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Authors	Juin-Jen Chang, Wan-Ting Chang, YiLi Chien, and Chun-Hung Kuo
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Who Paid for the Profits of Taiwan's Central Bank?*

Juin-Jen Chang† Academia Sinica

Wan-Ting Chang‡ National Tsing Hua University

YiLi Chien§ Federal Reserve Bank of St. Louis

Chun-Hung Kuo¶ National Tsing Hua University

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Abstract

We analyze the interaction between the Taiwan central bank's profits and its policies. To earn large and consistent profits, the Taiwan central bank significantly expanded its balance sheet and relied on inexpensive short-term domestic funding to invest in longer-term foreign debt securities. In doing so, the central bank engineered a massive duration and currency mismatch on its balance sheet to capture term and currency risk premiums. We also argue that these large profits could not have been realized without a low rate policy combined with heavy regulations on domestic financial institutions. These regulations function like a tax on the returns of private overseas investments, effectively trapping funds within the domestic financial system. Ultimately, the profits earned by the central bank are, in effect, an implicit tax revenue levied on domestic depositors.

JEL codes: G12, E62

Key words: monetary policy, fiscal policy, Central bank independence, financial repression

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†Institute of Economics, Academia Sinica, Taiwan. Email: jjchang@econ.sinica.edu.tw

‡Department of Economics National Tsing Hua University, Taiwan. Email: cwanting218@gmail.com

§Research Division, Federal Reserve Bank of St. Louis, USA. Email: yilichien@gmail.com

¶Department of Economics National Tsing Hua University, Taiwan. Email: kuoch@mx.nthu.edu.tw

1 Introduction

Over the past two decades, Taiwan's central bank has consistently generated substantial profits. Its net interest income has remained above 1% of GDP, averaging 1.76% of GDP between 2001 and 2023. Since most of these profits are remitted to the Ministry of Finance, the government's budget constraints have been considerably eased. The large and steady remittances from the central bank have become a crucial revenue source, accounting for an average of 9.58% of total government revenue between 2000 and 2023.[1] Consequently, the Taiwanese government has been able to finance its expenditures without having to issue additional government debt.

On the surface, the steady profits earned by the central bank may seem like good news, as they help alleviate the government's fiscal burden, which would otherwise fall on taxpayers. However, the persistent scale of these profits has sparked debate among economists and central bankers regarding their potential economic and policy ramifications.[2]

Central bank independence is the primary concern for economists. If the government becomes overly reliant on the central bank's surplus remittances, it could compromise the bank's ability to make independent decisions, thereby affecting the effectiveness of interest rate and exchange rate policies (Chen, Liu, and Wang, 2013; Chen et al., 2021; Wu et al., 2024). By contrast, Taiwan's central bank states that remitting surplus profits to the Ministry of Finance is both legal and appropriate, provided that the central bank has achieved its statutory goals.[3]

To shed light on this issue and help settle the debate, we examine how Taiwan's central bank has consistently earned profits through the evolution of its balance sheet and policy. We first document that the Central Bank of Taiwan has implemented a significant currency and duration mismatch on its balance sheet—borrowing from Taiwanese households through the banking sector, primarily at floating rates, and investing in longer-duration foreign assets to capture term and currency premiums. By the end of 2023, the size of the central bank's balance sheet had reached 83% of GDP. Over 43% of its liabilities, including cash, bank reserves, and government deposits, had no duration. In addition, the central bank issued short-duration securities, mostly maturing within one year, to fund its foreign asset purchases. These short-term securities accounted for 41.6% of its liabilities. On the asset side, the Central Bank of Taiwan invested in foreign securities, primarily longer-term foreign government bonds, with holdings amounting to 75.2% of GDP. The massive currency and duration mismatches on its balance sheet have enabled the Central Bank of

[1] Figures A.1 and A.2 show the trend of the Taiwan central bank's remittances as a share of total state-owned enterprises' remittances and total government revenue, respectively.

[2] For example, at the end of 2023, several news outlets drew attention to this issue : Business Today.

[3] When a legislator questioned the governor of Taiwan's central bank about its large profit remittances, the governor responded by saying that there is nothing inherently wrong with generating excess surpluses, as long as the central bank fulfills its mandates and policy goals. See the news report by Business Yee (in Traditional Chinese).

Taiwan to reap the benefits of term and currency risk premiums.[4]

From an ex-ante perspective, the investment strategy of Taiwan's central bank could generate considerable profits. However, this strategy carries inherent risks, as the possibility of losses is always present—financial engineering cannot eliminate risk. For instance, expropriation risk may arise through debt restructuring. A recent proposal suggests converting U.S. short-term Treasury bonds into long-term or ultra-long-term bonds to reduce refinancing pressure. Although this proposal—referred to by the media as the "Mar-a-Lago Agreement"—has not yet been implemented, it could have significant implications for the U.S. Treasury market and interest rate structure. This poses notable risks to creditor nations, including Taiwan's central bank, which holds substantial U.S. government bonds.

Even if we acknowledge the risky investment strategy adopted by the Taiwan central bank, this does not fully explain why the central bank has been able to consistently earn steady profits for more than two decades. Our analysis indicates that the persistent stream of profits mainly came from the spread between domestic and foreign interest rates. The Taiwan central bank is able to fund its higher-yield foreign debt security investment by borrowing at lower domestic interest rate without hedging the currency risk. Our finding also raises the question: Why don't Taiwanese financial institutions adopt the same investment strategy and earn profits similar to those of the Taiwan central bank? Instead, financial institutions in Taiwan lend their funds to the central bank through short-term securities and earn lower returns. Essentially, there is a risk mismatch at play. The central bank backs risk-free promises to its security holders, primarily banks, while relying on risky investments to generate excess returns. In other words, the central bank is able to consistently issue over-priced (low-yield) securities and fund its overseas investments.

In this paper, we argue that the various regulations imposed by Taiwan's central bank constitute financial repression, creating an unequal playing field between the central bank and other financial institutions in Taiwan. These regulations effectively trap domestic funds within the domestic financial system, leading to an overvaluation of central bank securities. In other words, the central bank's funding cost is suppressed compared to what it would be in an unregulated market environment. We provide empirical evidence supporting this argument. Among the current regulations, the hedging requirement imposed by the central bank plays a significant role.

[4]The International Monetary Fund (IMF) has explicitly highlighted central bank balance-sheet vulnerabilities arising from high holdings of foreign-currency reserves financed through short-term sterilization instruments, creating both currency and duration mismatches (Hooley, Lattie, and Stella, 2023). Currency mismatch risk typically arises from exchange rate fluctuations, and maturity mismatch risk occurs when assets are long-term and illiquid, while liabilities are short-term. Lafarguette and Veyrune (2021) stated that accumulating foreign reserves and issuing short-term sterilization instruments to offset FX interventions expose central banks' balance sheets to interest rate, valuation, and maturity risks. The analysis of currency and maturity mismatches in balance sheets has also increasingly become a regular element in the IMF's toolkit for surveillance in emerging market countries (Rosenberg et al., 2005).

Specifically, Taiwanese financial intermediaries are required to partially hedge the currency risk associated with foreign investments. Given the high hedging costs, this hedging requirement effectively prevents these institutions from replicating the central bank's carry trade strategy.

From the perspective of Covered Interest Rate Parity (CIP), the cost of hedging faced by Taiwanese financial institutions is exactly equal to the interest rate differential between domestic and foreign assets. As a result, the hedging requirement reduces their post-hedging returns on foreign investments. Consequently, this regulation amounts to financial repression by restricting the overseas investment opportunities of Taiwan's financial intermediaries and effectively trapping their assets within the domestic market.

The financial market data indicate a persistent negative TWD (New Taiwan dollar) cross-currency basis against the USD, suggesting that currency hedging costs are even higher than the interest rate difference. In other words, for a hedged foreign investment originating from Taiwan, the profit generated by the interest rate spread is outweighed by its associated hedging costs, resulting in a negative-return on investment. This phenomenon aligns with the findings of Du, Tepper, and Verdelhan (2018), which demonstrate that low-interest-rate currencies tend to have more negative bases against the USD as investors seek higher yields abroad. Among the world's major currencies, the Japanese yen has established itself as a primary funding currency for global carry trades due to the Bank of Japan's ultra-low interest rate policy over the past decades. The cross-currency basis of USD/JPY has remained consistently negative since the global financial crisis. Nevertheless, the CIP deviation observed in the USD/TWD onshore FX forward market is even larger than that in the USD/JPY forward market (Du and Huber, 2024). In short, the large negative basis in the USD/TWD market, driven by the scale of international capital flows, further reduces the hedged returns on foreign investments for Taiwan's private financial institutions.

We view this pronounced CIP deviation as clear evidence of financial repression, stemming from capital controls and mandatory hedging requirements imposed by the central bank and the financial regulator.

