# A close up of text AI-generated content may be incorrect.

# 1 Introduction

# 2 Literature review

# Research Questions

In recent years, dramatic shifts in NFA positions have raised new questions about the drivers of external wealth. The case of the United States is particularly striking. As documented by Atkeson et al. (2022), the U.S. NFA position deteriorated sharply after 2007, not because of worsening trade deficits, but due to negative valuation effects on gross foreign asset and liability positions. This shift challenged earlier interpretations of the “exorbitant privilege” and suggested a structural transformation in the dynamics of global capital.

During this same period, Switzerland experienced markedly different dynamics. While also exposed to global financial volatility, its NFA position continued to rise in the long term, supported by sustained current account surpluses and strong financial integration. Yet, sharp fluctuations occurred around major crises, including the 2008 global financial crisis, the 2011 eurozone crisis, and the 2020 COVID-19 shock. These episodes raise critical questions about the stability and composition of Switzerland’s external wealth: to what extent is it driven by trade flows versus valuation effects? And how resilient is it to global financial shocks?

This study investigates the evolution of Switzerland’s NFA position over the past two decades. Specifically, we ask:

* How has Switzerland’s NFA changed over the last decades?
* What are the underlying drivers of these changes—current account surpluses, capital flows, or valuation effects?

To answer these questions, we develop a comprehensive empirical framework combining structural decomposition, econometric testing, and time-series modeling. By situating Switzerland’s experience in the context of broader international trends, our findings offer insights into the sources of external wealth and the extent to which valuation effects help or hinder financial resilience.

# 3. Methodology

This study investigates the dynamics of Switzerland’s Net Foreign Assets (NFA) using a multi-method empirical strategy that integrates descriptive statistics, structural break analysis, stationarity diagnostics, and time-series econometric modeling. The goal is to uncover both the long-term trends and the short-run determinants of Switzerland’s external wealth, with a particular focus on capital flows, and valuation effects.

### 3.1 Data Source and Preprocessing

To ensure the quality and consistency of the data, several preprocessing steps were undertaken. The original dataset contained multi-level column headers, which were standardized. The date column was cleaned, and the data was ordered chronologically to support time-series analysis. Missing values were checked and confirmed to be absent. Since some of the data was originally reported monthly, it was annualized using a twelve-month rolling aggregation to align with the structure of yearly macroeconomic variables.

The dataset includes:

* Net Foreign Assets (NFA): in both absolute levels and annual percentage changes.
* Capital flow components:
  + Current Account (CA)
  + Foreign Direct Investment (FDI)
  + Financial Account (FA), including subcategories:
    - Direct Investment
    - Portfolio Investment
    - Other Investment
    - Reserve Assets
* Valuation-related indicators:
  + Excess Returns on external asset positions
  + Exchange Rates: EUR/CHF, USD/CHF, JPY/CHF, GBP/CHF, CNY/CHF, and SDR
  + Domestic Interest Rates: Swiss National Bank (SNB) policy rate
  + Equity Indices: US Dow Jones and Japan’s Nikkei 225
  + Gold Reserves held by the SNB

While gold reserves are formally classified as part of official reserves rather than valuation effects, this study includes them in the valuation analysis. This is motivated by the fact that their market value fluctuates and they serve as a strategic safe-haven asset during financial uncertainty, potentially influencing the valuation of Switzerland’s net foreign position.

### 3.2 Analytical Approach

#### 3.2.1 Descriptive and Structural Analysis

The analysis begins with visual inspection and descriptive statistics to establish long-term NFA trends and volatility patterns. Structural changes in the trajectory of NFA were tested formally using the Chow test, with breakpoints centered around three critical episodes: the 2008 global financial crisis, the 2011 Eurozone crisis, and the 2020 COVID-19 pandemic. The fit of pre- and post-break linear models was assessed through Residual Sum of Squares (RSS) comparisons.

#### 3.2.2 Stationarity and Granger Causality

Given the time-series nature of the data, all variables were subjected to Augmented Dickey-Fuller (ADF) tests to assess stationarity. Series identified as non-stationary were transformed using first differencing, ensuring the validity of inference in dynamic modeling. This transformation enables interpretation in terms of short-run changes rather than long-term levels, which is particularly relevant when analyzing annual macroeconomic fluctuations. ADF test results for capital flows and valuation effects are reported in Table 1andTable 4, respectively.

To identify dynamic relationships among variables, Granger causality tests were conducted between potential explanatory variables and changes in NFA. These tests assess whether lagged values of one variable have statistically significant predictive power for another. Importantly, Granger causality does not imply true causation in an economic sense, but rather indicates predictive precedence based on past values. If a variable Granger-causes another, it improves forecasting accuracy by incorporating its lags.

The insights gained from these tests informed the specification of Vector Autoregressive (VAR) models used in the subsequent analysis, ensuring the inclusion of empirically relevant and temporally predictive variables.

### 3.3 Dynamic Modeling

The core econometric approach relies on Vector Autoregressive (VAR) models to capture the interdependent relationships between Switzerland’s NFA and its potential drivers. Three distinct models were constructed, each targeting a specific dimension of NFA dynamics: capital flows, valuation channels, and the relationship between NFA and gold reserves. Prior to estimation, all time series were tested for stationarity using the Augmented Dickey-Fuller (ADF) test. Variables found to be non-stationary were transformed through first differencing to ensure valid inference. Lag order selection for each model was guided by the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Hannan–Quinn Information Criterion (HQIC).

