Income Instruments

Figure 8: Search screen for fixed income products of BTG Pactual Banck on 06/15/2024.



Source: https://investimentos.btgpactual.com/renda-fixa <Access on 06/15/2024>.

Figure 9: Examples of post-fixed income securities available at BTG Pactual Bank on 06/15/2024.

EMISSOR	PRODUTO	PRAZO	VENCIMENTO	INDEXADOR	TAXA
Neon Financeira	CDB	903	02/12/2026	%CDI	118,50%
Banco Original	CDB	1097	14/06/2027	%CDI	117,50%
Banco Paulista	CDB	730	12/06/2026	%CDI	117,00%
BDMG	CDB	1644	12/12/2028	%CDI	116,00%
BDMG	CDB	1826	12/06/2029	%CDI	116,00%
BDMG	CDB	1461	12/06/2028	%CDI	115,00%
Banco Semear	CDB	1800	17/05/2029	%CDI	114,00%
Banco Original	CDB	730	12/06/2026	%CDI	114,00%
BDMG	CDB	1279	13/12/2027	%CDI	114,00%
BDMG	CDB	1097	14/06/2027	%CDI	113,00%
Caruana	CDB	1825	11/06/2029	%CDI	113,00%
Santana CFI	CDB	365	12/06/2025	%CDI	113,00%

Source: Obtained through direct contact with the advisory office of BTG Prosperidade Investimentos on 06/15/2024. https://prosperidadeinvest.com.br

Figure 10: Examples of Inflation-Linked Securities Available at BTG Pactual Bank on 06/15/2024

EMISSOR	PRODUTO	PRAZO	VENCIMENTO	INDEXADOR	TX. PORTAL
Banco Pan	LF	1826	12/06/2029	IPCA	7,25%
Banco Fibra	CDB	1644	12/12/2028	IPCA	7,20%
Banco Fibra	CDB	1826	12/06/2029	IPCA	7,20%
Banco Pan	LF	1097	14/06/2027	IPCA	7,20%
Banco Fibra	CDB	2009	12/12/2029	IPCA	7,15%
Banco Pan	CDB	1097	14/06/2027	IPCA	7,15%
Banco Pan	CDB	1826	12/06/2029	IPCA	7,15%
Banco Fibra	CDB	1461	12/06/2028	IPCA	7,10%
Banco Pan	LF	1461	12/06/2028	IPCA	7,10%
Banco Pan	CDB	1461	12/06/2028	IPCA	7,05%

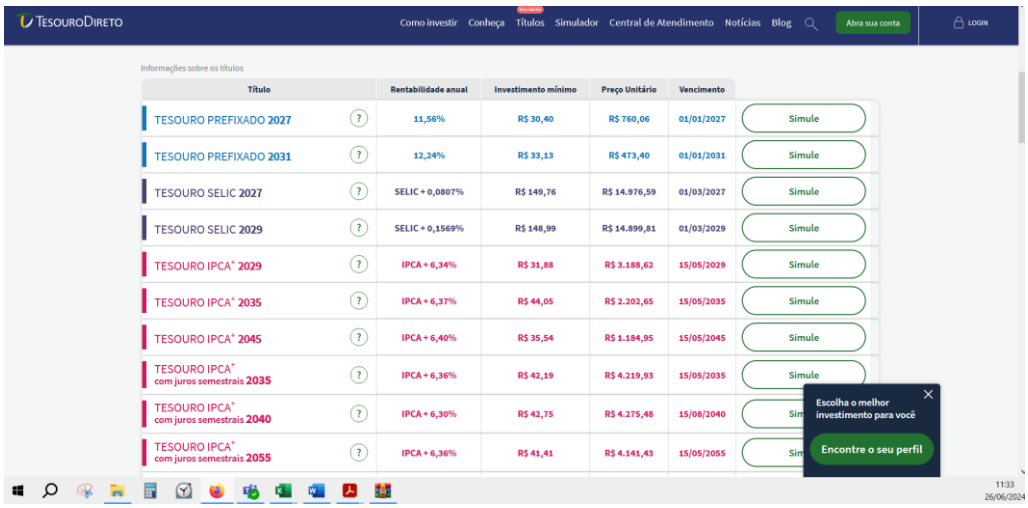
Source: Obtained through direct contact with the advisory office of BTG Prosperidade Investimentos on 06/15/2024. <https://prosperidadeinvest.com.br>