To quantify the effect of financial repression on the central bank's profitability, we consider two counterfactual scenarios. The first assumes that the Central Bank of Taiwan is required to hedge its foreign investments, as financial institutions typically are. We find that central bank profits would be significantly reduced under such a currency hedging requirement. Between 2005 and 2022, the rate of return on the central bank's foreign investments would decrease by 1.13% on average if it were to hedge its currency risk. Given its large holdings of foreign reserves, the estimated return reduction for Taiwan's central bank would average 0.90% of GDP. Compared to the net interest revenue of 1.79% of GDP during the same period, this suggests that approximately half of net

interest income would be eliminated if the central bank fully hedged its foreign asset positions.

For financial stability purposes, deposit institutions are regulated to manage their interest rate risk by reducing duration mismatches on their balance sheets. However, the central bank is not subject to such regulations and is therefore able to take on greater duration risk. In our second counterfactual accounting exercise, we assume that the central bank's asset duration roughly matches its liability duration. Under this assumption, we calculate the net income the central bank would have earned. The results show that the average net interest income would have declined from 1.72% of GDP per year to just 0.46% of GDP, representing a 74% reduction.

These two simple counterfactual exercises underscore that all of the Central Bank of Taiwan's net income could be attributable to its risk-taking strategy involving duration and currency mismatches. Such strategies are typically not feasible for domestic financial institutions due to regulatory constraints—constraints that can be interpreted as a form of financial repression. Ultimately, the suppressed domestic interest rate acts as a tax on depositors in Taiwan. In other words, at least part of the profit earned by the central bank represents an implicit tax revenue levied on domestic depositors.

2 Related Literature

This paper is motivated by and is most closely related to Chen et al. (2021), who cover a broad range of issues—from documenting the low interest rate and undervalued exchange rate policies implemented by the central bank to analyzing the negative consequences of these policies. By contrast, our study delves deeper into the central bank's investment strategy and emphasizes the need for financial regulatory policies beyond the low interest rate regime. In particular, we first point out that the central bank's carry trade investment strategy entailed significant risks. Because the central bank had earned consistent profits over the past decades, these risks were not readily apparent. We further argue that such risks were obscured by financial repression.

Ideally, a central bank should focus on its policy mandate rather than on profits or losses. Consistent with this view, Bell et al. (2023) note that "[w]hile central bank losses will affect the consolidated public finances, serving as a source of revenue for governments is not the purpose of a central bank: they exist to fulfill their policy mandates, including price and financial stability." Nevertheless, there is a growing empirical literature showing that central banks do take profitability into account. Our work contributes to this literature. Goncharov, Ioannidou, and Schmalz (2023) find that central bank profits tend to cluster around mildly positive levels, with few instances of substantial gains. Jeanne and Svensson (2007) find that even independent central

banks are concerned about their balance sheets and capital levels. Although generating a positive profit is not a formal mandate for most central banks, these findings suggest that they may be subject to political pressure to avoid losses. Wang (2025) documents that central banks sometimes mitigate losses through foreign exchange interventions. The Taiwan central bank's consistently large profits (as a percentage of GDP) surpass those of most—if not all—other central banks. As a result, its substantial and regular remittances to the Ministry of Finance blur the line between a public financial institution and a central bank.

The currency exposure of the Central Bank of Taiwan's portfolio makes it highly averse to TWD appreciation. Several studies have examined Taiwan's exchange rate interventions. Most of these studies find evidence that Taiwan's central bank intervenes in the FX market when the TWD appreciates against the USD but not when it depreciates (Chen, 2016, 2019; Chen and Wu, 2008, 2010; Bergsten and Gagnon, 2012). Nevertheless, our study highlights that the central bank's consistent profit primarily stems from the interest rate differential between Taiwan and foreign countries rather than exchange rate depreciation. The reasoning is simple and straightforward: for consistent gains, the exchange rate would need to depreciate continuously. However, we find relatively little evidence to support this. For example, during our sample period, the average annual depreciation rate of the New Taiwan dollar against the U.S. dollar is nearly zero, at -0.07%, indicating a slight appreciation. It is important to note that our study does not contradict the previous literature. An asymmetric and persistent FX intervention does not necessarily lead to long-term currency appreciation or depreciation. It is possible that, without the Taiwan central bank's FX intervention, the Taiwanese dollar would have appreciated significantly.

Our work contributes to the growing literature on covered interest rate parity (CIP) deviations in currency markets. Regulators may play a key role in preventing arbitrageurs from closing the gap by imposing capital or hedging requirements on financial institutions (Du, Tepper, and Verdelhan, 2018). In the case of Taiwan, we show that CIP deviations directly support the central bank's low-rate policies by reducing the hedged return gap between foreign and domestic investments. Additionally, the hedging requirement and capital control, introduced under the name of macroprudential policy, can also be interpreted as financial repression.

Our paper is organized as follows. Section 3 examines the balance sheet of the Taiwan central bank and documents its carry trade investment strategy. A carry trade refers to the practice of borrowing in low-interest-rate currencies to invest in high-interest-rate currencies without hedging the associated currency risk. We demonstrate that the source of its consistent profits stems from the interest rate spread between domestic and foreign markets, particularly the United States. Section 4 analyzes the large CIP deviation observed in the FX forward market, which serves as

supporting evidence of financial repression. Additionally, we quantify the reduction in the central bank's profits if it is required to hedge its foreign investments. Section 5 argues that central bank profits function, in effect, as a tax on domestic depositors. We also discuss the potential policy constraints imposed by the Taiwan central bank's profit objectives. Finally, Section 6 concludes our study.

3 The Taiwan Central Bank's Carry Trade

Since 2000, the Taiwan central bank has significantly increased the size of its balance sheet relative to the Taiwanese economy. Much of this expansion on the asset side has been driven by the accumulation of foreign assets as part of its foreign reserves. On the liability side, the increase is largely due to the issuance of central bank securities in domestic currency, which are held exclusively by the domestic banking sector.

To build its foreign reserves, the Taiwan central bank buys foreign currency while selling domestic currency in the foreign exchange market, which typically causes the domestic currency to depreciate relative to the foreign currency. Simultaneously, the central bank issues short-term securities in exchange for its own currency. With abundant bank reserves, the issuance of these securities has become a key tool for managing short-term domestic interest rates. The evolution of the balance sheet then reflects the exchange rate and monetary policies implemented by the Taiwan central bank.

3.1 The Balance Sheet of the Taiwan Central Bank

Table 1 offers a snapshot of the Taiwan central bank's balance sheets at the end of 2000, 2011, and 2023. The years were chosen according to the start of our data sample in 2000, the middle year in 2011, and the most recent available data in 2023.

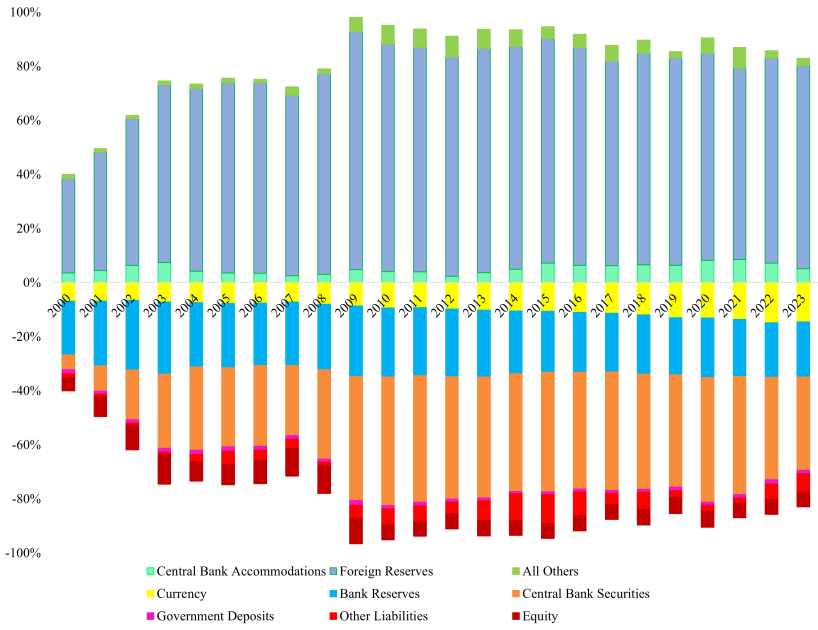
In 2023, the Taiwan central bank invested 75.2% of GDP in foreign securities through foreign reserves. To fund its foreign reserves operations, the central bank not only relied on currency and bank reserves, which accounted for 14.6% and 20.3% of GDP, respectively, but also issued central bank securities amounting to 34.6% of GDP. By contrast, its balance sheet was significantly smaller in 2000, with foreign reserves making up 34.9% of GDP, primarily funded by currency and bank reserves. Overall, the Taiwan central bank's balance sheet more than doubled from 2000, driven by an increase in foreign securities and the issuance of central bank securities. Figure 1 illustrates the evolution of the central bank balance sheet from 2000 to 2023.