Formally, a Vector Autoregressive (VAR) model of order p can be written as:

where Yt​ is a vector of endogenous variables, Ai​ are coefficient matrices, and ϵt​ is a vector of white noise disturbances. We apply this framework in three distinct settings:

Variable selection was guided by three criteria: (a) theoretical relevance based on the literature review, (b) statistical pre-testing via correlation analysis and bivariate Granger causality tests, and (c) parsimony considerations to address degrees of freedom concerns. For each model, we started with a comprehensive set of theoretically relevant variables, then refined the specification based on preliminary statistical significance and multicollinearity diagnostics, removing variables with variance inflation factors (VIF) exceeding 7.0 or showing minimal correlation with NFA movements.

#### 3.3.1 VAR Model on Capital Flows

The VAR model for capital flow dynamics is specified as:

Where:

* ΔNFA is the first difference of the Net Foreign Asset position,
* CA: Current Account,
* FDI: Foreign Direct Investment,
* FA: Financial Account,
* εt error term.

All included variables were found to be stationary in levels, as shown inTable 1. Multicollinearity is not a concern in this model as all VIF values are below 1.5 (Table 2). The optimal lag length for the VAR was selected as one based on AIC, BIC, and HQIC values (Table 3).

Table 1. Augmented Dickey-Fuller (ADF) test results – capital flow variables

|  |  |  |
| --- | --- | --- |
| Series | p-value |  |
| FDI\_Total | 0.000 | Stationary |
| Financial Account | 0.000 | Stationary |
| Net Financial Account – Direct Investment | 0.000 | Stationary |
| Net Financial Account – Portfolio Investment | 0.000 | Stationary |
| Net Financial Account – Other Investment | 0.0005 | Stationary |
| Net Financial Account – Reserve Assets | 0.000 | Stationary |
| Current Account | 0.000 | Stationary |
| NFA (Percent Change) | 0.000 | Stationary |

Table 2. Variance inflation factors (VIF) – capital flow variables

|  |  |
| --- | --- |
| Variable | VIF |
| FDI\_Total | 1.030310 |
| Financial\_Account | 1.494540 |
| Net Financial account - Direct investment | 1.440681 |
| Net Financial account - Portfolio investment | 1.102951 |
| Net Financial account - Other investment | 1.079682 |
| Net Financial account - Reserve assets | 1.155643 |
| Current\_Account | 1.018592 |
| NFA\_Pct\_Change | 1.101540 |

Table 3. Lag order selection – capital flows model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lag Order | AIC | BIC | FPE | HQIC |
| 0 | 52.09 | 52.28 | 4.208e+22 | 52.15 |
| 1 | **51.10** | **52.01** | **1.569e+22** | **51.40** |
| 2 | 51.70 | 53.35 | 3.022e+22 | 52.25 |

#### 3.3.2 VAR Model on Valuation Effects

The VAR model examining valuation-related variables is specified as:

where:

* Gold: SNB Gold Reserves,
* DJIA: Dow Jones Industrial Average returns,
* FX: Exchange rate variables (EUR/CHF),
* CD: dummy variables for major crisis periods.

While the initial specification considered a broader set of valuation-related variables—including excess returns, SNB rates, and multiple exchange rate series, the final VAR model retains only gold reserves, Dow Jones returns, the EUR/CHF exchange rate, and a crisis dummy. This selection reflects a combination of empirical and practical considerations. First, all included variables demonstrated either theoretical relevance or moderate correlations with NFA changes. Second, multicollinearity was evaluated through VIF values and highly collinear or redundant variables were excluded. Finally, given the limited number of time-series observations typical in macroeconomic analysis, the model had to remain parsimonious to avoid overfitting.

Non-stationary variables were differenced prior to estimation, based on the ADF results inTable 4. Multicollinearity diagnostics (Table 5) show acceptable VIF values. Based on information criteria, the optimal lag length was determined to be two lags (Table 6).

Table 4. ADF test results – valuation effects model variables

|  |  |  |
| --- | --- | --- |
| Series | p-value | Stationarity Status |
| NFA (Percent Change) | 0.0000 | Stationary - |
| Crisis Dummy | 0.0001 | Stationary |
| Exchange Rate Effects (Stocks, %) | 0.6994 | Non-stationary → First difference applied |
| Price Effects (Stocks, %) | 0.0636 | Non-stationary → First difference applied |
| US – Dow Jones | 0.3750 | Non-stationary → First difference applied |
| Japan – Nikkei 225 | 0.0012 | Stationary |
| Gold Reserves | 0.0394 | Stationary |
| SNB Policy Rate | 0.9991 | Non-stationary → First difference applied |
| Excess Return | 0.8786 | Non-stationary → First difference applied |
| EUR/CHF Exchange Rate | 0.0000 | Stationary |
| USD/CHF Exchange Rate | 0.0647 | Non-stationary → First difference applied |

Table 5. Variance inflation factors (VIF) – valuation model variables

|  |  |
| --- | --- |
| Variable | VIF |
| NFA\_Pct\_Change | 1.68 |
| Crisis\_Dummy | 4.11 |
| Exchange\_Rate\_Effects\_Stocks | 1.92 |
| EUR\_CHF | 1.52 |
| USD\_CHF | 1.67 |
| Price\_Effects\_Stocks | 3.04 |
| US - Dow Jones Industrial Average | 6.38 |
| Japan - Nikkei 225 | 4.73 |
| FX\_Reserves\_Securities | 3.00 |
| Gold\_Reserves | 2.61 |
| SNB\_Rate | 1.42 |
| Excess\_Return | 2.92 |

Table 6. Lag order selection – valuation effects model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lag Order | AIC | BIC | FPE | HQIC |
| 0 | 11.23 | **11.48** | **7.538e+04** | 11.28 |
| 1 | 11.34 | 12.83 | 9.256e+04 | 11.63 |
| 2 | **10.74** | 13.48 | 9.137e+04 | **11.27** |

#### 3.3.3 Focused VAR Model on Gold Reserves

The bivariate VAR model focused on NFA and gold reserves is represented as:

The optimal lag length was determined to be five lags (Table 7). This model enables a deeper investigation of the safe-haven and reserve asset function of gold in Switzerland’s external position.