Figure 11: Examples of Fixed-Rate Securities Available at BTG Pactual Bank on 06/15/2024

EMISSOR	PRODUTO	PRAZO	VENCIMENTO	INDEXADOR	TX. PORTAL
Banco Original	CDB	1097	14/06/2027	PRE	13,56%
anco C6 Consignad	CDB	1826	12/06/2029	PRE	13,30%
Banco Original	CDB	730	12/06/2026	PRE	13,18%
anco C6 Consignad	CDB	1461	12/06/2028	PRE	13,15%
Banco Fibra	CDB	1644	12/12/2028	PRE	12,90%
Banco Fibra	CDB	1826	12/06/2029	PRE	12,90%
anco C6 Consignad	CDB	1097	14/06/2027	PRE	12,90%
Banco Fibra	CDB	1461	12/06/2028	PRE	12,75%
Banco Pan	LF	1826	12/06/2029	PRE	12,74%
Banco BTG Pactual	LF	1826	12/06/2029	PRE	12,69%
Andbank	CDB	1440	22/05/2028	PRE	12,65%

Source: Obtained through direct contact with the advisory office of BTG Prosperidade Investimentos on 06/15/2024. https://prosperidadeinvest.com.br

Figure 12: Examples of Brazilian Government Bonds available on 06/26/2024.



Source: < https://www.tesourodireto.com.br/titulos/precos-e-taxas.htm>

Figure 13: Examples of Galapagos Products.

Relatório Consolidado de Investimentos

Galapagos Wealth Management

Crédito Privado	Taxa	Dt Compra	PU Compra	Dt Vencimento	Posição Inicial	Posição Final	Valor Atual Líquido	Rentabilidade Mês %
CRA								
CRA ALIANCA IPCA 9,5 15mai2028 CRA02300CI1	IPCA+ 9,5	30/10/2023	1.011,2133	15/05/2028	14.580,1900	14.660,57	14.660,57	0,55%
CRA BELMIRO IPCA 9 20nov2029 CRA02300HQX	IPCA+ 9	08/09/2023	1.068,5474	20/11/2029	53.786,4345	53.975,89	53.975,89	0,35%
CRA CABO VERDE IPCA 8 30jun2026 CRA02100199	IPCA+ 8	25/10/2023	645,4341	30/06/2026	15.519,3159	15.596,33	15.596,33	0,50%
CRA CABO VERDE IPCA 8 30jun2026 CRA02100199	IPCA+ 8	21/12/2022	806,1827	30/06/2026	14.518,0697	14.590,12	14.590,12	0,50%
CRA CABO VERDE IPCA 8 30jun2026 CRA02100199	IPCA+ 8	19/05/2022	927,2082	30/06/2026	11.514,3311	11.571,47	11.571,47	0,50%

Source: <https://glpgwm.com/conta/login?returnUrl=%2F>

Appendice 5. Portfolio complementary information

Figure 5 complementary information

Efficient Frontier and Tangency Portfolio Calculation:

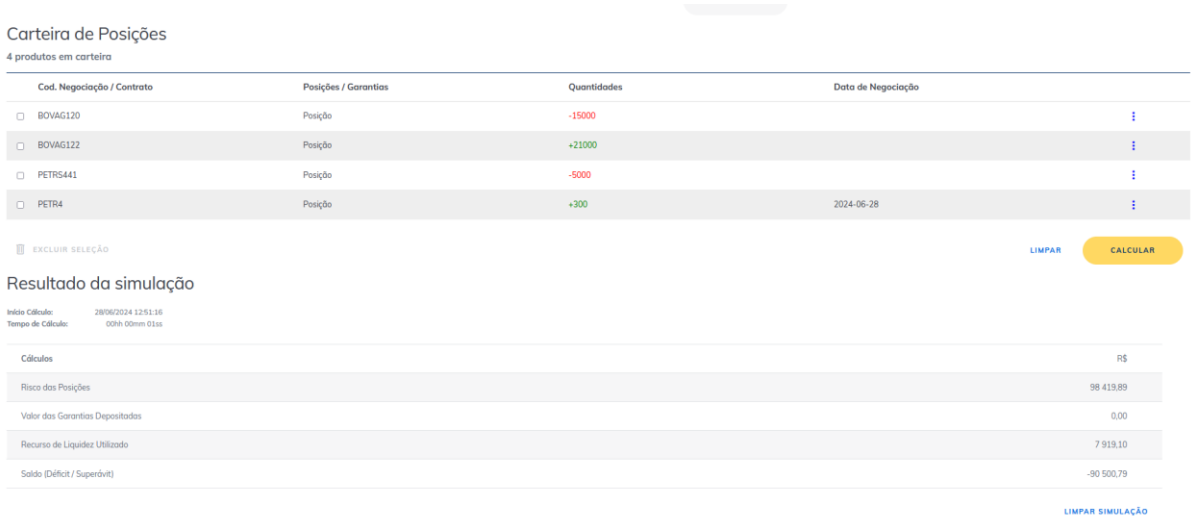
Simulated 10,000 portfolios using Monte Carlo simulation to generate possible combinations of the asset categories.

Calculated the expected return and risk (standard deviation) for each simulated portfolio.

Identified the portfolio with the highest Sharpe Ratio as the tangency portfolio.

Adjusted the returns of the tangency portfolio by adding the 1.5% increment from structured operations.

Figure 14: Example of B3 Margin Simulation.



Carteira de Posições

4 produtos em carteira

Cod. Negociação / Contrato	Posições / Garantias	Quantidades	Data de Negociação
BOVAG120	Posição	-15000	
BOVAG122	Posição	+21000	
PETRS441	Posição	-5000	
PETR4	Posição	+300	2024-06-28

EXCLUIR SELEÇÃO LIMPAR CALCULAR

Resultado da simulação

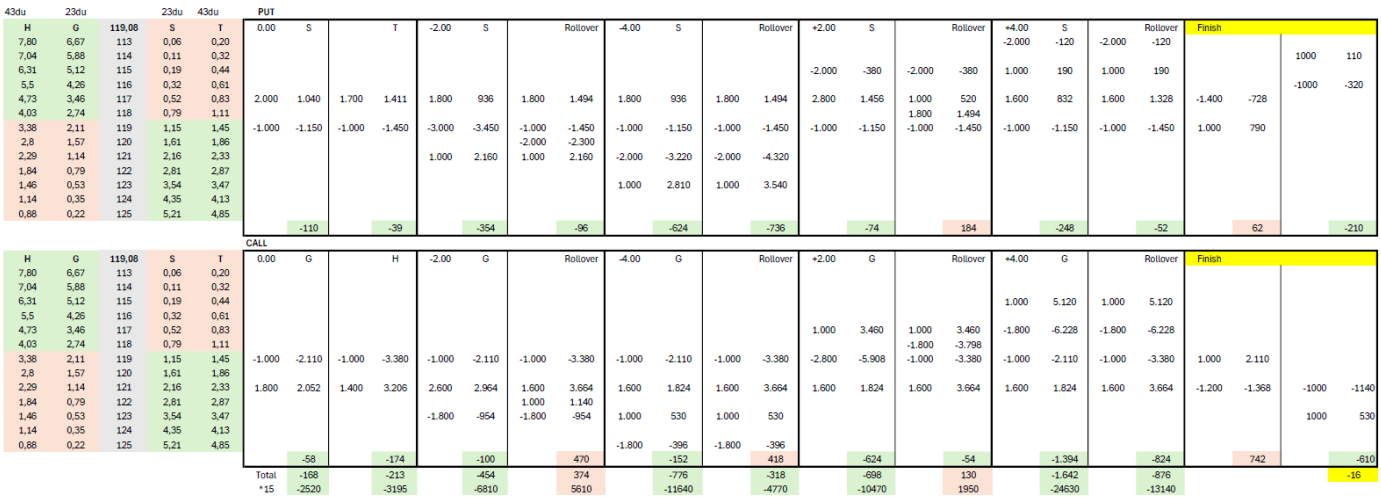
Início Cálculo: 28/06/2024 12:51:16
Tempo de Cálculo: 00hh 00mm 01ss

Cálculos	R$
Risco das Posições	98 419,89
Valor das Garantias Depositadas	0,00
Recurso de Liquidez Utilizado	7 919,10
Saldo (Déficit / Superávit)	-90 500,79

LIMPAR SIMULAÇÃO

Source: <https://simulador.b3.com.br/>

Figure 15:Assembly simulation, High, Low, Rollover and Disassembly scenarios of the BOVA11 operation.



