Navigating Interest Differentials: Yen Carry Trade Mechanisms and Corporate Financing Decisions

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INTRODUCTION

In recent decades, movements in the Japanese yen have been a key determinant of the workings of the world economy. The policy of borrowing low-return yen to invest in a better-performing asset elsewhere, known as the yen carry trade, is not just a short-run pursuit of differential interest rates. It is a manifestation of underlying asymmetries of monetary policy, of behavioral asymmetries between investors in uncertain environments, and of the structural vulnerabilities of open markets.

Understanding the yen carry trade calls for a look at both its theoretical underpinnings and its practical applications. Therein lies the failure of the major conditions of international finance, especially the failure of uncovered interest parity. Beyond that, the strategy intersects with firm-specific decisions, capital market liquidity, and periods of global financial strain. Its impact is compounded by leverage, skewed by expectation, and increasingly influenced by changes in monetary policy in Japan.

This thesis addresses the subject from a holistic perspective, from tracing the economic logic, operative mechanisms, and overall market repercussions of the carry trade. Integrating analysis of past trends with a new look at recent trends, it seeks not just to uncover how the carry trade works, but how it influences risk transmission and strategic action from industry to industry. The overarching mission is to see the yen's ongoing relevance in a system that remains driven by divergence, a propensity towards volatility, and the quest for yield.

CHAPTER 1: THE CARRY TRADE AND ITS THEORETICAL FRAMEWORK

1.1. Introduction to the Carry Trade

In the modern global financial architecture, few practices have been as long-standing as the carry trade. One of the most sustained characteristics of global markets is a phenomenon on which the carry trade relies: the presence of interest rate differentials between different countries. The essence of the carry trade is to borrow in a low-interest-rate currency (termed the funding currency) and invest the proceeds in a higher-interest-rate currency or asset (termed the target or investment currency). The investor receives a payoff from the interest rate differential (termed the carry), while being subjected to capital appreciation or depreciation with any exchange rate movement.

The profitability of the carry trade is contingent on the failure of the uncovered interest parity (UIP) condition, which predicts that any difference in interest rates between two currencies must equal the expected exchange rate change.

Yet the carry trade does involve substantial risks. Most notably among them is exposure to exchange rate risk. Should the funding currency exchange rate rise substantially, the anticipated interest differentials can be offset, leading to large financial losses.

The strategy has been especially prominent in times of low global volatility and high liquidity when investors are keener to take on risk in order to earn yield. These are fertile times for widespread carry trade to flourish and thereby to impact exchange rates, stock and bond markets, and general financial stability. In addition, higher levels of leverage in carry trade positions increase both returns and risks, and thus also represent a potential trigger for systemic market corrections when unwound.

Although the mechanics of the carry trade are relatively simple to express in financial terms, its consequences extend far beyond arbitrage opportunities at the individual level. Carried out on a large scale by financial intermediaries and institutional investors, carry trade tactics become a fundamental force behind capital flows across borders and have real impacts on exchange rates as well as credit and market stability. Thus, it is necessary to understand the wider significance to international finance of the phenomenon. As a

fundamentally cross-border investment technique, the carry trade functions as a vehicle by which differences in monetary policy are transmitted across borders to impact not just foreign exchange markets but also the prices of equities and bonds in target nations.

1.2. Definition and theoretical background

1.2.1. Detailed definition of Carry Trade

To build on the conceptual framework previously discussed, the carry trade can be formalized as a strategy aimed at generating profit by exploiting disparities in nominal yields across currencies. In its simplest form, it involves borrowing in a currency with a low interest rate (the funding currency) and investing in a currency with a higher interest rate (the target or investment currency). The fundamental goal of the strategy is to capture the interest rate differential as a source of profit, under the assumption that the exchange rate between the two currencies will remain stable or move favorably during the holding period. The return on a standard carry trade position can be expressed as follows:

$$Return = \left(i_{target} - i_{funding}\right) + \Delta e$$

Where:

- i_{target} = interest rate in the target (high yielding) currency
- $i_{funding}$= interest rate in the funding (low yielding) currency
- Δe = change in the exchange rate, defined as the percentage appreciation or depreciation of the target currency relative to the funding currency

In this framework:

- A positive Δe implies an appreciation of the target currency, enhancing the carry trade return.
- A negative Δe implies a depreciation of the target currency, reducing or possibly negating the carry trade return

The strategy is most profitable when the target currency does not depreciate by more than the interest differential, an outcome that directly contradicts the Uncovered Interest Parity (UIP) condition. According to UIP, the expected appreciation of the funding currency should fully offset the interest rate gain from holding the target currency, thereby

eliminating arbitrage opportunities. However, substantial empirical evidence shows that UIP does not hold consistently in practice, which allows carry trade strategies to generate persistent, albeit risky, returns[1,2]. Importantly, the carry trade is not limited to spot currency markets. It can also be executed through forward contracts or currency swaps, in which the investor simultaneously agrees to exchange currencies at a future date and rate[3].

While the basic mechanics are straightforward, the carry trade becomes more complex in practice due to the use of leverage, portfolio diversification across multiple currency pairs, and hedging through derivatives. These extensions enhance potential returns but also magnify downside risks, especially during periods of elevated market volatility, when the funding currency can appreciate sharply as investors unwind positions. This phenomenon often associated with global "risk-off" episodes.

Thus, the carry trade is best understood as a conditional arbitrage strategy: it offers returns only under certain market conditions and exposes investors to potentially asymmetric outcomes.

1.2.2. Key theoretical concepts: Covered and Uncovered Interest Rate Parity

As introduced earlier, the theoretical foundations of the carry trade are closely tied to two central concepts in international finance: Covered Interest Rate Parity (CIP) and Uncovered Interest Rate Parity (UIP). These parity conditions describe how interest rate differentials between countries relate to movements in exchange rates and are essential to understanding both the rationale for and the apparent anomalies exploited by carry trade strategies.

Covered Interest Rate Parity (CIP):

Covered Interest Rate Parity is a no-arbitrage condition that holds when investors use forward contracts to eliminate exchange rate risk in cross-currency investments. According

[1] Engel, C. (2016). *Exchange Rates, Interest Rates, and the Risk Premium*. *American Economic Review*, 106(2), 436–474.
[2] Burnside, C., Eichenbaum, M., Kleshchelski, I., & Rebelo, S. (2011). *Do Peso Problems Explain the Returns to the Carry Trade? Review of Financial Studies*, 24(3), 853–891.
[3] Clarida, R., Davis, J., & Pedersen, N. (2009). *Currency Carry Trade Regimes: Beyond the Fama Regression*. *Journal of International Money and Finance*, 28(8), 1375–1389.

to CIP, the difference between the interest rates of two countries should equal the forward premium or discount on their respective currencies. Mathematically, it is expressed as:

$$(1 + i_{domestic}) = \left(1 + i_{foreign}\right) \times \frac{F}{S}$$

Rearranging the formula leads to the approximation:

$$\frac{F - S}{S} \approx i_{domestic} - i_{foreign}$$

Where:

- F = forward exchange rate (funding currency per unit of target currency)
- S = spot exchange rate (funding currency per unit of target currency)

This relationship assumes no transaction costs and no capital controls, and it generally holds in well-functioning, liquid markets. If CIP fails, it suggests either arbitrage opportunities exist or there are frictions such as capital constraints, regulatory barriers, or credit risks. While historically considered robust, CIP was found to deviate significantly during the 2007–2009 global financial crisis, particularly due to counterparty risk and disruptions in funding markets[4]. CIP is not directly exploited by the carry trade, because carry trade strategies do not hedge currency risk. However, it provides a reference point for constructing risk-neutral strategies, against which the behavior of unhedged positions like the carry trade can be compared.

Uncovered Interest Rate Parity (UIP):

Uncovered Interest Rate Parity is a more theoretical construct than CIP, and it plays a central role in justifying or challenging the logic of the carry trade. UIP posits that the expected change in the spot exchange rate should equal the interest rate differential between two countries. Unlike CIP, this condition is not covered by a forward contract, leaving the investor exposed to currency risk[5]. UIP is expressed as:

$$E\left[\frac{S_{t+1} - S_t}{S_t}\right] = i_{funding} - i_{target}$$

Where:

[4] International Monetary Fund. (2019). Covered Interest Parity Deviations: Macrofinancial Determinants
[5] Investopedia. (2024). Uncovered Interest Rate Parity (UIP): Definition and Calculation.

- E = expectation operator
- S_t= spot exchange rate at time t (funding currency per unit of target currency)
- S_{t+1}= expected future spot rate at time $t+1$

Alternatively, it can be rearranged as:

$$E[S_{t+1}] = S_t \times \left(\frac{1 + i_{funding}}{1 + i_{target}}\right)$$

According to UIP, a currency with a higher interest rate should depreciate in the future by an amount that offsets the interest differential. Conversely, a low-yielding currency should appreciate, such that no arbitrage opportunities exist over time. Under this theory, the carry trade should offer zero expected returns, since any gain from the interest spread would be offset by losses from currency movements.

In practice, however, UIP fails consistently and predictably. Numerous empirical studies have shown that high-interest rate currencies tend to appreciate or depreciate less than expected, leading to positive average returns for carry trade strategies[6]. This anomaly is known as the forward premium puzzle, and it undermines the core assumption of rational expectations in efficient currency markets.

Implications of UIP Failure and Theoretical Controversies:

The UIP failure has been at the center of considerable controversy in the literature. Various theories have been advanced:

- *Time-varying risk premia:* require a reward to bear the risk of a foreign currency, particularly under risk-averse or unstable markets. According to this perspective, profits on carry trades are not arbitrage but a remuneration for bearing systematic risk factors.
- *Behavioral finance models:* imperfect expectations, herding behavior, and information asymmetries may cause long-run departures from UIP.
- *Market segmentation and constraints:* these refer to regulatory or structural constraints prohibiting full arbitrage and the ability to eliminate inefficiencies.

[6] Ames, M., Bagnarosa, G., Kosmidis, I., & Peters, G. W. (2014, June 17). Upside and Downside Risk Exposures of Currency Carry Trades via Tail Dependence

The significance of UIP's failure to the carry trade is deep-seated. It rationalizes the empirical profitability of the strategy while also highlighting its inherent risk. As returns are not arbitrage-assured, carry traders face possible losses when exchange rates suddenly realign under financial distress episodes or policy expectation shifts.