Table 7. Lag order selection – gold reserves model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lag Order | AIC | BIC | FPE | HQIC |
| 0 | 10.27 | **10.37** | 2.895e+04 | 10.28 |
| 1 | 10.56 | 10.85 | 3.879e+04 | 10.59 |
| 2 | 10.98 | 11.47 | 6.060e+04 | 11.02 |
| 3 | 10.41 | 11.10 | 3.687e+04 | 10.48 |
| 4 | 10.50 | 11.39 | 4.630e+04 | 10.59 |
| 5 | **9.56** | 10.64 | **2.331e+04** | **9.67** |
| 6 | 9.68 | 10.95 | 4.214e+04 | 9.80 |

* You can **compare Switzerland to the U.S.**:
  + Does Switzerland earn an “exorbitant privilege” too?
  + Do its **valuation gains or losses offset its large current account surplus**?
  + What role does the **SNB’s asset composition (e.g., gold, FX reserves)** play in these valuation effects?
  + Unlike the U.S., does Switzerland suffer from **exorbitant duty** (i.e., losses on foreign assets)?

Would you like a brief visual diagram comparing the U.S. vs. Swiss external positions in this framework?

# 4. Analysis

## Trends and Structural Shifts in Switzerland’s NFA

### 4.1.1 Long-Term Trends and Crisis Impacts on Switzerland's NFA

Switzerland’s Net Foreign Assets (NFA) have grown steadily over the past four decades, reaching a peak above 800 billion CHF in 2023. Yet this growth path has been far from smooth: annual changes (shown in Figure 1) fluctuated sharply, sometimes by more than 140 billion CHF, often tracking global financial shocks.

A graph showing the growth of the net foreign assets

AI-generated content may be incorrect.

Figure 1: Annual change in Switzerland's net foreign asset

A graph with a line and a line

AI-generated content may be incorrect.

Figure 2. Switzerland’s net foreign asset position and rolling average

Figure 2 plots the NFA time series alongside its rolling average, underscoring the long-term upward trend. The rolling average smooths short-term volatility and supports the view that the post-2008 period marks a structural shift in Switzerland’s external financial position.

To better understand the net position, it is essential to examine its underlying components: foreign assets and foreign liabilities. Figure 3 provides broader context by tracing the evolution of both over time:

* Foreign Assets (green line): Exhibit a steady upward trend, indicating Switzerland’s increasing investment in foreign markets.
* Foreign Liabilities (red line): Also increase over time, but at varying rates, influencing NFA fluctuations.
* The gap between assets and liabilities represents the NFA level, when liabilities grow faster than assets, NFA stagnates or declines.

To complement the analysis of absolute levels, Figure 4 presents Switzerland’s Foreign Assets, Foreign Liabilities, and Net Foreign Assets (NFA) as shares of GDP.

A graph showing the growth of the country

AI-generated content may be incorrect.

Figure 3. Switzerland’s foreign assets, liabilities, and net foreign asset over time

A graph showing the growth of the country

AI-generated content may be incorrect.

Figure 4. Switzerland’s foreign assets, liabilities, and net foreign assets as shares of GDP

### 4.1.2 The Role of Financial Crises in NFA Evolution

To evaluate potential regime shifts in NFA trends, we applied the Chow test for structural breaks at key economic events. Table 8 reports the results.

Table 8: **Chow test results for structural breaks in Switzerland’s NFA trends**

|  |  |  |  |
| --- | --- | --- | --- |
| Breakpoint Year | Chow Test Statistic | P-value | Structural Break? |
| 2008 (Financial Crisis) | 8.8001 | 0.0008 | Significant |
| 2011 (Eurozone Crisis) | 12.5031 | 0.0001 | Significant |
| 2020 (COVID-19 Shock) | 0.2701 | 0.7649 | Not Significant |

As Table 8shows, there are significant structural breaks in 2008 and 2011, indicating that these crises paved the way for notable shifts in Switzerland’s NFA trajectory. However, no structural break was detected in 2020 (p = 0.7649), suggesting that the COVID-19 pandemic did not fundamentally alter the long-term trend of NFA accumulation.

To further investigate, we analyzed the **residual sum of squares (RSS) before and after each breakpoint**. Table 9presents the results.

Table 9: **RSS before and after breakpoints**

|  |  |  |  |
| --- | --- | --- | --- |
| ****Breakpoint Year**** | ****RSS****  ****(Full Sample)**** | ****RSS****  ****(Before Breakpoint)**** | ****RSS****  ****(After Breakpoint)**** |
| **2008 – Financial Crisis** | **226.13B** | **31.89B** | **118.58B** |
| **2011 – Eurozone Crisis** | **226.13B** | **33.41B** | **98.48B** |
| **2020 – COVID 19** | **226.13B** | **219.88B** | **2.81B** |

For 2008 and 2011, RSS values decline markedly, indicating that incorporating breakpoints enhances model fit, confirming structural breaks. Although the 2020 Chow test does not yield statistical significance, the RSS drop (from 219.88B to 2.81B) suggests a notable reduction in NFA volatility following the pandemic.

