# The rise of inelastic intermediaries and exchange rate dynamics*

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**Abstract**

This paper investigates the interaction between the rise of inelastic intermediaries, e.g. mutual funds and exchange traded funds (ETFs), and exchange rate dynamics. By leveraging regulatory microdata on the universe of mutual funds domiciled in Switzerland, we first document the remarkable rise of the market share of this industry. Mutual funds went from holding 5% of domestic currency fixed income instruments in 2005 to 51% in 2024. We show that these intermediaries have strict mandates and trade only when faced with in(out)-flows. This makes the market more price-inelastic on aggregate in response to asset demand shocks. We develop an analytical model that we bring to the microdata. We find that (i) an inflow into domestic mutual funds with a large portfolio weight on the domestic currency appreciates it and (ii) the reduced aggregate elasticity makes the exchange rate more sensitive to capital flows. Finally, using a weekly panel of five advanced economies, we document the external validity of this mechanism. We show that the currencies whose markets see a higher prevalence of inelastic intermediaries react significantly more strongly to capital inflows.

**JEL Codes:** F31, G23, G15, F21, E44

**Keywords**: Inelastic intermediaries; mutual funds; exchange rate dynamics; capital flows.

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# 1 Introduction

In recent decades, the structure of international financial intermediation has undergone a profound transformation. Investment via mutual funds and exchange-traded funds (ETFs) has grown rapidly. By leveraging supervisory microdata from Switzerland on (i) security holdings by banks, and (ii) the universe of domestic mutual funds, we document that the share of domestic-currency bonds held by mutual funds has risen from approximately 5% in 2005 to nearly 50% in 2024 (Figure 1a). Using global mutual fund data, we can see that this rise is mirrored , although with significant heterogeneity, in other advanced economies, where the footprint of bond funds in domestic markets has expanded steadily (Figure 1b).

These intermediaries operate under rigid mandates that constrain currency weights and allocations, and they trade largely in response to investors' purchases and redemptions. This combination of mechanical mandates and granular shocks implies that mutual funds behave as "inelastic intermediaries" in the sense of Gabaix and Koijen (2023) by supplying and demanding assets in ways that are relatively insensitive to prices.

Against this backdrop, a second fact has emerged: an increased co-movement between capital flows and exchange rates. Switzerland is a particularly interesting case. Prior to the Global Financial Crisis (Figure 2a) capital in/out flows displayed no systematic correlation with the Swiss Franc (CHF)/USD exchange rate. However, since 2010 the relationship has strengthened and become more volatile over time (Figure 2b).

This paper argues that these two developments are intimately linked. As the market share of inelastic intermediaries (mutual funds and ETFs) grows, the elasticity of domestic-currency assets decreases. As a result, capital inflows that would once have been absorbed with minimal price impact now translate directly into persistent exchange rate pressure. We develop a simple theoretical framework to formalise this mechanism and test its predictions using novel Swiss microdata that cover the universe of domestically domiciled mutual funds from 2005 to 2024, comprising at the end of the sample around 1,914 individual funds with CHF 1.9 trillion in assets under management (AUM). We also leverage a proprietary commercial dataset, EPFR[1], on weekly mutual fund flows for 5 advanced economies - Switzerland, United Kingdom, United States, Australia and Canada - providing external validity to the results.

We develop an analytical model that builds on Gabaix and Maggiori (2015) to capture the role of inelastic mutual funds in foreign exchange markets. We introduce into the model a class of intermediaries with rigid currency mandates. They hold fixed portfolio shares across currencies and respond mechanically to investor flows, which makes their net demand essentially price-inelastic. The model yields two main predictions. First, inflows into funds that put a high portfolio weight on a given currency generate immediate and persistent appreciation pressure, as inelastic interme-

[1]EPFR is a commercial data provider, whose solutions on Fund Flows and Allocations have a comprehensive coverage of over 151,000 share classes, comprising more than $55 trillion in assets under management (AUM).

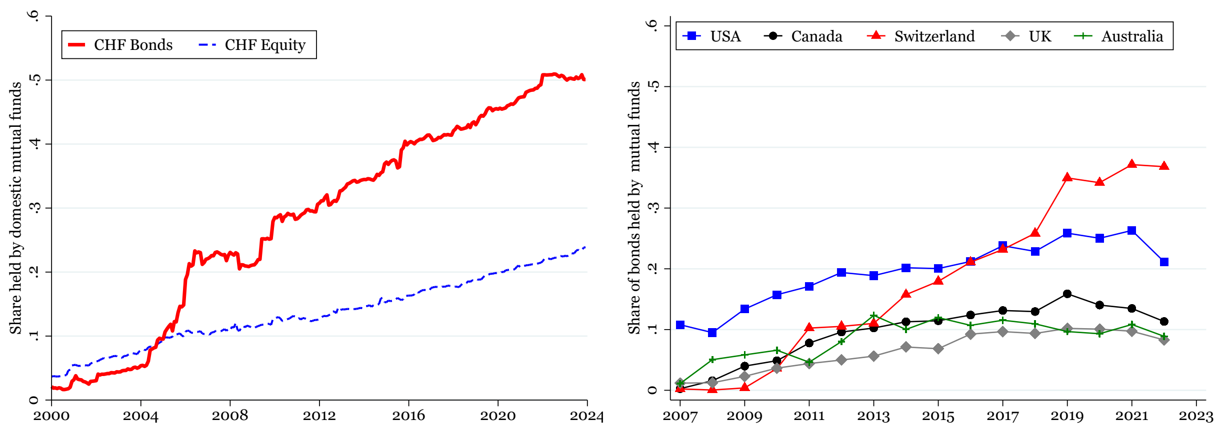
diaries cannot reallocate across currencies. Second, as the market share of these intermediaries ($\chi$) increases, exchange rates become more sensitive to any future in/outflows, since a larger fraction of supply is inelastic. Thus, the model provides a microfounded mechanism through which structural changes in intermediation steepen the effective supply curve of domestic-currency assets and cause comovement of capital flows and exchange rates.

We test these two propositions empirically, by first using Swiss microdata and then extending the analysis to a panel of 5 advanced economies. We exploit the granularity of the Swiss domestic fund industry, which we can observe in its entirety at the quarterly frequency, and we identify idiosyncratic flow shocks at the fund level to construct a granular instrumental variable (GIV) à la Gabaix and Koijen (2024). We use this GIV to compute the dynamic response of the exchange rate to a one standard deviation (1sd) net flow into or out of funds, weighted by their domestic currency portfolio weight. Such an inflow (outflow) appreciates (depreciates) the bilateral CHF/USD exchange rate (or similarly the CHF effective exchange rate) by approximately 1 percent within one quarter, with the effect persisting for six quarters and peaking at 4% after 4 quarters. To assess the quantitative importance of this channel, we compare its magnitude to that of other common shock measures. We find that the impact of a 1sd GIV shock is more significant than and in line (although slightly larger) than a 1sd US, EA or domestic (Swiss) monetary policy shock. Although this impact is smaller in magnitude than the impact of a 1sd change in the Global Financial Cycle factor by Miranda-Agrippino and Rey (2020), it appears better identified because of the absence of any pre-trends. In agreement with the second prediction of the model, we find that, by splitting the sample, passthrough of flows to the exchange rate becomes significantly positive in the later high-$\chi$ sample while it is insignificant in the earlier low-$\chi$ sample.

We then test this latter finding, the importance of $\chi$, more formally and directly by moving to a cross-country dimension. We construct a multicountry weekly panel that combines the data on global bond mutual fund flows (from active and passive mutual funds), effective exchange rates, and time/country-varying measures of $\chi$. An examination of the behaviour of exchange rates around large flows in and out of domestic bond markets from foreign investors, reveals that country-weeks with high $\chi$ experience greater exchange rate responses to bond fund inflows. This pattern holds when controlling for short-term interest rate movements, risk, country and time unobservables, and it suggests that rising inelasticity indeed contributes to the change in the behaviour of the exchange rate that we observe in Figure 2b. These cross-country results also strengthen the external validity of the findings identified in the Swiss microdata.

**Related literature** Our paper builds on, and contributes to, four interconnected strands of research. The inelastic-markets hypothesis of Gabaix and Koijen (2023) and the framework of Gabaix and Maggiori (2015) emphasise that asset prices respond strongly when the marginal holder is unwilling or unable to absorb shocks. We extend these ideas to a *cross-currency* settings in which a

Figure 1: THE RISE OF INELASTIC INTERMEDIARIES




(a) Share of CHF assets held by domestic mutual funds

(b) Share of bonds held by mutual funds in five AEs

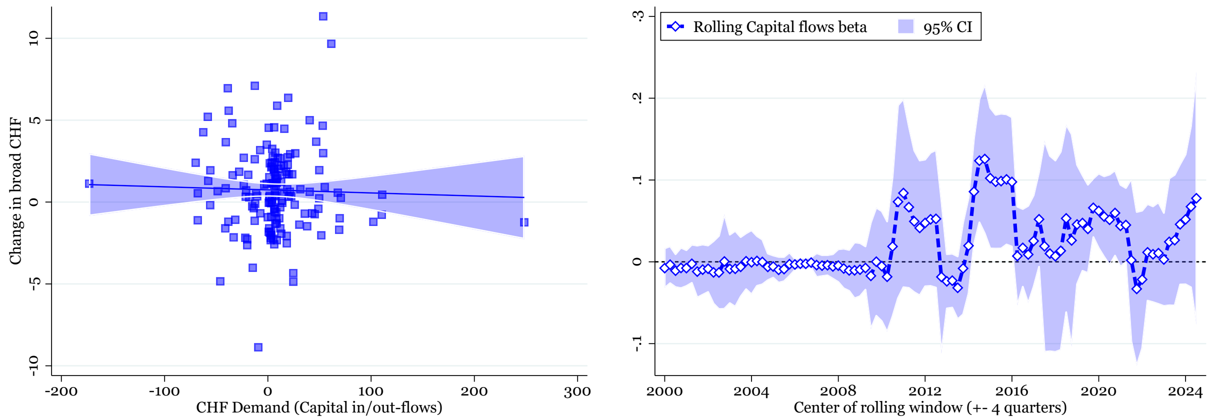
NOTE. Panel (a) plots the monthly share of total outstanding CHF denominated bonds held by mutual funds, from the SNB security holding statistics (WEBM). Panel (b) similarly constructs a measure of the share of outstanding domestic bonds held by inelastic intermediaries by using EPFR mutual funds allocation data and IMF WEO data for country-level outstanding debt statistics.

rising share of mandate-constrained mutual funds mechanically tightens the effective supply of domestic-currency assets. Koijen and Yogo (2023) and Greenwood et al. (2023) provide further evidence that limited intermediation capacity helps explain large price swings in other asset markets; we show that similar mechanisms operate in foreign exchange (FX) markets.

A classic literature reports little relation between macro fundamentals and exchange rates (Meese and Rogoff, 1983; Fama, 1984; Obstfeld and Rogoff, 2001). More recently, Lilley et al. (2022) document an FX *reconnect*: some measures of common proxies for global risk appetite gain predictive power for exchange-rate movements. Competing explanations focus on financial frictions (Itskhoki and Mukhin, 2021; Kouri, 1977, 1981) and segmented demand Gourinchas et al. (2022). We contribute to this discussion by showing that the secular rise of inelastic intermediaries- as captured by the market share parameter $\chi$ - provides a channel through which capital flows translate into stronger exchange rate pressure.

A growing literature studies how open-end funds manage inflows and outflows (Bagattini et al., 2023; Ma et al., 2022; Salarkia, 2023; Zeng, 2017) and how their trading moves prices (Coval and Stafford, 2007; Vayanos and Woolley, 2011). Ben Zeev and Nathan (2024) and Sialm and Zhu (2024) link fixed-income fund flows to currency returns, and Hacioğlu-Hoke et al. (2024) document in rich microdata the use of FX derivatives by different types of investors. Our contribution is to leverage supervisory microdata that cover *the universe* of Swiss-domiciled funds, allowing us to quantify both the rigidity of currency mandates and the pass-through from fund-level flows to the CHF.

