RIETI Discussion Paper Series 26-E-065

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RIETI Discussion Paper Series 26-E-065
September 2026

The Swiss Franc and the Swiss Economy: Updated evidence※

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Abstract

Researchers reported that exports of Switzerland's most sophisticated sectors such as chemicals and pharmaceuticals are price inelastic. They attribute this to the limited competition that advanced products face. Recently China has emerged as an export powerhouse in chemicals, pharmaceuticals, and other sectors. Using data up to 2026, this paper reports that Swiss export price elasticities have increased, even for chemical and pharmaceutical exports. Evidence also indicates that appreciations and declines in rest of the world stock returns depress Swiss stock returns in most sectors. Swiss GDP and stock prices have nevertheless held up well during the crisis-prone period beginning with the COVID-19 pandemic in 2020. Switzerland should focus on maintaining this resilience in the face of trade wars, continuous appreciations, energy price hikes, and other shocks

JEL classification: F10, F40

Keywords: Switzerland, Exports, Exchange Rate Exposures

※This study is conducted as a part of the research at the Research Institute of Economy, Trade and Industry (RIETI). The draft of this paper was presented at the DP seminar of the Research Institute of Economy, Trade and Industry (RIETI). I thank Kyoji Fukao, Keiichiro Kobayashi, Eichi Tomiura, and other colleagues for excellent comments. Any errors are my responsibility.
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1. Introduction

The Swiss economy has been an island of stability. Since 2001 its unemployment rate has averaged 4.3% and never reached 6%. Its inflation rate has averaged 0.6% and never reached 3%. Its federal public debt in 2025 equaled 21% of GDP. Swiss GDP per capita in 2026 equaled USD 116,005. This is the second highest in the world.[1]

Switzerland also invests heavily in education and research. The Federal Institute of Technology Zurich ranks as the 11th best university in the world in the 2026 QS World University Rankings and the Federal Institute of Technology Lausanne ranks as the 22nd best. Switzerland spent CHF 25.9 billion (USD 32.4 billion) on research and development (R&D) in 2023, with 70% of this amount coming from the private sector (Avenir Suisse, 2026). The investment in education and R&D has contributed to Switzerland's export basket since 2001 being on average the 3rd most sophisticated in the world according to the Atlas of Economic Complexity. [2]

Switzerland's sophisticated economy and low inflation, unemployment, and public debt make it attractive to investors in crisis times. de Boer et al., (2020) and Fink et al., (2022) have documented the Swiss franc's safe haven properties. Goldberg and Krogstrup (2018), recasting the Exchange Market Pressure index, found that the franc faced the most appreciation pressure of any currency when risk aversion increased between 2009 and 2017. The Swiss current account surplus also averaged 9% of GDP between 2001 and 2023.

[1] The data in this paragraph come from the CEIC database and from the World Population Review. The website are, respectively, www.ceicdata.com and https://worldpopulationreview.com .
[2] The website for the QS World University Rankings is https://www.topuniversities.com/qs-world-university-rankings . The website for the Atlas of Economic Complexity is https://atlas.hks.harvard.edu/ .

Safe haven capital inflows and large current account surpluses have caused the Swiss franc to appreciate. Figure 1 shows that the CHF has appreciated by 51% versus the euro and 73% versus the U.S. dollar between January 2001 and May 2026.

Much research has indicated that an appreciating franc only exerts a limited impact on the volume of Swiss exports. This is because, as the IMF (2013) stated, that Swiss ". . .exporting industries may be built around production of very specific items, which are particularly valued for their brands or special characteristics and hence face limited price competition" (IMF, 2013, p. 18)

Auer and Sauré (2011) investigated exports from 24 OECD countries to the other 23. They employed annual panel data over the 1972-2000 period and importer-exporter fixed effects. They reported that Switzerland's exports had the lowest exchange rate elasticities of all the 24 countries investigated. They attributed this to the fact that Swiss exports are concentrated in sophisticated sectors with low price elasticities.

Sauré (2015) demonstrated that the increase in the Swiss trade surplus over two decades was driven by the pharmaceutical sector. He noted that demand for pharmaceutical goods is inelastic. This is because medical products are often essential to save lives and are covered by health insurance. He estimated a panel data model to explain Switzerland's net exports to 24 countries over the 1988-2007 period. He found that the exchange rate had no impact on pharmaceutical trade. For total trade, he found in his preferred (Arellano-Bond) specification that there was not a statistically significant relationship between exchange rates and trade. In his other specification, he reported that a 10% appreciation was associated with a 3.3% decrease in net exports.[3]

[3] Sauré (2015) also reported vector autoregression evidence indicating that the exchange rate did not impact Swiss pharmaceutical trade but did affect non-pharmaceutical trade.