1.2.3. Macroeconomic conditions that favor Carry Trade activities

The profitability and size of carry trade schemes are extremely responsive to macroeconomic environments. Improved comprehension of such macroeconomic foundations is vital when modeling the dynamics of carry trade schemes both over time and in different regions. One fundamental requirement is the existence of consistently low nominal interest rates in the country of the funding currency. Japan is the best example to date, having had near-zero or even negative rates since the late 1990s due to incipient and long-standing deflationary tendencies and soft domestic demand. This rendered the yen an extremely enticing source of funding, particularly at times of global accommodation episodes such as post-2008 quantitative easing or the period of the COVID-19 stimulus when markets were saturated by cheap liquidity[7]. Investors are attracted to such a source of funding because low levels of borrowing costs enable better leverage efficiency and minimize the amount required to earn positive returns.

Yet low rates are insufficient by themselves. Carry trades also necessitate financial environments of stability and low volatility. The strategy has been referred to as "short volatility"[8] by many because it performs best when markets are stable and global indices of volatility, such as the VIX, are low. The empirical data reveal a negative relationship between levels of VIX and returns on carry trades (especially in AUD/JPY pairs) where episodes of spikes in volatility dramatically cut into returns or initiate losses[9]. A scatter graph of monthly VIX values against AUD/JPY returns from 1995 to 2025 pictures the

[7] International Monetary Fund. (2020). Global financial stability report: Bridge to recovery – Capital flows and the risk of financial instability (Cap. 2).
[8] Brunnermeier, M. K., Nagel, S., & Pedersen, L. H. (2008). Carry trades and currency crashes (NBER Working Paper No. 14473). National Bureau of Economic Research.
[9] StarseedFX. (2025, April 14). Underground Secrets: How the Volatility Index Unmasks AUD/JPY Moves.

relationship and has a downward trend line to prove it: times of financial distress are usually associated with the unwind of carry positions.

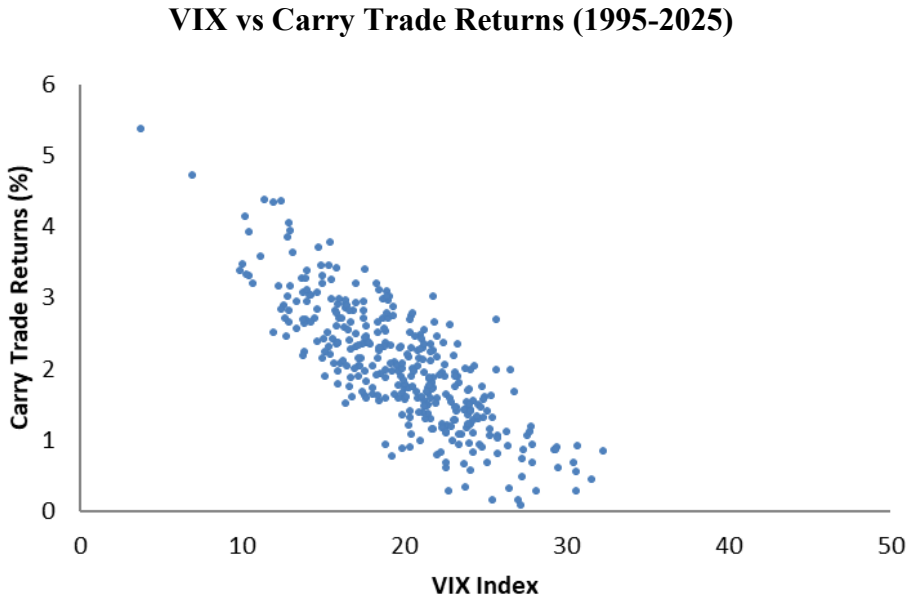

Figure 1: Monthly scatter plot (1995–2025) with the VIX on the x-axis and carry trade returns (monthly % change in AUD/JPY) on the y-axis.

Sources: VIX Index (FRED), AUD/JPY (Yahoo Finance).

Lastly, predictability in macro policy, particularly monetary policy, is of central importance for stabilizing expectations. Central banks committing to inflation targets credibly, adopting rule-like interest rate policies.

1.3. Corporate finance implications

Building upon the earlier discussion of the macroeconomic foundations that make carry trade strategies viable, it is important to extend the analysis to the corporate finance domain, where firms, particularly those operating across borders, face continuous exposure to currency fluctuations. While carry trades are often associated with speculative investment strategies, the underlying principle of exploiting or managing exchange rate differentials also plays a central role in how multinational corporations (MNCs) structure their financial policies, debt portfolios, and risk management frameworks. As established earlier, carry trades depend on maintaining an open position in foreign exchange markets,

hoping that the interest differential is not offset by an adverse currency movement[10]. In contrast, corporate treasuries typically aim to mitigate exchange rate risk rather than profit from it.

Currency Risk and Exposure

Corporations engaged in international operations are exposed to several forms of currency risk, including:

- *Transaction risk: it* arises from settling imports, exports, or intercompany transactions denominated in foreign currencies.
- *Translation risk:* the consolidation of foreign subsidiaries' financial statements affects reported earnings due to fluctuating exchange rates.
- *Economic risk: a* broader concept referring to the impact of exchange rate movements on a firm's competitive position and future cash flows.[11]

In this context, a company that borrows in a foreign currency with a favorable interest rate differential may lower its financing costs in the short term. However, unless this exposure is managed carefully, unexpected appreciation of the funding currency (e.g., the Japanese yen in a reversal scenario) can result in significant balance sheet losses, as liabilities denominated in the foreign currency become more expensive to service[12]. While the strategy is profitable under conditions of currency stability, it can become highly destabilizing during episodes of risk-off sentiment or tightening monetary conditions[13]. Firms are not immune to this dynamic, and their risk management approach must account for these asymmetric outcomes.

[10] Daniel, K., Hodrick, R. J., & Lu, Z. (2014). The Carry Trade: Risks and Drawdowns. Working paper, Columbia Business School. NBER Working Paper No. 20433.
[11] Anzuini, A., & Fornari, F. (2011). *Macroeconomic Determinants of Carry Trade Activity*. Bank of Italy Working Paper No. 817
[12] Bruno, V., & Shin, H. S. (2017). Global dollar credit and carry trades: A firm-level analysis. Review of Financial Studies, 30(3), 703–749.
[13] Bhansali, V. (2007). Volatility and the carry trade. The Journal of Fixed Income, 17(3), 72–84.

Hedging Strategies and Instruments

To deal with such exposure, corporations utilize a variety of hedging techniques, typically involving derivative instruments or natural hedging methods. The most common methods are:

- *Forward contracts,* which tie down a rate of exchange on a future deal and eliminate the uncertainty surrounding floating currencies.
- *Currency swaps,* which involve exchanging principal and interest payments in different currencies.
- *Options,* which are more flexible by providing the right but not the obligation to swap money at a specified rate.

The instruments above are chosen based on the firm's needs and adversity to risk, accounting considerations, and expectations on exchange rate movements. For example, a firm might use a forward contract to hedge a yen-denominated loan if it has no natural offsetting yen cash flows, thereby neutralizing the risk of yen appreciation, a scenario reminiscent of the carry trade unwind episodes discussed in previous sections. Some firms also engage in natural hedging, which involves matching revenue and costs in the same currency or aligning foreign assets and liabilities.

Strategic Considerations in Currency-Linked Financing

The foreign currency decision to borrow entails more than simply reducing interest costs. Companies must consider:

- Anticipated exchange rate movements, both on the basis of macroeconomic fundamentals and central bank communication, as outlined above under UIP deviations.
- Foreign capital markets liquidity and accessibility, particularly in markets with large bond or syndicated loan markets.
- Regulatory and accounting implications, such as how foreign debt is accounted for under IFRS or local GAAP standards.

The logic of the carry trade is built into firm finance decisions when Japanese or Swiss markets are considered. In the early 2000s period of ultra-low Japanese rates, we saw many

European and Asian companies issuing yen-denominated debt (samurai bonds), effectively mimicking carry trade arrangements in a firm finance framework[14]. Beneficial as it was under stable exchange rate environments, most of the firms suffered losses when the yen appreciated steeply during global downturns.

1.4. How Carry Trade strategies impact corporate financing decisions

Carry trade dynamics have increasingly influenced corporate financing decisions, particularly by internationally active firms aiming to minimize capital costs and optimize capital structures. The fundamental carry trade logic of using low-interest-rate currencies like the US dollar or the Japanese yen to finance higher-yielding investments is reflected in the behavior of firms through foreign currency-denominated debt issuance (for example, Samurai Bonds) and during times of favorable interest rate differentials and low levels of exchange rate volatility[15]. Emerging market firms are also found to employ financial behaviors reflecting carry trades, whereby firms holding excess cash pools issue USD-denominated debt and reinvest the proceeds in local financial products or cash-substitute holding, undertaking implicit currency risk in the quest for yield increase[16].

These approaches affect the balance sheets of firms by adding currency mismatches and increasing financial risk if the financing currency appreciates suddenly. These risks are especially serious for firms without natural hedges or adequate foreign exchange revenues. An example is when a firm takes out yen-denominated loans in order to fund local currency-denominated assets and the yen appreciates afterwards. The costs of debt service increase in real terms and hurt profitability.
The macroeconomic consequences of such behavior are large. By providing capital to local markets through carry-trade-type operations, corporates support local credit conditions, at times bypassing capital controls through off-shore affiliates and intra-group lending

[14] Cheung, Y.-L., Cheung, Y.-W., & He, A. W. W. (2012). Yen carry trades and stock returns in target currency countries. Japan and the World Economy, 24(3), 174–183.
[15] Daniel, K., Hodrick, R. J., & Lu, Z. (2014). The Carry Trade: Risks and Drawdowns. Working paper, Columbia Business School. NBER Working Paper No. 20433.
[16] Oxford Academic. (2017). Global Dollar Credit and Carry Trades: A Firm-Level Analysis.

arrangements. Although it supports economic activity when economies are growing strongly, it also leaves banks vulnerable to abrupt turns which could force the corporates to de-lever and upend financial stability[17].

1.5. Case Study

To explore how carry trade strategies influence corporate financing, let's imagine a non-financial firm ("Firm X") located in an emerging market. Over three years, it faces different financial conditions both at home and in global markets.