Table 1: The Expansion of the Taiwan Central Bank's Balance Sheet

% of GDP, Year End	2000	2011	2023
Assets			
Central Bank Accommodations	3.6%	4.0%	5.1%
Foreign Reserves	34.9%	83.0%	75.2%
All Others	1.6%	6.8%	2.7%
Liabilities and Equity			
Currency	6.9%	9.3%	14.6%
Bank Reserves	19.9%	25.1%	20.3%
Central Bank Securities	5.4%	46.9%	34.6%
Government Deposits	1.6%	1.3%	1.2%
Other Liabilities	1.3%	5.8%	6.8%
Equity	4.9%	5.5%	5.5%
Total	40.0%	93.8%	83.0%

Unit: % of GDP. Source: Taiwan's Central Bank and National Accounts of Taiwan

Figure 1: The Taiwan Central Bank's Balance Sheet



Unit: % of GDP.
Source: Taiwan's Central Bank and National Accounts of Taiwan

In what follows, we show that the balance sheet of Taiwan's central bank is heavily exposed to currency and interest rate risks due to its currency and duration mismatches.

3.2 Currency Mismatch

The balance sheet of Taiwan's central bank is heavily exposed to currency risk. Almost all of its assets are held in foreign assets in the form of foreign reserves or central bank accommodations denominated in foreign currency, while all of its liabilities are denominated in the local currency. To the best of our knowledge, none of its foreign asset position is currency hedged. While this is a common practice for central banks holding foreign reserves, the currency risk exposure is especially pronounced in Taiwan due to the large size of its foreign asset holdings, which have exceeded 80% or even 90% of GDP over the past decade. This makes the currency mismatch on its balance sheet particularly notable. For example, in 2023, the foreign reserve is about 75% of GDP. A 5-percentage-point appreciation in the TWD leads to an approximate 3.75% of GDP marked-to-market loss in its foreign investment.

3.3 Duration Mismatch

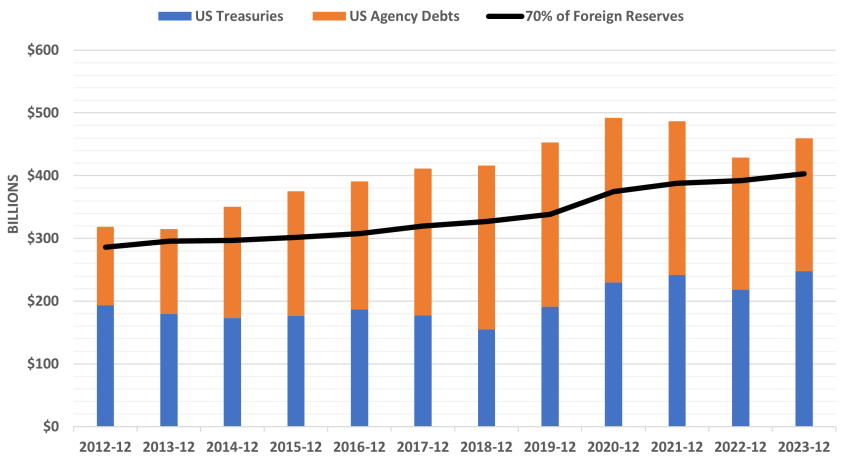
In this subsection, we provide more quantification of the duration risk exposure of the central bank's financial assets and liabilities reported in Table 1.

We begin by estimating the duration of its liabilities. Currency, bank reserves, and government deposits have zero duration. The duration of central bank certificates ranges from 1 week to 2 years, with most maturing in less than a year. The duration of central bank certificates is estimated by using its issuance data. Once we have the duration of each liability item, we can then calculate the overall duration of the entire liabilities. The results show that the average duration is relatively short — only 1.92 months (0.16 years) — ranging from half a month in 2000 to 2.6 months in 2018. In other words, the central bank borrows primarily at the very short end of the yield curve. Given that the short-term interest rate is a policy tool of the central bank, this suggests that the Taiwan central bank can effectively manage its borrowing costs through its interest rate policy.

It takes more work to estimate the asset duration because the Taiwan central bank does not officially reveal the portfolio details of its foreign securities. In spite of this, it is believed that most of its foreign positions are longer-term foreign government bonds, mostly U.S. Treasury bonds. This belief was confirmed by a news article in the Taiwan Commercial Times, which reported (in translation) that "The Deputy Governor of the Central Bank, Tzung-Ta Yen, stated today (March 20th, 2023) during a legislative session that about 70% of the Central Bank's foreign exchange reserves are held in U.S. Treasury bonds.[5] However, these are held to maturity, with fixed interest received annually, which does not affect the returns." According to the report, it could be the case

[5] A more recent news article by the Economic Daily News in March 2025 suggested that the share has increased to over 90%.

Figure 2: Taiwan Holdings of U.S. Treasuries and Agency Debts (Trailing 12 months)



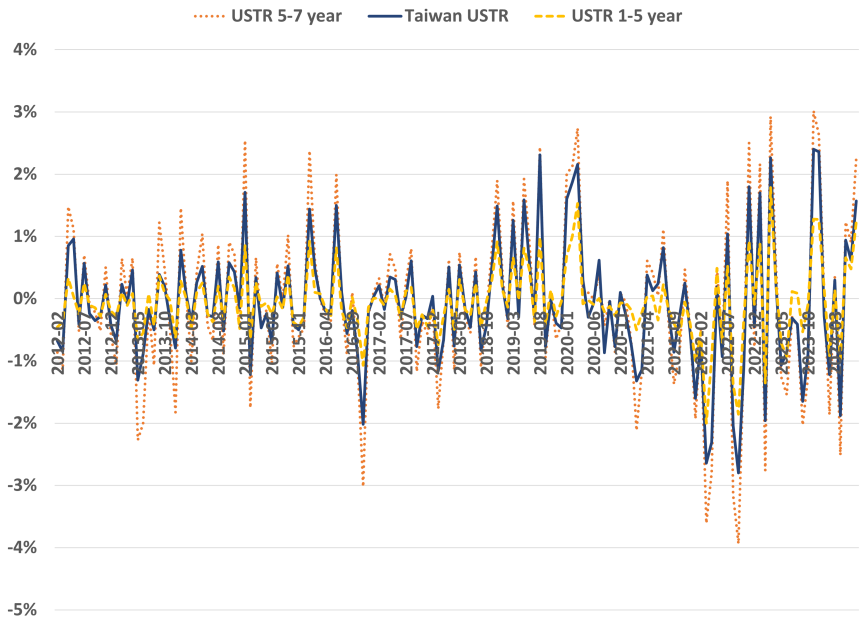
Source: U.S. Treasury International Capital (TIC) System and the Central Bank of Taiwan.

that most of the Taiwan central bank's bond investments are held to maturity.

To address these issues more accurately, our strategy is to explore an alternative data source: the Treasury International Capital (TIC) data. The TIC data tracks the overall purchases of each foreign country of U.S. securities, including Treasury bonds, government agency debt, corporate debt, and stocks. It also provides information on U.S. holdings of foreign securities at the individual country level. That is, the TIC data provide valuable information on the amount of U.S. assets held by Taiwan residents, including the central bank and private financial institutions.

Using the TIC data, Bertaut and Judson (2014) and Bertaut and Judson (2022) estimate U.S. cross-border securities investments at a monthly frequency and decompose changes in securities holdings into flows and valuation components. By utilizing their estimates, Figure 2 displays Taiwan's holdings of U.S. Treasuries and agency debts, shown in blue and orange bars, respectively, along with a line plot representing 70% of Taiwan's official foreign reserves. The plot aligns with the narrative that approximately 70% of Taiwan's foreign reserves are invested in U.S. Treasuries and agency debts. Other Taiwan financial institutions, notably the life insurance companies, also hold a large amount of foreign assets. Nevertheless, as indicated by Setser and S.T.W (2019), the portfolio of Taiwan life insurers consists primarily of corporate bonds (up to 80%) and agency debt securities, suggesting that insurance companies are not the major holders of U.S. Treasuries. Although this comparison has the caveat that TIC data are marked to market while Taiwan's foreign reserves are recorded at book value, it is almost certain that most of the U.S. government debt and at least a large portion of the agency debt reported in the TIC data are held by the Central Bank of Taiwan.

Figure 3: Price Return Comparison (Monthly)



Source: U.S. Treasury International Capital (TIC) System, estimate by Bertaut and Judson (2022) and Bloomberg.

We then employ a strategy of comparing the price returns of Taiwan's holdings of U.S. Treasuries to the price returns of U.S. Treasuries with varying maturities. The idea is that the price return of a bond is sensitive to its duration. As interest rates change, the variation in the price return is highly correlated with its duration. By exploring this relationship, we are able to roughly estimate the duration of the central bank's U.S. bond holdings. Figure 3 provides supporting evidence that the duration of its foreign reserves invested in U.S. Treasuries is significantly longer than that of its liabilities. The price return falls between two Treasury bond indices: one with a 5-to-7-year duration and another with a 1-to-5-year duration. This observation suggests that the average asset duration is around 4 years, which is significantly longer than its liability duration of only 0.16 years.[6] Due to this duration mismatch, there is interest rate risk exposure on the central bank's balance sheet. A permanent 1-percentage-point rise in interest rates leads approximately to an 4% asset loss while reducing liabilities by only 0.16%.[7] In 2023 the foreign reserves amount to about 75% of GDP, and thus a 4% loss is equivalent to 3% of GDP.

[6]The effective durations of the U.S. Treasury bond indices reported on the ICE Index platform were 2.55 and 5.37 for the 1-to-5-year and 5-to-7-year durations, respectively, in November 2024.