Thorbecke and Kato (2018) investigated how exchange rates impact Swiss aggregate and disaggregated exports. Using Johansen maximum likelihood estimation and quarterly data on Swiss aggregate exports over the 1989–2016 period, they found no evidence that exchange rates impact exports. Using panel dynamic ordinary least squares estimation and annual data on Swiss exports to 14 countries over the 1990-2014 period, they reported that a 10% appreciation was associated with a 4.4% drop in aggregate exports, a 3.2% decrease in consumption goods exports, and a 3.6% decrease in non-pharmaceutical goods exports. They found that the exchange rate did not impact pharmaceutical goods exports. Lamla and Lassmann (2011), Hanslin Grossman et al. (2016), and Eugster and Donato (2025) also reported that exchange rates have a modest and muted impact on Swiss pharmaceutical and chemical exports.

Brunhart and Geiger (2025) investigated how Swiss exports responded to the quasi-natural experiment of the CHF appreciation in January 2015 when Switzerland abandoned its minimum exchange rate relative to the euro. They reported that for the largest export sector, chemicals and pharmaceuticals, CHF export prices fell so the prices in euros remained constant. The chemical and pharmaceutical sector was able to lower CHF export prices because of high profit margins (24% of turnover) and low financial constraints. As a result, chemical and pharmaceutical exports increased following the CHF appreciation of 36% on 15 January 2015.

As Auer and Sauré (2011) noted, one reason why Swiss sectors such as pharmaceuticals and chemicals have low exchange rate elasticities is because they have faced limited competition in producing these goods. However, China has emerged as a formidable competitor in the pharmaceutical and chemical industries. Barwick et al. (2026) documented that by 2020 China had surpassed the U.S. and the EU in global clinical trials. They also showed that Chinese scholars now publish over 50,000 biomedical papers per year. China has also been able to

manufacture goods at low prices. As Chinese firms have reached the technological frontier in many areas of pharmaceutical and chemical production, they may challenge Swiss companies in these industries. Swiss industries including both pharmaceuticals and chemicals complain that the strong franc weakens their competitiveness (Ruehl and Smith, 2026).[4]

This paper includes data since the ascent of China's pharmaceutical and chemical sectors to estimate Swiss exchange rate elasticities. Autoregressive distributed lag (ARDL) estimation over the 2000 to 2026 period yield price elasticities of unity for Switzerland's aggregate exports and of over 0.8 for Switzerland's pharmaceutical and chemical exports. Panel dynamic ordinary least squares estimation over the 2001 to 2023 period yield price elasticities of 0.6 for pharmaceutical exports and of over 0.9 for chemical exports. Unlike findings using earlier data, these results indicate that appreciations reduce the price competitiveness of even Switzerland's most advanced sectors.

In addition to reducing the volume of exports, appreciations may also decrease the profitability of Swiss firms. For domestically produced exports, labor and capital costs are denominated in Swiss francs and revenues are received in foreign currencies. If appreciations lower Swiss franc export prices relative to Swiss franc costs, they will reduce profits. Eugster and Donato (2025) examined how exchange rates impact profits. Estimating a quarterly vector autoregression over the 1984-2021 period, they found that a Swiss franc appreciation caused a significant and long-lasting decline in perceived profits in the retail and manufacturing sectors.

Thorbecke and Kato (2018) estimated the pass-through of exchange rates to export prices. They used monthly data over the 2000-2016 period. They reported that that a 10% appreciation led to a 4% decrease in Swiss franc export prices for capital goods. They also

[4] The Swiss manufacturer Johannes Läderach said that the strong franc is the greatest threat for the Swiss economy (Bassin, 2026).

reported that Swiss franc export prices for capital goods tumbled relative to Swiss franc costs after the Global Financial Crisis, squeezing profit margins.