1. Simulated Firm-Level Data: Building the Foundation

Key characteristics of Firm X across three years:

Metric	Year 1	Year 2	Year 3
Local interest rate (Country A)	7.5%	8.0%	8.0%
US interest rate (USD funding)	1.5%	2.0%	2.5%
Exchange rate volatility	4.0%	5.0%	9.0%
Change in USD/local FX rate	1.5%	-0.5%	5.0%
USD debt issued (in $ m)	50	100	0
Cash-to-assets ratio	8.0%	12.0%	5.0%
Total debt-to-assets (leverage)	30.0%	35.0%	20.0%
Share of revenue in USD	30.0%	20.0%	15.0%

Table 1

*All figures and estimates are hypothetical but based on real-world variables and plausible magnitudes, used solely to illustrate the underlying decision-making logic.

2. How Firms Decide to Use Carry Trade Strategies

We estimate the model through a multinomial logistic regression framework, which is a statistical method for modeling choices among more than two alternatives. In this case, the firm chooses between:

[17] Ames, M., Bagnarosa, G., & Peters, G. W. (2013). Reinvestigating the Uncovered Interest Rate Parity Puzzle via Analysis of Multivariate Tail Dependence in Currency Carry Trades.

- No debt issuance
- Issuing domestic currency debt
- Issuing foreign (USD) debt

We assume the firm's decision depends on several key variables:

- Cash levels: Firms with more cash can afford to take on riskier strategies.
- Leverage: More leveraged firms may prefer lower-cost foreign debt.
- Exchange rate volatility: High volatility increases risk, making carry trades less attractive.
- Interest rate differential: The bigger the gap between home and foreign rates, the more tempting the carry trade.

We model the firm's decision as:

$$P(Issue_{it} = j) = \frac{e^{x_{it}\beta_j}}{\sum_{k=0}^{2} e^{x_{it}\beta_k}}$$

$$for\ j\ \in \{0 = no\ issuance,\ 1 = local\ currency,\ 2 = foreign\ currency\}$$

Let the vector include cash/assets, leverage, FX revenue share, exchange rate volatility, and interest differential.

Assumed estimated coefficients for USD bond issuance (j=2):

- $\beta_{cash} > 0$
- $\beta_{leverage} > 0$
- $\beta_{FX\ volatility} < 0$
- $\beta_{interest\ differential} > 0$

Where:

- Higher cash → more likely to issue USD debt (consistent with carry-trade motives).
- Higher leverage → more likely to use foreign funding for capital efficiency.
- Higher FX volatility → reduces likelihood of foreign debt issuance.
- Greater interest spread → encourages carry trade strategy.

In Year 2:

- The interest rate gap between the firm's local borrowing cost (8%) and U.S. borrowing cost (2%) is 6%.
- FX volatility is moderate at 5%, meaning risk is manageable.

- The firm's cash ratio is high (12%), which gives it financial flexibility.

Outcome: These factors increase the probability that Firm X chooses to issue USD-denominated debt, making this a prime example of a corporate carry trade strategy.

3. How Much Foreign Debt Does the Firm Take?

We use a model to analyze the proportion of USD debt. This model is ideal for bounded outcomes like "share of foreign debt" (which ranges from 0% to 100%).

$$USD\ Debt\ Share_{it} = X_{it\gamma} + \epsilon_{it},\ observed\ only\ if\ USD\ Debt\ Share > 0$$

We assume the share of USD debt increases when:

- The firm has more cash.
- The interest rate differential is high relative to FX volatility.
- The firm earns some of its revenue in USD, which provides a natural hedge.

Example Calculation:

In Year 2:

- Interest rate differential = 6%
- FX volatility = 5% → Carry attractiveness = 6 / 5 = 1.2
- Cash ratio = 12%
- USD revenue share = 20%

Assumed coefficients:

- $\gamma_{cash} = 1.8$
- $\gamma_{interest\ diff_\sigma} = 3.0$
- $\gamma_{FX\ revenue} = 0.5$

$$USD\ Debt\ Share = 1.8 \times 0.12 + 3.0 \times 1.2 + 0.5 \times 0.20 = 3.916 \approx 39\%$$

Interpretation: Under favorable conditions, nearly 40% of the firm's new debt might be USD-denominated, driven by profitability expectations and risk tolerances.

4. What Happens If the Exchange Rate Moves the Wrong Way?

If the domestic currency weakens, the cost of repaying USD-denominated debt increases in local currency terms.

Expected Carry Trade Profit:

$$\Pi = (i_{local} - i_{USD}) - \Delta e$$

Where:

- $i_{local} = 8\%$
- $i_{USD} = 2\%$
- $\Delta e = change\ in\ FX\ rate$

If the local currency strengthens by 1%, then:

$$\Pi = 8\% - 2\% - (-1\%) = 7\%\ profit$$

5. Final Takeaways

From this analysis, we learn:

- Firms with high cash reserves are more likely to use carry trade debt.
- Exchange rate volatility is a critical constraint on using foreign borrowing.
- The expected return must be balanced against the potential FX loss.
- In times of global instability, firms reduce exposure or unwind positions to avoid losses.

In sum, carry trade strategies can offer lower funding costs and access to deep capital markets, but they also introduce significant risks that firms must carefully manage through financial modeling, hedging, and strategic timing.

1.6. Real-World Illustration: Petrobras and Carry Trade-Driven Financing

The conceptual framework developed from the theoretical example of Firm X applies directly to the real-world financing patterns of Petrobras, Brazil's state-controlled energy giant. Over the course of the 2000s and especially following the period in and around 2008, Petrobras became one of the biggest issuers of USD-denominated debt by corporates in the emerging markets. Firstly, Brazil's traditionally high local interest rates relative to nearly

zero U.S. rates supplied a beneficial interest rate differential to induce offshore loan taking[18]. Secondly, Petrobras showed characteristics aligned with the patterns of carry trade behavior: it borrowed foreign debt when the local currency was performing strongly and exchange rate volatility was low, consistent with the statistical result that firms are more prone to USD borrowing when local exchange rates are appreciating, and exchange rate volatility is absent[19]. Thirdly, the firm's large operating cash flows generated the liquidity cushion required to absorb foreign currency exposure in the absence of immediate financing requirements and in line with the behavioral pattern seen in the simulated Firm X. Having earned substantial USD revenues in oil exports, Petrobras also had considerable local-currency denominated obligations in Brazilian real (BRL), resulting in partial currency mismatch on its books. This mismatch grew more serious in the period between 2015 and 2016 when a steep depreciation in the value of the BRL strongly amplified the local-currency cost of foreign debt service. This is a classic case of the systemic risk surrounding corporate carry trade when macroeconomic circumstances turn against it[20].

[18] Bruno, V., & Shin, H. S. (2017). Global dollar credit and carry trades: A firm-level analysis. Review of Financial Studies, 30(3), 703–749.
[19] Petróleo Brasileiro S.A. (Petrobras). (2010). Corporate funding strategy through USD-denominated bonds [Investor prospectus].
[20] Hattori, M., & Shin, H. S. (2009). Yen carry trade and the subprime crisis. IMF Staff Papers, 56(2), 384–409.

CHAPTER 2: THE MECHANICS OF THE YEN CARRY TRADE

The second chapter focuses on the structural features that make the Japanese yen a uniquely attractive funding currency within global carry trade strategies. While the previous section outlined the mechanics and theoretical basis of carry trades, this chapter shifts attention to the specific conditions in Japan that have consistently supported the international use of the yen for such purposes.

Through an analysis of Japan's prolonged low-interest rate environment, the institutional role of the Bank of Japan, and the market perception of the yen as a stable or depreciating currency, the chapter examines how macroeconomic policy and market expectations interact to sustain cross-border capital flows. By understanding these dynamics, it becomes possible to evaluate not only the appeal of the yen from a financial standpoint, but also the broader implications for global liquidity and risk-taking behavior.

2.1. How the Yen Carry Trade Works

2.1.1. Mechanics behind the Yen Carry Trade

As distinct from generic carry trade approaches, the yen carry trade has developed a particular identity in global finance due to the structural conditions existing consistently in Japan's monetary and macroeconomic environment. The distinguishing feature is not the interest-rate difference per se, but the stability with which Japan has been delivering an ultra-low level of capital costs across a period of many decades and has thus created a stable and recurring source of financing available in a variety of market cycles[21].

Investors typically borrow yen from local Japanese money markets, foreign bank channels, or by selling yen-denominated bonds like Samurai, as mentioned before, or Euroyen debt. The money is then used to buy higher-yielding currencies and the capital is moved to foreign bond markets, foreign stock indices, or even speculation in real estate in emerging markets.

[21] Jordà, Ò., & Taylor, A. M. (2012). The carry trade and fundamentals: Nothing to fear but FEER itself. Journal of International Economics, 88(1), 74–90.

In addition, expectations of the behavior of the yen are at the core of the strategy. This generates a risk profile that is asymmetric. In times of stable global risk appetite or a bullish mood in markets, the yen depreciates and enhances the profitability of the trade. In times of market stress, the yen will appreciate sharply as capital returns to perceived safety and leaves carry trade positions vulnerable to huge and swift losses[22].

In reality, the yen carry trade is a systemic conduit connecting Japan's internal monetary policy to global markets and is much more than a financial tool. Unwinding has in the past increased asset classes' volatility and has been both a tool of yield enhancement as well as a possible vector of financial instability.

2.1.2. Flow of funds and typical transaction structures

At its most fundamental level, the transaction is initiated by a yen-denominated bond or loan issuance. Hedge funds, investment banks, and multinationals are able to tap such liquidity directly from Japanese banks or indirectly from offshore financial hubs.

Following the securing of the yen financing, the second step involves the conversion of it to a higher-paying currency, normally through the spot FX market. The borrowed yen might thus be swapped into US dollars, and the latter spent on long-term US Treasury obligations with a yield of 3–4% or used to gain exposure to emerging sovereign debt with possibly even better returns—though with additional risk.

In more sophisticated structures, investors synthetically replicate the same exposure using cross-currency swaps. In such a case, a physical exchange of principal does not take place. Rather, parties enter into an agreement to exchange interest payments denominated in two different currencies so that a side may capture a higher yield and pay in yen. This type of structure is commonly used by institutional investors or by a corporate treasury to more exactly manage both currency and interest rate risk and to match up against accounting standards treating a derivative as distinct from a cash instrument.