[7]The durations are approximately estimated due to data limitations and should be interpreted as being indicative rather than precise measures.

3.4 Unrealized Gains and Losses

The Taiwan central bank holds a substantial amount of foreign securities, primarily U.S. government bonds. The market value of these securities fluctuates with economic conditions and U.S. interest rate policy. If the market price of a security with a certain maturity falls below its purchase price, the price return (excluding interest payments) on the security will be negative. This results in unrealized losses if the central bank continues to hold the security, or realized losses if it decides to sell.[8]

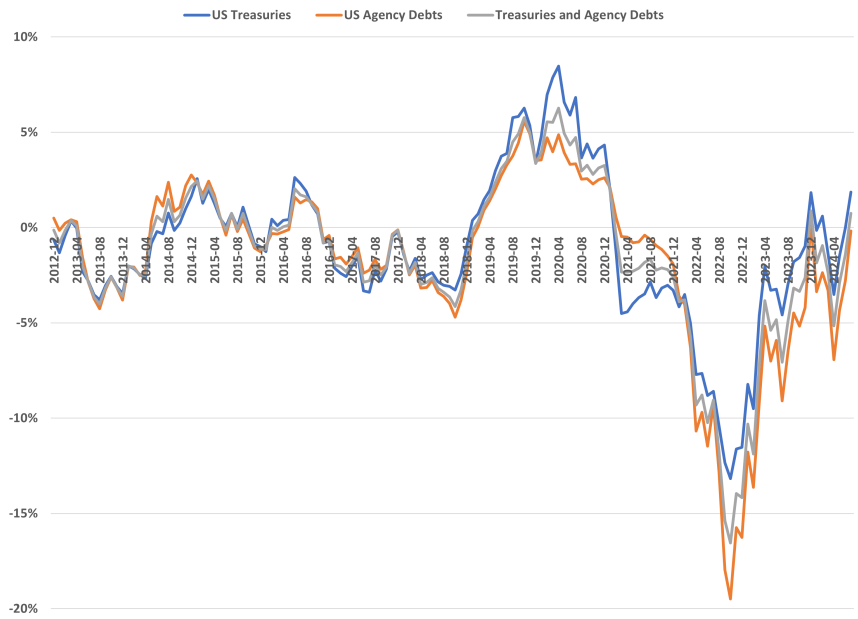
In this subsection, we use the return on U.S. Treasury and agency debt held by Taiwan (TIC data) as a proxy for the return on Taiwan's foreign reserves invested in U.S. assets. The estimated price returns, the returns excluding coupon payments, are shown in Figure 4. The average price returns for U.S. Treasury and agency debt between 2012 and 2023 are -1.0% and -1.6%, respectively. Our examination of the TIC data provides a key takeaway: the profit earned by the Central Bank of Taiwan did not come from the capital gains of its U.S. public debt holdings. This implies that the Central Bank of Taiwan's profits are primarily derived from the yield difference between domestic and foreign interest rates or operational gains in the foreign exchange market.

In addition, the price returns were particularly poor in 2022, when the Federal Reserve rapidly raised its policy rate to combat U.S. inflation. The valuation return was -11.53% for Treasury holdings, -16.26% for agency debt, and -14.17% for the weighted average of the two. Based on a simple back-of-the-envelope calculation, it is likely that the central bank of Taiwan experienced significant unrealized capital losses in 2022. Assume that about 70% of foreign reserves, equivalent to approximately $388 billion, were held in U.S. assets at the end of 2021. A 14.17% loss on $388 billion equals $55 billion, which amounts to roughly 7.2% of Taiwan's 2022 GDP. The loss was larger than the Taiwan central bank's equity of around 5.5% of GDP at the end of 2022. That is, it is very likely that the central bank was in fact operating with negative capital if the balance sheet is fully marked-to-market at that time.[9] Recall that this is likely to underestimate the true unrealized loss since it omits the potential loss for the remaining 30% of foreign reserves. In addition, by examining the price return data after 2022, it appears that these unrealized losses have not yet been fully recovered, and the central bank of Taiwan could well be operating with negative capital in 2023 and 2024.

[8]Notice that Article 43 of the Act of the Central Bank of the Republic of China (Taiwan) regulates how the central bank handles its gains and losses in accounting. However, based on the disclosed data since 2011, it appears that the Taiwan central bank reports only gains and losses arising from exchange rate fluctuations, omitting those related to changes in market value. This results in unreported unrealized gains and losses. Figure B.2 provides a comparison between the gains and losses disclosed by the central bank and our own calculations, which consider only exchange rate movements.

[9]It is known that the central bank can operate even with negative capital. Nevertheless, a large negative capital could weaken market confidence in the central bank. See Bell et al. (2023).

Figure 4: Taiwan Holdings of U.S. Treasury and Agency Debt Returns



Source: U.S. Treasury International Capital (TIC) System, estimate by Bertaut and Judson (2022).

3.5 Yield Analysis

As indicated by the previous subsection, it does not appear that the central bank's excess profit arises from price return gains (valuation effects) of its foreign reserves. As noted earlier, the Deputy Governor of the Taiwan central bank has publicly stated that its foreign bond positions are intended to be held to maturity, which minimizes the role of price returns. By holding bonds to maturity, the central bank is assured of receiving the bond's face value (assuming no default) along with regular interest payments (coupons) throughout the bond's lifespan. This approach effectively insulates the central bank from price fluctuations in the bond market.

The hold-to-maturity strategy does not, however, shield the Taiwan central bank from interest rate risk due to the duration mismatch on its balance sheet. If short-term interest rates rise suddenly, interest expenses increase accordingly due to the shorter duration of liabilities, while interest income (or coupon payments) remains locked at a lower yield because of the longer duration of assets. As a result, interest income may become insufficient to cover interest expenses, leading to losses. This risk persists even when financial institutions intend to hold their bonds to maturity. After several rounds of QE, the Federal Reserve's balance sheet has also inherited significant interest rate risk exposure. The substantial losses it currently incurs are a direct result

of its duration mismatch following large-scale asset purchases.[10]

Given that U.S. long-term bond yields are consistently positive, at least in nominal terms, the Taiwan central bank's asset holdings can reliably generate positive returns while ignoring the risk of default. However, to secure a net positive profit, the borrowing cost of the central bank—specifically, the interest payments on its domestic liabilities—must remain lower than the yields earned on its foreign assets. Figure 5 provides evidence that the asset yield consistently exceeds the liability yield. Additionally, the asset yield, measured as the interest income divided by the total assets, behaves like a moving average of U.S. 10-year Treasury yields, consistent with a hold-to-maturity portfolio. The liability yield closely follows, and only slightly exceeds, the overnight interbank lending rate.

As is evident from Figure 5, there is a secular decline in the U.S. Treasury yield, which has driven down the foreign interest income. However, the domestic short-term interest rate controlled by the Taiwan central bank has also fallen accordingly. The overnight bank lending rate declined from 3.7% to 0.34% between 2000 and 2010 and has remained low until 2022. As a result, the Taiwan central bank has maintained a significant and consistent yield spread between its foreign assets and domestic liabilities. Given this stable spread and the large size of its balance sheet, the Taiwan central bank has consistently earned significant net interest income in each year, averaging 1.76% of GDP and ranging from 1% to 2.5% of GDP.

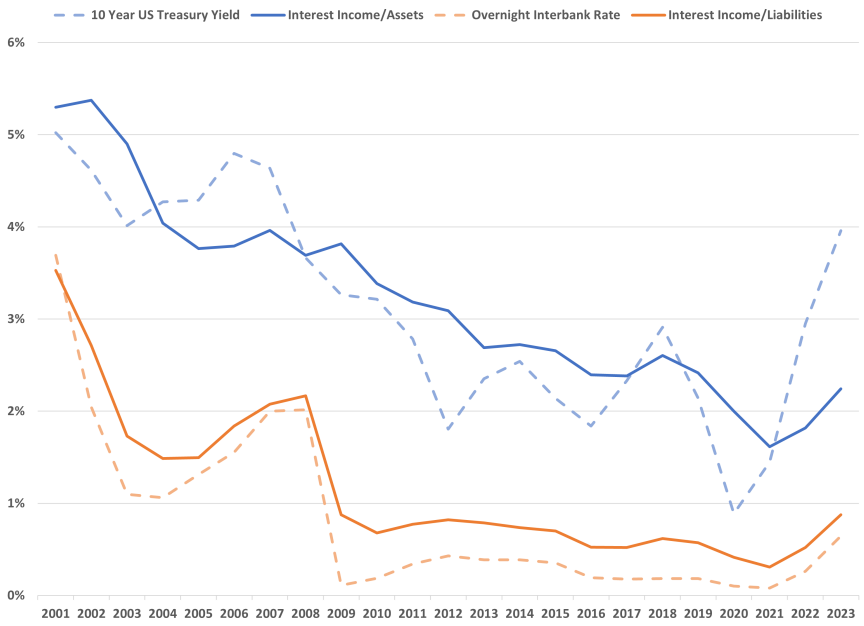
Therefore, our analysis indicates that the central bank's major source of profit stems from the interest rate spread between domestic and foreign markets. As long as Taiwan's central bank can maintain exchange rate stability and set domestic interest rates lower than foreign rates, its investment strategy can effectively ensure a steady stream of profit.