Figure 2: EXCHANGE RATE AND CAPITAL FLOWS




(a) Quarterly Δ broad CHF NEER versus capital flows (b) 8-quarter rolling coefficient of Δ CHF on capital flows

NOTE. Panel (a) is a binscatter of quarterly capital flows into Switzerland on the x-axis from SNB balance of payments statistics (positive values for inflows) versus quarterly changes in the broad CHF nominal effective exchange rate from the BIS. Panel (b) reports the coefficient estimated by a rolling regression of quarterly changes in the broad CHF nominal effective exchange rate on quarterly capital flows, after controlling for interest rate differentials and changes in central bank reserves. The rolling window is centered and includes 4 quarters either side.

Because individual intermediaries can be large relative to the market, idiosyncratic flow shocks can be leveraged to construct exogenous instruments. The GIV methodology of Gabaix and Koijen (2024) has been applied to global bank lending (Bippus et al., 2024), cross-border portfolio flows (Aldasoro et al., 2023), and international equity funds (Camanho et al., 2022). We adapt this strategy to confidential Swiss fund-level data, and instrument aggregate CHF flows with size-weighted idiosyncratic shocks at the *share-class* level.

By integrating these four strands of literature, the paper provides a unified explanation for why exchange rates have become increasingly sensitive to asset demand from domestic and foreign investors over the past two decades and highlights the macrofinancial consequences of the steady shift toward inelastic intermediation.

The rest of the paper proceeds as follows. Section 2 describes the data and stylised facts. Section 3 sets out the theoretical framework. Section 4 estimates the causal impact of fund inflows on the CHF and documents the time-varying elasticity. Section 5 extends the analysis to a multicountry weekly panel. Section 6 concludes.

## 2 Data and stylised facts

In this section, we describe the construction of our new dataset, which relies on confidential regulatory filings covering the universe of Swiss domiciled mutual funds. Based on this detailed dataset, we then document the characteristics of these funds that underlie their impact on exchange rate dynamics: currency specialisation, rigid mandates and flow-induced trading.

## 2.1 Data description

The Swiss National Bank (SNB) collects quarterly data from the universe of Swiss-domiciled mutual funds on behalf of FINMA (the Swiss financial regulator). The funds report all positions by asset class (equity, money market, bonds, etc.), currency (CHF or not) and counterparty domicile (domestic or cross-border). A wide array of funds is represented in the sample, including both active and passive funds, with a broad set of asset class mandates (equity, bonds, mixed, real estate, and money market). More detailed summary statistics and sample coverage are provided in the Appendix A.3. Importantly, for each reporting fund, we observe their inflows and outflows at the share-class level (the average fund has 2 share classes: a snapshot of the distribution of share classes per fund is shown in Figure A.3 in the Appendix). That is, each reporting unit provides the precise amount and count of shares sold and redeemed in the previous quarter. This allows us to observe inflows and outflows without worrying about valuation effects.

We complement these data with another confidential SNB dataset, called WEBM. This data set contains information on securities holdings in bank custody accounts in Switzerland according to the category of security, investment currency and domicile of the issuer at a monthly frequency[2].

## 2.2 Four facts about inelastic intermediaries

Why is the rise of intermediation by mutual funds and ETFs in cross-border investment relevant for asset prices and exchange rates? As a first step toward answering this question, we show in the microdata two structural characteristics that set mutual funds and ETFs apart from most other financial intermediaries.

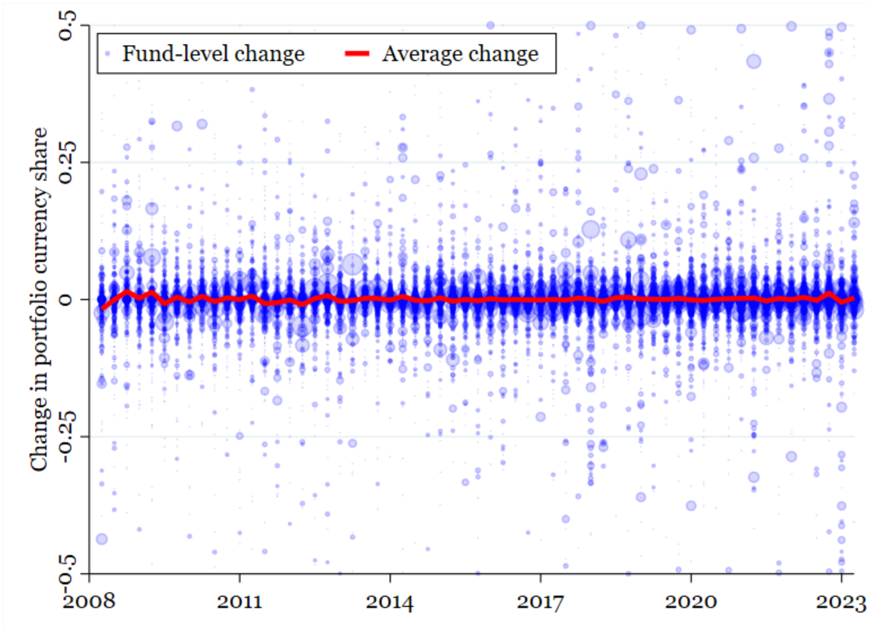
First, we find that even active funds are subject to very rigid mandates, which makes the fund-level portfolio share that is allocated to a specific currency remarkably stable. Second, when faced with inflows and outflows, mutual funds accommodate them by selling portfolio securities rather than by adjusting their cash buffers.

**Fact 1. Currency shares are rigid.** In Figure 3, we show that portfolio currency shares are persistent both in the aggregate and at the micro level. The average change in currency shares at the fund level is always around 0.[3] A stable foreign currency share requires rebalancing, i.e., it requires sales (purchases) of domestic assets when the domestic currency appreciates (depreciates).

[2] https://data.snb.ch/en/topics/banken/cube/bawebewa(sidebar:banken/explanations_banken/erhbwebkud)

[3] Figure A.4 depicts the distribution of funds' currency shares, with two snapshots: at the end of the sample (2023) and beginning (2008). At both moments in time, between 35% and 45% of funds hold only assets in foreign currency, while funds holding assets only in domestic currency increase from 20% to approximately 35%. All other units in the sample invest in assets with a mix of currency denominations.

Figure 3: CURRENCY RIGIDITY IN MUTUAL-FUND PORTFOLIOS




NOTE. This figure plots for each fund in the sample (blue marker), their quarterly change in the currency portfolio weight allocated to the domestic currency. The size of the marker indicates the size - assets under management (AUM) - of the funds. The red line is the (weighted) average of the change across funds in each quarter.

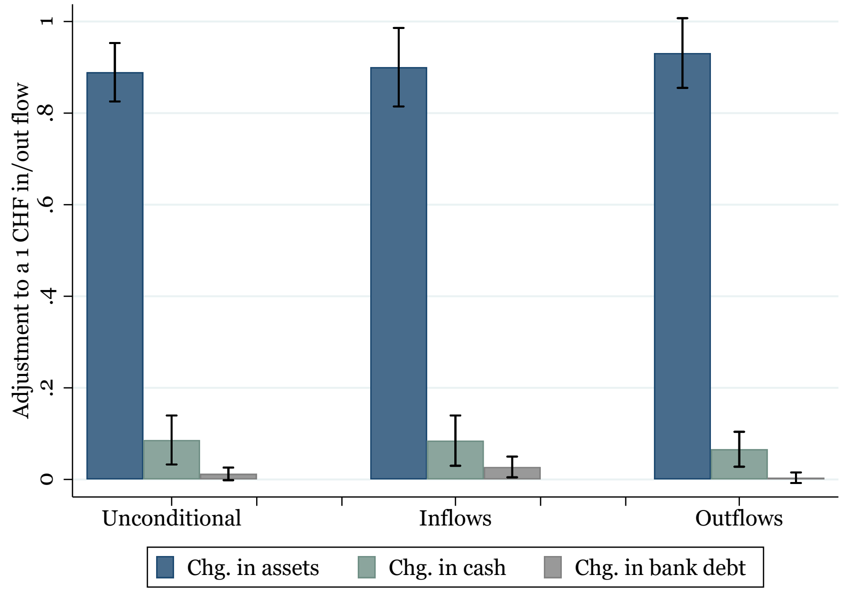
Rigid mandates are not the only way in which the action space of fund managers is constrained. Flow-induced trading is also a source of inelasticity, which we now discuss.

**Fact 2. Funds are bound by flow-induced trading.** Shares of mutual funds can be purchased and redeemed daily by investors. Consequently, the manager must adjust the portfolio by selling/purchasing assets when faced with inflows and outflows. Funds sometimes construct a cash buffer that can shelter them from flow-induced fire sales or purchases. The cash share of the portfolio is, however, often very limited. Additionally, funds can borrow from banks or financial institutions, but this is a negligible component[4]. Importantly, our dataset allows us to observe not only flows (issuance and redemptions) directly,but also the cash position and bank liabilities. We can therefore formally test the manager's reaction function. Specifically, for a CHF 1 net flow out of the fund, we can compute how much of it is met by eating into the cash buffer, that is, by reducing the fund asset position, or by emergency borrowing. We estimate this for unconditional flows, as well as for inflows and outflows separately.

We run the following fund-level specification:

[4]Bagattini et al. (2023) show for EU investment funds, that bank-affiliated mutual funds face smoother, less performance-sensitive inflows than independent funds do, and this allows them to run leaner cash buffers. When large outflows do arise, the parent bank effectively backstops them by purchasing their shares, providing internal liquidity support that helps the funds weather distress.

Figure 4: FLOW-INDUCED PORTFOLIO ADJUSTMENT




NOTE. This figure plots the result of estimating equation (1): the bars are the coefficients for the response of each of the three balance sheet items (assets, cash, debt) to a CHF 1 inflow (2nd group of bars), outflow(3rd group of bars) or unconditional flow (1st group of bars). The whiskers identify 95% confidence intervals. As the three items exhaust the balance sheet, the bars sum up to 1 within group.

$$\Delta y_{f,t} = \alpha + \beta \Phi_{f,t} + \gamma_f + \delta_{m,t} + u_{f,t} \tag{1}$$

where $\Delta y_{f,t}$ is the quarterly change in thousand CHF in asset holdings, cash, and borrowing. The net flow measure $\Phi_{f,t}$ is the difference between net issuance and net redemptions in a quarter $t$ of fund $f$ (measured in thousand CHF). The fund fixed effects $\gamma_f$ control for fund-specific non time-varying unobservables, whereas the manager-company-time fixed effect $\gamma_{m,t}$ absorbs the time-varying developments common to the manager-company. The results of the estimation are presented in Figure 4. We see that when faced with a flow of CHF 1 (positive or negative) , the fund reacts by changing its asset position by CHF 0.87 and its cash position by CHF 0.11. The response of borrowing is insignificant and much smaller. Conditioning the flows to be eihter positive or negative illustrates that the reactions to inflows and outflows are broadly symmetric. The coefficients indicate that when faced with an outflow, funds respond almost exclusively by liquidating their position, with a small and less significant use of cash reserves. The use of borrowing is insignificant. For the case of inflows, the relative response of cash is similar but somewhat smaller.

**Fact 3. Funds are granular.** The Lorenz curves for assets under management (AUMs) of the funds in our sample are displayed in Figure A.5. We see clear evidence of granularity, that is, the top 10% of funds hold $\sim 40\%$ of the total AUM. We exploit this feature of the data in the empirical specification.

**Fact 4. Funds cater to domestic investors.** In our data, we can inspect the ownership structure of our funds, namely, whether their investors are domestic or foreign residents. The data in Figure A.6 suggest that both the stock of mutual fund shares and the gross flows are driven almost exclusively by domestic investors.

Together, these four empirical regularities motivate a theoretical framework in which a rising share of intermediaries are mandate-constrained and flow-driven, which reduces the aggregate supply elasticity of domestic currency assets.