The last stage of the transaction has to do with repatriation. Upon maturity of the foreign investment, proceeds are converted back to yen to service the initial undertaking. This stage

[22] Hattori, M., & Shin, H. S. (2009). Yen carry trade and the subprime crisis. IMF Staff Papers, 56(2), 384–409.

involves the biggest source of possible loss: if the yen has appreciated relative to the investment currency, repurchase costs will reduce or eliminate the interest differential initially earned. If the yen has fallen, the gain is maximized.

What makes the yen carry trade so influential is not merely the size of such trades but also their propensity to become coordinated among market players. In times of stable rates and low volatility, capital flows out of Japan in quest of yield. During global financial tightness, however, such flows rapidly reverse and induce swift appreciation of the yen, market instability, and in extreme circumstances, foreign asset selling.

The framework of the yen carry trade produces an interconnected system of capital mobility, risk exposure, and policy transmission. Japanese monetary policy and market sentiment are felt far beyond the country's borders through these avenues.

2.2. The Attractiveness of the Yen as a Funding Currency: Analysis of Japan's low-interest rate environment

Japan's role as a perennial provider of low-cost capital stems from a unique and persistent macroeconomic condition: decades of structurally low, and at times negative, interest rates. This feature makes the yen particularly attractive as a funding currency in global carry trade operations. The phenomenon is not incidental but the result of deeply rooted monetary and demographic factors, and it has positioned the Bank of Japan (BoJ) as one of the most dovish central banks among advanced economies.

The Japanese low-rate regime began in the early 1990s, following the collapse of its asset price bubble[23]. In the aftermath, the economy entered a prolonged period of stagnation, deflation, and weak private sector demand, a situation often referred to as the "lost decade", though it has extended far beyond ten years. The BoJ responded with a sequence of aggressive monetary easing policies, including zero and negative interest rates and early adoption of QE.

In more recent years, the BoJ adopted negative interest rate policy (NIRP) in 2016, pushing short-term rates to –0.1%. Long-term yields, including the 10-year government bond, have

[23] MarketBulls. (2024). Japanese Asset Price Bubble Explained Briefly

also hovered near or below zero under the BoJ's yield curve control (YCC) framework, which caps yields through unlimited asset purchases[24]. This artificial suppression of interest rates has significantly reduced the cost of borrowing in yen, especially in comparison to other major currencies like the USD, GBP, or AUD[25].
The investors have come to treat the yen as a "low-yield anchor" in the global monetary system, a kind of base currency from which to leverage positions in higher-return jurisdictions.
This enduring interest rate gap between Japan and the rest of the world provides the financial logic behind yen-funded carry trades. Borrowing costs in yen are often so low that even modest returns in foreign markets generate a positive carry.

Japan's low-interest rate environment is not temporary but a structural condition that makes the yen consistently attractive as a funding currency. It is the foundation upon which the entire yen carry trade strategy is built, enabling capital to flow outward in search of yield while anchoring risk in the assumption of stable or depreciating exchange rates.

2.3. International Financing strategies

2.3.1. How multinational companies leverage the carry trade to reduce their cost of capital

The yen carry trade itself is especially enticing as a means of cost reduction because of Japan's chronically low interest rate regime and capital market liquidity and stability. Hedge funds will speculate on the carry trade to capture the excess gain, but multinational companies pursue the technique as part of their overall enterprise treasury operations on a long-term basis.
The underlying incentive is simple: cheaper financing.
And it is the strategic aspect of this practice that makes it more than a straightforward cost-reducing exercise. This is reminiscent of the behavior of carry trade investors: lending in

[24] Morningstar (2023). The Bank of Japan Tweaks Yield-Curve Control Policy
[25] Columbia SIPA. (2016). Bank of Japan: Japan yield-curve-control regime [Capstone report]. Columbia University School of International and Public Affairs.

low-yielding currencies to redirect capital geographically or by asset class buckets. Currency exposure is often left unhedged in such scenarios, especially if the firm anticipates a depreciation of the yen or if it can absorb decent FX volatility in exchange for cheaper financing.

Besides this, multinational firms design their operations to leverage regulatory and tax differences. They utilize offshore affiliates in nations with good tax treaties or weak capital controls to route borrowings denominated in yen through entities distributing cash intra-group through intercompany loans or capital contributions. Not only does it increase the cost differential, but also facilitates advanced internal management of capital across borders.

The historical safe-haven behavior of the yen also makes it less likely to experience sudden funding stoppages even in times of global turmoil.

2.3.2. Comparative analysis with other funding strategies

While the yen carry trade is appealing for its low nominal cost, its risk-return profile must be assessed against alternatives such as local currency borrowing, U.S. dollar funding, and synthetic solutions. Each approach involves different exposures to interest rate risk, currency volatility, liquidity, and market access.

Local currency borrowing is typically considered the most prudent from a risk management perspective, as it fully aligns liabilities with revenues and eliminates direct foreign exchange risk. However, in many emerging markets, the local yield curve is steep and nominal rates are high—often exceeding 6–8% for medium-term corporate debt. For example, a Brazilian multinational raising funds in BRL might pay an 8% annual coupon, while Japanese yen rates could be close to zero. Moreover, liquidity can be thin for large deals, and long-term maturities may not be available without significant concessions on price or collateral[26].

U.S. dollar funding offers several advantages: deep liquidity, access to global investors, and a range of maturities. Dollar funding costs (e.g., 3–5% for investment-grade borrowers in

[26] K. Malhotra, D. Dhutia, & S. Nayak. (2025). Indian firms look homewards for borrowings as local yields fall; global appetite stays weak. Reuters.

recent years) have generally been higher than yen, but lower than most emerging market rates. The main risk is currency mismatch. The "Taper Tantrum" of 2013 highlighted how rapidly dollar liabilities can become more expensive when U.S. rates rise and global capital flows reverse, triggering stress in EM corporate bond markets[27].
Synthetic funding strategies, using cross-currency swaps or FX forwards, allow firms to borrow in one currency and synthetically convert their obligations into another, capturing rate differentials without physically issuing debt abroad. For instance, a European firm might borrow in euros and use a swap to replicate yen funding costs.

During the COVID-19 shock of March 2020, cross-currency basis spreads widened sharply, making synthetic funding more expensive and in some cases unavailable[28].
Multinationals can issue Samurai or Euroyen bonds or borrow via syndicated loans at rates often well below 1%[29]. In stable periods, this creates a powerful arbitrage: borrowing at 0.3% in yen and investing in assets yielding 3–4% in USD or local currency can generate substantial carry. However, the risk is highly asymmetric. When the yen appreciates rapidly, such as in late 2008 (USD/JPY from 110 to 88) or early 2016 (from 121 to 112 in weeks), the local currency value of yen liabilities surges, potentially causing large unhedged losses[30].

2.4. Case Study: Vodafone's Samurai Bond Strategy

Vodafone Group Plc's issuance of Samurai bonds in 2012 serves as a prime example of a global corporation leveraging Japan's low interest rate environment to optimize its capital structure. The transaction's impact can be measured across several dimensions: reduction in weighted average cost of capital (WACC), interest expense savings, and management of FX exposure.

[27] Allianz Global Investors (2025). US investment grade: Credit quality comes with yield.
[28] State Street Global Advisors. (2020). US-dollar funding stress in the time of COVID-19 [White paper].
[29] Cheung, Y.-L., Cheung, Y.-W., & He, A. W. W. (2012). Yen Carry Trades and Stock Returns in Target Currency Countries. Japan and the World Economy, 24(2), 174–183.
[30] Hattori, M., & Shin, H. S. (2009). Yen Carry Trade and the Subprime Crisis. IMF Staff Papers, 56(2), 384–409.

Transaction Structure and Scale

In October 2012, Vodafone issued approximately ¥80 billion (around $1 billion at the time) in Samurai bonds, split into tranches with 5 and 10-year maturities. Coupon rates ranged from 0.73% (5-year) to 1.17% (10-year)—substantially lower than comparable dollar or euro bonds issued that year.

Interest Expense Savings and WACC Impact

Reviewing Vodafone's 2013 financial statements (ending March 2013), total net debt stood at £25.2 billion, with a reported average cost of debt (pre-tax) of 4.7%[31]. By introducing low-cost yen debt, Vodafone was able to modestly decrease its consolidated interest expense. Specifically, the Samurai bond's interest expense for the first year would be:
Interest on 5-year tranche:

- ¥40bn × 0.73% = ¥292 million (~$3.6 million)

Interest on 10-year tranche:

- ¥40bn × 1.17% = ¥468 million (~$5.8 million)

Combined, the yen tranches incurred approximately $9.4 million in annual interest for $1 billion of debt, versus an estimated $47 million if funded at Vodafone's average 4.7% cost.
Annual interest savings: $47m - $9.4m = ~$37.6 million.

FX Risk and Hedging

While the yen's ultra-low rate provided clear savings, Vodafone's exposure to FX risk was non-trivial. A 10% appreciation of the yen against the pound or dollar, unhedged, would have increased the local-currency cost of interest and principal repayment by the same percentage. Vodafone addressed this by engaging in cross-currency swaps to hedge most of its yen obligations. According to its 2013 Annual Report, Vodafone reported that *"[...] substantially all foreign currency debt is swapped to floating rate sterling or euro [...]*",

[31] Vodafone Group Plc. (2013). Annual report and accounts 2013 (p. 98–101).

reducing direct FX translation risk, but at the expense of additional swap costs and potential basis risk[32].

Liquidity and Funding Diversification

The Samurai market provided Vodafone access to a large and stable investor base, primarily Japanese institutions, at a time when European credit markets were experiencing volatility post-sovereign debt crisis. The ability to issue in yen thus improved Vodafone's liquidity position, extended its maturity profile (as the Samurai bonds were among its longest-dated instruments), and signaled credit strength to rating agencies.