The export price data that Thorbecke and Kato (2018) used are no longer updated. Another way to gauge how the franc affects profitability is to examine how it impacts stock prices. In theory stock prices equal the expected present value of future cash flows. As Black (1987, p. 113) noted "The sector-by-sector behavior of stocks is useful in predicting sector-by-sector changes in output, profits, or investment. When stocks in a given sector go up, more often than not that sector will show a rise in sales, earnings, and outlays for plant and equipment." Results reported here indicate that 39 out of 56 sectors investigated are harmed by Swiss franc appreciations. In addition, 53 out of the 56 sectors are harmed by declines in the world stock market. These findings highlight the importance of international trade for Swiss firms.

The year 2020 began what Ramos-Horta et al. (2022) have called the megacrisis period. COVID-19 arrived in 2020 and restricted movement. Russia invaded Ukraine in 2022, causing prices of oil, natural gas, grains, fertilizers, metals and other commodities to soar. Worldwide inflation in 2022 reached its highest level in more than 40 years. President Trump's election in 2024 multiplied trade policy uncertainty. The U.S.—Iran War in 2026 caused commodity prices to spike. Climate change has also melted glaciers and precipitated droughts, wildfires, floods.

This paper investigates how the Swiss economy has fared during the megacrisis era. The results indicate that GDP and stock prices have help up well. Exports of pharmaceuticals and chemicals, however, are lagging

The next section reports time series evidence of trade elasticities. Section 3 presents panel data evidence of exchange rate and GDP elasticities. Section 4 investigates the exposure of

Swiss sectoral stock returns to exchange rates and rest of the world economic activity. Section 5 concludes.

2. Time Series Estimates of Export Elasticities

This section presents times series evidence of price elasticities for Switzerland's exports. It examines (1) total exports, (2) exports without precious metals, gemstones, works of art and antiques, and (3) chemical and pharmaceutical exports. As Eugster and Donato (2025) reported, gold exports are large, volatile and only tangentially connected to the Swiss economy. The Swiss Federal Statistical Office (FSO) also provides data on exports excluding precious metals and gemstones, works of art and antiques. As Eugster and Donato discussed, this series is preferable for examining the expenditure-switching effects of exchange rates. The SFO also provides disaggregated export data beginning in 2012. While this sample is short, in the case of chemical and pharmaceutical exports there is a close connection with the SFO data and data available in earlier years in Eugster and Donato's Appendix B. Thus chemical and pharmaceutical exports are also investigated. The Swiss Federal Customs Administration no longer provides export price data. This paper thus follows Eugster and Donato in deflating exports using the Swiss producer price index.[5]

The exchange rate is measured using the Bank for International Settlement CPI-deflated broad real effective exchange rate. Foreign economic activity is measured using OECD GDP.[6] Augmented Dickey-Fuller tests indicate that all of variables employed are integrated of order one

[5] The export and ppi data are available at the CEIC database. The URL is ceicdata.com .

[6] The exchange rate data are available at https://data.bis.org/ and the GDP data at www.oecd.org .

(I(1)) or zero (I(0)). Autoregressive distributed lag (ARDL) estimation, which is appropriate when some variables are I(1) and some are I(0), is thus employed.

ARDL involves regressing the first difference of the dependent variable on lagged levels and lagged first differences of the dependent and independent variables. The export equations can be written as:

$$\Delta lnEx_t = \beta_0 + \beta_1 lnEx_{t-1} + \beta_2 lnrer_{t-1} + B_3 lnY_{t-1} + \sum_{i=1}^{k} \gamma_{1i} \Delta lnEx_{t-i} + \sum_{i=0}^{m} \gamma_{2i} \Delta lnrer_{t-i} + \sum_{i=0}^{n} \Delta lnY_{t-i} , \quad (1)$$

where *Ex* represents exports, *rer* represents the real effective exchange rate, and *Y* represents rest of the world GDP. The long run exchange rate elasticity is then given by β_2/β_1 and the long run GDP elasticity by β_3/β_1. Bounds tests can be used to test the null hypothesis of no cointegration against the alternative of cointegration. The Schwarz information criterion can be used to determine the number of lags.

Table 1 presents the results from estimating equation (1). Column (2) presents the results for total exports, column (3) for total exports excluding precious metals and gemstones, works of art and antiques, and column (4) for chemical and pharmaceutical exports. In every case F- and t-statistics from bounds tests permit rejection of the maintained hypothesis of no cointegration. The exchange rate elasticities in all three cases are negative, indicating that a Swiss franc appreciation reduces exports. For total exports the coefficient equals -1.34 with a probability value of 0.080. For total exports excluding gold and valuables the coefficient equals -0.99 with a probability value of 0.005. For chemical and pharmaceutical exports the coefficient equals -0.82 with a probability value of 0.013.