## 3 Theoretical framework

In this section, we present a simple theoretical model that illustrates the impact that inelastic intermediation can have on exchange rate determination. The model incorporates the stylised facts illustrated in the previous section and formalises how a demand flow into a given market can have different price (i.e. exchange rate) impact depending on how elastic the aggregate supply in that market is. It illustrates two key conclusions. The growth of the mutual funds industry not only puts itself pressure on the exchange rate, but also magnifies the exchange rate impact of capital flow shocks. The framework is a general (net) supply and demand system. One concrete illustration is the Euro- CHF market, with the exchange rate capturing the CHF price of Euros.

We build upon the model by Gabaix and Maggiori (2015) (GaMa), in which currencies are intermediated by balance-sheet constrained financiers and where changes in the supply or demand for different currencies can push exchange rates away from their fundamental values. Households smooth their total consumption over time and allocate resources to tradable and non-tradable goods. This consumption decision leads to two expressions for the period 0 and period 1 equilibrium "flow" demand for domestic currency

$$\xi_0 e_0 - \iota_0 + Q_0 = 0; \quad \xi_1 e_1 - \iota_1 - RQ_0 = 0. \tag{2}$$

The first equation in (2) is the market clearing equation for the CHF against the Euro at time 0. For the market to clear, the net demand from net exports ($\xi_0 e_0 - \iota_0$) needs to be offset by that from intermediaries ($Q_0$). At time 1, the same net-export channel generates a demand for CHF of $\xi_1 e_1 - \iota_1$, whereas the financiers need to sell their CHF position $RQ_0$ that has accrued interest at rate $R$ (as shown in the second equation in (2)). In the baseline GaMa model, $Q_0$ is entirely absorbed by international financiers, whose asset demand is given by

$$Q_0 = \frac{1}{\Gamma}\mathbb{E}\left[e_0 - \frac{R^*}{R}e_1\right]. \tag{3}$$

We modify this environment by allowing domestic households to also save via inelastic intermediaries, e.g., mutual funds that have a mandate to hold a fraction $\theta$ of their assets in domestic bonds. This can be seen as a representative intermediary that aggregates all mutual funds with different $\theta_i$. We capture the degree of prevalence of this saving technology by $\chi$, the aggregate market inelasticity. In other words, $\chi$ measures the proportion of outstanding bonds held by inelastic intermediaries. This is a stock notion. The flow change in demand by inelastic intermediaries is determined not by returns, but purely by inflows and outflows. We can therefore rewrite equation (3) as

$$Q_0 = \frac{1-\chi_0}{\Gamma}\mathbb{E}\left[e_0 - \frac{R^*}{R}e_1\right] + \chi_0\Phi_t, \tag{4}$$

where $\Phi_t$ are the total CHF inflows into inelastic intermediaries, $\Phi_t = \theta Q_0^{MF}$, and $Q_0^{MF}$ is the fund-specific net total of shares issued and shares redeemed.

The share of total domestic currency bonds held by inelastic intermediaries entering in period 0 is $\chi_0$, namely

$$\chi_0 = \frac{B_0^{MF}}{B_0^{tot}}. \tag{5}$$

An inflow $Q_0^{MF}$ mechanically increases the numerator $B_1^{MF}$ that enters the following period, i.e., the quantity of domestic currency bonds held by the inelastic sector. Therefore, if we assume that the supply of bonds is slow-moving, then the law of motion for $\chi$ is

$$\chi_1 \approx \chi_0 + \frac{Q_0^{MF}}{B_0^{tot}} \tag{6}$$

By assuming for simplicity that $R = 1$ and using (2) and (4) we can solve for the equilibrium exchange rate:

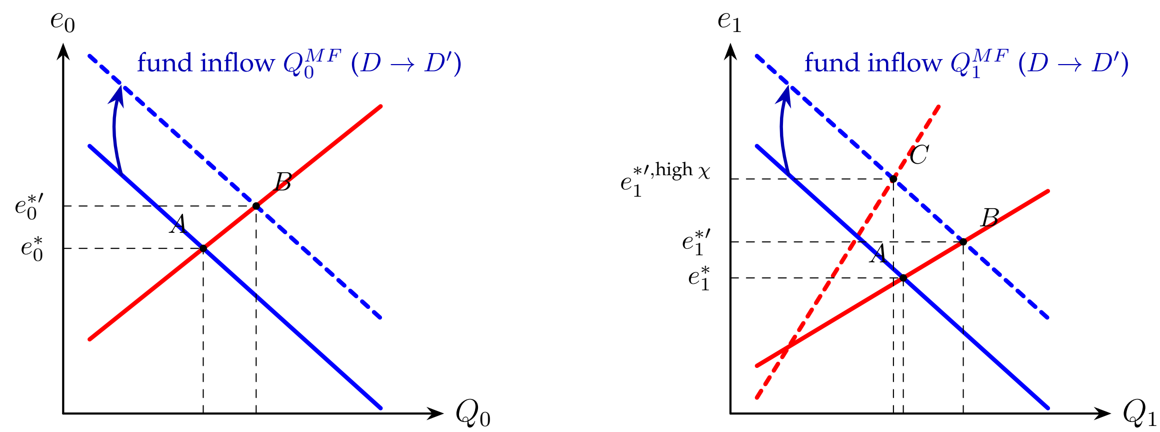
$$e_0 = \frac{(1-\chi+\Gamma)i_0 + (1-\chi_0))\,\mathbb{E}[i_1] - \Gamma\chi_0\Phi_t}{2(1-\chi_0)+\Gamma}. \tag{7}$$

From this equation we can see that inflows into inelastic intermediaries can affect the exchange rate via two parameters: a short-term shock to $\Phi_t$ or a long-term increase to $\chi$.

**Proposition 1 (Fund flows as asset demand shocks).** *A fund's net inflow in period 0 will cause an appreciation of the currency in the same period. That is,*

$$\frac{\partial e_0}{\partial Q_0^{MF}} = \left(-\frac{\Gamma\chi}{2(1-\chi)+\Gamma}\right)\theta < 0\,. \tag{8}$$

Figure 5: EFFECTS OF FUND INFLOWS IN THE MODEL: DEMAND SHIFT AND SUPPLY STEEPENING




(a) Short-run demand shift.

(b) Long-run amplification (higher $\chi$).

This inflow will also mechanically cause an increase in the next period's share held by inelastic intermediaries $\chi_1$ as per the law of motion. This, in turn, affects how shocks are transmitted in period 1.

**Proposition 2 (Fund flows steepen supply for the next periods).** *Any inflow in the next period will have a stronger effect on the exchange rates because the fund inflow in period 0 mechanically increases the share of inelastic intermediaries $\chi_1$. Specifically,*

$$\frac{\partial e_1}{\partial Q_0^{MF}} = \frac{\partial e}{\partial \chi} \frac{1}{B_0^{tot}} \tag{9}$$

*where (assuming that interest rate differentials do not move )*

$$\frac{\partial e}{\partial \chi} = \frac{-\Gamma(2+\Gamma)\,\Phi}{((2+\Gamma)-2\chi)^2}. \tag{10}$$

*where the sign depends exclusively on $\Phi$.*

The two propositions can be visualised graphically. First, in the short-run, fund inflows shift the demand for assets in domestic currency to the right (given $\chi_0$). The left panel (a.) of Figure 5 shows this. Panel (b.) of Figure 5 shows the longer-run effect, whereby fund inflows in the current period increase $\chi_1$, and a higher $\chi_1$ steepens the supply curve such that the same inflow causes a larger $|\Delta e_1|$.

# 4 Fund inflows and their impact on the exchange rate

The two key results of the model presented in Section 3 are that (i.) inflows into CHF-denominated mutual funds affect the exchange rate and that (ii.) a higher market share of inelastic intermediaries $\chi$ increases the price impact of any future demand shift. We test these two effects empirically. In this section, we estimate the causal effect of flows on the exchange rate based on Swiss micro data. In Section 5 we exploit the cross-country variation to investigate how the prevalence of inelastic intermediaries affects the sensitivity of different currencies.

## 4.1 Empirical strategy

For each fund $i$, we observe inflows, outflows and the currency composition of its allocations. As we showed in Section 2, an inflow of CHF 1 corresponds to an asset purchase of CHF 1, and vice versa for an outflow. Looking at the portfolio share that each fund allocates to CHF assets, we can calculate the total CHF inflows into mutual funds $i$ as

$$\phi_{i,t} = \frac{Assets\ in\ CHF_{i,t}}{Total\ assets_{i,t}}(issues_{i,t} - redemptions_{i,t}) \tag{11}$$

and aggregate as

$$\Phi_t = \sum_{i=0}^{N} \phi_{i,t} \tag{12}$$

Analogously, we can perform the same procedure for non-CHF flows into mutual funds.

The challenge is that the measure in (12) cannot be used to estimate the effects of flows and consequent asset trading on exchange rates. Flows might themselves be caused by exchange rate movements. To circumvent this challenge, we use a GIV approach (Gabaix and Koijen, 2024). To express the simultaneous causality problem and its proposed solution more formally, it is useful to look at a stylised example, as described by the following system:

$$e_t = \psi \Phi_{St} + \varepsilon_t \tag{13}$$

$$\phi_{it} = \gamma e_t + \eta_t + u_{it} \tag{14}$$

where $e_t$ is the exchange rate, $\Phi_{St} = \sum_i S_i \phi_{it}$ with $S_i$ representing the weight (AUM) of fund $i \in \{1, ..., N\}$ and with $\sum_i S_i = 1$. Each fund's net inflows $\phi_{it}$ depend on the exchange rate $e_t$ as in (14), with flow elasticity $\gamma$, and some shocks. The exchange rate, in turn, depends on the aggregate net inflows into CHF $\Phi_{St}$, which is the size-weighted sum of fund-level inflows, with a sensitivity $\psi$ that is the inverse of the elasticity. We impose that $\psi \times \gamma \neq 1$, which ensures the existence of a unique solution of our system (13) – (14). The econometrician observes $S_i$, $e_t$, and $\phi_{it}$.

Our object of interest is $\psi$, which tells us how the exchange rate $e_t$ responds to an exogenous net

CHF inflow into mutual funds. We cannot estimate $\psi$ by OLS, as $\varepsilon_t$ and $\eta_t$ are typically correlated; this implies that $\Phi_{St}$ is correlated with $\varepsilon_t$ in (13) and that $e_t$ is correlated with $\eta_t$ in (14).

We construct the GIV as the size-weighted average net inflow, $\Phi_{St} = \sum_i S_i \phi_{it}$, minus the equal-weighted equivalent, $\Phi_t = (1/N) \sum_{i=1}^{N} \phi_{it}$:

$$z_t := \Phi_{St} - \Phi_t. \tag{15}$$

By aggregating (14) with either size weigthing or equalweighting we obtain

$$\Phi_{St} = \gamma \sum_i S_i e_t + \sum_i S_i \eta_{i,t} + \sum_i S_i u_{it} = e_t + \eta_{i,t}^{aggr} + u_{St}, \tag{16}$$

$$\Phi_t = \gamma (1/N) \sum_{i=1} e_t + (1/N) \sum_{i=1} \eta_{i,t} + (1/N) \sum_{i=1} u_{i,t} = e_t + \eta_{i,t}^{aggr} + u_{Et} \tag{17}$$

The GIV $z_t$ is the sum of the fund-specific idiosyncratic demand shocks.

$$z_t = \Phi_{St} - \Phi_t = u_{St} - u_{Et} \tag{18}$$

All of the steps above are performed to ensure that the exogeneity condition holds

$$u_{i.t} \perp \eta_t, \varepsilon_t \tag{19}$$

we then have $\mathbb{E}\left[u_t \varepsilon_t\right] = 0$; therefore, $\mathbb{E}\left[z_t \varepsilon_t\right] = 0$. Using (13)yields $\mathbb{E}\left[\left(e_t - \psi \Phi_{s_t}\right) z_t\right] = 0$; thus, $\psi = \mathbb{E}\left[e_t z_t\right] / \mathbb{E}\left[\Phi_{st} z_t\right]$.

The empirical counterpart of $\psi$ (i.e., the sensitivity of the exchange rate to fund inflows) is the estimator $\psi_T^e = \sum_{t=1}^{T} e_t z_t / \sum_{t=1}^{T} \Phi_{st} z_t$.