Summary Table

Metric	Standard Funding	Samurai Bond	Impact
Coupon rate (5/10yr)	4.70%	0.73%/1.17%	3.5 to 4.0%
1st year interest ($bn)	$0.0470	$0.0094	$0.0376
WACC effect (est.)	4.70%	-0.15%	Lower funding costs
FX risk	Low (native CCY)	Hedge via swaps	Higher complexity

Table 2
Source: Vodafone Group Plc, Annual Report 2013

Conclusion

Vodafone's 2012 Samurai bond issue is a case study that illustrates how big multinational companies can best exploit the extremely low interest rates prevailing in Japan to save on finance costs and structure their capital most efficiently. By issuing ¥80 billion of yen-denominated debt at much cheaper coupon rates than those prevailing in dollar or euro markets, the company saved significant amounts of annual interest costs and lowered its weighted average cost of capital (WACC). The transaction also provided Vodafone with diversification of the sources of fund raising at a time of extreme volatility in European credit markets.

[32] Vodafone Group Plc. (2013). Annual report and accounts 2013 (pp. 98–101).

Yet, these gains came at the price of a set of operational and capital complexities that necessitated advanced risk management. Despite widespread use of cross-currency swaps to hedge yen exposure, there was residual foreign exchange risk, mostly against unexpected JPY/GBP or JPY/EUR exchange rate movements. The derivative usage also came with counterparty and basis risk, most critically in stressed markets where swap markets can become illiquid or costly. Finally, the issuing of Samurai bonds entailed the added operational complexity of compliance with Japanese disclosure requirements and compliance standards.

The case shows that effective implementation of these strategies is not just a function of having access to the global capital markets but also of having good quality financial infrastructure to monitor, hedge against, and respond to latent long-run weaknesses.

CHAPTER 3: GLOBAL FINANCIAL MARKET IMPACTS

3.1. Impact on Bond and Equity Market

3.1.1. How liquidity generated by the carry trade affects stock markets

One of the primary implications of yen carry trade activities is the role they play as a channel of international liquidity that profoundly affects both equity and fixed-income markets. By borrowing capital from low-cost Japanese interest rates and shifting it across borders into riskier assets with a superior yield, the process brings a liquidity injection boost. This is not merely a matter of easing cross-border capital flows but is a driver of taking more risk in the process that creates compression of risk premia and upward pressures on price levels of assets[33]. Equity markets themselves tend to gain from the redistribution process, as levered players undertake portfolio rebalancing against equities instead of against bonds in the drive for more risk-adjusted returns.[34,35].

In addition, flows of yen carry trade cause currency and equity returns to become more highly correlated, especially across emerging markets. Past periods of history, with the mid-2000s being an example, show that times of yen depreciations are usually accompanied by inflation of the asset price in equity markets of the receiving capital countries. For example, the depreciation of the yen relative to the U.S. dollar from 2005 until early 2007 coincided with a steep climb of the S&P 500 index. The high correlation of the USD/JPY exchange rate with U.S. equity returns throughout this period is widely regarded as proof of carry trade-generated equity flows.

However, such liquidity conduit is intrinsically pro-cyclical and prone to sudden reversals. During times of extreme international uncertainty, like the 2008 financial debacle or the

[33] Cheung, Y.-L., Cheung, Y.-W., & He, A. W. W. (2012). Yen Carry Trades and Stock Returns in Target Currency Countries. Japan and the World Economy, 24(2), 174–183
[34] Anzuini, A., & Fornari, F. (2011). Macroeconomic Determinants of Carry Trade Activity. Bank of Italy Working Paper No. 817.
[35] Bhansali, V. (2007). Volatility and the carry trade. The Journal of Fixed Income, 17(3), 72–84.

COVID-19 market shock, investors will unwind carry positions and cause the yen to appreciate and capital to be repatriated. Such a process of deleveraging translates into steep equity market corrections as a consequence of forced asset selling and margin calls and amplifies financial instability. In that sense, the yen carry trade is a hidden systemic risk: it inspires asset price inflation in booms but induces volatility and capital flight in downturns[36].

3.1.2. Effects on bond yields and market volatility

The influence of yen carry trade dynamics extends beyond equity markets into the realm of fixed income, where it interacts in more subtle but equally consequential ways with bond yields and volatility structures. Unlike equities, which absorb capital as a direct reflection of risk appetite, bond markets reflect both the cost of capital and the expectations of monetary policy. The liquidity generated by carry trades (particularly those funded in yen) can therefore distort price discovery mechanisms, flatten yield curves, and reduce term premia, especially during periods of global monetary divergence.

When investors borrow yen to purchase long-duration bonds denominated in higher-yielding currencies (e.g., U.S. Treasuries), they are effectively engaging in duration extension funded by foreign leverage. The immediate effect is downward pressure on long-term yields in the destination country. As capital flows increase demand for these bonds, their prices rise and yields compress. This yield suppression can occur independently of domestic fundamentals, which complicates central banks' ability to interpret bond market signals as a reflection of economic conditions.

A historical illustration of this occurred during the 2005–2007 pre-crisis phase, where large-scale yen-funded flows were directed toward U.S. government and agency bonds. Japanese rates remained near zero while the Federal Reserve gradually tightened, widening the interest rate differential. Foreign holdings of U.S. Treasuries rose from approximately $2.2 trillion in 2004 to $2.7 trillion in 2006, with a significant portion indirectly supported by leveraged structures. During this period, the 10-year U.S. Treasury yield fell from 4.9%

[36] Jordà, Ò., & Taylor, A. M. (2012). The carry trade and fundamentals: Nothing to fear but FEER itself. Journal of International Economics, 88(1), 74–90.

to 4.5%, despite consistent rate hikes from the Fed—a paradox often referred to as the "conundrum" by then-Chairman Alan Greenspan. One contributing factor was the influx of yen-carry-driven demand, which compressed long yields beyond what domestic conditions would justify.

Additionally, the carry trade can alter yield curve dynamics, particularly flattening the curve during periods of strong inflows and steepening it when carry trades unwind. Investors engaging in such trades often target longer-dated bonds to maximize carry, pushing down the term premium. However, when risk appetite contracts and positions are liquidated, these same bonds face sharp sell-offs, generating upward yield pressure that may be mistaken for inflation expectations or growth concerns. The consequence is increased volatility in longer-term yields, even if short rates remain anchored.

This effect is magnified under low-volatility regimes. When global implied volatility is subdued, the perceived stability incentivizes greater carry positioning. However, this accumulation of "hidden leverage" becomes a source of amplified drawdowns once volatility returns.

3.2. Implications for Foreign Exchange Markets

3.2.1. Analysis of currency movements triggered by carry trade flows

Carry trade activity, as explained multiple times throughout the thesis, has a powerful and often non-linear influence on the dynamics of foreign exchange (FX) markets. The essential mechanism is rooted in the cross-border conversion of borrowed yen into higher-yielding currencies, creating persistent selling pressure on the yen and sustained demand for target currencies such as the U.S. dollar, Australian dollar, or various emerging market units. When carry trades are expanding, this flow acts as a systematic force of depreciation for the funding currency.

Between early 2005 and mid-2007, the USD/JPY exchange rate rose from approximately 103 to over 120, a depreciation of the yen by more than 16%[37]. This movement cannot be

[37] Hattori, M., & Shin, H. S. (2009). Yen carry trade and the subprime crisis. IMF Staff Papers, 56(2), 384–409.

fully explained by interest rate differentials alone; it was strongly correlated with increases in global risk appetite and expansion of leveraged carry trade positions[38].

Conversely, when global financial conditions tighten, due to rising risk aversion, spikes in volatility, or expectations of Japanese monetary tightening, the process unwinds. Investors close their carry positions by converting higher-yielding currencies back into yen to repay their obligations. This forced repatriation exerts upward pressure on the yen, often resulting in sharp and rapid appreciation. For instance, in the first quarter of 2007 and again during the global financial crisis of 2008, the yen appreciated by more than 10% against the U.S. dollar within a matter of weeks, driven largely by the mass unwinding of carry trade positions.

Empirical studies confirm that currency pairs most involved in carry trades display excess sensitivity to changes in global risk sentiment, measured by proxies such as the VIX (see above) or credit spreads. When volatility rises, high-yield currencies tend to depreciate against funding currencies like the yen, amplifying market swings beyond what fundamentals would predict[39]. This dynamic results in so-called "crash risk" for carry traders, as positive returns collected over months or years can be rapidly offset by large FX moves during periods of stress.

In summary, carry trade flows inject a cyclical, risk-sensitive component into FX markets, fostering periods of low volatility and trending exchange rates, but also increasing the likelihood of sharp reversals when risk sentiment deteriorates. For policymakers, these flows complicate currency management and can exacerbate the impact of global shocks on domestic financial stability.

3.2.2. Spillover effects on global FX markets

The yen carry trade's global reach implicates that its effects are not limited to the bilateral exchange rate of yen against a given target currency. Instead, widespread carry trading

[38] Brunnermeier, M. K., Nagel, S., & Pedersen, L. H. (2008). Carry trades and currency crashes (NBER Working Paper No. 14473). National Bureau of Economic Research

[39] Daniel, K., Hodrick, R. J., & Lu, Z. (2014). The Carry Trade: Risks and Drawdowns. Working paper, Columbia Business School. NBER Working Paper No. 20433.

generates a network of spillovers that influence currency dynamics far beyond the immediate investment and funding pairs.
When carry trade positions are accumulated, not only does the yen decline, but high-yielding currencies like the Australian dollar, New Zealand dollar, Turkish lira, or Brazilian real appreciate as well as capital gets reallocated. This synchronized behavior generates greater co-movement among what have been dubbed “investment currencies,” as well as a distinct differentiation between funding currencies and target currencies in world FX markets.

Empirical observation indicates that correlations among high-yielding emerging market currencies and developed market “investment” currencies increase substantially: sometimes to more than 0.7 over rolling horizons during intense carry trade episodes. This interlinkage accelerates both positive and negative shocks[40].
One of the consequences is the transmission of volatility shocks and liquidity. Unwinding of carry trade extracts liquidity from not only a specific, but from all those markets where carry funds had flowed. This can lead to "herding" dynamics and amplify one-way moves, in particular in less liquid EM - FX crosses. The "Taper Tantrum" of 2013 illustrated how a change in global funding conditions, which initially reflected U.S. monetary policy, could get amplified through carry position unwinding, resulting in a synchronized currency decline as well as reserve losses in a wide range of emerging economies.

During periods of stability, carry trade flows can reduce volatility, strengthen local currencies, and promote risk taking. However, once sentiment unwinds, the same flows turn around sharply, tending to cause more extreme adjustments than can be forecast from a purely local perspective. BIS and IMF researches, have identified that economies with higher carry trade exposures to the outside world undergo higher exchange rate volatility as

[40] Hattori, M., & Shin, H. S. (2009). Yen carry trade and the subprime crisis. IMF Staff Papers, 56(2), 384–409.

well as more abrupt capital flow reversals during stress periods in global financial markets[41].