This reduction in volatility may reflect the effects of policy interventions or broader economic adjustments that stabilized foreign asset accumulation in response to the crisis. To visualize these disruptions, we estimated separate linear trend models before and after each identified breakpoint. Figure 5illustrates the results:

1. **2008 Financial Crisis** (Left Panel): The pre-crisis trend (blue line) shows strong NFA growth, which slows significantly in the post-crisis period (red line). This aligns with the broader literature indicating a contraction in global capital flows following the financial crisis.
2. **2011 Eurozone Crisis** (Middle Panel): A similar pattern emerges, with a sharp decline in NFA accumulation post-crisis. The Swiss economy, often seen as a financial safe haven, may have experienced shifts in capital inflows and outflows during this period.
3. **2020 COVID-19 Shock** (Right Panel): The Chow test does not confirm a significant break (p = 0.7649). However, the noticeable shift in the post-2020 trend and the substantial decrease in residual variance (RSS drop from 219.88B to 2.81B) suggest that NFA behavior changed after the pandemic. The slope reversal from positive to negative further indicates a potential slowdown or reversal in Switzerland’s foreign asset accumulation, contrasting with past crises where NFA growth persisted, albeit at a lower rate. The small number of observations post-2020 makes it difficult to determine whether this change represents a temporary adjustment or a new trajectory. Future data availability may provide better insights into the long-term effects of the pandemic on Switzerland’s foreign asset accumulation.

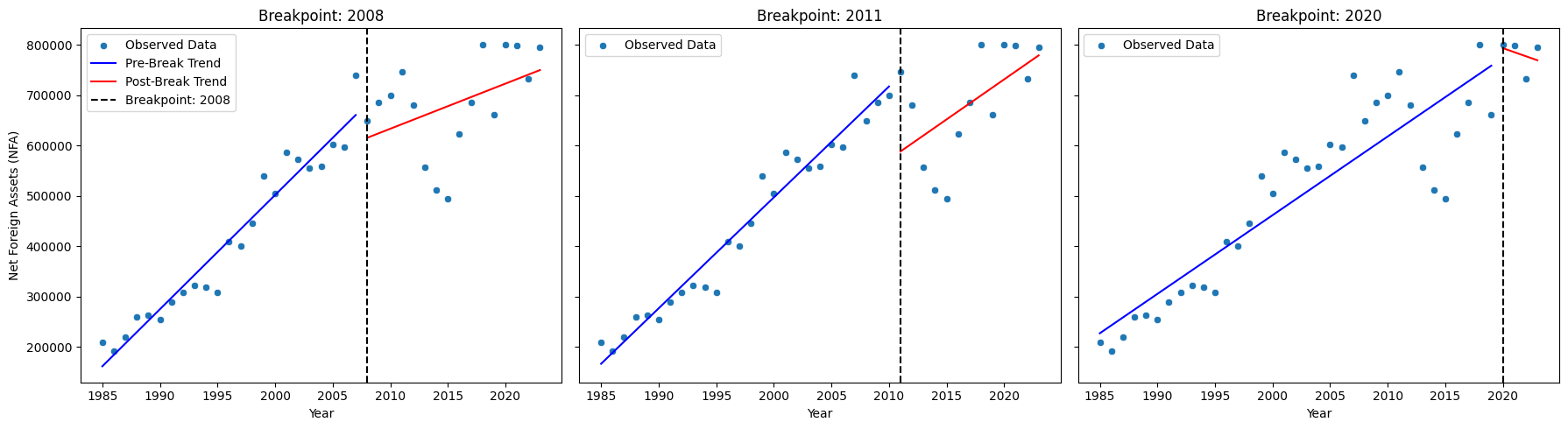


Figure 5: Structural breaks in Switzerland’s NFA trends (2008, 2011, 2020)

### 4.1.3 Decomposition of NFA into Its Components

To frame the empirical investigation, we begin with an accounting decomposition of Switzerland’s Net Foreign Asset (NFA) position. Following Atkeson et al. (2022), the NFA evolves according to the identity:

Where:

* CAj : current account
* VAj : valuation effects
* RESj : residual discrepancies or statistical errors

A graph of different colored lines

AI-generated content may be incorrect.

Figure 6. Decomposition of Switzerland’s net foreign asset

Figure 6 illustrates the cumulative contribution of each component. The dominant upward trajectory of the current account component (blue line) suggests that consistent trade surpluses are the primary driver of NFA growth. In contrast, valuation effects (orange line) have persistently weighed negatively on NFA, particularly after 2008, possibly due to underperformance in Swiss-held foreign assets. Residuals (green) remain minimal, indicating reliable data reconciliation over time.

While the cumulative picture highlights long-run trends, annual movements offer further insight into short-term dynamics and volatility, particularly during crisis years. Figure 7 provides a detailed breakdown of the yearly changes in the Current Account, Valuation Effects, and their combined impact over the years 2000 - 2023

These findings visually reinforce the hypothesis that transactional factors, especially the current account, are the dominant driver of Switzerland’s external wealth, while valuation effects may act as a drag on NFA. In addition to the cumulative decomposition of Switzerland’s NFA, it is informative to examine the annual changes in each component independently.

A graph of different colored lines

AI-generated content may be incorrect.

Figure 7. Comparative trends in Switzerland’s current account, valuation effects, and combined impact

## Transactional Drivers of NFA: The Role of Capital Flows

Building on the trend analysis in the previous section, which shows that the current account explains the majority of NFA growth, we now evaluate whether capital flows (specifically FDI, the Financial Account, and the Current Account) are statistically significant drivers of NFA changes.

### 4.2.1 Exploring Economic Drivers of Switzerland’s External Wealth

To begin the analysis, we decomposed the Financial Account into its subcomponents being direct investment, portfolio investment, other investment, reserve assets. The figure below shows the individual trends of each component over time, plotted with the same Y-axis scale for consistency.

A graph of financial data

AI-generated content may be incorrect.