For the previous equation to hold, we must make sure that (19) holds, and that the fund-level shocks $u_{it}$ are truly idiosyncratic and not correlated with common factors and shocks, beyond what is gained by this differencing procedure outlined in equation (15). For this purpose, we proceed as follows. First, we compute fund-specific net purchases of CHF assets $\phi_{it}$ and use them in the following high-dimensional fixed effect specification

$$\phi_{i,t} = \alpha_{mt} + \delta_{shareclass} + \nu_{i,t} \tag{20}$$

where for each fund, we control for any variation at the managing company x time level, as well as non time-varying share-class characteristics (more fine-grained than just the fund level). We also extract the first 10 principal components of the $\phi_{i,t}$ to control for their common variation. We then use the idiosyncratic residual from this estimation $\nu_{i,t}$, rather than the raw flow itself $\phi_{i,t}$ to construct $z_t$. This, together with the inclusion of the principal components in the final specification, ensures that the estimated coefficient of the impact of $z_t$ is not biased by any confounders at the time x share-class level.

Besides having to be exogenous, the instrument also needs to be relevant. For there to be a meaningful difference between the weighted and unweighted idiosyncratic residuals, there must be granularity in the AUM distribution. That is, if there were no difference between the AUM-weighted and equally weighted fund-level $\nu_{i,t}$, $z_t$ would display no variation and would be a weak instrument. We show in Figure A.5 that this assumption is satisfied. The resulting series for $z_t$ is presented in Figure B.2.

### 4.2 Estimating the impact of fund inflows on the exchange rate

We estimate the coefficient $\beta^h$ that describes the impact of CHF bond fund inflows on the exchange rate (which is related to $\psi$ in the previous subsection) by running the following local-projection specification:

$$e_{t+h} - e_{t-1} = \alpha_q^h + \beta^h \frac{z_t}{\sigma_z} + \gamma' controls_t + \lambda' \hat{\eta}_t + \epsilon_t \tag{21}$$

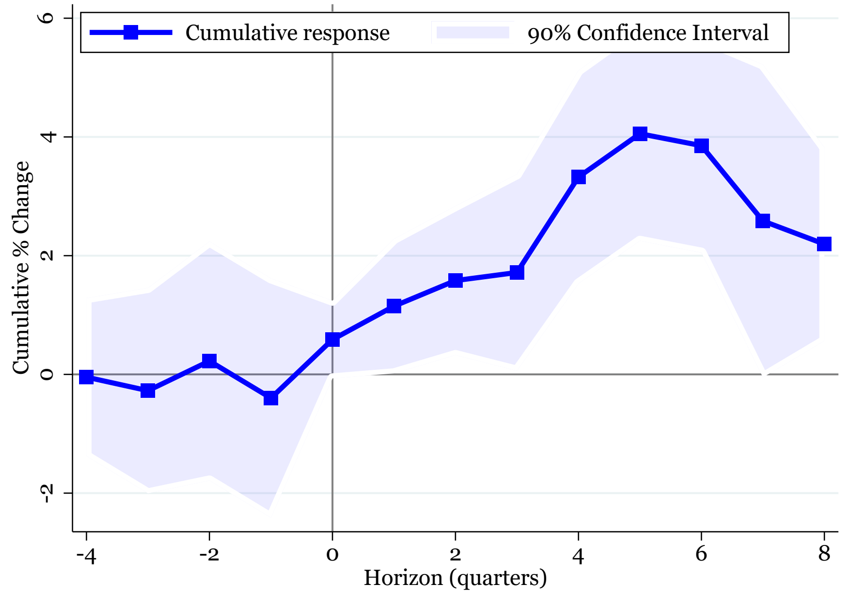
where the variable of interest is the h-quarter ahead log-change in the exchange rate (CHF/USD bilateral) because of the causal effect of a net flow in or out of CHF mutual funds. We rescale the shock so that the coefficient can be interpreted as the response to a 1 standard deviation inflow. We control for the first 10 principal components extracted from the raw fund flow data $\hat{\eta}_t$. The set of controls also includes return differentials, 1-year and 10-year US/Swiss yield differentials, two lags of $z_t$ and five lags of the dependent variable. The specification also controls for global risk by including VIX and for seasonality with quarter fixed effects, $\alpha_q^h$. We include as a control the GIV measure constructed using the fund flows to non-CHF funds. We include the 4 periods before the shock to check for pre-trends and anticipation effects, and we compute Newey and West (1987) standard errors with 8 lags.

Figure 6 reports the estimated impulse response. A one standard deviation inflow into CHF mutual funds causes a statistically significant and persistent appreciation of the domestic currency. The cumulative appreciation amounts to approximately 3 percent after one year. We delve into the quantitative interpretation of these results in more detail in the next subsection.

### 4.3 Quantitative benchmarking of the effect of fund flows

To gauge the magnitude of the estimated dynamic multiplier and its policy relevance, we benchmark it against the standard shocks used in the literature. Specifically, we re-estimate specification (21) by replacing the GIV for CHF fund flows with four alternatives: (i) US monetary policy shocks identified by Bauer and Swanson (2023), (ii) Swiss monetary policy shocks computed by Choi et al. (2024), (iii) Euro area monetary policy shocks by Jarociński and Karadi (2020), and (iv) the global financial cycle factor from Miranda-Agrippino and Rey (2020). We verify in the Appendix B.2

Figure 6: DYNAMIC RESPONSE OF THE EXCHANGE RATE TO FUND FLOWS



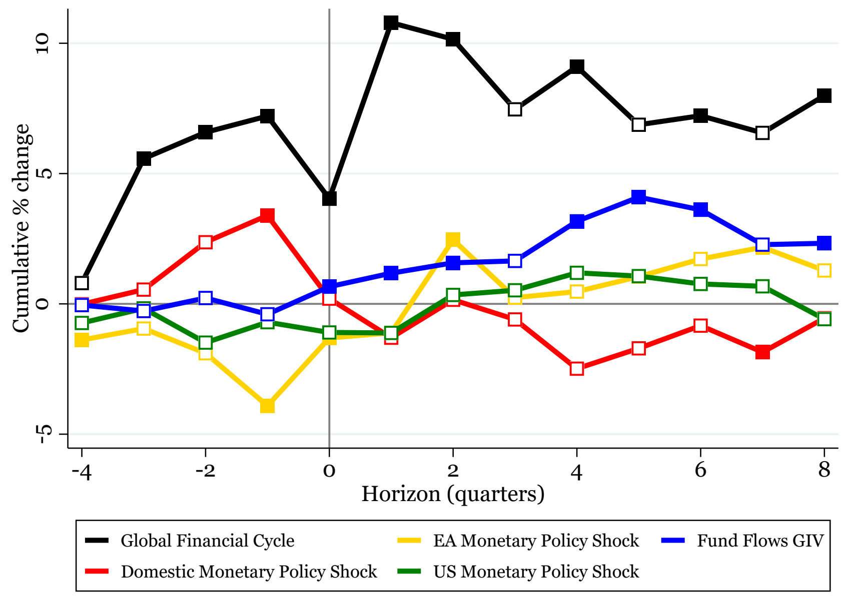

NOTE.Dynamic response of $e_t$ (bilateral CHF/USD exchange rate) to exogenous flows in and out of CHF mutual funds identified using a granular instrumental variable approach Gabaix and Koijen (2024) in a local projection specification (Jordà, 2005). The weights are computed with lagged fund AUM. The local projection specification controls for 10 principal components estimated on the raw flow data, VIX, lags of shock and dependent variable and interest differentials. The shaded area represents 95% confidence intervals, calculated using Newey and West (1987) standard errors with 8 lags. The sample period is 2007q1-2023q4.

that our fund flow GIV is not systematically correlated with any of these benchmarks. Each series is normalized so that we estimate the response of the exchange rate to a one–standard deviation shock. Figure 7 reports the resulting impulse responses. To avoid clutter, the 90 % confidence intervals for each IRF are not reported. Instead, filled markers denote statistically significant coefficients, while hollow markers denote insignificant ones. This standardisation allows for a direct comparison of the relative magnitude and significance of the dynamic responses across shocks. The blue line, which replicates the result of Figure 6, is similar in magnitude to the responses obtained for monetary policy shocks. However, it is consistently more statistically significant and, crucially, shows no evidence of pre-trends. In contrast, the response to the global financial cycle measure is significantly larger in magnitude, but the pre-trend suggests a less identified effect.

### 4.4 Evidence of increased aggregate inelasticity

According to the theory in Section 3, a higher $\beta^h$ corresponds to a more inelastic market with a higher $\chi$. As a first test of this hypothesis, we run our estimation on two different subsamples with different aggregate elasticities: first, on the 2007-2014 sample (in which the average $\chi$ was 24%) and then, on the 2015-2024 sample (in which the average $\chi$ was 49%). In the latter subsample, we

Figure 7: COMPARING EXCHANGE RATE RESPONSES: FUND FLOWS VS. BENCHMARK SHOCKS

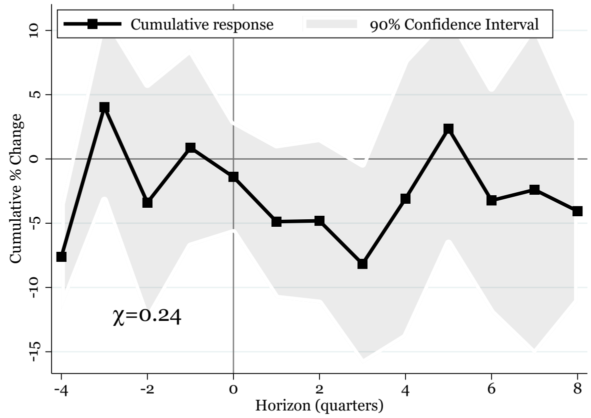



NOTE.Dynamic response of the CHF/USD exchange rate to different one–standard deviation shocks: exogenous fund flows into CHF mutual funds (Granular IV), US monetary policy shocks, Swiss monetary policy shocks, euro area monetary policy shocks, and the global financial cycle factor. Impulse responses are estimated in a local projection framework. Filled markers denote statistically significant coefficients; hollow markers denote insignificant ones.

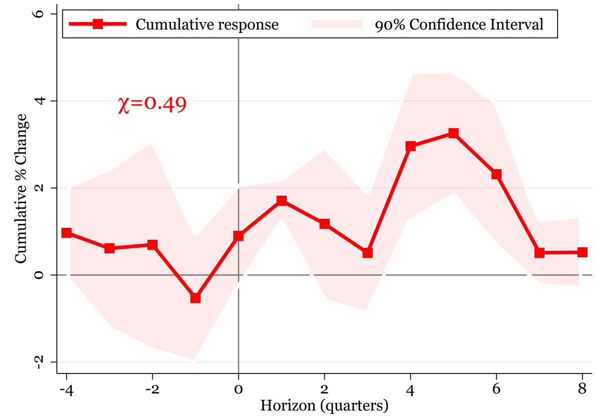
exclude the first two quarters of 2015, as they may be associated with a higher volatility of the exchange rate and portfolio adjustment due to the discontinuation of the exchange rate floor by the SNB in January 2015. The results remain robust if we start the latter subsample in 2016. They are similarly robust to different choices of subsamples.

Figure 8 presents the estimated $\beta^h$ for the low-inelasticity period and high-inelasticity period, respectively. Indeed, we find that in the early low-$\chi$ sample, the effect is never significantly different from 0, while it is positive and significant for the later high-$\chi$ sample. We consider this evidence for the importance of $\chi$ as merely suggestive and test this more directly in the next section.

Figure 8: IMPACT OF INELASTICITY ON THE DYNAMIC RESPONSE OF THE EXCHANGE RATE




(a) Early sample (2007Q1–2014Q4)




(b) Later sample (2015Q2–2023Q4)

NOTE. Dynamic response of $e_t$ (bilateral CHF/USD exchange rate) to exogenous flows in and out of CHF mutual funds identified using a granular instrumental variable approach (Gabaix and Koijen, 2024) in a local projection specification (Jordà, 2005). The weights are computed with lagged fund AUM. The local projection specification controls for 10 principal components estimated on the raw flow data, VIX, and interest differentials. The sample period is 2007q1-2014q1 for panel (a) and 2015q2-2023q4 for panel (b).