3.3. Risks and Financial Instability: Examination of the risks associated with large-scale trade operations

Beneath its apparent simplicity, the carry trade has a set of risks that are both significant and, at times, highly non-linear. Here, we focus on three critical risk dimensions: exchange rate risk, leverage risk, and liquidity risk. Each is illustrated with real-world or numerical examples to underscore the potential for severe financial instability.

1. Exchange Rate Risk: The Core Vulnerability

The exchange rate risk as a core vulnerability was vividly demonstrated during the 2008 financial crisis.

Between July 2008 and January 2009, the USD/JPY exchange rate moved from 107 to below 90, representing a yen appreciation of nearly 16% in just six months. For a hedge fund or corporation that had borrowed ¥1 billion to invest in USD assets (assuming a 10x leverage ratio, common in carry trade strategies), this move resulted in catastrophic FX losses. A position of $10 million (financed at 10x leverage) would face an FX-related loss of $1.6 million, potentially wiping out most or all of the original capital[42].

A Value at Risk (VaR) approach makes these numbers more concrete. For a portfolio of yen-funded carry trades, with historical annualized FX volatility of 11% and a 1% one-day VaR (z-score ≈ 2.33), the potential one-day loss on a $100 million notional position is:

$$VaR_{1\%,1\ day} = \$100\ million\ \times \frac{2.33}{\sqrt{252}} \cong 1.5\ million$$

[41] Bank for International Settlements. (2012). Systemic risk in global banking: What can available data tell us and what more data are needed? (BIS Working Paper No. 376); International Monetary Fund. (2015). Global Financial Stability Report: Navigating monetary policy challenges and managing risks.

[42] Hattori, M., & Shin, H. S. (2009). Yen carry trade and the subprime crisis. IMF Staff Papers, 56(2), 384–409.

However, in periods of crisis, volatility can spike, making actual losses many multiples of daily VaR estimates. This scenario played out during the 2008 crisis and the "Yen Shock" in early 2016, when the yen gained nearly 10% in a few days following Bank of Japan policy surprises and global risk aversion[43].

2. Leverage Risk: Amplification of Losses

Carry trades are almost always conducted with leverage, as the natural yield differentials are often modest. Leverage multiplies both gains and losses, turning moderate currency moves into existential threats.

Suppose a fund leverages its capital 20:1, borrowing ¥2 billion to invest in Australian dollars at a yield pick-up of 3%. An adverse yen movement of 5% (well within historical monthly swings during crises) instantly erases the entire principal and can lead to margin calls and forced liquidation of positions. In 2007, several quant funds and macro hedge funds, including major names like Amaranth Advisors and Peloton Partners, suffered multi-billion dollar losses as carry trades unwound and FX volatility soared[44].

A sensitivity analysis illustrates this:

- At 10:1 leverage, a 10% yen appreciation results in a 100% capital loss.
- At 20:1 leverage, even a 5% move is fatal.

This risk is compounded by the tendency of market participants to increase leverage during periods of low volatility, precisely when latent risk is highest, as seen in the run-up to both the 2008 crisis and the 2015-2016 "risk-off" episodes[45].

[43] Daniel, K., Hodrick, R. J., & Lu, Z. (2014). The Carry Trade: Risks and Drawdowns. Working paper, Columbia Business School. NBER Working Paper No. 20433;
[44] Brunnermeier, M. K., Nagel, S., & Pedersen, L. H. (2008). Carry trades and currency crashes (NBER Working Paper No. 14473). National Bureau of Economic Research.
[45] Macroalchemist (2024, September 13). The Yen Carry Trade – Leverage, Losses, and Lessons.

3. Liquidity and Funding Risk: The Unseen Threat

Liquidity risk emerges when market conditions force the simultaneous unwinding of carry trade positions. As investors scramble to exit, the depth of both FX and underlying asset markets evaporates, widening bid-ask spreads and increasing transaction costs.

During the August 2007 quant fund crisis, when global markets, saw daily USD/JPY trading volumes spike, effective liquidity dropped as spreads widened from typical levels of 0.01 yen to over 0.10 yen per dollar on major platforms. In illiquid moments, the cost to close positions soared, and asset prices (including U.S. Treasuries and EM bonds) saw outsized moves as forced sellers overwhelmed the market.

A further aspect is rollover risk: much carry trade funding is short-term, while assets are often longer-dated. When confidence collapses, short-term funding can dry up overnight, forcing fire sales. This was especially evident in March 2020, when COVID-19-induced stress led to a "dash for cash" and massive position unwinds across FX and fixed income markets.

The risks of yen carry trade operations are not linear or stationary: they are small and manageable in calm markets, but explosive under stress due to leverage, correlation, and liquidity spirals.

3.4. Carry Trade and Speculative Bubbles

Having examined the structural risks embedded in yen carry trade strategies, it is essential to acknowledge that their influence extends well beyond episodes of instability or market volatility. Sustained and large-scale carry trade activity has historically played a catalytic role in the development of speculative bubbles across asset classes and geographies. When the redistribution of flows persist in periods of low global volatility and accommodative monetary policy, they exert sustained upward pressure on asset prices—frequently pushing valuations beyond levels justified by fundamentals. The combination of abundant liquidity, leverage, and momentum-driven investor behavior creates fertile ground for asset price bubbles to emerge and inflate.

Investor psychology is central to this process. The consistent profitability of carry trades in tranquil environments often generates a feedback loop driven by overconfidence, recency bias, and the systematic underestimation of tail risk. This leads to herd behavior, as investors replicate strategies that appear successful, amplifying market distortions. When positions become crowded, and market participants are similarly exposed, the entire structure becomes increasingly fragile[46]. This dynamic is not merely theoretical but has been observed repeatedly in major market episodes.

One key example is the Asian Financial Crisis of 1997–1998. In the years leading up to the crisis, countries like Thailand and Indonesia saw large inflows of capital funded through yen-denominated borrowing. Both global hedge funds and local corporations exploited Japan's ultra-low interest rates to invest in higher-yielding local currency assets, including real estate, equities, and bonds. From 1994 to mid-1997, Thailand's and Indonesia's foreign liabilities grew by over 40%, with a significant share linked to short-term foreign-currency funding, particularly in yen[47]. As structural weaknesses in these economies became apparent, investors rapidly reversed their positions. The resulting "sudden stop" triggered a wave of currency collapses and defaults: the Thai baht depreciated by over 50% within a year, and the Indonesian rupiah fell by nearly 80%[48]. The yen itself appreciated by almost 20% against the U.S. dollar between October 1997 and January 1998, as investors repatriated capital[49]. The IMF estimated that over $100 billion exited the region in a few quarters, catalyzing a synchronized collapse in asset prices and economic output. BIS data revealed that for every 1% appreciation of the yen versus the dollar, Asian equity markets declined by 1.5–2% in the following days, illustrating how tightly carry flows and asset prices were interconnected[50].

A decade later, similar dynamics were observed during the 2007–2008 global financial crisis. From 2005 to mid-2007, persistently low Japanese interest rates (hovering around

[46] Morningstar. (2024, September 5). The Japanese yen still poses 'a very big risk' to global markets.
[47] International Monetary Fund. (1998). World Economic Outlook: Financial crises—Causes and indicators, Table 14.
[48] International Monetary Fund. (1998). Crisis in Asia: Regional and global implications, Table 3.
[49] Bank of Japan, historical exchange rates; Reuters data, 1997–1998.
[50] Galati, G., Heath, A., & McGuire, P. (2007). Evidence of carry trade activity. BIS Quarterly Review, 31–44, Fig. 4.

0.5%) and yen weakness encouraged massive carry trade buildup—particularly into U.S. mortgage-backed securities, equities, and emerging market assets. Estimates suggest that yen carry positions surpassed $1 trillion globally by 2007[51].

In early 2008 alone, a two-week span saw the yen gain 8% as global equities plummeted[52]. Bond markets also felt the impact: the U.S. 10-year Treasury yield dropped from 5.1% to 3.3% between June 2007 and March 2008, reflecting a broad flight to safety and the liquidation of leveraged fixed-income positions[53].

More recently, in August 2024, a sharp unwind of yen carry trades occurred concurrently with the bursting of speculative bubbles in several high-yield markets, including tech equities and cryptocurrencies. While a full analysis of this event is addressed in the following chapter, the episode provides a contemporary illustration of how cross-border leverage, investor herding, and monetary asymmetries can interact to destabilize asset markets.

While carry trades do not deterministically cause bubbles, the probability increases when favorable funding conditions are accompanied by behavioral reinforcement and herd-like behavior. Once the macro environment shifts, due to policy tightening, geopolitical events, or a change in investor sentiment, the reversal of these flows can generate abrupt and disorderly corrections, exposing the underlying overvaluation. Thus, even though yen-funded carry trades are often associated with incremental yield and portfolio enhancement, they also carry the latent capacity to distort asset pricing and fuel speculative excess, both in advanced and emerging economies.

[51] Investguiding. (2025). How to Invest In Japanese Yen

[52] Bloomberg L.P. (s.d.). Bloomberg FX and S&P 500 indices [Data set]. Bloomberg Terminal.

[53] Bloomberg Terminal; Bank for International Settlements. (2008). BIS Quarterly Review: International banking and financial market developments.

CHAPTER 4: THE CURRENT STATE AND FUTURE OF THE YEN CARRY TRADE

The yen carry trade situation turned completely in 2024 following the Bank of Japan's (BOJ) unprecedented raising of policy interest rates, ending an era of ultra-accommodative Japanese post-war monetary policy. The move effectively closed down interest rate differentials that fueled gigantic yen financed carry trades. The rate hike was swift in unleashing an unwinding of carry trades in an aggressive fashion, an occurrence of instantaneous, significant consequence in both domestic as well as international financial markets.

The most tangible impact was a strong yen appreciation as short positions financed by borrowed funds were closed, forcing investors to recall money. The exchange adjustment landed heavily on Japanese share markets, leading to a tumbling 12.5% drop in the Nikkei index for August 2024. The selling was not just carry trade unwinding of this magnitude but also more widespread realignment of yen-denominated funding related risk premia. The upsets quickly spread to international indices of equities, with the S&P 500 hardly spared losses as foreign investors scrambled to close over-the-counter trades and rebalance portfolios in accordance with the new interest-rate regime.