43du	23du		23du	43du	PUT																					
H	G	119,08	S	T	0.00	S		T	-2.00	S		Rollover	-4.00	S		Rollover	+2.00	S		Rollover	+4.00	S		Rollover	Finish			
7,80	6,67	113	0,06	0,20																	-2.000	-120	-2.000	-120				
7,04	5,88	114	0,11	0,32																							1000	110
6,31	5,12	115	0,19	0,44													-2.000	-380	-2.000	-380	1.000	190	1.000	190				
5,5	4,26	116	0,32	0,61																							-1000	-320
4,73	3,46	117	0,52	0,83	2.000	1.040	1.700	1.411	1.800	936	1.800	1.494	1.800	936	1.800	1.494	2.800	1.456	1.000	520	1.600	832	1.600	1.328	-1.400	-728		
4,03	2,74	118	0,79	1,11															1.800	1.494								
3,38	2,11	119	1,15	1,45	-1.000	-1.150	-1.000	-1.450	-3.000	-3.450	-1.000	-1.450	-1.000	-1.150	-1.000	-1.450	-1.000	-1.150	-1.000	-1.450	-1.000	-1.150	-1.000	-1.450	1.000	790		
2,8	1,57	120	1,61	1,86							-2.000	-2.300																
2,29	1,14	121	2,16	2,33					1.000	2.160	1.000	2.160	-2.000	-3.220	-2.000	-4.320												
1,84	0,79	122	2,81	2,87																								
1,46	0,53	123	3,54	3,47									1.000	2.810	1.000	3.540												
1,14	0,35	124	4,35	4,13																								
0,88	0,22	125	5,21	4,85																								
						-110		-39		-354		-96		-624		-736		-74		184		-248		-52		62		-210

CALL																										
H	G	119,08	S	T	0.00	G		H	-2.00	G		Rollover	-4.00	G		Rollover	+2.00	G		Rollover	+4.00	G		Rollover	Finish			
7,80	6,67	113	0,06	0,20																								
7,04	5,88	114	0,11	0,32																								
6,31	5,12	115	0,19	0,44																	1.000	5.120	1.000	5.120				
5,5	4,26	116	0,32	0,61																								
4,73	3,46	117	0,52	0,83													1.000	3.460	1.000	3.460	-1.800	-6.228	-1.800	-6.228				
4,03	2,74	118	0,79	1,11															-1.800	-3.798								
3,38	2,11	119	1,15	1,45	-1.000	-2.110	-1.000	-3.380	-1.000	-2.110	-1.000	-3.380	-1.000	-2.110	-1.000	-3.380	-2.800	-5.908	-1.000	-3.380	-1.000	-2.110	-1.000	-3.380	1.000	2.110		
2,8	1,57	120	1,61	1,86																								
2,29	1,14	121	2,16	2,33	1.800	2.052	1.400	3.206	2.600	2.964	1.600	3.664	1.600	1.824	1.600	3.664	1.600	1.824	1.600	3.664	1.600	1.824	1.600	3.664	-1.200	-1.368	-1000	-1140
1,84	0,79	122	2,81	2,87							1.000	1.140																
1,46	0,53	123	3,54	3,47					-1.800	-954	-1.800	-954	1.000	530	1.000	530											1000	530
1,14	0,35	124	4,35	4,13																								
0,88	0,22	125	5,21	4,85									-1.800	-396	-1.800	-396												
						-58		-174		-100		470		-152		418		-624		-54		-1.394		-824		742		-610
					Total	-168		-213		-454		374		-776		-318		-698		130		-1.642		-876				-16
					*15	-2520		-3195		-6810		5610		-11640		-4770		-10470		1950		-24630		-13140				

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