Figure 8. Financial account components over time

In order to compare the relative importance of the Financial Account, Current Account, and FDI over time, we plotted these variables, as shown in Figure 9. Overall, the Current Account appears to be the most stable component, while the Financial Account exhibits the highest volatility. The downward trend in FDI is concerning, as it suggests diminishing contributions from long-term investments to NFA growth.

A graph of financial account

AI-generated content may be incorrect.

Figure 9. Current account, financial account, and FDI over time

### 4.2.2 VAR Analysis of Capital Flows and NFA Dynamics

To further understand the relationships identified visually, we proceed with statistical analysis. We begin with a correlation analysis to assess initial associations. The correlation matrix reveals that the Current Account exhibits the strongest correlation with NFA percentage changes, suggesting a potential link between trade-related flows and external wealth accumulation. In contrast, FDI and the Financial Account show weaker correlations, implying that capital flows may not have an immediate impact on NFA fluctuations.

As confirmed in the methodology, all capital flow variables are stationary, allowing direct estimation of a VAR model without differencing. Granger causality tests reveal that the Current Account significantly predicts changes in NFA, reinforcing its central role in driving Switzerland’s external wealth accumulation. In contrast, FDI and Financial Account flows do not exhibit statistically significant predictive power, suggesting they may be too volatile or long-term in nature to influence short-term NFA dynamics.

Table 10. Granger causality test results

|  |  |  |  |
| --- | --- | --- | --- |
| Predictor Variable | F-Statistic | p-value | Conclusion |
| FDI\_Total → ΔNFA | 2.0954 | 0.1572 | No Causality |
| Financial\_Account → ΔNFA | 0.0091 | 0.9245 | No Causality |
| Current\_Account → ΔNFA | 99.4859 | 0.0000 | Granger-Causal |

While the Granger causality tests indicated that only the Current Account predicts NFA changes, the VAR model reveals that FDI also has a statistically significant effect on NFA percentage changes when controlling for other capital flow components.

**In the equation for NFA percentage change, both Current Account (p < 0.001) and FDI (p = 0.005) coefficients are statistically significant, while Financial Account is not. These results reinforce the idea that trade-related transactions and direct investment are relevant for external wealth accumulation, but portfolio-related capital flows are not.**

Table 11. VAR results for capital flows model

|  |  |  |  |
| --- | --- | --- | --- |
| Predictor | Coefficient | p-value | Interpretation |
| L1.FDI\_Total | 0.267 | 0.005 | Statistically significant |
| L1.Financial\_Account | -0.234 | 0.263 | Not significant |
| L1.Current\_Account | 4.358 | 0.000 | Highly significant |
| L1.NFA\_Pct\_Change | -0.036 | 0.654 | Not significant |

To quantify the impact of shocks, we estimate impulse response functions (IRF). The results, shown in Figure 10, reveal distinct dynamics:

* A one-standard-deviation shock to the Current Account leads to a strong, immediate, and persistent increase in NFA percentage changes, confirming its dominant role.
* FDI shocks also result in a short-term rise in NFA, peaking within two periods and fading thereafter, suggesting a temporary influence.
* In contrast, Financial Account shocks have no meaningful or lasting effect on NFA, as responses remain within confidence intervals.
* The response of NFA to its own past shocks is mild and short-lived, indicating low autocorrelation.

A group of graphs showing the function of a financial account

AI-generated content may be incorrect.

Figure 10. Impulse response functions (orthogonalized)

**These IRFs support the VAR results and highlight the asymmetric impact of capital flow components: while trade surpluses and direct investments contribute to NFA growth, financial account flows do not materially affect Switzerland’s external wealth.**

**In summary, our analysis shows that the Current Account is the principal driver of Switzerland’s NFA accumulation, with FDI playing a secondary but significant role. Portfolio flows captured by the Financial Account, however, do not meaningfully influence NFA dynamics. This suggests that Switzerland’s external wealth is shaped primarily by trade performance and long-term investment flows rather than short-term capital movements.**

**A graph showing the different colored lines

AI-generated content may be incorrect.**

Figure 11. Ten year forecast values for capital flows

## Valuation Effects

As shown in Figure 6, valuation effects have persistently subtracted from Switzerland’s NFA position, particularly after 2008. To investigate this channel further, we assess whether excess returns, interest rate differentials, exchange rate fluctuations, and asset price movements help explain these negative valuation effects.

We structure this analysis around four potential transmission channels: excess returns, interest rate dynamics, exchange rate movements, and asset price effects, including stock indices and gold reserves. Each is examined for its contribution to changes in Switzerland’s NFA.

### 4.3.1 Exploring Valuation Channels: Returns, Rates, and Exchange Rates

##### *Excess Returns*

Figure 12presents the evolution of excess returns on Swiss foreign assets relative to liabilities since 2000. Returns exhibit notable fluctuations tied to major economic events, most prominently, the 2008 Global Financial Crisis, during which excess returns dropped by approximately 6%. Volatility diminished somewhat post-2011, while the gradual decline in returns after 2015 may reflect structural shifts in global risk premiums or portfolio allocations.

A graph with blue lines and red dots

AI-generated content may be incorrect.

Figure 12. Excess returns on Swiss foreign assets vs. liabilities

To assess whether financial crises caused structural changes, we conducted Chow tests for breakpoints in 2008, 2011, and 2020. The results, shown below, indicate no statistically significant breaks in any of these years.

Table 12. Chow test results **for structural breaks in excess returns**

|  |  |  |  |
| --- | --- | --- | --- |
| Breakpoint Year | Chow Test Statistic | P-value | Structural Break? |
| 2008 (Financial Crisis) | 0.9128 | 0.4168 | Not Significant |
| 2011 (Eurozone Crisis) | 1.2121 | 0.3176 | Not Significant |
| 2020 (COVID-19 Shock) | 0.0286 | 0.9718 | Not Significant |

These results suggest that while excess returns are volatile, they do not display persistent regime shifts during financial crises. We next examine whether interest rate policy might explain these fluctuations.