These transactions follow the classic pattern of carry trade behavior in sudden spikes in volatility and risk attitude. The risk-return profile of carry was witnessed vividly in 2024, when Japanese policy reversal set in motion a virtuous cycle of strengthening currencies, asset price corrections, and leveraged unwinding

4.1. Immediate Market Reactions to BoJ Rate Hike

4.1.1. Equity Market Collapse in Japan

The Japanese equity market plunged quickly and steeply instantly after the Bank of Japan's announcement. In two trading days, Nikkei 225 lost more than 2,200 points (around 6%), its second-worst one-day point drop on records. The immediate decline was largely fueled

by exporters and interest-rate-sensitive sectors, which were directly impacted by the spontaneous appreciation of the yen and consequent negative implications on their earning prospects. The scenario worsened strongly on August 5, as panic selling sent the Nikkei down another 12.4% to close at 31,458, its near-25% downfall from July's high of above 42,000. At the same time, the general TOPIX index lost 12.2% in tandem[54].

Volatility jumped tremendously, and the Nikkei volatility index hit crisis-high figures that recalled previous financial crises, e.g., Black Monday of 1987. Analysts calculated that nearly 70–80% of this market decline was directly linked to yen appreciation, while 20–30% was traced to general global recessionary fears, most of which were based on disappointing U.S. economic indicators, as well as bursts of speculative bubbles in technology stocks.[55] Financial sector stocks, which normally benefit from rising interest rates, ironically lost heavily in an abrupt drop in bond yields and generalized market stress.

Despite the severity of this decline, markets proved to be quite resilient and recovered quickly. On 6 August, the Nikkei posted a strong bounce of about 10.2% - the third-largest one-day increase on record. By mid-August, the equity index had largely recovered, indicating that the sharp sell-down was driven largely by liquidity concerns and not by any fundamental flaws in underlying economy or corporate sector.[56]

4.1.2. Yen Surge and Currency Volatility

The BOJ's turn to monetary tightening brought about a swift and steep appreciation of the yen, reversing dramatically its ongoing depreciation path. In mid-July to early August 2024, the yen jumped strongly, appreciating close to 12% against the U.S. dollar from about ¥162 to an intraday high of ¥141.7 for every dollar on August 5. This was one of the sharpest recent exchange rate actions, leading to widespread unwinding of yen-funded carry trades, which stood at an estimated ¥40 trillion (about $250 billion).

[54] Bloomberg L.P. Bloomberg Terminal
[55] Reuters (2024). Nikkei Index Sees Largest Drop Since 1987 Black Monday.
[56] Bank for International Settlements. (2024). The market turbulence and carry trade unwind of August 2024 (BIS Bulletin No. 90)

The surge in yen was also fueled by weakening U.S. economic indicators and forecasts of near-term Federal Reserve rate cuts, reducing the interest rate spread from the U.S. side. This double whammy of both BOJ policy and moving U.S. monetary expectations hugely amplified currency volatility[57].

4.1.3. Global Bond and Equity Market Spillovers

The implications of Japan's equity and currency volatility spread quickly to global bond and equity markets. Japanese Government Bonds (JGBs) briefly jumped into a steep rise in yields to nearly 1% shortly after announcement, as investors priced in tighter monetary conditions. But extreme equity market turbulence quickly evoked a flight-to-quality, as yields on JGB fell to about 0.75% by August 5, indicating market complexity in times of co-movements of both equity and currency stresses.

Across the world, bond markets reflected the same, as investors rushed into safer instruments as fears of recession escalated. The U.S. Treasury market also exhibited significant drops in yields, evidenced by a sharp drop in both the 10-year and 2-year yields, temporarily inverting and subsequently re-steeping the yield curve. Particularly, the U.S. 10-year yield dropped by about 40 basis points, reflecting widespread investor nervousness and expectations of aggressive Federal Reserve rate cuts[58].

Global equity markets were not spared these shocks either. European and other Asian indices fell quite steeply, as did the Euro Stoxx 50 and wider-domiciled MSCI Asia Pacific ex-Japan indices, losing considerable ground in one day alone. In the United States, markets did initially exhibit great volatility, though relatively quickly stabilized, supported by expectations of monetary easing. The VIX index spiked steeply, briefly rising above

[57] Bank for International Settlements. (2025). Bond market dynamics post-BOJ policy shift. BIS Quarterly Review.
[58] Reuters (2024). Stocks surge while Treasury yields, dollars retreat after Fed signals lower rates.

levels of 60, to levels associated with such episodes as the COVID-19 crisis, before stabilizing at high but tolerable levels shortly thereafter.

4.2. Specific Focus on Corporate Debt Costs

After BoJ decision, the scale of its government bond purchases reduced, easing its yield curve control (YCC) mechanism[59]. While the 10-year JGB yield target rose only modestly, from around 0% to approximately 0.25%, the symbolic and practical consequences were significant.

For Japanese corporates, particularly those accustomed to years of virtually costless debt, this tightening cycle rapidly translated into rising funding costs. According to Mizuho Research, the average interest rate on corporate loans increased from 1.2% in FY2023 to 1.7% in FY2024, with projections pointing to 1.9% in FY2025. New corporate bank loans, previously priced close to zero, were being issued in the 1–2% range, effectively doubling the cost of debt relative to the ultra-low-rate regime. While these rates remain modest in global terms, the relative change has introduced real pressure on corporate balance sheets. The impact has been particularly acute for small and medium-sized enterprises (SMEs). Many of these firms had relied on pandemic-era zero-interest public loans, which reverted to market-based terms in 2023–2024. The termination of subsidies and simultaneous rate normalization created a dual shock. Mizuho estimates that the resultant rise in interest costs could reduce ordinary profits by as much as 1.3% for the most exposed SMEs. Numerous SMEs, operating on thinner margins and highly dependent on variable-rate bank lending, saw their interest coverage ratios (ICR) fall below 1: indicating that interest expenses exceeded operating earnings[60]. These financial pressures contributed to a surge in SME insolvencies in 2024, particularly in sectors with weak pricing power or low post-pandemic recovery.

Larger firms have, for the most part, weathered the shift more effectively. Many had refinanced their debt at ultra-low fixed rates between 2020 and 2021 and entered the

[59] Kyodo News (2024), BoJ Raises Interest Rates to 0.25% in push toward normalization amid weak yen.
[60] Bank of Japan (2024a), Financial System Report.

tightening phase with strong cash positions. Nonetheless, the BoJ observed a slow but broad-based decline in ICRs even among large corporates in 2024, suggesting that the cumulative rise in funding costs is beginning to erode financial cushions.
Despite these challenges, credit demand has remained resilient. BoJ and regional banks reported continued loan uptake, as firms sought liquidity to manage higher costs and sustain operations. However, this surface-level robustness masks a growing division: large firms retain access to favorable long-term financing, while SMEs are increasingly exposed to refinancing risk and rising interest burdens.

Globally, the BoJ's normalization coincided with a broader tightening cycle, intensifying refinancing risks for corporates across regions. The IMF warned of a looming "refinancing wall", as large volumes of corporate debt mature between 2024 and 2025, much of which will need to be rolled over at interest rates 3–4 percentage points higher than original coupon rates[61]. While large multinationals may be able to absorb the shift through retained earnings or access to capital markets, SMEs face far steeper challenges. In the Euro Area, loan rates for SMEs rose to 4–5%, the highest levels in over a decade. 30–50% of SMEs in both advanced and emerging markets now generate insufficient cash flows to cover interest payments, a structural vulnerability that has already pushed default rates in U.S. speculative-grade debt to 4.8% by mid-2024[62].

The BoJ's 2024 policy pivot, though moderate in nominal terms, has had substantial effects on corporate financing in Japan and beyond. The re-pricing of yen funding has strained SMEs and altered global capital flows, underscoring the fragility of carry-dependent funding models. The systemic nature of these effects has prompted close monitoring by institutions such as the IMF, OECD, and BoJ itself, which continues to calibrate its tightening path cautiously to avoid financial dislocations.

[61] International Monetary Fund. (2024). Global financial fragilities mount despite rate cuts and buoyant markets.
[62] Organisation for Economic Co-operation and Development. (2024). Financing SMEs and entrepreneurs 2024; European Central Bank. (2025). Statistical Data Warehouse [Dataset].

4.3. Conclusion and Policy Implication

4.3.1. Synthesis of key findings from the thesis

This thesis comprehensively examines the yen carry trade, a prominent feature of global financial markets, characterized by its exploitation of persistent interest rate differentials driven primarily by Japan's extensive period of ultra-low interest rates. A critical observation emerging from this analysis is the consistent empirical failure of the UIP, which has systematically allowed investors to profit from interest rate differentials despite significant inherent exchange rate risks. The robustness and persistence of these returns have attracted diverse market participants, including speculative investors, institutional asset managers, and multinational corporations, each amplifying the carry trade's impact through extensive use of leverage. The analysis further highlights how such leveraged positions substantially enhance both potential returns and systemic vulnerabilities, creating conditions conducive to significant market disruptions during periods of heightened volatility and abrupt currency adjustments.

Through detailed empirical exploration, including real-world case studies of Vodafone's Samurai bonds issuance and Petrobras's strategic use of USD-denominated debt, this thesis illustrates the sophisticated manner in which corporations harness low-cost yen financing to substantially reduce their weighted average cost of capital. These cases underscore how businesses strategically navigate international financial markets to optimize financing conditions, significantly influencing corporate decision-making and international capital flows. Nonetheless, the research provides compelling evidence of the considerable risks inherent to these strategies, notably exposure to sudden and unpredictable currency appreciations and elevated market volatility, as vividly demonstrated by the dramatic market repercussions following the Bank of Japan's monetary policy shift in 2024.

A particularly salient contribution of this thesis lies in its critical evaluation of the carry trade's broader implications for global financial stability. The thesis identifies the yen carry trade not only as an arbitrage mechanism but as a systemic catalyst capable of inflating

speculative asset bubbles, which, upon reversal, engender profound financial instability. Historical precedents and the recent 2024 crisis serve as potent reminders of the interconnectedness of global markets and the systemic risks posed by extensive carry trade activities. Thus, this thesis ultimately underscores the imperative of recognizing and managing these dynamics through vigilant oversight, rigorous risk management practices, and prudent financial regulatory frameworks.