In every case the coefficient on rest of the world GDP is insignificant but the coefficient on the time trend is significant. Regressing rest of the world GDP on a time trend over the

sample period yields a t-statistic greater than 67. The multicollinearity between GDP and the time trend reduces the precision of estimates of the GDP elasticity.

The exchange rate elasticities in Table 1 far exceed those reported by Sauré (2015), Thorbecke and Kato (2018), and others. This implies that Swiss franc appreciations switch expenditures away from Swiss exports. These findings hold even for highly sophisticated chemical and pharmaceutical exports.

3. Panel Data Estimates of Export Elasticities

This section presents panel data evidence of price elasticities for Switzerland's exports. It examines total exports, total exports (excluding gold), capital and equipment goods exports, chemical exports, consumption goods exports (including watches), and pharmaceutical exports. Exports to 25 major importers are obtained from the CEPII-CHELEM database.[7] The data are measured in U.S. dollars and are deflated using the Swiss producer price index converted to U.S. dollars using the U.S. dollar/Swiss franc nominal exchange rate. Data on the bilateral CPI-deflated real exchange rate between Switzerland and the importing country and real GDP in the importing countries are also obtained from the CEPII-CHELEM database.

A battery of panel unit root tests indicates that some to the variables are I(1) and some are I(0). Panel dynamic ordinary least squares (DOLS) provides a relatively robust method to estimate statistical models. For instance, Wagner and Hlouskova (2010) found that DOLS is less sensitive than other estimators with respect to the impact of stable autoregressive roots approaching the unit circle, the effects of an I(2) component, and the presence of cross-sectional

[7]The importing countries are Australia, Austria, Belgium, Canada, China, Finland, France, Germany, India, Indonesia, Ireland, Israel, Italy, Japan, Malaysia, Netherlands, New Zealand, Singapore, South Korea, Spain, Sweden, Taiwan, Türkiye, the United Kingdom, and the United States.

correlation and cross-unit cointegration. Kao and Chiang (2000) showed that panel DOLS estimators and t-statistics have better small sample properties and provide better approximations to the normal distribution than estimators and t-statistics obtained using panel OLS or panel fully modified OLS methods. DOLS estimation is thus employed.

The model can be written:

$$lnX_{j,p,t} = \beta_0 + \beta_1 lnBRER_{j,t} + \beta_2 lnY_{j,t} + \sum_{k=-q}^{r} \gamma_{1,k} \Delta lnBRER_{j,t-k} + \sum_{k=-q}^{r} \gamma_{2,k} \Delta lnY_{j,t-k} \quad (2)$$

where $lnX_{i,j,p,t}$ equals exports from Switzerland to country j in product category p, $lnBRER_{j,t}$ equals the bilateral real exchange rate between Switzerland and country j, $lnY_{j,t}$ equals GDP in importing country j, and the other terms represent country-specific lags and leads of the first differenced regressors.[8] The first-differenced regressors are included to asymptotically remove endogeneity and serial correlation. A sandwich estimator is used to allow for heterogeneity in the long-run residual variances. Country-specific fixed effects and country-specific time trends are also included.

Table 2 presents the results from estimating equation (2). Column (2) presents the results for total exports, column (3) for total exports excluding gold, column (4) for capital and equipment goods exports, column (5) for chemical exports, column (6) for consumption goods exports (including watches), and column (7) for pharmaceutical exports. The exchange rate and GDP elasticities in every case are correctly signed and statistically significant at the 1% level.

For total exports, a 10% appreciation is associated with a 4% decrease in exports. For total exports excluding gold, a 10% appreciation is associated with a 5.2% decrease in exports.

[8] The number of leads and lags are set equal to two.

For capital goods exports, a 10% appreciation is associated with a 7% drop in exports; for chemical goods, with a 9.3% drop in exports; for consumption goods, with a 3.8% drop in exports; and for pharmaceutical goods with a 5.8% drop in exports.

When gold is excluded in column (3), the exchange rate response rises from -0.40 to -0.52. Since gold is only tangentially related to the Swiss real economy, excluding gold reduces distortions in the estimation. The elasticities for chemicals (-0.93) and pharmaceuticals (-0.58) indicate that appreciations depress exports in these sophisticated categories. This corroborates the findings in Table 1.