##### *Interest Rate Effects on Valuation*

As a global financial center, Switzerland’s monetary policy, especially the SNB interest rate, could influence excess returns through capital flows or portfolio reallocations. Correlation analysis reveals only a weak negative relationship (contemporaneous: -0.0949; lagged: -0.1162), and regression models confirm this with low explanatory power (R² = 0.015; p-values > 0.8). However, Granger causality tests identify a significant effect at lag 2 (p = 0.0004), suggesting a delayed impact.

These results imply that interest rate changes may affect excess returns with a time lag, potentially due to gradual adjustments in investment strategies. Still, monetary policy does not appear to be a dominant factor in explaining valuation effects.

##### *Exchange Rate Trends and Structural Breaks*

Exchange rate volatility, especially CHF appreciation during crises, is another potential source of valuation changes. To test this, we examine percentage changes in CHF against six major currencies, grouped by region:

* **Europe: EUR, GBP**
* **North America: USD, SDR**
* **Asia: JPY, CNY**

As Table 13 shows, Chow test identified a significant structural shift in 2008, no such break was detected in 2011 or 2020.

Table 13: Chow test results results **for structural breaks in** exchange rates

|  |  |  |  |
| --- | --- | --- | --- |
| Currency Pair | 2008 (Crisis) | 2011 (Eurozone) | 2020 (COVID-19) |
| EUR/CHF | Significant | Not Significant | Not Significant |
| USD/CHF | Not Significant | Not Significant | Not Significant |
| JPY/CHF | Not Significant | Not Significant | Not Significant |

While the 2008 crisis appears to have significantly affected exchange rates, fixed-effects panel regressions reveal that neither contemporaneous nor lagged exchange rate changes significantly influence valuation effects. This suggests that while CHF volatility spiked during crises, its long-run impact on valuation is limited, pointing to the need to consider additional macro-financial drivers.

##### *Visual Analysis of Cumulative Valuation Effects*

To better understand how various valuation channels contribute to NFA changes over time, we present a cumulative analysis of Excess Returns, SNB Rate Effects, and Exchange Rate Changes (EUR & USD). This visual representation helps identify persistent trends or shifts that may not be immediately evident through statistical tests alone.

A graph of different colored lines

AI-generated content may be incorrect.

Figure 13. Cumulative valuation effects

The cumulative analysis shows that Excess Returns and SNB Rate Effects peaked around 2006, well before the 2008 crisis, and declined sharply afterward. This suggests broader structural shifts rather than crisis-specific impacts. Meanwhile, USD/CHF depreciation shows a persistent negative trend, while EUR/CHF remains more stable but depreciates post-2010. Despite its relative stability, EUR/CHF may play a significant role in the VAR analysis, warranting closer examination. The VAR model will test whether these trends are statistically significant and assess their joint influence on NFA dynamics.

The VAR model will test whether these visually identified trends have statistically significant effects on NFA. Excess Returns' volatility, SNB Rate shifts, and USD/CHF depreciation will be assessed for their joint influence.

### 4.3.2 Full VAR Analysis: Joint Dynamics of Valuation Channels

While individual tests reveal limited explanatory power for most valuation variables, they may still influence NFA dynamics collectively through delayed or interacting effects. To assess these joint dynamics, we estimate a Vector Autoregression (VAR) model incorporating key valuation channels: excess returns, exchange rate effects, SNB interest rate, asset price changes (e.g., Dow Jones and Nikkei indices), gold reserve values, and a crisis dummy variable to account for Chow test results.

As established in the methodology, necessary differencing was applied to non-stationary series, and multicollinearity was within acceptable limits (see Table 4 and Table 5). Granger causality tests (Table 14) highlight gold reserves as the only statistically significant predictor of NFA changes at the 5% level (lag 3), supporting its role as a safe-haven asset. Other variables including excess returns, exchange rates, stock indices, and SNB rates do not exhibit significant causal relationships with NFA dynamics.

Table 14 Granger causality test results (NFA\_Pct\_Change as dependent variable)

|  |  |  |  |
| --- | --- | --- | --- |
| Predictor Variable | Lag(s) | p-value | Conclusion |
| US - Dow Jones Industrial Average (Diff) | 1–3 | > 0.24 | No Causality |
| Exchange Rate Effects on Stocks (Diff) | 1–3 | > 0.27 | No Causality |
| Price Effects on Stocks (Diff) | 1–3 | > 0.25 | No Causality |
| SNB Rate (Diff) | 1–3 | > 0.86 | No Causality |
| Excess Return (Diff) | 1–3 | > 0.32 | No Causality |
| Crisis Dummy | 1–3 | > 0.93 | No Causality |
| Japan - Nikkei 225 | 1–3 | > 0.84 | No Causality |
| USD/CHF (Diff) | 1–3 | > 0.63 | No Causality |
| EUR/CHF | 1–3 | ~ 0.11 | Marginally Significant |
| Gold Reserves | 3 | 0.003 | Granger-Causal |

The VAR model includes NFA percentage change, Gold Reserves, US stock returns (Dow Jones), EUR/CHF exchange rate, and a crisis dummy. These variables are selected for their theoretical relevance and potential joint dynamics, with Gold Reserves showing significant Granger causality. US stock returns and EUR/CHF are included to capture broader market and exchange rate effects, while the Crisis Dummy accounts for structural breaks. Including all variables helps detect interactions and delayed effects that single tests may miss.