## 5 Inelasticity and cross-border capital flows

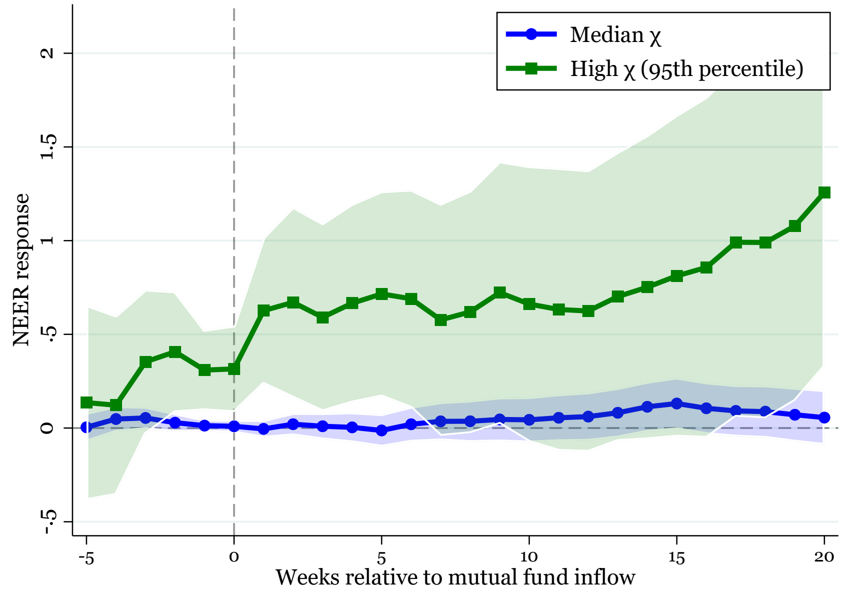
Figure 8 suggests that an increase in $\chi$ raises the sensitivity of the exchange rate to shifts in the demand for domestic currency assets. In this section, we test this hypothesis directly and examine the external validity of the results obtained from Swiss microdata. For this purpose, we turn to a cross-country panel setting. We construct a high-frequency (weekly) dataset that covers five major countries/currencies—USD, GBP, CHF, AUD, and CAD—from 2008 through 2024. The dataset combines (i) mutual fund flows into and out of each country's bond market from EPFR, (ii) global mutual fund asset allocations to each market, also from EPFR, and (iii) effective exchange rates from the BIS. Using the allocation data, we construct for each country a time-varying measure of $\chi$ (i.e. the share of bonds held by mutual funds and ETFs), analogous to those shown in Figure 1b. By exploiting both the cross sectional and time series variation in $\chi$, we test whether a higher $\chi$ implies a greater sensitivity of exchange rates to cross-border capital flows.

Figure C.1 documents the behaviour of weekly fund flows associated with active (in blue) and passive funds (in red), in and out of the five countries' bond markets. Each panel also reports the development over time of $\chi$ for each country.

We estimate the sensitivity of weekly exchange rates to mutual fund flow innovations. Our baseline specification is a local projection framework with country and week fixed effects:

$$\Delta e_{i,t+h} = \alpha_{i,t} + \beta_h u_{i,t} + \theta_h \left(u_{i,t} \times \tilde{\chi}_{i,t-1}\right) + \Gamma_h X_{i,t} + \epsilon_{i,t+h}, \tag{22}$$

Figure 9: CAPITAL FLOWS' IMPACT ON THE EXCHANGE RATE ACROSS INELASTICITY QUANTILES




NOTE. Dynamic response of the nominal effective exchange rate (NEER) to inflows from foreign-domiciled mutual funds, estimated in a weekly panel of advanced economies. The solid line shows the response when inelasticity $\chi$ is at its median, while the dashed line shows the response when $\chi$ is at its 95th percentile. Exchange rate sensitivity to inflows is significantly larger and more persistent in high-inelasticity states.

where $\Delta e_{i,t+h}$ is the cumulative log-change in the nominal effective exchange rate (NEER) of country $i$ from $t$ to $t + h$. The innovation $u_{i,t}$ is the residualized EPFR mutual fund inflow into country $i$'s bond market, which is orthogonalised with respect to its own lags, global flows, lagged exchange rate changes, and both country and week fixed effects. The interaction $\chi_{i,t}$is the time-varying inelasticity share, as measured by the fraction of the bond market held by mutual funds. We recentre $\chi$ using the difference between the 50th and 95th percentiles:

$$\tilde{\chi}_{i,t} = \frac{\chi_{i,t} - \chi^{50}}{\chi^{95} - \chi^{50}} \tag{23}$$

where the 50 and 95 superscripts indicate the 50th and 95th percentiles of $\chi$. We can thus interpret $\beta_h$ as the impact of fund flows when $\chi$ is at its median value, whereas $\beta_h + \theta_h$ is the impact when $\chi$ is high (at its 95th percentile). That is, the interaction term $u_{i,t} \times \chi_{i,t}$ allows us to test directly whether countries with higher $\chi$ exhibit a larger pass-through of fund flows into exchange rates. The set of controls $X_{i,t}$ includes lagged exchange rate changes, global flows (leave-one-out), weekly short-term interest rate changes, the interaction between the VIX and country dummies, and weighted monthly exchange rate forecasts to absorb expectations. Standard errors are two-way clustered at the country and week level.

To assess the dynamic responses, we estimate the specification for horizons $h = -5, \ldots, 20$. Negative horizons provide a pre-trend test, whereas positive horizons trace out the dynamic IRFs. Figure 9 reports the impulse responses of the NEER to inflows from foreign-domiciled mutual funds in our weekly cross-country panel. When $\chi$ is at its median, the cumulative response is small in magnitude and not significantly different from zero at any horizon. In contrast, when $\chi$ is at the 95th percentile, inflows generate a sizable and persistent appreciation of NEER, with effects that remain statistically significant for more than ten weeks. Pre-trend tests at negative horizons show no evidence of anticipation effects. A jack-knife robustness exercise, whereby each of the 5 countries is dropped in turn, is shown in Figure C.2. Together, these results confirm the model's prediction that higher inelasticity amplifies thesensitivity of the exchange rate to capital flows.

# 6 Conclusion

This paper documents the contemporaneous unfolding of two stylised facts: (i) the rise in the market share of inelastic intermediaries and (ii) the increased sensitivity of exchange rates to asset demand shocks (capital flows). We argue that (i) can explain (ii).

To formalise this argument, we develop an analytical model of exchange rate determination with inelastic mutual funds. This model yields two testable predictions:(i) net inflows (outflows) into domestic currency denominated mutual funds cause the domestic exchange rate to appreciate (depreciate), and, in turn, (ii) they increase the market share of mutual funds $\chi$, which makes the market more inelastic and, thus, the exchange rate more sensitive to any future asset demand shock.

We test these two hypotheses empirically by leveraging both a unique supervisory dataset that covers the universe of Swiss-domiciled mutual funds from 2005 to 2024 and weekly data on mutual fund flows from EPFR. Our analysis provides strong support for the model's two central predictions. First, consistent with Proposition 1, we find that net inflows into CHF-denominated mutual funds lead to a contemporaneous and persistent appreciation of the domestic currency. By using fund-level idiosyncratic shocks through a GIV strategy, we estimate that a one–standard deviation flow generates a cumulative impact of approximately 3% over the course of a year. Second, in line with Proposition 2, we document that the exchange rate impact of flows increases with the market share of inelastic intermediaries and the exchange rate's elasticity to investment flows: in the earlier period, when mutual funds held roughly one quarter of outstanding CHF bonds, flows had no measurable effect on the exchange rate, whereas in the later period, with fund holdings approaching one half, the pass-through becomes statistically and economically significant. By extending the analysis to a high-frequency cross-country panel, we confirm that currencies with higher values of $\chi$ exhibit stronger and more persistent responses to foreign bond fund flows. Taken together, these findings demonstrate that the rise in inelastic intermediation can steepen the effective supply curve of domestic-currency assets, thereby amplifying the sensitivity of exchange rates to capital-flow shocks as predicted by the model.

In general, our paper contributes to the policy debate on how the rising importance of non bank financial intermediaries (NBFIs) and the internationalisation of portfolios have affected policymakers' trade-offs (Bank for International Settlements (BIS), 2025). More specifically, our findings have implications for monetary, fiscal and macroprudential policy. On the monetary side, the increased sensitivity of exchange rates to capital flows directly affects policy transmission. From a fiscal perspective, the fact that inelastic intermediaries now absorb a large share of debt including that of the government means that sovereign debt issuance strategies can have direct liquidity effects and impact exchange rate determination. Finally, from a macroprudential standpoint, our findings highlight the importance of monitoring the liquidity and risk-management practices of mutual funds and ETFs: their rigid mandates and flow-driven trading can act as amplifiers of exchange rate volatility.

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# Appendix

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# A. Data

## A.1 Data description

We combine two confidential supervisory datasets maintained by the Swiss National Bank (SNB):

1. **FOND dataset.** Reports quarterly balance-sheet information for the universe of Swiss-domiciled mutual funds, including assets by class (equity, bond, money market, real estate, and mixed) and by the currency of denomination. For each share class, we observe the assets under management (AUM), net subscriptions and redemptions, cash positions, and bank liabilities. The dataset covers both active and passive funds and includes investment funds managed by bank-affiliated and independent management companies.

2. **WEBM dataset.** Monthly statistics on all securities held in Swiss bank custody accounts, as classified by the investor sector, domicile of issuer, and currency of denomination. We use WEBM to compute the aggregate shares of CHF-denominated bonds held by mutual funds and other sectors.

When we move to the cross-country high-frequency setting, we use:

- **EPFR Global Fund Flows and Allocation**
- **IMF World Economic Outlook (WEO) and BIS** for exchange rate indices and aggregate debt data.

Our sample covers 2005 Q1–2024 Q4 for the Swiss microdata and 2008–2024 for the weekly cross-country panel (United States, United Kingdom, Canada, Australia, and Switzerland).

## A.2 Construction of the key variables

**Fund flows ($\Phi_{i,t}$)** For each fund $i$ and quarter $t$, we define net flows as the difference between new share issuance and redemptions:

$$\Phi_{i,t} = (\text{Issues}_{i,t} - \text{Redemptions}_{i,t}). \tag{A.1}$$

Flows are expressed in CHF and measured at the share-class level to avoid valuation effects. The fund-level flows into CHF-denominated assets are:

$$\phi_{i,t} = \left( \frac{\text{Assets in CHF}_{i,t}}{\text{Total Assets}_{i,t}} \right) \Phi_{i,t}. \tag{A.2}$$

Aggregate flows into CHF assets are obtained by summing across funds:

$$\Phi_t = \sum_i \phi_{i,t}. \tag{A.3}$$

We analogously compute flows into non-CHF assets.

**Cash buffers and borrowing** Each fund reports holdings of "liquid assets" and "bank debt." Cash buffers include deposits and money-market instruments; bank debt includes credit lines and repo borrowing. We standardise these as shares of the total AUM.

**Currency portfolio shares** $s_{i,t}^{CHF}$ denotes the share of a fund's portfolio denominated in CHF. We use its time variation to measure currency rigidity and to identify the degree of mandate constraint.

