

HKD Link Exchange Rate Arbitrage Innovative Model Under the HKMA Monetary System

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ABSTRACT

This research proposes a novel approach to enhancing the link exchange rate system, emphasizing a shift from passive regulatory oversight to active market mechanics. The initiative intends to harness market forces as a primary mechanism for system stabilization, rather than depending exclusively on interventions by governmental authorities or central banks. In an increasingly interconnected global economy, where capital flows and currency valuations can change rapidly, it is essential to develop methodologies that allow for real-time responsiveness to market fluctuations. Key to this innovative initiative is to implementation of an arbitrage mechanism, which serves as a critical financial strategy employed by traders to exploit price discrepancies across different markets. By facilitating swift adjustments in currency values, arbitrage not only aids in aligning exchange rates but also mitigates the impact of speculative bubbles and excessive volatility on financial markets. Moreover, the research advocates for the integration of advanced analytical frameworks and econometric models to better predict and understand market behaviors. This will provide stakeholders with the tools necessary to make informed decisions rooted in robust data analysis and empirical evidence. Ultimately, by activating the inherent dynamics of the market through structured arbitrage, this research highlights a paradigm shift that aims to empower investors and institutions alike, promoting a more resilient exchange rate system that is less susceptible to systemic risks and more reflective of actual economic conditions.

Key words: Arbitrage, Link Exchange Rate, finance & Banking, Currency board system

Introduction

Hong Kong's interbank offered rate has dropped unusually in recent weeks. From a high in early May, it decreased to over 4%. As of May 4, the one-month interbank offered rate fell to 0.75%, a decline of 4 cents and 3%. Within just three weeks, it plunged sharply by 3.25%, a record that

has never been seen before. This is also an unusual development. Typically, there is a difference in interest rates between Hong Kong and the US due to the linked exchange rate. In the past, people have closely monitored the records, and most of the time, the interest rate differentials between the two have been around 1% or less, sometimes even exceeding 2%. This time, the difference is staggering—over 3%. It's unprecedented since the linked exchange rate was introduced. (HKMA 2025)

What's behind the scenes, specifically the interest rate difference between Hong Kong and the US. There may be some flaws in the linked exchange rate mechanism. To understand it, we must first understand the currency board system.

Currency Board System

Under the currency board system, arbitrage activity is linked to the exchange rate tied to the Hong Kong dollar. This mechanism works by attracting funds to Hong Kong, which in turn causes the dollar to appreciate, rise in value, and increase supply, leading to lower interest rates. When interest rates in Hong Kong banks decrease, the difference between the two rates should widen. This widening gap would theoretically trigger an arbitrage response.

The currency board system operates on the principle of maintaining a fixed exchange rate between the domestic currency, in this case, the Hong Kong dollar (HKD), and a foreign reserve currency, usually the US dollar. This system ensures that for every unit of HKD in circulation, there is an equivalent amount of foreign currency held in reserve, promoting stability and confidence in the currency.

In the context of the HKD, when capital flows into Hong Kong are strong, the demand for the HKD increases, leading to appreciation of its value against other currencies. As more foreign investments are made in local markets, the increased demand for HKD results in a higher supply of the currency in circulation.

As the supply of HKD rises, interest rates in Hong Kong's banking system generally tend to decline. Lower interest rates in Hong Kong can create a differential when compared to interest rates in other countries. This differential, or spread, becomes an opportunity for making profit.

The underlying problem causing this phenomenon (HK money flow)

The current linked exchange rate regime in Hong Kong is characterized by rigidity, raising concerns about its suitability in the prevailing economic conditions. One must consider whether Hong Kong's economic cycle is currently diverging from that of the United States. Despite the apparent misalignment, it is crucial to maintain a stable linked exchange rate system due to its

importance in underpinning market confidence and minimizing currency risk. In this research paper, we will elaborate on this issue in greater depth.

Subsequent to the discussion, a pronounced decline in market indices was observed, eliciting mixed sentiments among stakeholders. On one hand, there is a sense of satisfaction among some market participants due to the significant reduction in interest rates, which could potentially spur borrowing and investment. On the other hand, this reaction also reflects underlying apprehensions about the long-term implications of such volatility on the economic environment.

Due to the sharp decline in bank interest rates, the bank's fixed Hong Kong dollar time deposits have nearly lost their one-month value. As a result, the interbank interest rates have fallen sharply, banks have reduced their discounts on time deposits. The interest rate in Hong Kong has dropped significantly recently. This decline began earlier this month, following a large influx of funds into the city, which prompted the Hong Kong Monetary Authority to increase its demand for funds. The Hong Kong dollar's strong Convertibility Guarantee led the supervisory authority to freeze the exchange rate. The influx of U.S. dollars led to a sell-off of Hong Kong dollars, causing the banking system's balance to increase in just a few weeks.