VAR regression results are shown in Table 15. The most notable findings are the statistical significance of US - Dow Jones returns (L1) (p = 0.008) and EUR/CHF (L1 and L2) (p = 0.015 and p = 0.010, respectively) in predicting NFA percentage changes. This suggests that US stock returns and exchange rate fluctuations, particularly EUR/CHF, have measurable impacts on NFA dynamics.

The Crisis Dummy shows some marginal significance at L2 (p = 0.066), indicating that structural breaks may have some influence on NFA changes, but not consistently. Surprisingly, Gold Reserves, which previously exhibited significant Granger causality, are not statistically significant in the full VAR model. This loss of significance could be due to multicollinearity, limited sample size, or the inclusion of additional variables that absorb explanatory power.

The results highlight the importance of including EUR/CHF and US stock returns in the analysis, as they appear to influence NFA dynamics more consistently than other variables. The findings suggest that valuation effects related to exchange rates and broader market movements may be more relevant than previously anticipated.

Table 15. VAR model coefficients (dependent variable: NFA\_Pct\_Change)

|  |  |  |
| --- | --- | --- |
| Predictor | Coefficient | p-value |
| const | 2.338507 | 0.490 |
| L1.NFA\_Pct\_Change | 0.374496 | 0.274 |
| L1.Crisis\_Dummy | 13.702470 | 0.443 |
| L1.Gold\_Reserves | -0.203693 | 0.470 |
| L1.US - Dow Jones\_Diff | 7.316980 | 0.008 |
| L1.EUR\_CHF | -2.132282 | 0.015 |
| L2.NFA\_Pct\_Change | 0.111602 | 0.725 |
| L2.Crisis\_Dummy | -37.054008 | 0.066 |
| L2.Gold\_Reserves | 0.056140 | 0.827 |
| L2.US - Dow Jones\_Diff | 0.923650 | 0.616 |
| L2.EUR\_CHF | 2.133466 | 0.010 |

A graph of a function

AI-generated content may be incorrect.

Figure 14. Impulse response function for full model

In summary, while Gold Reserves show predictive power in isolation, their significance diminishes in the full VAR model. Instead, US stock returns and EUR/CHF exchange rates emerge as the most relevant predictors of NFA changes. These findings underscore the importance of considering exchange rate effects and global market conditions when analyzing Switzerland’s external wealth.

### 4.3.3 Focused VAR Analysis on Gold Reserves

While the full VAR model identified US stock returns and EUR/CHF exchange rates as significant predictors of NFA changes, Gold Reserves remain theoretically important as a safe-haven asset. Granger causality tests previously confirmed their predictive power for NFA changes at lag 3. Their theoretical relevance and prior Granger causality significance warrant further investigation through a focused bivariate VAR model. This approach helps isolate the unique relationship between variables, reducing the risk of overfitting, particularly relevant when working with small-sample macroeconomic data.

Table 16 reveal a statistically significant and negative effect of the third lag of Gold Reserves on NFA percentage change (p < 0.001), suggesting that an increase in gold holdings three years prior is associated with a subsequent decline in NFA growth. While this may appear counterintuitive, it could reflect countercyclical accumulation strategies where gold is stockpiled in anticipation of external shocks that eventually suppress NFA performance.

Table 16 **VAR model coefficients – NFA equation (selected)**

|  |  |  |  |
| --- | --- | --- | --- |
| Predictor | Coefficient | p-value | Interpretation |
| L3.Gold\_Reserves | -0.843 | 0.000 | Statistically significant, negative |
| L5.NFA\_Pct\_Change | 0.447 | 0.131 | Not significant |
| L1 to L4 Gold Reserves | Various | > 0.1 | Not statistically significant |

In the reverse equation, where Gold Reserves is the dependent variable, the second lag of NFA percentage change is statistically significant (p = 0.022), and the third lag of Gold Reserves is also significant (p = 0.032). These findings confirm a dynamic two-way relationship with strong autocorrelation in gold reserve adjustments, consistent with strategic reserve management by the Swiss National Bank.

Table 17. **VAR model coefficients – gold reserves equation (selected)**

|  |  |  |  |
| --- | --- | --- | --- |
| Predictor | Coefficient | p-value | Interpretation |
| L2.NFA\_Pct\_Change | 0.969 | 0.022 | NFA Granger-causes gold accumulation |
| L3.Gold\_Reserves | -0.623 | 0.032 | Negative autocorrelation |

The impulse response functions (Figure 15) support this interpretation. A shock to NFA leads to a short-term increase in gold reserves, peaking around the second to third period, mirroring the significance of lag 2 in the equation. Meanwhile, a shock to gold reserves has a modest, negative impact on NFA in the short term, aligning with the coefficient sign and reinforcing the interpretation of countercyclical accumulation. Additionally, gold reserve shocks exhibit negative autocorrelation, consistent with strategic rebalancing following large reserve moves. To further assess the predictive power of Gold Reserves and NFA, we generate 10-year forecasts based on the focused VAR model.

A graph of different types of graphs

AI-generated content may be incorrect.

Figure 15. Impulse response functions for gold reserves

A graph of a graph showing the different types of changes

AI-generated content may be incorrect.

Figure 16. Ten-year forecast based on focused VAR

The correlation matrix of residuals shows a high degree of comovement between the two variables (ρ = 0.71), which further supports the notion of joint dynamics between gold reserve accumulation and external wealth fluctuations.

In sum, while the full model yielded inconclusive results, the focused VAR with Gold Reserves reveals a statistically robust and economically meaningful relationship. These results underscore the importance of decomposing valuation channels and isolating variables with strong theoretical grounding. Gold appears to act as a countercyclical buffer in Switzerland’s external asset management, particularly during periods of financial uncertainty.