**Market inelasticity ($\chi_t$)** We define the following:

$$\chi_t = \frac{\text{CHF-denominated bonds held by mutual funds}}{\text{Total outstanding CHF bonds}}. \tag{A.4}$$

The numerator and denominator come from WEBM. Across countries in the weekly panel we construct:

$$\chi_{i,t} = \frac{\text{Bond holdings of mutual funds (EPFR)}}{\text{Total public + private debt (IMF WEO)}}. \tag{A.5}$$

## A.3 FOND summary statistics

Table A.1: FOND SUMMARY STATISTICS

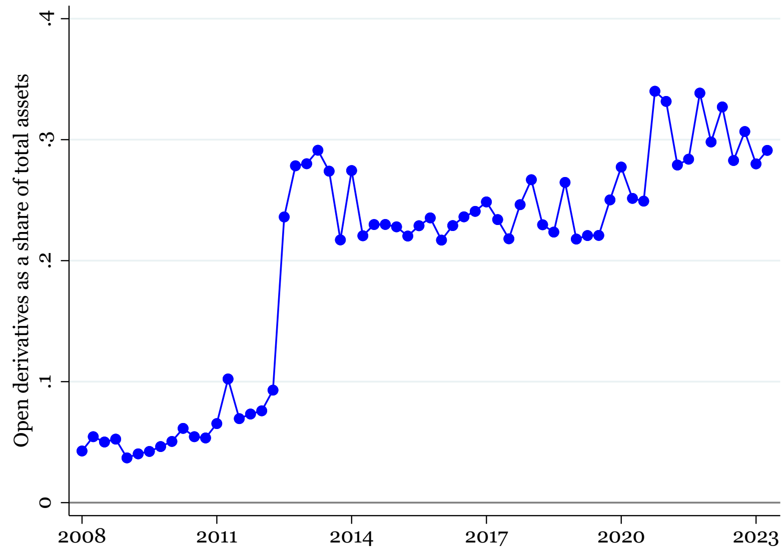
| Variable | Mean | SD | p10 | p25 | Median | p75 | p95 | N |
|---|---|---|---|---|---|---|---|---|
| *Panel A. Fund– share class–quarter observations (2005 Q1–2024 Q4, CHF bn unless noted)* | | | | | | | | |
| Total net assets (AUM) | 0.27 | 1.16 | 0.005 | 0.02 | 0.06 | 0.2 | 1.1 | 124,886 |
| NAV per share (CHF ’000) | 5.33 | 270 | 0.09 | 0.11 | 0.16 | 1.03 | 2.04 | 124,891 |
| Cash buffer (%) | 7.2 | 35 | 0.02 | 0.4 | 1.6 | 5.3 | 37.5 | 92,566 |
| Bank borrowing (%) | 2.4 | 8.8 | 0 | 0.01 | 0.09 | 0.4 | 16.2 | 92,566 |
| Net flow (% of AUM) | 13.3 | 218 | -11.3 | -3.5 | 0 | 5 | 38 | 124,797 |

| Variable | CHF bn | N of funds | % of total AUM |
|---|---|---|---|
| *Panel B. Types of fund (end of sample)* | | | |
| Equity | 406.6 | 738 | 33 |
| Bond | 328.1 | 426 | 27 |
| Mixed | 139.4 | 294 | 11 |
| Real Estate | 115.6 | 107 | 9.2 |
| Active | 807.1 | 1367 | 65 |
| Passive | 323.2 | 348 | 26 |

NOTE. Summary statistics for confidential microdata FOND on the universe of Swiss-domiciled mutual funds.

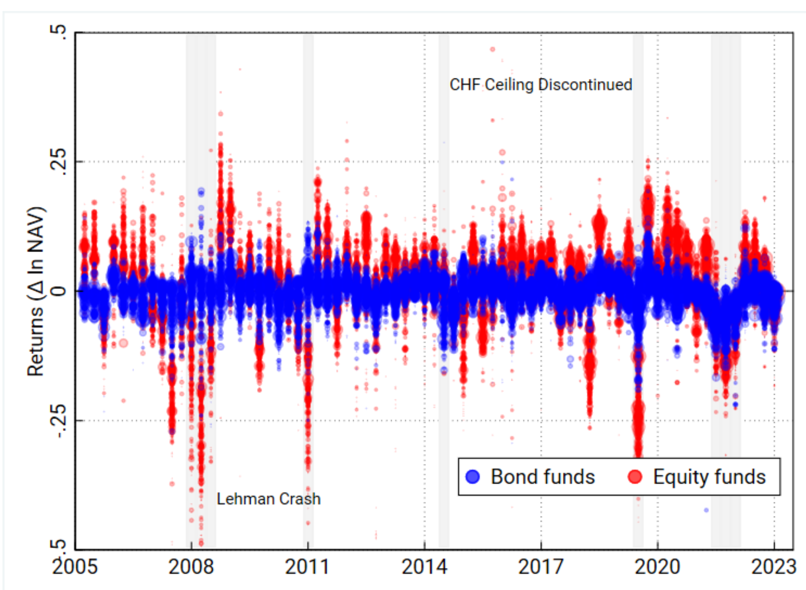
## A.4 Additional stylised facts from the mutual fund microdata

Figure A.1: INCREASE IN CURRENCY HEDGING



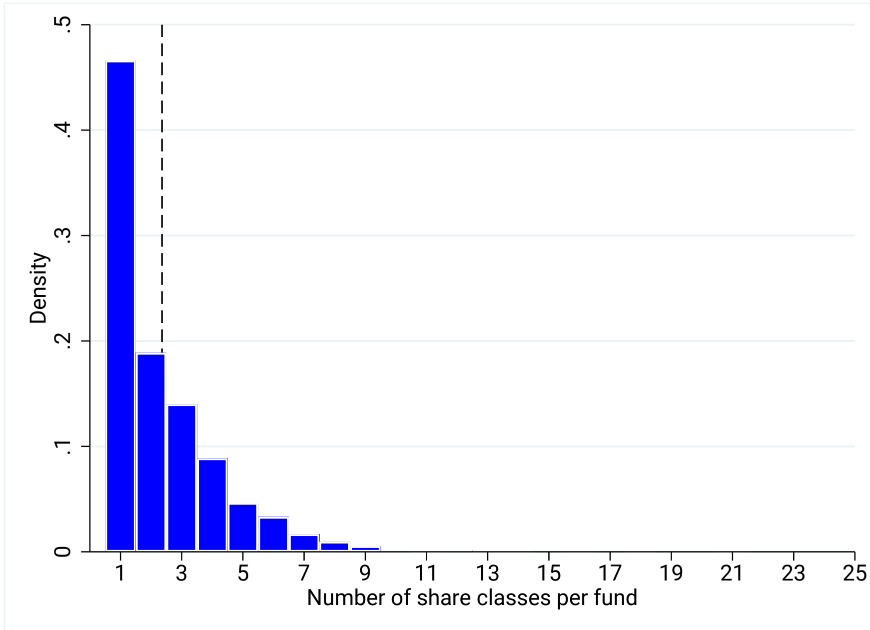

NOTE. This figure plots the size-weighted average across funds of the ratio constructed by dividing the amount of open derivative positions of a fund by its AUM in a quarter.

Figure A.2: FUND RETURNS OVER TIME



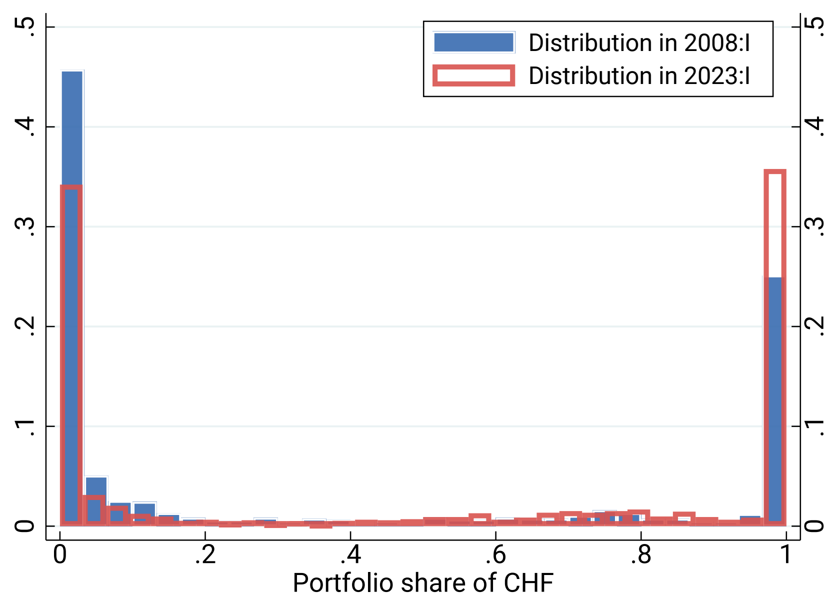

NOTE. This figure plots quarterly changes in NAV for each fund in the sample.

Figure A.3: Distribution of the share classes per fund



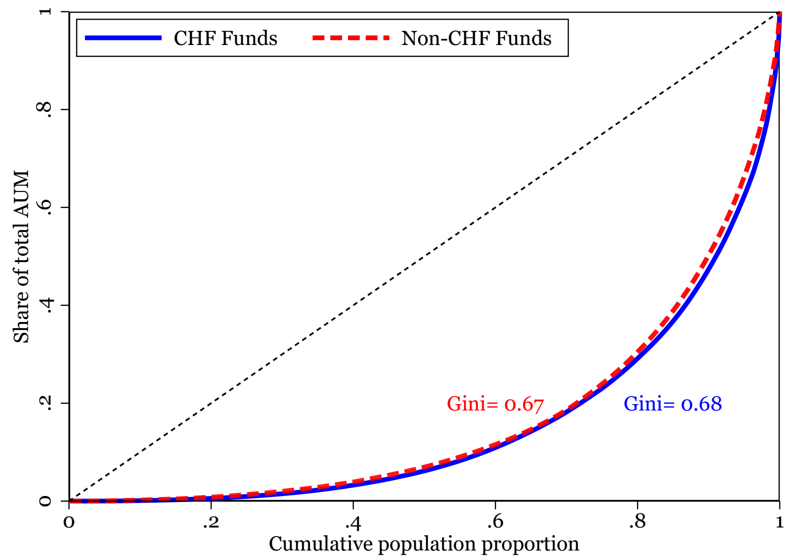

Note. This figure plots the distribution (density) of share classes per fund, for each fund at the moment of maximum number of share classes over the time series.

Figure A.4: Distribution of the funds' currency portfolio weights



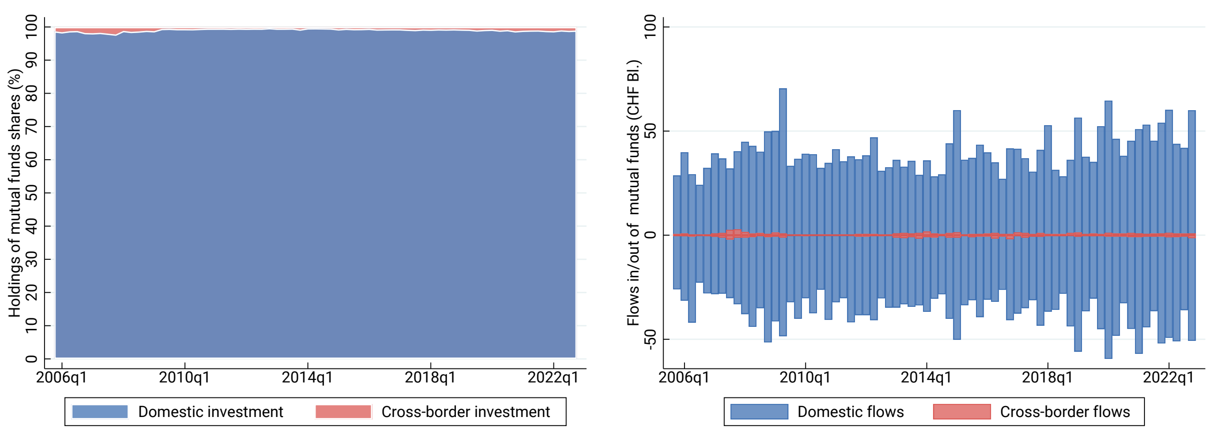

Note. This figure plots the distribution (density) of domestic currency fund portfolio shares, in 2008q1 (blue) and 2023q1 (red).

Figure A.5: Lorenz curve for the funds' AUM




Note. This figure plots the Lorenz curves for funds' AUM, for CHF and non-CHF funds respectively, alongside with their Gini coefficients.