Discussion:

Explicit meaning

To explain this phenomenon requires looking at the influx of capital, especially since the Hong Kong Stock Exchange has seen a large number of new IPO listings, which have brought in a significant amount of capital. According to our banking system records, nearly RMB 50 billion has entered our banking system. Currently, our RMB balance sheet stands at approximately RMB 900 billion. This is clear evidence of a substantial inflow of new funds. (HKMA, 2025)

There's a significant amount of money flowing into Hong Kong, driven by various factors. For one, CATL raised nearly \$40 billion in new shares, and this was followed by the freezing of hundreds of billions of funds. Many Hong Kong-listed companies also had to pay out Hong Kong dollar dividends in the first half of the year, creating a huge demand for funds that has been temporarily driven up.

According to the Hong Kong Monetary Authority's own explanation, they attribute this to rising demand for investment activities related to Hong Kong stocks. However, it's puzzling. If so much capital is flowing in, one would expect Hong Kong stocks to rise. Yet, the magnitude of the increase doesn't seem to correlate directly with the influx of funds. Except for CATL, transaction volume only experienced a slight uptick on the day of listing. (HKMA 2025)

Technically, when interest rates in Hong Kong banks drop, the difference between the two rates should grow wider. This, in turn, would theoretically trigger an interchange response.

Essentially, the available funds should be converted to US dollars to tackle the high interest rate situation. With the US dollar's one-month interest rate near 4% and Hong Kong's at 0.75%, there's a 3.25% interest rate difference. The one-link replacement mechanism allows Hong Kong and US dollars to act as equivalent currencies, similar to holding U.S. dollars. If you trust the linked exchange rate mechanism, your funds should be in U.S. dollars. Under the I-Federation mechanism, a currency board indicates increased demand for U.S. dollars.

The decrease in demand for the Hong Kong dollar has raised interbank interest rates, leading to a slight decline. Recently, rates are slightly higher than before, surpassing the strong party's convertibility guarantee of about 7.8 to 1 US dollar. It is unusual for interbank rates to fall, as shown in the chart continuously. In the past decade, interbank interest rates have never unexpectedly reached 4% in a short time before dropping sharply to 0.75 cents, a record first.

From 2020 to 2022, the Hong Kong dollar's interbank interest rate was near zero, mirroring the U.S. dollar's low rates. The Federal Reserve eased monetary policy due to the pandemic and resumed bond buying, which lowered U.S. dollar rates. Consequently, the Hong Kong dollar's rates remained low, as the interest rate spread between the two currencies was unlikely to increase. (HKMA 2023)

Interest rates in the US are still high, and many factors are influencing potential cuts this year. The sharp decline we're seeing is likely due to underlying structural changes rather than short-term factors. This unusual phenomenon, and it seems like there's some implicit meaning behind it. There appears to be a connection between the US dollar and the Hong Kong dollar, which is impacting capital flow. Could there be an issue with the arbitrage mechanism. We considering this question and will try to analyze it implicitly.

The implicit meaning

The rationale underpinning the widening interest rate differential between Hong Kong and the United States transcends the previously discussed considerations, notably encompassing the phenomenon of capital parking. It is crucial to comprehend that prevailing asset prices are indicative of anticipated future economic conditions. This relationship signifies that the trajectory of current prices offers insights into foreseeable events, while the movement of capital itself conveys substantial information regarding future market dynamics. The market operates as a conduit of authentic communication, and astute investors have already adapted their strategies accordingly. A pertinent illustration of this is evident in the actions of the renowned investor Warren Buffett, who has substantially liquidated his equity holdings in favor of cash reserves.

This scenario suggests that capital residing in Hong Kong presents a comparatively lower risk profile than that found in alternative jurisdictions. Additionally, since interest rates are intrinsically tied to perceived risk, the varying levels of risk appetite among investors serve to elucidate the interest rate gap existing between Hong Kong and the United States.

Although this is the case, the currency board system's principles require that the Hong Kong dollar's interest rate closely matches the US dollar's over time. This connection shows that Hong Kong's monetary policy framework is closely tied to the US's, making interest rate movements dependent on each other.

From an alternative perspective, the current discount of the Hong Kong dollar relative to the US dollar may be regarded as a transient occurrence. In the longer term, economic fundamentals suggest that the interest rates of both economies will converge, reflecting the stability and predictability of the linked exchange rate system. This convergence is critical as it indicates a normalization of the monetary conditions in Hong Kong where external shocks and local economic variations are gradually absorbed into a cohesive financial ecosystem.