The GDP elasticity excluding gold in column (3) is much smaller than the elasticity excluding gold. This could indicate that gold flows in large part to more advanced economies. The GDP elasticities for chemicals, consumption goods, and pharmaceuticals are approximately two or larger. These findings indicate that, as the rest of the world prospers, Swiss exports in these key sectors balloon.

4. The Exchange Rate Exposure of Swiss Sectors

Many studies have investigated the link between stock returns and exchange rates. Examples include Dominguez & Tesar (2006), Ito et al. (2016), and He et al. (2026). This involves regressing stock returns on exchange rates and other variables.

In addition to the exchange rate, several control variables are also included. The first is returns on the world stock market. This helps capture the impact of economic conditions in other countries on Swiss firms. The second is crude oil prices. Switzerland may be harmed by oil price increases. Fossil fuels comprised 58% of Switzerland's 2024 energy consumption.[9]

[9] The data in this paragraph come from International Energy Agency (2026).

Switzerland also imported 48% of its energy supply in 2024. The third is unexpected inflation calculated as the residual from an autoregressive integrated moving average model. The fourth is the monetary policy rate. Until the end of 2019 this is the midpoint between the lower and upper limits for the Swiss National Bank (SNB) target for the 3-month Libor rate. After this it is the SNB policy rate.

The estimated equations take the form:

$$\Delta R_{i,t} = \alpha_0 + \beta_1 \Delta REER_t + \beta_2 \Delta World_t + \beta_3 \Delta Brent_t + \beta_4 Inftres_t + \beta_6 \Delta Policyrate\,, \quad (2)$$

where $\Delta R_{i,t}$ is the monthly stock return for Swiss sector *i*, $\Delta REER_t$ is the change in the log of the BIS real effective exchange rate, $\Delta World_t$ is the return for the world stock market, $\Delta Brent_t$ is the change in the log of the spot price for Brent crude oil, $Inftres_t$ is the residual from an ARIMA model of inflation, and $\Delta Policyrate_t$ is the change in the SNB policy rate.[10] The data extend from January 2003 to December 2025. Since first differences are used, the sample for the estimation begins in February 2003.

Table 3 reports the exchange rate elasticities in column (2) and the elasticity to world stock returns in column (4). Column (6) reports the adjusted R-squared statistics. These average 0.31. This is good for regressions with stock returns. Results for the other coefficients are available on request.

Column (2) indicates that 53 out of 56 sectors have negative coefficients, indicating that an appreciation reduces returns. Of the 56 coefficients, 39 are statistically significant and seven more are statistically significant at the 10% level. For the 53 negative coefficients, their values average -0.75. This indicates that a 10% CHF appreciation is associated with a 7.5% decrease in

[10] Exchange rate changes also affect stock prices by impacting the CHF price of firms' foreign capital stock. Unfortunately detailed data on foreign capital disaggregated by sector is unavailable.

stock returns. Thus the coefficients are not only statistically significant but also economically significant. Both the chemical and the pharmaceutical sectors are harmed by appreciations. This is something that Thorbecke and Kato (2018) did not report over the 2001-2016 sample period.

Column (4) indicates that 55 out of 56 sectors have positive coefficients, indicating that an increase in world stock returns increases Swiss stock returns. Of the 56 coefficients, 51 are statistically significant at the 1% level, two more at the 5% level, and two more at the 10% level. For the 55 positive coefficients, their values average 0.91. This indicates that a 10% increase in world stock returns is associated with a 9.1% increase in stock returns.

The results reported here indicate that the exchange rate and the state of the world economy are vitally important for Swiss firm. A CHF depreciation is associated with an increase in stock returns for the lion's share of Swiss sectors. An increase in world stock returns is associated with an increase in stock returns for virtually all sectors. These findings reflect the fact that exports to the rest of the world are vital to Swiss firms because Switzerland has a small domestic market.

5. How Has Switzerland Fared During the Megacrisis Era

The megacrisis era began with the arrival of COVID-19 in early 2020. It continued with the Russia-Ukraine War that began in February 2022. The war raised prices for fuels, fertilizers, grains, metals, and other vital commodities. It continued with floods, droughts, earthquakes, and extreme heat associated with climate change. President Trump's election in 2024 then multiplied trade policy uncertainty. The U.S.—Iran War in 2026 caused commodity prices to spike.