Figure A.6: Domestic versus cross-border ownership of Swiss mutual funds



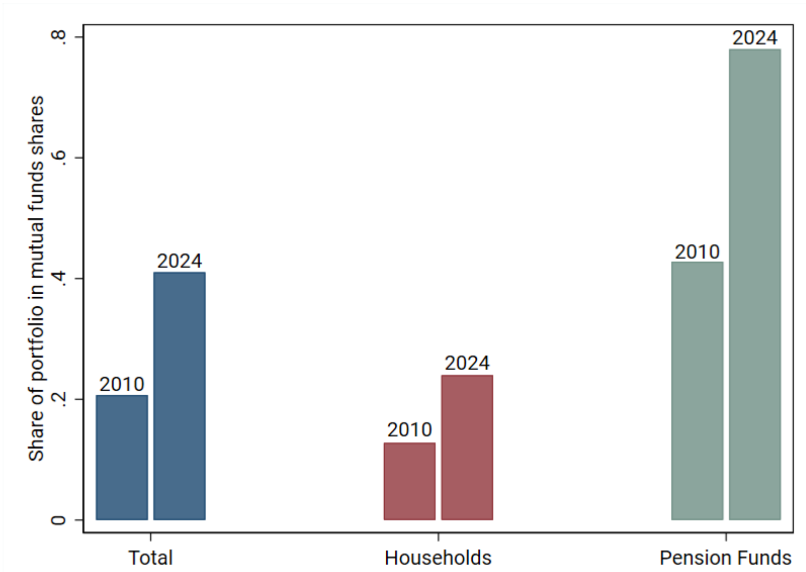

(a) Total share holding

(b) Gross fund flows

Note. This figure plots the share of total mutual fund shares held by domestic vs cross-border investors (panel a) and the same breakdown for gross fund flows (panel b).

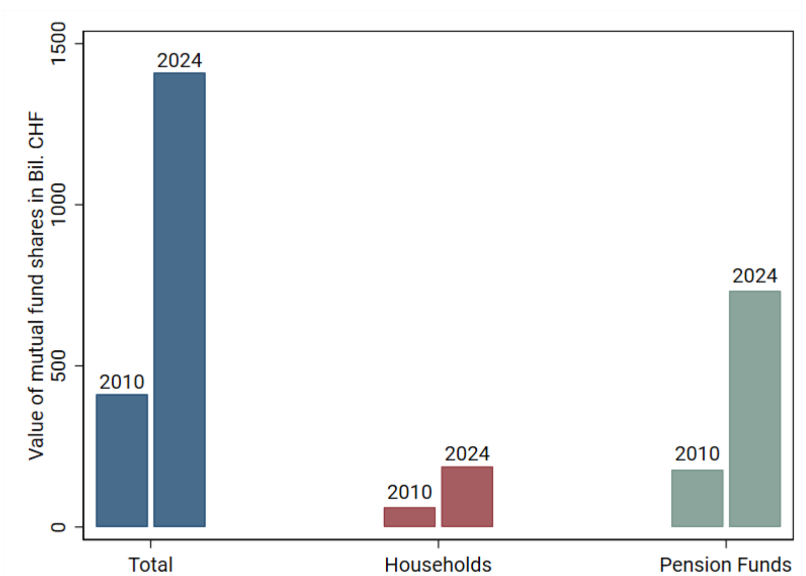
## A.5 Who owns the inelastic intermediaries?

Figure A.7: PORTFOLIO SHARE OF MUTUAL FUND SHARES BY INVESTOR TYPE




NOTE. This figure plots the share of the portfolio of households, pension funds and all investors allocated to mutual fund shares. The source is the SNB security holding statistics (WEBM).

Figure A.8: AMOUNT OF HOLDINGS OF SWISS MUTUAL FUNDS BY INVESTOR TYPE




NOTE. This figure plots the amount of mutual fund shares in the portfolios of households, pension funds and all investors. The source is the SNB security holding statistics (WEBM).

## A.6 Response of investors to intermediaries' performance

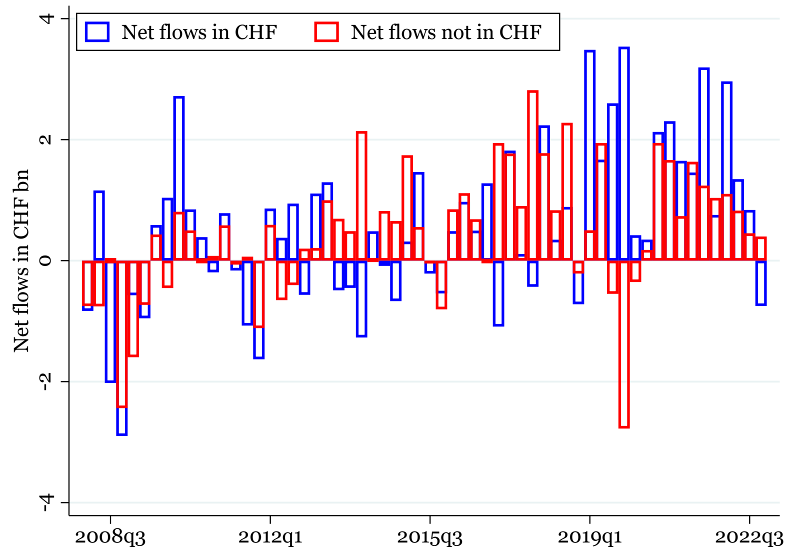
Table A.2: EXCHANGE RATES, FUND FLOWS AND RETURNS

| | Fund returns | Net in-/outflows | |
|---|---|---|---|
| Valuation (CHFUSD × portfolio share) | 0.205*** | | -0.0346 |
| | (3.67) | | (-1.15) |
| Valuation (CHFEUR × portfolio share) | 0.426*** | | -0.0611 |
| | (4.75) | | (-1.43) |
| Returns ($\Delta NAV_t$) | | -0.0411* | |
| | | (-2.33) | |
| First lag $\Delta NAV_{t-1}$ | -0.0371 | -0.00646 | |
| | (-0.56) | (-0.49) | |
| Second lag $\Delta NAV_{t-2}$ | -0.0494 | -0.0123 | |
| | (-1.00) | (-0.93) | |
| Observations | 108,696 | 51,219 | 51,398 |
| Company–Time FE | Yes | Yes | Yes |
| Fund FE | Yes | Yes | Yes |
| Controls | Yes | Yes | Yes |

# B. GIV details and robustness

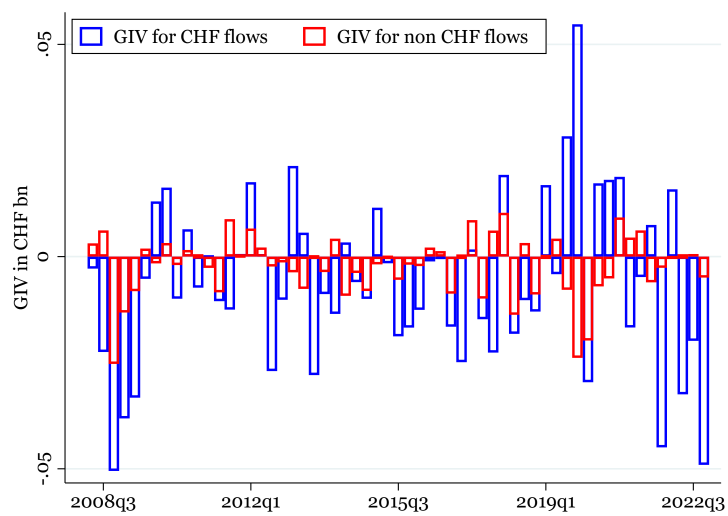
## B.1 Time series of the raw aggregate flows and GIV

Figure B.1: Raw aggregate net fund flows




Note. This figure plots the sum of the net flows (issuance-redemption) of each fund times their CHF portfolio share, summed across funds to obtain aggregate net flows in chf (blue) and not in chf (red).

Figure B.2: Time series of the GIV




Note. This figure plots the time series of the GIV instruments for net flows in CHF (blue) and not in CHF (red).

## B.2 Testing that the GIV is uncorrelated with macro shocks

Table B.1: GIV is uncorrelated with main macro shocks/variables

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Fund flows (GIV, std.) | | | | | | | |
| Global Financial Cycle | 0.227 | | | | | | | 0.047 |
| | (0.202) | | | | | | | (0.252) |
| Domestic MP shock | | 1.498 | | | | | | $3.679^{*}$ |
| | | (1.671) | | | | | | (1.879) |
| US MP shock (B&S) | | | -1.364 | | | | | -0.596 |
| | | | (2.475) | | | | | (2.441) |
| EA MP shock (J&K) | | | | -3.478 | | | | -3.675 |
| | | | | (2.500) | | | | (2.188) |
| Short-rate diff (UIP) | | | | | -0.008 | | | 0.351 |
| | | | | | (0.136) | | | (0.298) |
| Long-rate diff (term) | | | | | | 0.091 | | -0.572 |
| | | | | | | (0.234) | | (0.542) |
| VIX (scaled) | | | | | | | $-0.323^{***}$ | -0.326 |
| | | | | | | | (0.105) | (0.217) |
| Observations | 59 | 47 | 47 | 59 | 59 | 59 | 59 | 47 |
| $R^2$ | 0.026 | 0.010 | 0.006 | 0.036 | 0.000 | 0.003 | 0.121 | 0.244 |
| Adjusted $R^2$ | 0.009 | -0.012 | -0.016 | 0.019 | -0.017 | -0.014 | 0.106 | 0.108 |

Robust standard errors in parentheses. $^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

## B.3 Coefficients of all regressors in the baseline specification

Table B.2: Baseline GIV specification: Responses at h = -1, 0, +1

| | (1) | (2) | (3) |
|---|---|---|---|
| | h = -1 | h = 0 | h = +1 |
| GIV (t-1) | 0.002 | 0.002 | 0.007 |
| | (0.004) | (0.004) | (0.007) |
| GIV (t-2) | -0.008 | -0.008 | 0.001 |
| | (0.006) | (0.006) | (0.006) |
| GIV non-CHF (t) | -0.002 | -0.002 | $0.011^{*}$ |
| | (0.006) | (0.006) | (0.006) |
| Short-rate diff (UIP) | -0.003 | -0.003 | -0.004 |
| | (0.004) | (0.004) | (0.007) |
| Long-rate diff (10y) | -0.007 | -0.007 | -0.045 |
| | (0.027) | (0.027) | (0.042) |
| $\Delta_t e^{CHFUSD}$ | -0.171 | -0.171 | $-0.303^{*}$ |
| | (0.159) | (0.159) | (0.150) |
| $\Delta_{t-1} e^{CHFUSD}$ | $-0.286^{**}$ | $-0.286^{**}$ | -0.125 |
| | (0.111) | (0.111) | (0.256) |
| $\Delta_{t-2} e^{CHFUSD}$ | -0.146 | -0.146 | -0.275 |
| | (0.141) | (0.141) | (0.166) |
| $\Delta_{t-3} e^{CHFUSD}$ | -0.145 | -0.145 | -0.213 |
| | (0.218) | (0.218) | (0.294) |
| $\Delta_{t-4} e^{CHFUSD}$ | 0.025 | 0.025 | -0.033 |
| | (0.111) | (0.111) | (0.176) |
| $\Delta_{t-5} e^{CHFUSD}$ | 0.031 | 0.031 | 0.019 |
| | (0.098) | (0.098) | (0.251) |
| PC 1 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| PC 2 | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| PC 3 | 0.000 | 0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| PC 4 | -0.000 | -0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) |
| PC 5 | -0.000 | -0.000 | $-0.000^{**}$ |
| | (0.000) | (0.000) | (0.000) |
| PC 6 | -0.000 | -0.000 | $-0.000^{*}$ |
| | (0.000) | (0.000) | (0.000) |
| PC 7 | 0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) |
| VIX | 0.010 | 0.010 | -0.000 |
| | (0.006) | (0.006) | (0.007) |
| Quarter (seasonal control) | -0.003 | -0.003 | -0.004 |
| | (0.004) | (0.004) | (0.006) |
| _cons | -0.008 | -0.008 | 0.028 |
| | (0.020) | (0.020) | (0.024) |
| Observations | 53 | 53 | 52 |