So, here is an innovative idea for a suggestion: by utilizing the risk and rate method, we can modify the link exchange rate in a more systematic way that follows the arbitrage system, driven by market forces to initiate the link exchange rate. This research paper's idea is far better than the traditional method of merely using the authorities' power to manipulate the market. My research initiative is to utilize the market arbitrage mechanism to protect the link exchange system. When the HKD is attacked by external forces, it means the risk of the HKD will increase, and consequently, the interest rate of the HKD will also rise, like a **mirror effect**, reflecting the current situation. When the risk of HKD is high, the rate of the HKD will also be high, and vice versa. My innovative research model, let's call it the Risk-Rate model (RR model), aims to activate market forces, the invisible hand, to address the link exchange rate problem rather than relying solely on the authorities' power. Utilizing the arbitrage system to activate and engage market forces in addressing the link exchange problem is a much more ideal and mature method for correcting the link exchange rate issue.

Suggestion:

Optimization modify reforms can be implemented in the arbitrage mechanism and the capital currency pool function. The carry rate ratio and risk ratio serve as pricing tools to adjust the price and maintain the linked exchange rate. This allows currencies from both places to be hedged more effectively. A new optimized logarithmic channel provides the basis for price adjustment, carry, and risk hedging to balance interest rates and risks. As a result, the arbitrage function can be effectively utilized.

7.9	A	Section A Intervention p.t.
7.85	B	Section BCD Non- Intervention p.t.
7.8	C	
7.75	D	
7.7	E	Section E Intervention p.t.

Max Arbitrage Gain HKD 7.85-HKD 7.75=HKD 0.1

Max 0.1 to Min 0.01 → 0

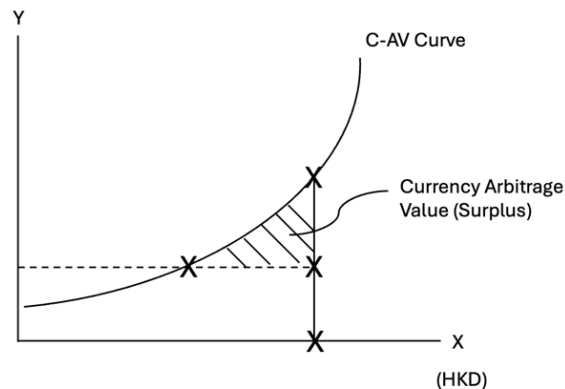
Innovative HKD link exchange rate **Mirror** Arbitrage Model

$$r_i = r_{risk}$$

$$\frac{\partial(r_i)}{\partial(t)} = \frac{\partial(r_{risk})}{\partial(t)}$$

$$\frac{\partial(y)}{\partial(t)} = \frac{\partial(r_i)}{\partial(t)}$$

$$\frac{\partial(x)}{\partial(t)} = \frac{\partial(r_{risk})}{\partial(t)}$$



Innovative HKD link exchange rate Arbitrage Model

$$Area = \int \frac{\partial(y)}{\partial(t)} - \int \frac{\partial(x)}{\partial t}$$

Area > 0 Arbitrage

Area < 0 non_Arbibitrage

Area = Currency Arbitrage Value (Surplus)

In a certain amount of time (period of time),

If there is a surplus area, then currency arbitrage will be possible.

If there is a negative area or no surplus area, then currency arbitrage will not be possible.

This paper proposes utilizing the Hong Kong Monetary Currency Board System to suggest a modification to the price rate under the Arbitrage mechanism.

In the above example, that mean, in a specified duration, often referred to as a time period, the existence of a surplus area indicates that there are opportunities for currency arbitrage. Currency arbitrage is the simultaneous buying and selling activities of a currency in different markets to exploit price differentials, thus generating arbitrage (profit).

Conversely, if there exists a deficit area or an absence of a surplus area, currency arbitrage becomes infeasible. In such scenarios, the market conditions do not support the disparity in currency values needed to facilitate arbitrage opportunities, ultimately disallowing the possibility of profiting from currency fluctuations across different markets.

Conclusion:

This research suggests an innovative idea to modifying the link exchange rate system. The initiative aims to activate market forces to protect the system instead of relying solely on authorities. By utilizing the arbitrage system, we can easily manage market fluctuations in a more sophisticated manner. In addition, in the short term, the interest rates may not align with those observed in both Hong Kong and the United States; however, it is imperative that they eventually synchronize over the long term due to the mechanics of a linked exchange rate system. This system necessitates that the domestic interest rates adjust to the prevailing rates in these major economies to maintain currency stability and economic equilibrium. Consequently, sustained divergences from international interest rates could threaten the peg's integrity and impact capital flows, prompting eventual convergence in rates to uphold the underlying economic fundamentals. Hope this research article can contribute to academia, especially for the

citizens of mankind.

References

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