4.3.2. Implications for policymakers and corporate finance strategies

The findings from this thesis provide several critical implications for both policymakers and corporate finance strategies. Policymakers must remain acutely aware of the profound global impact of the yen carry trade and other similar financial strategies. They should strive to develop regulatory measures that address excessive leverage and market volatility associated with such trades. Implementing macroprudential policies aimed at monitoring and mitigating systemic risks is essential, especially in scenarios where widespread carry trade activity may lead to financial instability.

From a corporate finance perspective, firms must adopt comprehensive risk management frameworks when engaging in carry trade-related financing strategies. These frameworks should include regular stress testing, extensive use of hedging instruments to mitigate currency and interest rate risks, and conservative leverage policies to maintain resilience during market reversals. Businesses must also integrate contingency planning into their financial strategies, preparing adequately for abrupt shifts in monetary policy or significant exchange rate movements. Ultimately, a balanced approach that leverages favorable financing conditions while maintaining preparedness for financial turbulence will be crucial in sustaining long-term corporate stability and profitability in the increasingly interconnected global financial landscape.

BIBLIOGRAPHY

- Allianz Global Investors. (2025). US investment-grade bonds: Credit quality comes with yield. Allianz Global Investors. https://www.allianzgi.com/en/insights/outlook-and-commentary/us-investment-grade-bonds-a-promising-outlook
- Ames, M., Bagnarosa, G., & Peters, G. W. (2013, March 18). Reinvestigating the Uncovered Interest Rate Parity Puzzle via Analysis of Multivariate Tail Dependence in Currency Carry Trades. http://arxiv.org/pdf/1303.4314v3
- Ames, M., Bagnarosa, G., Kosmidis, I., & Peters, G. W. (2014, June 17). Upside and Downside Risk Exposures of Currency Carry Trades via Tail Dependence. http://arxiv.org/pdf/1406.4322v1
- Anzuini, A., & Fornari, F. (2011). Macroeconomic determinants of carry trade activity (Working Paper No. 817). Bank of Italy. https://www.bancaditalia.it/pubblicazioni/temi-discussione/2011/2011-0817/index.html
- Bank for International Settlements. (2008) Quarterly Review: International banking and financial market developments. https://www.bis.org/publ/qtrpdf/r_qt0812.pdf
- Bank for International Settlements. (2012). Systemic risk in global banking: What can available data tell us and what more data are needed? (BIS Working Paper No. 376). https://www.bis.org/publ/work376.pdf
- Bank for International Settlements. (2024). The market turbulence and carry trade unwind of August 2024 (BIS Bulletin No. 90). https://www.bis.org/publ/bisbull90.pdf
- Bank for International Settlements. (2025). Bond market dynamics post-BOJ policy shift. Quarterly Review. https://www.bis.org/publ/qtrpdf/r_qt2503.pdf
- Bank of Japan. (2024a). Financial system report. https://www.boj.or.jp/en/research/brp/fsr/fsr240418a.htm
- Bhansali, V. (2007). Volatility and the carry trade. The Journal of Fixed Income, 17(3), 72-84. https://doi.org/10.3905/jfi.2007.700219
- Bloomberg L.P. Bloomberg FX and S&P 500 indices [Data set]. Bloomberg Terminal.

- Bruno, V., & Shin, H. S. (2017). Global dollar credit and carry trades: A firm-level analysis. Review of Financial Studies, 30(3), 703-749. https://doi.org/10.1093/rfs/hhw099
- Brunnermeier, M. K., Nagel, S., & Pedersen, L. H. (2008). Carry trades and currency crashes (Working Paper No. 14473). National Bureau of Economic Research. https://doi.org/10.3386/w14473
- Burnside, C., Eichenbaum, M., Kleshchelski, I., & Rebelo, S. (2011). Do peso problems explain the returns to the carry trade? Review of Financial Studies, 24(3), 853-891. https://www.nber.org/system/files/working_papers/w14054/revisions/w14054.rev2.pdf
- Cheung, Y.-L., Cheung, Y.-W., & He, A. W. W. (2012). Yen carry trades and stock returns in target currency countries. Japan and the World Economy, 24(3), 174-183. https://doi.org/10.1016/j.japwor.2012.03.002
- Clarida, R., Davis, J., & Pedersen, N. (2009). Currency carry trade regimes: Beyond the Fama regression. Journal of International Money and Finance, 28(8), 1375-1389. https://doi.org/10.1016/j.jimonfin.2009.08.010
- Columbia SIPA. (2016). Bank of Japan: Japan yield-curve-control regime [Capstone report]. Columbia University School of International and Public Affairs.
- https://www.sipa.columbia.edu/bank-japan-japan-yield-curve-control-regime
- Daniel, K., Hodrick, R. J., & Lu, Z. (2014). The carry trade: Risks and drawdowns (Working Paper No. 20433). National Bureau of Economic Research. http://www.nber.org/papers/w20433
- European Central Bank. (2025). Statistical Data Warehouse [Data set]. https://sdw.ecb.europa.eu
- Galati, G., Heath, A., & McGuire, P. (2007). Evidence of carry trade activity. BIS Quarterly Review, (September), 31-44 https://www.bis.org/publ/qtrpdf/r_qt0709e.pdf
- Hattori, M., & Shin, H. S. (2009). Yen carry trade and the subprime crisis. IMF Staff Papers, 56(2), 384-409. https://doi.org/10.1057/imfsp.2009.2

- International Monetary Fund. (1998). Crisis in Asia: Regional and global implications (Interim assessment, Table 3). https://www.imf.org/-/media/Websites/IMF/imported-flagship-issues/external/pubs/ft/weo/weo0598/pdf/_0598ch2pdf.ashx
- International Monetary Fund. (1998). World Economic Outlook: Financial crises-Causes and indicators (Table 14). https://www.imf.org/external/pubs/ft/weo/weo1298/pdf/file4.pdf
- International Monetary Fund. (2015). Global Financial Stability Report: Navigating monetary policy challenges and managing risks. https://www.imf.org/~/media/Websites/IMF/imported-flagship-issues/external/pubs/ft/GFSR/2015/01/pdf/_textpdf.ashx
- International Monetary Fund. (2019). Covered Interest Parity Deviations: Macrofinancial Determinants. https://www.imf.org/en/Publications/WP/Issues/2019/01/16/Covered-Interest-Parity-Deviations-Macrofinancial-Determinants-46472
- International Monetary Fund. (2020). Global Financial Stability Report: Bridge to recovery - Capital flows and the risk of financial instability (Ch. 2). https://www.imf.org/en/Publications/GFSR/Issues/2020/10/13/global-financial-stability-report-october-2020
- International Monetary Fund. (2024c). Global financial fragilities mount despite rate cuts and buoyant markets. https://www.imf.org/en/Blogs/Articles/2024/10/22/global-financial-fragilities-mount-despite-rate-cuts-and-buoyant-markets
- Investguiding. (2025, May 27). How to Invest In Japanese Yen (2025) https://investguiding.com/article/how-to-invest-in-japanese-yen
- Investopedia. (2024). Uncovered Interest Rate Parity (UIP): Definition and Calculation. https://www.investopedia.com/terms/u/uncoveredinterestrateparity.asp
- Jordà, O'., & Taylor, A.M. (2012). The carry trade and fundamentals: Nothing to fear but FEER itself. Journal of International Economics, 88(1), 74-90. https://doi.org/10.1016/j.jinteco.2012.01.007
- Kyodo News. (2024a). BOJ hikes rates to 0.25 % in push toward normalization amid weak yen. Kyodo News. https://english.kyodonews.net/news/2024/07/6822440d53e2-update1-bank-of-japan-raises-policy-rate-to-around-025-from-0-01-range.html
- Macroalchemist (2024). The Yen Carry Trade - Leverage, Losses, and Lessons. https://macroalchemist.com/the-yen-carry-trade-leverage-losses-and-lessons/

- MarketBulls. (2024). Japanese Asset Price Bubble Explained Briefly. https://market-bulls.com/japanese-asset-price-bubble-explained/
- Morningstar (2023). The Bank of Japan Tweaks Yield-Curve Control Policy. https://www.morningstar.hk/hk/news/237792/the-bank-of-japan-tweaks-yield-curve-control-policy.aspx
- Morningstar. (2024). The Japanese yen still poses 'a very big risk' to global markets. https://www.morningstar.com/news/marketwatch/20240905407/the-japanese-yen-still-poses-a-very-big-risk-to-global-markets-heres-why
- Organisation for Economic Co-operation and Development. (2024). Financing SMEs and entrepreneurs 2024: https://www.oecd.org/publications/financing-smes-and-entrepreneurs-2024_fa521246-en.htm
- Oxford Academic. (2017). Global Dollar Credit and Carry Trades: A Firm-Level Analysis. https://academic.oup.com/rfs/article/30/3/703/2758633
- Petròleo Brasileiro S.A. (Petrobras). (2010). Corporate funding strategy through USD-denominated bonds [Investor prospectus]. https://www.sec.gov/Archives/edgar/data/1119639/000119312512038110/d293138d424b2.htm
- Reuters. (2024b). Nikkei index sees biggest rout since 1987 Black Monday. https://www.reuters.com/markets/asia/japans-nikkei-sees-biggest-rout-since-1987-black-monday-2024-08-05/
- Reuters. (2025a). Indian firms look homewards for borrowings as local yields fall, global appetite stays weak. https://www.reuters.com/markets/asia/indian-firms-look-homewards-borrowings-local-yields-fall-global-appetite-stays-2025-05-08/
- StarseedFX. (2025). Underground Secrets: How the Volatility Index Unmasks AUD/JPY Moves. https://starseedfx.com/advanced-trading-strategies/volatility-index-audjpy-strategy/
- State Street Global Advisors. (2020). US-dollar funding stress in the time of COVID-19 [White paper]. https://www.ssga.com/library-content/pdfs/insights/192334-inst-charts-for-dollar-funding-v3-sv.pdf
- Vodafone Group Plc. (2013). Annual report and accounts 2013 (pp. 98-101). https://investors.vodafone.com/~/media/files/v/vodafone-ir/documents/performance/financial-results/2013/vodafone-annual-report-2013.pdf