This section investigates how the Swiss economy has fared during these difficult times. The strategy here is simple. Trends and seasonal patterns of GDP, exports, and stock prices are

estimated over the 20-year period preceding the megacrisis period. Then the actual performance of these variables is compared with what would be predicted based on the previous two decades.

The estimated equations take the form:

$$Y_t = \beta_0 + \beta_1 Q_1 + \beta_2 Q_2 + \beta_3 Q_3 + \beta_4 Trend_t , \quad (4)$$

where Y_t is the variable being forecasted (GDP, exports, or stock prices), Q_1 , Q_2 , and Q_3 are dummy variables for quarters 1, 2, and 3, respectively, and $Trend_t$ is a linear time trend. Because stock returns should not have a seasonal pattern, quarterly dummies are not included when forecasting stock returns.

Figure 2 shows actual GDP over the 2020Q1-2026Q1 period and forecasted GDP. Figure 3 shows actual GDP (excluding exports and imports of valuables) and forecasts of GDP excluding valuables. Figure 2 shows that GDP fell about 15% below predicted values in the second quarter of 2020 as COVID-19 depressed economic activity. By the fourth quarter of 2021 GDP had fully recovered. Until 2026Q1 it closely tracked predicted values. Figure 3 shows that GDP excluding trade in valuables fell 9% below predicted values in 2020Q2. It also recovered by 2021Q4. In 2025Q2 it was 9% above forecasted values. In 2026Q1 it was close to forecasted values.

Figure 4 shows actual exports excluding valuables (i.e., precious metals, gemstones, works of art, and antiques) over the 2020Q1-2026Q1 period and forecasted exports excluding valuables. Figure 5 shows exports of chemicals and pharmaceuticals and forecasts of this variable. Figure 4 shows that exports fell 16% below predicted values in the second quarter of 2020 as COVID-19 hit economic activity. By the first quarter of 2021 exports exceeded forecasted values. Exports then hovered around predicted values and spiked in 2025Q1. This was due to front loading of exports to escape U.S. tariffs. In 2026Q1 exports were 5% below

predicted values. Figure 5 shows that chemical and pharmaceutical exports remained close to predicted values until the end of 2024. They spiked in 2025Q1 to avoid coming tariffs. They then fell and in 2026Q1 were 22% below predicted values.

Figure 6 shows aggregate stock prices over the 2020Q1-2026Q1 period and forecasted stock prices. Figure 7 shows stock prices for the pharmaceutical sector and forecasted prices for the pharmaceutical sector. Figure 6 shows stock prices fell 30% in March 2020 as COVID-19 struck. They quickly recovered though and by August 2021 were 30% above forecasted values. They remained above forecasts for most of the period. They fell 20% around 2 April 2025 when President Trump announced 31% tariffs on Swiss exports. They quickly recovered and in June 2026 were 20% above predicted values. Pharmaceutical stocks fell 27% in February and March 2020 as COVID-19 hit but quickly recovered. In 2020 and 2021 they averaged 16% above predicted values. In 2023 and 2024 they hovered around predicted values. They fell 20% in April 2025 as Trump announced tariffs. They quickly recovered though and in June 2026 were 30% above predicted values.

The results indicate that Swiss GDP has help us well during the 2020-2026 period. Aggregate exports were 5% less than predicted in 2026Q1 and chemical and pharmaceutical exports 22% less than predicted. Aggregate Swiss stock in June 2026 were 20% greater than forecasted and pharmaceutical stock 30% great. The Swiss economy has thus proved resilient during the megacrisis period, though exports are lagging.

6. Conclusion

The Swiss franc has continuously appreciated for decades. Researchers have found that appreciations matter little for Switzerland's exports of pharmaceuticals and chemicals. Even for

other categories, they often report small export elasticities. According to Auer and Sauré (2011) and the IMF (2013), this reflects the fact that Swiss exports are often sophisticated and face limited price competition.

Recently China has emerged as a formidable competitor in the pharmaceutical and chemical industries. China also produces goods at low price points. Competition from China and other countries may confront Swiss exports with greater price competition.

This paper investigates price elasticities for Swiss exports using data up to 2026. Time series evidence reveals elasticities of 1.34 for aggregate exports, 0.99 for aggregate exports excluding valuables, and 0.82 for chemical and pharmaceutical exports. These are higher than those reported in research over earlier sample periods. Panel data evidence reveals elasticities of 0.52 for total exports excluding gold, of 0.70 for capital and equipment goods exports, 0.93 for chemical exports, and 0.58 for pharmaceutical exports. The price elasticities for chemical and pharmaceutical exports indicates that appreciations deter exports even for these sophisticated categories.