# C. Weekly fund flows details and robustness

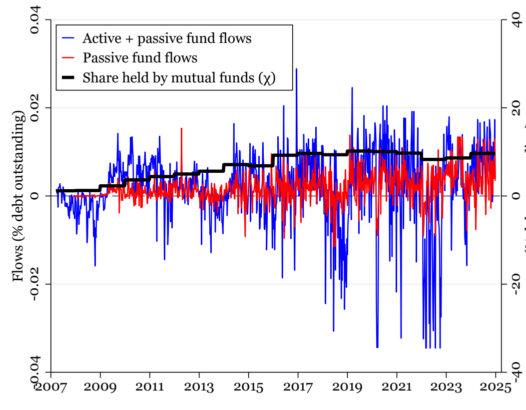
## C.1 EPFR fund flows and $\chi$

## C.2 Estimation when dropping one country at a time

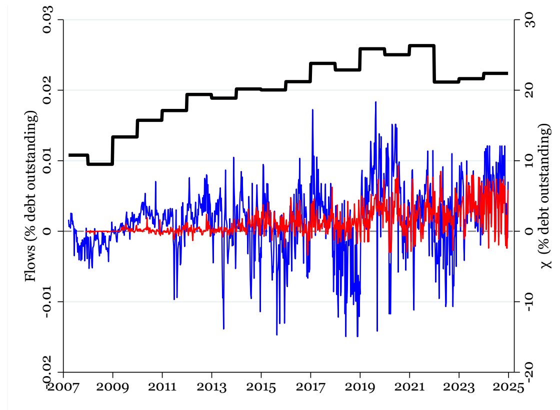
Table C.1: Weekly LP with $\chi$-heterogeneity: Responses at $= -1, 0, +1$

| | (1) | (2) | (3) |
|---|---|---|---|
| | $= -1$ | $= 0$ | $= +1$ |
| Global flow | 0.000** | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) |
| Global flow (t-1) | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| Global flow (t-2) | -0.000 | 0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| Global flow (t-3) | 0.000 | -0.000* | -0.000* |
| | (0.000) | (0.000) | (0.000) |
| Global flow (t-4) | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| Australia × VIX | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| Canada × VIX | -0.000* | -0.000** | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| UK × VIX | -0.000 | -0.000 | -0.000 |
| | (0.000) | (0.000) | (0.000) |
| USA × VIX | 0.000 | 0.000 | 0.000 |
| | (.) | (.) | (.) |
| $\Delta_{t-1}e$ | -0.004 | 0.003 | 0.002 |
| | (0.007) | (0.006) | (0.012) |
| $\Delta_{t-2}e$ | 0.001 | -0.001 | 0.005 |
| | (0.006) | (0.006) | (0.005) |
| $\Delta_{t-3}e$ | 0.004 | 0.004 | -0.003 |
| | (0.005) | (0.007) | (0.007) |
| $\Delta_{t-4}e$ | 0.001 | -0.005 | -0.001 |
| | (0.004) | (0.006) | (0.006) |
| $\Delta_{t-6}e$ | -0.041 | -0.010 | 0.012 |
| | (0.022) | (0.025) | (0.037) |
| $\Delta_{t-7}e$ | -0.007 | 0.018 | 0.054 |
| | (0.025) | (0.028) | (0.043) |
| $\Delta_{t-8}e$ | 0.012 | 0.024 | -0.020 |
| | (0.020) | (0.021) | (0.036) |
| $\Delta_{t-9}e$ | 0.035 | -0.047 | -0.080 |
| | (0.025) | (0.030) | (0.044) |
| $\Delta_{t-10}e$ | -0.034 | -0.021 | -0.062 |
| | (0.035) | (0.021) | (0.037) |
| $\Delta_{t-11}e$ | -0.043 | -0.040 | -0.050 |
| | (0.027) | (0.034) | (0.052) |
| $\Delta_{t-12}e$ | -0.035 | -0.008 | -0.004 |
| | (0.037) | (0.021) | (0.031) |
| $\Delta_{t-1}e$ | | 0.189*** | 0.153** |
| | | (0.031) | (0.041) |
| $\Delta_{t-2}e$ | | -0.077** | -0.080* |
| | | (0.024) | (0.034) |
| $\Delta_{t-3}e$ | | 0.013 | 0.020 |
| | | (0.025) | (0.036) |
| $\Delta_{t-4}e$ | | 0.003 | -0.023 |
| | | (0.019) | (0.031) |
| $\Delta_{t-5}e$ | | -0.040 | -0.053 |
| | | (0.023) | (0.032) |
| Weighted FX forecast | 0.001 | -0.000 | -0.000 |
| | (0.001) | (0.001) | (0.001) |
| _cons | 0.002 | 0.003** | 0.003 |
| | (0.001) | (0.001) | (0.002) |
| Observations | 3083 | 3071 | 3071 |

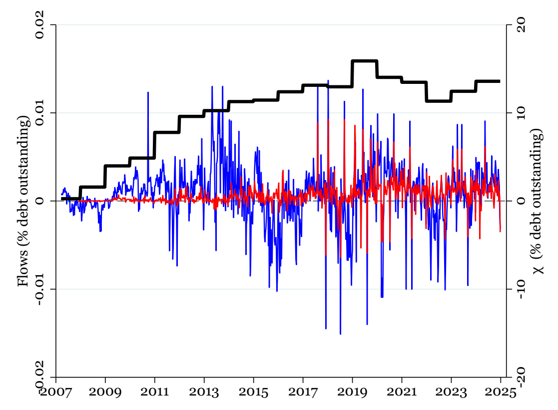
Figure C.1: WEEKLY FOREIGN-DOMICILED MUTUAL FUND FLOWS



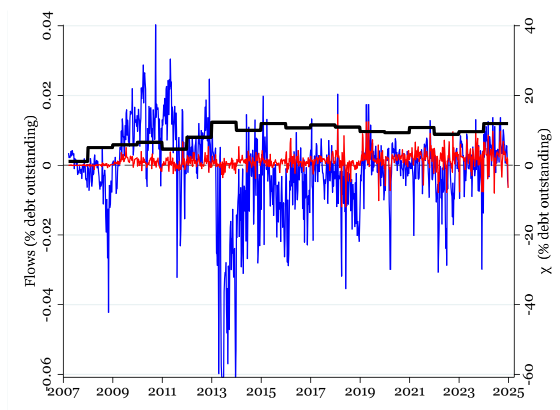

(a) United Kingdom



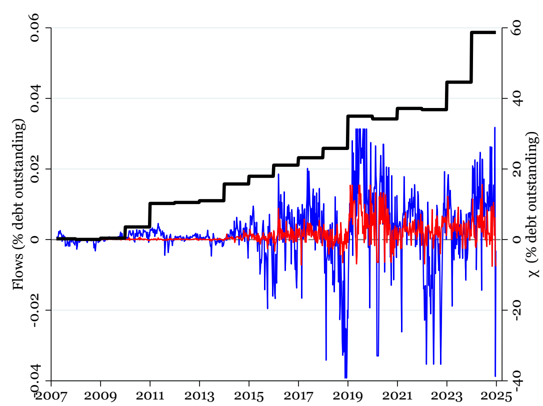

(b) United States




(c) Canada



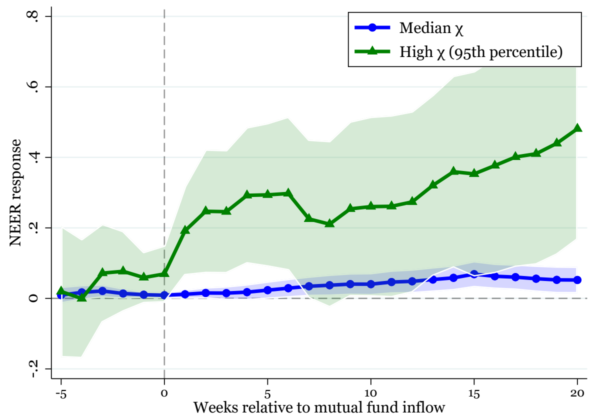

(d) Australia



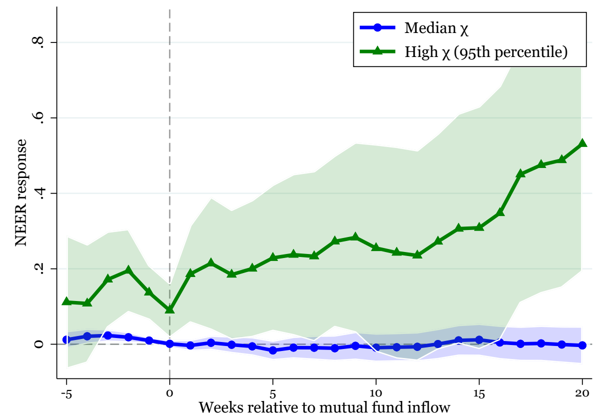

(e) Switzerland

**Note:** $\chi$ is the share of domestic debt volume held by foreign-domiciled mutual funds and is indicated on the right scale. Fund flows are expressed as share in lagged-value of domestic debt volume.

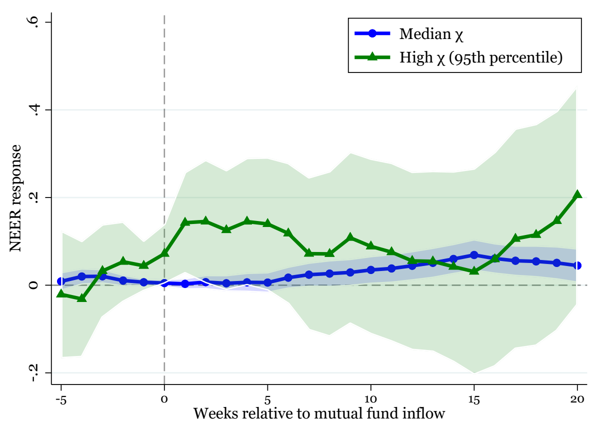
Figure C.2: Jack-nife by country robustness of $\chi$ fund flows local projections



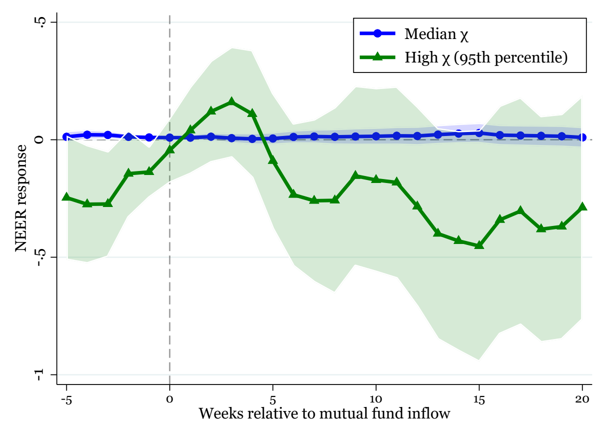

(a) Dropping the United Kingdom



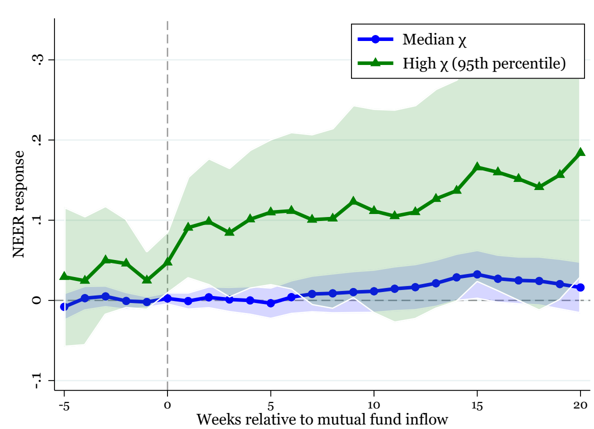

(b) Dropping Australia




(c) Dropping Canada




(d) Dropping the United States




(e) Dropping Switzerland