3.6 Off-Balance Sheet Foreign Asset Holdings

The total holding of foreign assets of the Taiwan central bank is larger than the amount reported officially. By conducting a thorough analysis of the USD-TWD foreign swap market, Setser and S.T.W (2019) conjecture that the Taiwan central bank engaged a large position of currency swaps, that was close to 100 billion in U.S. dollars, with private Taiwanese financial institutions. The official balance sheet of the Taiwan central bank does not reveal its currency swap position. On this issue, Setser and S.T.W (2019) state that "Taiwan is the only major economy which does not comply with the IMF's standard for reserve disclosure, and thus effectively hides its FX (Foreign exchange) derivatives book." These conjectures were confirmed later on when the central bank of

[10]The cumulative loss of the Federal Reserve can be found by referring to the earnings remittances due to the U.S. Treasury.

Figure 5: Interest Income of the Taiwan Central Bank



Source: Bloomberg, the Taiwan Central Bank, National Accounts of Taiwan and Authors' Calculations.
Note: The asset and liability yields are measured as the interest income and expense divided by the total assets and total liabilities, respectively.

Taiwan started to disclose its U.S. dollar swap position in 2020 on a monthly basis, as shown on its website. As of the end of 2023, the Taiwan central bank's dollar swap position amounted to about 86.8 billion U.S. dollars, which was around 11.3% of Taiwan's GDP. There was an additional 7.8 billion, about 1% of GDP, in foreign currency loans and deposits. These have brought the effective total of foreign assets held by the central bank to roughly 87.5% of GDP (75.2% + 11.3% + 1%).

In short, the actual balance sheet of Taiwan's central bank is even larger than that reported in Table 1 and Figure 1. As a result, some of our estimates are likely to be conservative because of this downward-biased measurement of its balance sheet.

4 Macro-Prudential Policy or Financial Repression?

To achieve its advantageous return spread, Taiwan's central bank has taken on both interest rate and currency risks. By tightly controlling the exchange rate and domestic interest rates, the central bank ensures a stable stream of revenue. However, this profit-earning strategy relies on the presence of financial frictions or regulatory constraints. Without such barriers, Taiwanese financial institutions could replicate the central bank's strategy by directly investing abroad and captur-

ing the same return spread.[11] In other words, without these financial regulations, it is not clear whether the central bank would still be able to borrow cheaply by issuing over-priced securities in the domestic market. Therefore, it must be the case that the central bank's investment strategy is one that private sector entities cannot fully implement.

What are these financial frictions or regulations? We argue that capital controls and currency hedging requirements are central to the explanation. For Taiwanese financial institutions, not only is the amount of foreign assets they are permitted to hold limited, but they are also required to hedge a significant portion of their currency risk. Under the name of macro-prudential policy, these regulatory restrictions operate through both price and quantity controls whose purpose is to maintain financial stability. Nevertheless, these regulatory policies also reflect characteristics of financial repression.

Financial repression refers to government policies that channel funds to the government or central bank in ways that would not occur in a fully deregulated market environment (Reinhart, Kirkegaard, and Sbrancia, 2011). In the context of Taiwan, the central bank's profits, which are remitted to the Ministry of Finance, can be interpreted as being a result of such repression. By implementing policies that limit the ability of private institutions to invest abroad or compete on an equal footing, funds are effectively trapped domestically, allowing the central bank to borrow at below-market rates.

Through this lens, capital controls and currency hedging requirements are the most relevant forms of financial repression that explain why Taiwanese financial institutions cannot replicate the Taiwan central bank's carry trade strategy. These measures ensure that the central bank has an advantage in earning returns that would otherwise be available to private sector participants.

It is important to note that the term "financial repression" does not inherently carry a negative connotation. In this paper, we remain neutral on its desirability or effectiveness. In other words, this phenomenon can also be described as a form of macroprudential policy, aimed at preserving financial stability by regulating cross-border capital flows and exchange rate exposures.

4.1 Regulations on Overseas Investment

Despite Taiwan's openness to international trade, its capital flows, in particular the overseas investments initiated by domestic financial institutions, are highly regulated. All overseas investment plans must be approved by the Financial Supervisory Commission (FSC) before implemen-

[11] According to a report by the Economic Daily News (in Traditional Chinese), the Financial Supervisory Commission (FSC) stated that the hedging ratio of Taiwan's life insurers is approximately 61.5% in March 2025. While hedging absorbs part of the exchange losses, it also significantly reduces exchange gains and may even result in net losses, as reported by the FSC.

tation. Financial institutions are required to submit periodic reports on the performance and risks of their overseas investments to the FSC. In addition, large-scale capital movements across borders must comply with reporting requirements and are subject to approval by the Central Bank of Taiwan.

For life insurers, duration mismatch is a critical issue because their liabilities—typically long-term obligations such as life insurance payouts and annuities—often extend decades into the future, while their assets, such as bonds or other investments, generally have shorter durations. The challenge of duration mismatch is particularly pronounced for Taiwan's life insurers due to the shortage of long-term bond issuers in the domestic market.

Starting in 2004, Taiwan's financial regulator gradually relaxed investment caps for life insurance companies. As a result, foreign investments by these insurers have grown rapidly, enabling them to seek higher-yield and longer-duration bonds abroad.[12] More specifically, their overseas investment has grown from below 20% of GDP in 2006 to 87% of GDP in 2022. The massive capital outflow indicates a strong desire to circumvent the low rate policy at home.

4.2 CIP Deviation as Evidence of Financial Regulation

However, these life insurers, unlike the government, are expected or required to hedge their currency risk at least partially. If covered interest rate parity (CIP) holds, the hedging cost is exactly equal to the interest rate difference between domestic and foreign assets conditional on the same duration. The hedging requirement for currency risk imposed on the domestic financial institutions can then effectively reduce their hedged returns on foreign investments. As a result, these hedging requirements enable financial repression by trapping the assets of financial intermediaries in Taiwan.

To make this idea concrete, consider the CIP formula between the USD and TWD. Let s_t^e denote the log of the TWD spot exchange rate per US dollar. The USD/TWD LIBOR basis is defined as the difference between the cash LIBOR rate for borrowing in USD and the synthetic USD LIBOR rate constructed from the TWD TAIBOR (Taipei Interbank Offered Rate) rates and hedged back into USD:

$$\underbrace{x_{t,t+n}}_{\text{Cross Currency Basis}} = r_{t,t+n}^{\$,Libor} - \underbrace{\left(r_{t,t+n}^{Taibor} - \rho_{t,t+n}\right)}_{\text{Synthetic US Dollar Rate}}, \tag{1}$$

where $\rho_{t,t+n}$ is defined as $\frac{1}{n}(f_t^n - s_t^e)$, representing the n-period forward premium (in logs) ob-

[12] The current overseas investment cap of insurers is set at 45% of their assets (see Article 146-4 of the Insurance Act). See also the Regulations Governing Foreign Investments by Insurance Companies.

tained from the forward exchange rate f_t^n and the spot exchange rate s_t^e. $-\rho_{t,t+n}$ reflects the FX hedging cost, which refers to the cost of protecting against exchange rate fluctuations in foreign currency transactions.

The cross-currency basis, x_t, measures the size of the CIP deviation. The currency carry trade normally involves borrowing in a low-interest-rate currency, such as the TWD, and investing in a high-interest-rate currency, such as the USD. In a situation where the U.S. interest rate is higher than the Taiwan interest rate, $r_{t,t+n}^{\$,Libor} > r_{t,t+n}^{Taibor}$, a negative cross-currency basis could occur if the FX hedging cost is sufficiently high. A negative basis implies that the synthetic U.S. dollar rate is higher than the actual U.S. dollar rate, thereby turning the profits from a currency carry trade negative if FX hedging is applied. Given that CIP is a no-arbitrage condition, a CIP deviation indicates the presence of financial frictions. A negative basis deviation underscores these frictions and reveals inefficiencies in the financial system (Du and Schreger, 2022).

Figure 6 plots the CIP deviations of Taiwan against other major advanced economies for 3-month maturities. Other maturities show a similar pattern. Between 2010 and 2023, the average basis at the 3-month horizon was -78 basis points (bps). Taiwan's CIP deviation is significant, even compared to other advanced economies such as Japan, which is well-known for its large CIP deviations. Due to the Bank of Japan's decades-long low interest rate policy, the Japanese yen has been recognized as a primary funding currency for carry trades. However, given the same maturity and sample period, Japan's CIP deviation is only -27 bps, approximately one-third of the deviation observed in Taiwan. Du and Huber (2024) document that the hedging behavior of Taiwan's life insurers is the key driver behind the large CIP deviation observed in Taiwan.