Estimating exchange rate exposures over the 2003-2025 period indicates that the lion's share of sectors investigated are harmed by CHF appreciations. These include the chemical and pharmaceutical sectors. Thorbecke and Kato (2018) did not report that these sectors were harmed by appreciations over the 2001-2016 sample period. The results in this paper also indicate that virtually all sectors are harmed by decreases in world stock returns. The exchange rate multiplier averages 0.75 and the world stock return multiplier 0.91. The serious exposure of Swiss sectors to both exchange rates and economic conditions in the rest of the world highlight how important exports are for the Swiss economy.

These results help explain why Swiss firms in 2026 are complaining about the strong CHF. Swiss industries including pharmaceuticals, watches, luxury goods, machinery, electrical engineering, metals, and chemicals have complained that the strong franc weakens their competitiveness (Ruehl and Smith, 2026). Swiss chocolate maker Johannes Läderach said that the strong franc is the greatest threat for the Swiss economy (Bassin, 2026).

In spite of the appreciating franc, Swiss economic performance during the megacrisis era from 2020 to 2026 has been good. Swiss GDP has followed its pre-crisis trend. Aggregate stock prices and pharmaceutical stock prices are much higher than predicted. On the other hand, aggregate exports and chemical and pharmaceutical exports in 2026 are lagging predictions.

Eugster and Donato (2025) found that CHF appreciations have a muted impact on chemical and pharmaceutical trade. They noted that appreciations may accelerate the sectoral reallocation of trade from losing sectors to sectors such as pharmaceuticals and chemicals. Losing sectors may thus shed jobs. Results reported here indicate that even pharmaceutical and chemical exports are sensitive to appreciations. This might worsen the impact of appreciations on employment even in these highly sophisticated sectors. Employment declines may be magnified as Swiss pharmaceutical companies move manufacturing and research and development to the U.S. Swiss policymakers, businesses, and citizens should focus on how to maintain economic resilience in the face of appreciations, trade wars, energy price hikes, and other shocks.

Table 1. Autoregressive Distributed Lag Estimates for Switzerland's Exports to the World.

(1)	(2)	(3)	(4)
Variables	Total Exports	Total Exports without Gold and Valuables	Chemical and Pharmaceutical Exports
BIS Real Effective Exchange Rate	-1.34* (0.76)	-0.99*** (0.34)	-0.82** (0.32)
OECD GDP	0.72 (1.71)	0.34 (0.83)	0.03 (0.68)
Trend	0.0051** (0.0025)	0.0038*** (0.0012)	0.0067*** (0.0021)
First Quarter Dummy Variable	0.014 (0.023)	-0.007 (0.013)	0.095*** (0.014)
Second Quarter Dummy Variable	-0.011 (0.022)	-0.017 (0.011)	0.014 (0.018)
Third Quarter Dummy Variable	-0.031 (0.022)	-0.045*** (0.011)	0.004 (0.014)
D(BIS Real Effective Exchange Rate)	-1.18*** (0.399)	-0.83*** (0.190)	-0.803*** (0.257)
D(BIS Real Effective Exchange Rate(-1))	-0.07 (0.40)	-0.24 (0.20)	0.145 (0.263)
D(OECD GDP)	0.08 (0.62)	0.55 (0.32)	0.178 (0.363)
D(OECD GDP(-1))	0.80 (0.56)	0.41 (0.27)	-0.104 (0.360)
F-Statistic from Cointegration Test	49.0***	52.3***	43.7***
t-Statistic from Cointegration Test	-12.8***	-10.5***	-8.8***
Adjusted R-Squared	0.166	0.487	0.553
Standard Error Of Regression	0.074	0.035	0.048
Sample Period	2000Q3 - 2026Q1	2000Q3 - 2026Q1	2000Q3 - 2026Q1
Number of Observations	103	103	103