# Discussion

This study examined the dynamics of Switzerland’s Net Foreign Asset (NFA) position through structural break tests, capital flow decomposition, and valuation channel analysis, thereby deepening the empirical understanding of a long-standing macroeconomic puzzle: why sustained current account surpluses have not translated into proportionate increases in external wealth.

Our findings confirm that while Switzerland maintains persistent trade surpluses, the corresponding accumulation of NFA has been periodically disrupted, most notably during the global financial crisis of 2008 and the Eurozone debt crisis of 2011. These episodes introduced significant structural breaks in NFA trends, reflecting crisis-induced capital volatility and valuation adjustments. In contrast, the COVID-19 pandemic did not yield a statistically significant break, suggesting that rapid fiscal and monetary responses, particularly by the Swiss National Bank (SNB), effectively cushioned the external balance from long-term disruption. This distinction reinforces the role of policy in mitigating global shocks and stabilizing external wealth accumulation.

Consistent with prior literature (e.g., Lane and Milesi-Ferretti, 2007; Atkeson et al., 2022), the current account emerges as the principal driver of NFA growth. Our VAR models and Granger causality tests show that trade surpluses have a strong and persistent predictive power over NFA changes. Foreign Direct Investment (FDI) also plays a supportive, if less robust, role. In contrast, portfolio and other financial account flows (often volatile and short-term) do not significantly affect external wealth accumulation. These results align with intertemporal adjustment models emphasizing the primacy of transactional flows in driving net positions.

Valuation effects, by contrast, remain persistently negative and difficult to predict. While exchange rate volatility, particularly during the 2008 crisis, shows up in structural break tests, VAR models indicate that individual valuation channels such as interest rates, excess returns, and asset prices exert limited explanatory power when considered in isolation. These results echo concerns in the literature (IMF, 2018; Obstfeld, 2012) about the inherent noise and complexity of modeling valuation adjustments in financially open economies. Even when global market indices like the Dow Jones and EUR/CHF exchange rate show some predictive power in multivariate settings, the effects remain context-dependent and fragile.

A novel and important contribution of this study lies in the identification of gold reserves as a countercyclical valuation buffer. While often overlooked in traditional valuation models, Swiss gold holdings show statistically significant bidirectional dynamics with NFA changes. Our focused VAR analysis reveals that gold reserves Granger-cause NFA fluctuations, suggesting a stabilizing role during periods of financial uncertainty. This likely reflects strategic accumulation by the SNB in anticipation of external shocks, a pattern consistent with its broader role in public reserve management since 2008. This insight complements Adler and Garcia-Macia’s (2018) arguments about the macro-stabilization function of reserve asset composition and adds empirical weight to the claim that gold acts as a policy tool in safe-haven economies.

Lastly, our results highlight the growing centrality of the SNB in shaping Switzerland’s external balance sheet. The post-2008 transfer of foreign asset holdings from the private to the public sector has concentrated valuation risks on the SNB’s balance sheet, converting market volatility into potential fiscal implications. This structural transformation underscores the dual role of the SNB as both a monetary authority and a financial shock absorber, an increasingly relevant consideration for external sustainability assessments.

In sum, the Swiss case underscores the difficulty of translating current account surpluses into net wealth in an environment of valuation volatility, global capital mobility, and safe-haven currency pressures. While capital flows, especially the current account remain the most reliable predictor of NFA growth, valuation dynamics and reserve strategies play a critical role in shaping short-term fluctuations. Future research could benefit from more granular and high-frequency data to better capture these interactions, especially during periods of global financial stress. Additionally, comparative studies across safe-haven economies could illuminate whether Switzerland’s reliance on gold and foreign reserves reflects a broader pattern of reserve management in small, open economies exposed to global uncertainty.

# References

Adler, G., & Garcia-Macia, D. (2018). The Stabilizing Role of Net Foreign Asset Returns (IMF Working Paper No. 18/79). International Monetary Fund.

Atkeson, A., Chari, V. V., & Kehoe, P. J. (2022). Valuation Effects and External Adjustment. NBER Working Paper No. 30579.

Bank for International Settlements. (2017). Speech by Thomas Jordan: Current Account Surpluses and the Swiss NIIP. BIS.

Gourinchas, P.-O., & Rey, H. (2007). International Financial Adjustment. Journal of Political Economy, 115(4), 665–703.

Gourinchas, P.-O., & Rey, H. (2014). External Adjustment, Global Imbalances, and Valuation Effects. In Gopinath, G., Helpman, E., & Rogoff, K. (Eds.), Handbook of International Economics (Vol. 4, pp. 585–645). Elsevier.

IMF. (2018). Revisiting the Net Foreign Asset Income Returns. IMF External Sector Report Background Paper.

IMF. (2022). Switzerland: Selected Issues (IMF Country Report No. 22/176). International Monetary Fund.

Lane, P. R., & Milesi-Ferretti, G. M. (2007). The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970–2004. Journal of International Economics, 73(2), 223–250.

Obstfeld, M. (2012). Does the Current Account Still Matter? American Economic Review, 102(3), 1–23.

Obstfeld, M., & Rogoff, K. (1995). The Intertemporal Approach to the Current Account. In Handbook of International Economics (Vol. 3, pp. 1731–1799). Elsevier.

OECD. (2022). Economic Survey of Switzerland. Organisation for Economic Co-operation and Development.

Stoffels, N., & Tille, C. (2007). Switzerland's Performance in the Global Economy. In The Swiss National Bank 1907–2007. Neue Zürcher Zeitung Publishing.

Stoffels, N., & Tille, C. (2020). Safe Haven Switzerland? A Stress Test of Capital Flows to and from Switzerland. Swiss Journal of Economics and Statistics, 156(1), 1–20.