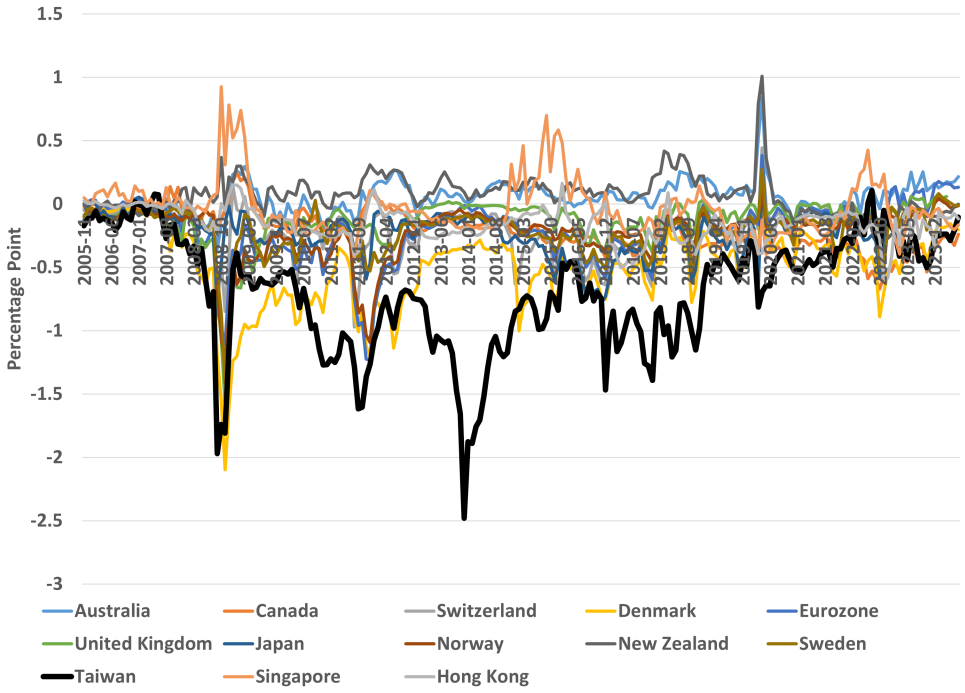
The large and consistent CIP deviations in the USD/TWD market provide supporting evidence to the view that the financial assets are effectively trapped in Taiwan. The large negative basis, which is determined by the size of and desire for capital outflows, reduces the hedged returns on overseas investments even further for the Taiwanese private financial institutions.

4.3 The Taiwan Central Bank's Profit and Currency Hedging Requirement

To quantify the role played by the currency hedging requirement in the central bank's profitability, we consider a counterfactual accounting exercise in which the Taiwan central bank is required to hedge its foreign investments, as financial institutions typically are. Our counterfactual exercise is in the same spirit of Chien, Cole, and Lustig (2024), who estimate the financial repression wedge in Japan. Specifically, this exercise explores how the central bank's earnings from the carry trade would change if it were obligated to mitigate currency risk.

Our counterfactual exercise assumes that the Taiwan central bank fully hedges the currency

Figure 6: CIP Deviation: Taiwan versus Other Advanced Economies



Source: Bloomberg and authors' calculation.

risk of its entire foreign asset portfolio through the forward exchange rate market without affecting the FX forward rate. Hence, our counterfactual is quite conservative because the negative cross-currency basis is assumed not to widen even when the central bank of Taiwan hedges all of its risk exposure.[13]

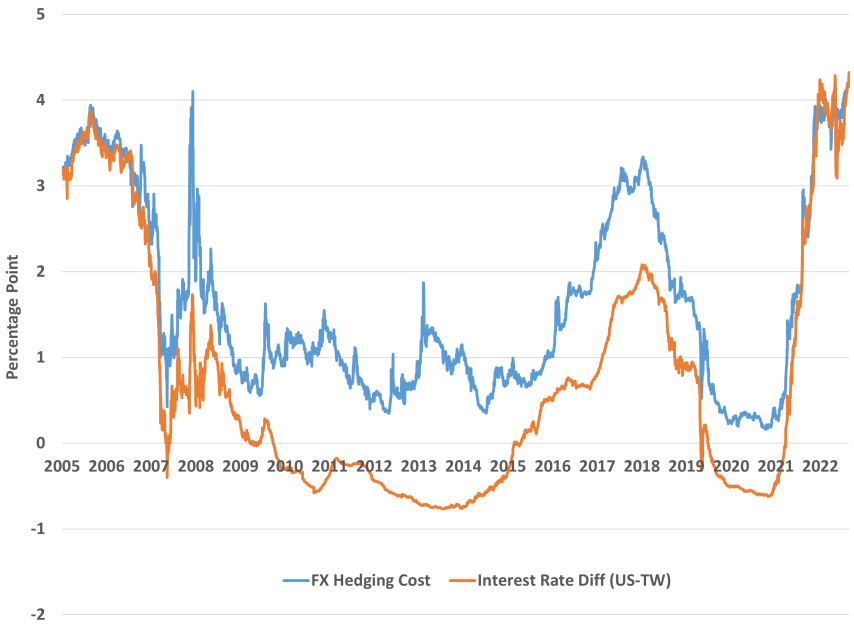
We begin by expressing the excess rate of return of an unhedged foreign investment for the Taiwan central bank. Let $r^{FA,\$}_{t,t+n}$ represent the rate of return on the central bank's foreign assets denominated in foreign currency. The unhedged excess rate of return in logs between time t and time $t+n$, $er^{unhedged}_{t,t+n}$, can be written as the return spread between foreign and domestic asset returns plus the appreciation of the foreign currency against the TWD:

$$er^{unhedged}_{t,t+n} = r^{FA,\$}_{t,t+n} - r^{DA,\$}_{t,t+n} + \frac{1}{n}(s^e_{t+n} - s^e_t), \tag{2}$$

where $r^{DA,\$}_{t,t+n}$ and s^e_t represent the domestic asset return and the TWD spot exchange rate in period

[13] A recent study by Du and Huber (2024) highlights a strong link between the cross-currency basis (CIP deviation) and hedging demand. Their estimates suggest that a hedging demand equivalent to 20% of GDP could result in an 80-basis-point in 3-month CIP deviation. In our counterfactual analysis, the additional hedging demand from the central bank amounts to at least 70% of GDP.

Figure 7: Currency Hedging Cost between the Taiwan and U.S. Dollars



Maturity: 12 Months. Source: Bloomberg and authors' calculations.

t, respectively.

In the counterfactual scenario, it is assumed that the Taiwan central bank fully hedges the currency risk of its entire foreign asset portfolio through the forward FX market. The return in logs on its foreign investments, after hedging, is expressed as the foreign currency return with the forward discount

$$er_{t,t+n}^{hedged} = r_{t,t+n}^{FA,\$} - r_{t,t+n}^{DA,\$} + \frac{1}{n}(f_t^n - s_t^e), \tag{3}$$

where f_t^n is the n-period forward exchange rate at period t.

It is clear that the difference between unhedged and hedged excess returns, the difference between equations (2) and (3), comes down to the gap between the forward exchange rate, f_t^n, and the realized spot exchange rate, s_{t+n}^e. Specifically, the return difference depends on whether there is a systematic deviation between the forward rate and the actual realized spot rate.

Figure 7 plots the currency hedging cost for a 12-month maturity ($n = 12$ months) alongside the interest rate difference between the US dollar and the Taiwan dollar. The hedging cost is consistently higher than the interest rate difference, indicating that the cost of hedging outweighs the benefits of the interest rate differential, resulting in a negative cross currency basis. In other words, if hedging were required for foreign investments initiated in TWD, it would almost never be profitable to invest abroad conditional on the same length of maturity.

In our calculations, we use the 12-month forward rate to match the annual frequency of our data. The return reduction, measured by $\frac{1}{n}(s^e_{t+n} - f^n_t)$, averaged 113 basis points between 2005 and 2022. This implies that the average rate of return on the central bank's foreign investments would have decreased by 1.13% if it had hedged its currency risk. Given its large holdings of foreign reserves, the estimated net return for Taiwan's central bank would have declined from 1.79% of GDP to 0.9% per annum over this period. These results indicate that central bank profits would have been reduced by 49.5% under an FX hedging requirement.

Our first counterfactual does not fully capture the impact of financial repression, as the underlying assumptions are quite conservative. We assume that the cross-currency basis remains unchanged even if hedging demand rises significantly by more than 70% of Taiwan's GDP. Moreover, our analysis does not account for other types of financial regulations, such as capital controls. Additionally, the remaining net asset return is likely to be driven by the term premium earned by the central bank due to its significant duration mismatch on its balance sheet. For the term risk premium, we then turn into the next counterfactual exercise.

4.4 The Taiwan Central Bank's Profit and Duration Risk

Banks typically fund long-term loans (e.g., mortgages and corporate loans) with short-term deposits, thereby naturally exposing themselves to interest rate risk. In Taiwan, the FSC and the central bank oversee regulations to manage duration mismatches in deposit institutions, primarily banks, aiming to maintain the financial stability of the banking sector. For example, Basel III compliance mandates that banks maintain sufficient capital buffers against duration risk. That is, it is costly for banks to maintain a large duration mismatch.

Nevertheless, most central banks themselves are not subject to these regulations. As discussed in Section 3, the Taiwan central bank exposes itself to a significant amount of duration risk, allowing it to reap the benefits of the term premium. To quantify the impact of a duration mismatch on the central bank's profitability, we conduct another simple counterfactual accounting exercise in which the Taiwan central bank's asset duration is reduced to match its liability duration, similar to how banks are typically encouraged by regulators to limit interest rate risk.

In our second counterfactual accounting exercise, we assume that instead of holding assets with an average duration of around four years (see Section 3), the Central Bank of Taiwan invests all of its foreign assets in three-month U.S. Treasury bills, roughly matching its liability duration, which is less than two months. Under this assumption, we then calculate the net income the central bank would have earned. The results show that the average net interest income would have declined from 1.72% of GDP per year to only 0.46% of GDP, representing a 74% reduction.

This simple counterfactual reveals that a significant portion of the excess returns earned by the Taiwan central bank stems from its balance sheet's duration mismatch. Domestic financial institutions are generally unable to implement such a strategy due to the high capital cost of duration risk imposed by bank regulators.

Finally, our two counterfactual exercises suggest that all of the Taiwan central bank's net income could be attributable to its risk-taking strategy involving duration and currency mismatches.

5 Implications of the Taiwan Central Bank's Carry Trade

By examining the Taiwan central bank's carry trade strategy and profits, our analysis identifies several insights, which we present below.

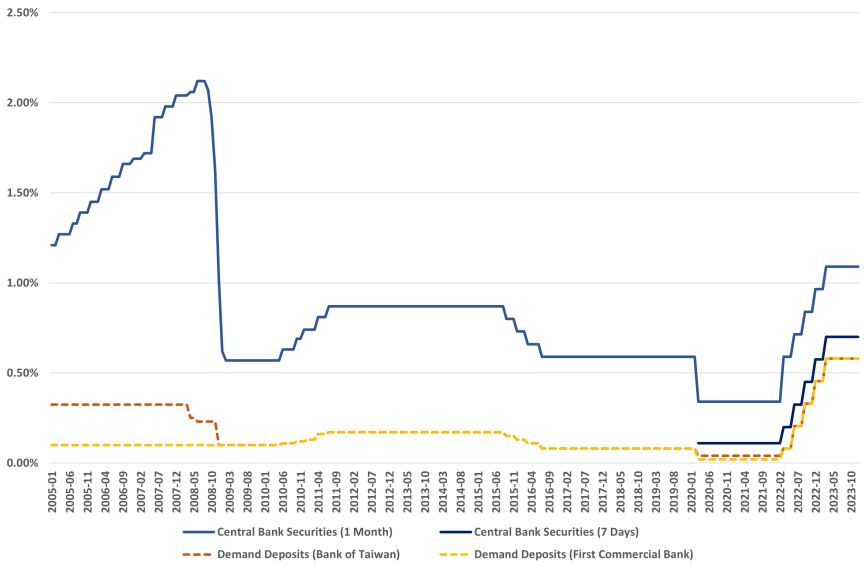
5.1 Who Paid the Profit of Taiwan's Central Bank?

Through the lens of financial repression, the profits earned by the central bank are de facto an implicit tax revenue levied on domestic depositors. This should not be surprising, as someone has to pay for its profit, and there is no free lunch in economics.

Specifically, to finance its holdings of foreign assets, Taiwan's central bank relies on the creation of bank reserves and the issuance of central bank securities. While the central bank can, in principle, create unlimited bank reserves, it cannot allow them to accumulate persistently, as bank reserves constitute high-powered money, which could result in an excessive injection of liquidity into the economy. Therefore, the central bank issues central bank securities to absorb the excess reserves it has created. This process of absorbing excess reserves is known as sterilization. Unlike bank reserves, which pay little to no interest, central bank securities carry an interest cost. These interest-bearing securities are welcomed by Taiwan's financial institutions, as commercial banks operate in an environment of abundant liquidity following a prolonged period of reserve injections. In this context, the floating interest paid on central bank securities constitutes the de facto cost to the central bank of holding foreign assets. In other words, the more the central bank implements sterilization, the higher the interest cost it has to bear.

While the primary reason for issuing central bank securities is to sterilize the excess bank reserves created, this does not change the fact that the central bank is effectively borrowing from the banking sector. Although the central bank is the sole issuer of these securities, the interest rate on them still depends on the banking sector's willingness to hold them. If demand for central bank securities is low, the central bank will need to offer a higher interest rate to attract buyers, thereby increasing the cost of holding foreign assets from the central bank's perspective. From

Figure 8: Interest Rates on Central Bank Securities and Demand Deposits



Source: Taiwan Central Bank's Statistical Database.

this analysis, it is evident that the central bank has an incentive to suppress the interest rate on its securities if it aims to achieve the implicit goal of generating remittances to the Ministry of Finance. However, to keep the interest rate low, the central bank must create an environment that encourages—or compels—domestic financial institutions to hold central bank securities. One way to achieve this is by limiting the investment alternatives available to these institutions. Thus, we can observe the central bank's incentive to regulate the banking sector's overseas investments. As a result, the banking sector's funds are effectively trapped in the domestic economy.

It is worth noting that the funding for purchasing central bank securities originates from household deposits. Therefore, the interest rate on demand deposits will never exceed the interest rate on central bank securities. In other words, the interest rate on central bank securities acts as a ceiling for the interest rates on demand deposits, as confirmed by the trend illustrated in Figure 8. In this regard, the household sector ultimately bears the cost of the central bank's excessive foreign asset holdings. More precisely, the interest income generated by the central bank through these arrangements functions as an implicit tax on households — particularly on demand depositors — who receive lower returns on their deposits than they would under a more liberalized or competitive market environment.[14]

This implicit taxation mechanism has broader implications for monetary policy and income

[14]From a related perspective, Wu et al. (2024) highlight the potential cost to taxpayers associated with the sizeable remittances of Taiwan's central bank. These remittances create additional new money (thereby expanding the monetary base), which must later be sterilized.

distribution. Financially unsophisticated households tend to save primarily in the form of demand deposits, while financially sophisticated households are more likely to invest in long-term assets such as stocks, life insurance claims, or even foreign assets. By maintaining artificially low short-term interest rates, the central bank may indirectly transfer resources from unsophisticated households—who are typically lower-income and less wealthy—to sophisticated households, who tend to be wealthier. This dynamic effectively mimics the behavior of a regressive tax policy (Greenwald et al., 2022; Chien, Cole, and Lustig, 2024; Fagereng et al., 2022). A detailed analysis of the redistributional effects of such policies also falls beyond the scope of this paper. We leave this important issue to future research.

5.2 Policy Limitation Caused by Profit Goal

Given its currency and duration mismatch, if the primary goal of the Taiwan central bank is to remit a certain amount of profit to the treasury, it has an incentive to maintain lower interest rates and avoid local currency appreciation to minimize potential losses. The central bank also prefers to keep a large balance sheet, which not only helps enlarge its profit but also increases its ability to stabilize the exchange rate.

Through various financial regulations, the Taiwan central bank firmly controls short-term domestic interest rates. Therefore, if the central bank consistently sets domestic short-term interest rates lower than the yields on its foreign bonds, it can always earn an excess return as long as the exchange rate remains stable. Nevertheless, this constrains the range of interest rate policies that the Taiwan central bank can implement if earning a sizable amount of profit is its primary goal. A simple back-of-the-envelope calculation can illustrate this point. Consider that the central bank is required or expected to earn net interest income at its past average amount of 1.76% of GDP. Given that the current size of its balance sheet is around 83% of GDP, the interest rate spread that the central bank needs to implement is 1.76% divided by 0.83, which equals 2.1%. In other words, the domestic short rate must be set at least 2.1% lower than the average foreign debt security yield under its balance sheet in order to achieve the expected profit. That is, by requiring the Taiwan central bank to consistently earn a certain amount of profit, a limitation is imposed on its interest rate policy.

Moreover, despite its hold-to-maturity intention, there are scenarios where the central bank might have to liquidate its asset position and hence realize a significant loss. That is, the duration risk cannot be eliminated completely by the hold-to-maturity strategy. For example, if Taiwan experiences a sudden capital outflow, then the central bank may need to sell some of these securities to defend the TWD from devaluation. To be more precise, if the Taiwan central bank refrains from

selling its foreign assets in response to capital outflows, it is difficult to maintain that its profit remittance practices are neutral in relation to its exchange rate policy. A sudden outbreak of high inflation could be another scenario. This happened in many advanced economies right after the Covid pandemic. In order to combat the rising inflation, the central bank had to tighten its monetary policy by raising the domestic interest rate. This is a scenario where the central bank faces a trade off between its profit goal and inflation mandate. These scenarios are most likely to emerge during an economic downturn, indicating that the central bank's foreign investments entail substantial risks for Taiwan. However, such risks are not reflected in the central bank's borrowing costs, precisely because they are obscured by mechanisms of financial repression.

6 Conclusion

This paper shows that the Central Bank of Taiwan's balance sheet is characterized by a substantial duration and currency mismatch. By taking currency and interest rate risk, the central bank has earned significant excess returns on its risky investments, averaging over 1.7% of GDP annually. This explains the large profits remitted from the central bank to the Ministry of Finance.

When we consider a counterfactual scenario in which the central bank fully hedges its currency risks, these excess returns decline by 50%. In another counterfactual, when the central bank is required to close its duration mismatch, its excess returns drop by 74%. These two exercises raise the question of whether the large excess return could be sustained in the absence of financial regulations. In effect, the profits retained by the central bank amount to an implicit tax levied on domestic depositors.

We also discuss the potential influence of the remittance target (implicitly) set by the government (or even by the central bank itself) on monetary policy. If the primary objective is to fulfill a commitment to remit a specified amount of revenue to the government, the central bank of Taiwan has a strong incentive to pursue low interest rate policies, prevent currency appreciation, and maintain an expanded balance sheet. These policy preferences, in turn, may introduce systematic biases into the monetary policy decision-making process.

It is worth noting that we do not claim that the Central Bank of Taiwan implements unethical or intentionally biased policies. Instead, our analysis focuses on the structure of its balance sheet and the associated risks and costs. We caution that the current structure may jeopardize the central bank's credibility in conducting an independent monetary policy. In particular, the practice of profit remittance lies at the core of the current situation. Furthermore, if this practice persists, the central bank may become increasingly reliant on various regulatory measures affecting interest

rates and the exchange rate, potentially leading to further distortions in the financial market and the broader economy.

Finally, the main purpose of this paper is not to blame any individuals or institutions, in particular the Central Bank of Taiwan. It needs to be emphasized that the central bank has successfully fulfilled its policy goals over the past two decades, as stated by the Governor of Taiwan's central bank. Inflation has been kept in check for most of this period, and the nominal exchange rate has remained stable in the sense that it has neither appreciated nor depreciated significantly over extended periods. Our main objective is to understand how the central bank's policies have interacted with its persistent profits. Once we gain this understanding, we can begin to assess whether these policies are optimal for the Taiwanese people, even if the central bank has successfully achieved its policy goals on all counts.

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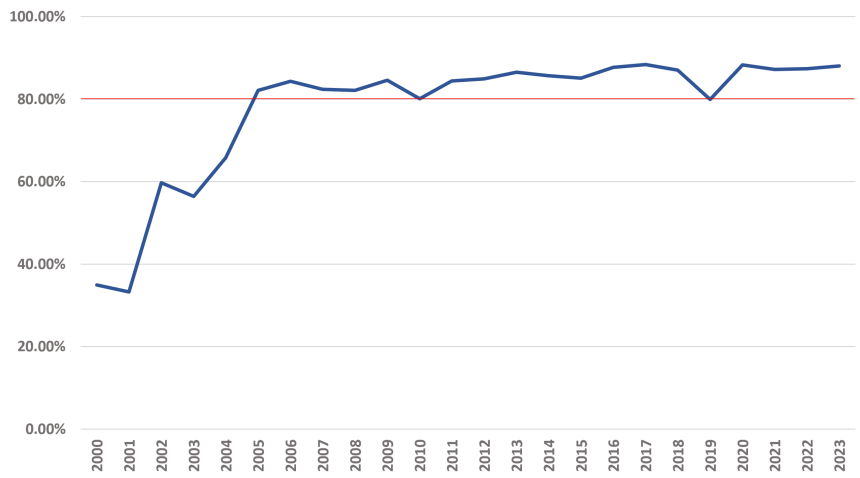
Appendix

A Remittances to the Ministry of Finance

Figures A.1 and A.2 show the trend of the Taiwan central bank's remittances as a share of total state-owned enterprises's (SOE) remittances and total government revenue from 2000 to 2023. The Taiwan central bank has been the largest remittance contributor among SOEs for the past two decades, accounting for more than 80% of the total for SOEs. Although the ratio of remittances to total government revenue has declined significantly since 2009, falling to 6.22% in 2023, which was the lowest level in the past decade, it still exceeds the average for advanced economies, which only stood at 0.4% on average between 2000 and 2022 (Bell et al., 2023).

Figure A.1: Remittances as a share of total state-owned enterprises' remittances

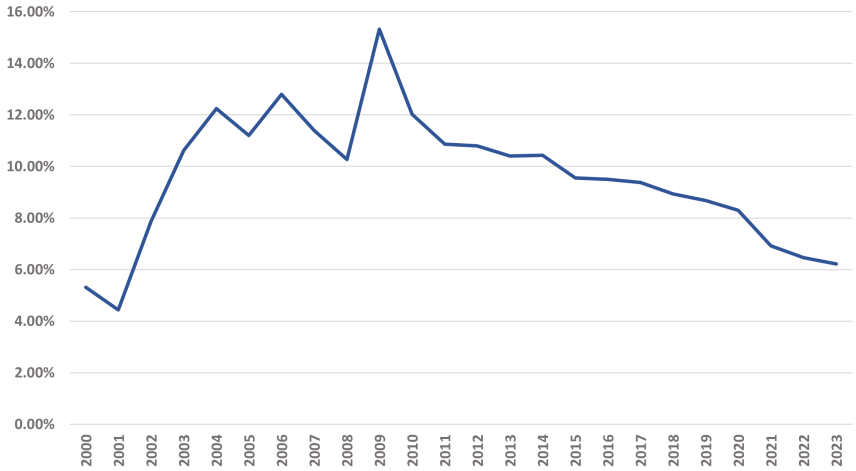


Source: Taiwan's Ministry of Finance

B Central bank's gains and losses in accounting

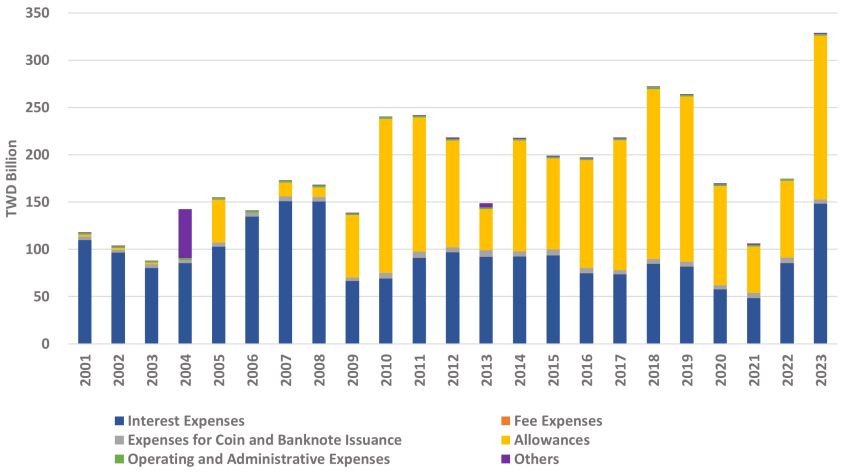
The Taiwan central bank's expenditures have mainly consisted of allowances in response to foreign exchange losses since the global financial crisis, as shown in Figure B.1. However, due to the large size of its balance sheet, these buffers are often insufficient. In such cases, deferred assets are used to absorb the remaining losses.

Figure A.2: Remittances as a share of total government revenue



Source: Taiwan's Ministry of Finance

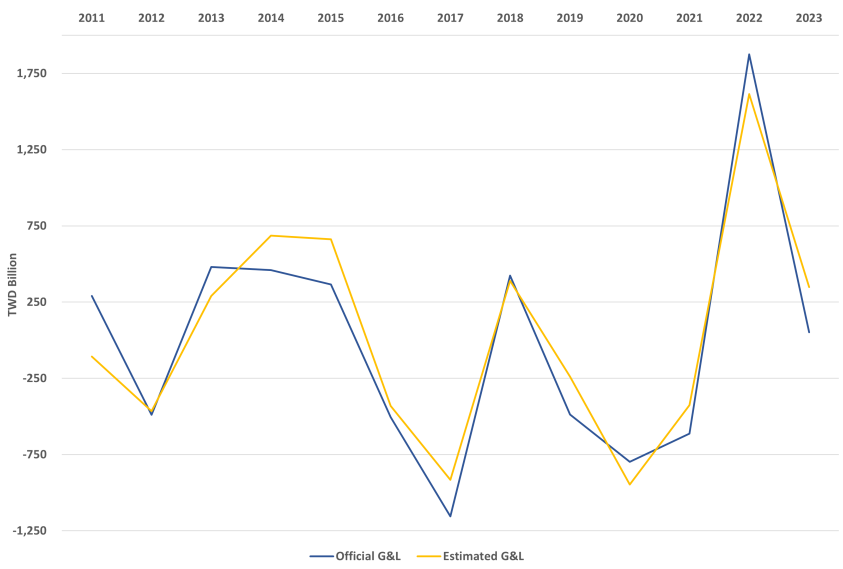
Figure B.1: The distribution of the central bank's expenditure



Source: Taiwan's central bank.

Figure B.2 compares the gains and losses disclosed by the Taiwan central bank (blue line) with our estimates (yellow line), derived by multiplying the foreign reserve balance (in USD) by the annual change in the TWD/USD exchange rate, showing that the disclosed gains and losses have considered only exchange rate movements.

Figure B.2: Trends of official and estimated gains and losses



Source: National audit office, Taiwan's Central Bank and authors' calculations.