Note: The table presents autoregressive distributed lag estimates of export elasticities. Tthe left-hand-side (lhs) variable is the first difference of total exports (column 2), total exports without gold and valuables (column 3), and chemical and pharmaceutical exports (column 4). The right-hand-side (rhs) variables include the lagged level of the Bank for International Settlements broad real effective exchange rate and OECD real GDP and first difference of these variables and these variables lagged one quarter. Also included are lagged levels of total exports (column 2), total exports without gold and valuables (column 3), and chemical and pharmaceutical exports (column 4) and first differences of these variables lagged one quarter. A constant, a trend term, and quarterly dummy variables are also included. The number of lags are determined by the Schwarz information criterion. F- and t-statistics from cointegration test are from

bounds tests of the null hypothesis of no cointegration. Heteroskedasticity and autocorrelation consistent standard errors are reported in parentheses.
Source: CEIC database, OECD database, Bank for International Settlements, and calculations by the authors.
*** [**] (*) denotes significance at the 1% [5%] (10%) level.

Table 2. Panel Dynamic Ordinary Least Squares Estimates of Trade Elasticities for Switzerland's Exports to 25 Countries.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Independent Variable	Total Exports	Total Exports (excluding gold)	Capital and Equipment Goods Exports	Chemical Exports	Consumption Goods Exports (including Watches)	Pharma-ceutical Exports
Real Exchange Rate Relative to the Importing Countries	-0.40*** (0.10)	-0.52*** (0.08)	-0.70*** (0.12)	-0.93*** (0.20)	-0.38*** (0.11)	-0.58*** (0.20)
Importing Country Real GDP	2.90*** (0.32)	1.34*** (0.27)	1.02*** (0.32)	2.10*** (0.52)	1.97*** (0.27)	2.27*** (0.47)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Heterogeneous Linear Trend	Yes	Yes	Yes	Yes	Yes	Yes
Sample Period	2001-2023	2001-2023	2001-2023	2001-2023	2001-2023	2001-2023
No. of Observations	575	575	575	575	575	575
Adjusted R-squared	0.973	0.982	0.970	0.946	0.986	0.967

Notes: The table presents panel dynamic ordinary least squares estimates of trade elasticities for Switzerland's exports to 25 countries. Switzerland's exports are measured in U.S. dollars and deflated using the Swiss producer price index converted to U.S. dollars using the nominal U.S. dollar/Swiss franc exchange rate. The independent variables are the CPI-deflated CHF real exchange rate relative to the importing countries, importing country real GDP, a time trend, and two lags and leads of the first differences of the independent variables. The expected sign is negative for the real exchange rate and positive for importing country real GDP. Standard errors are in parentheses. *** indicates significance at the 1% level.

Table 3. The Exposure of Sectoral Stock Returns to Exchange Rates and World Stock Returns.

(1)	(2)	(3)	(4)	(5)	(6)
Sector	Exchange Rate Coefficient	Standard Error	World Stock Return Coefficient	Standard Error	Adjusted R-squared
Aerospace	-0.57	1.35	2.08***	0.44	0.609
Asset Managers	-0.94***	0.17	0.97***	0.08	0.406
Auto Parts	-2.25***	0.38	2.00***	0.23	0.445
Banks	-0.64***	0.22	0.79***	0.11	0.503
Basic Materials	-0.44***	0.16	0.58***	0.08	0.573
Biotechnology	-0.64**	0.28	0.73***	0.11	0.574
Business Support Services	-0.64**	0.26	0.49***	0.06	0.545
chemicals	-0.40***	0.15	0.56***	0.08	0.668
Computer hardware	-0.38	0.55	1.15***	0.15	0.411
Computer Services	1.24	1.18	1.49***	0.44	0.455
Construction and Materials	-0.82***	0.15	1.02***	0.07	0.595
Consumer Discretionary	-0.90***	0.30	1.08***	0.14	0.527
Consumer staples	-0.52***	0.13	0.29***	0.05	0.270
Diversified Industries	-0.89**	0.35	0.94***	0.12	0.335
Drug retailer	-0.65**	0.33	0.49***	0.09	0.130
Electrical Components	-1.36***	0.30	1.17***	0.10	0.123
Electrical Equipment Other	1.66**	0.77	0.34*	0.20	0.123
Electricity	-0.37*	0.21	0.35***	0.07	0.12
Electronic Equipment: Control	-0.86***	0.20	1.01***	0.10	0.104
Electronic Equipment: Gauges and Meters	-1.00***	0.21	1.08***	0.09	0.310
Engineering and Contracting Services	-0.19	0.31	0.58***	0.15	0.427
Financial Services	-0.89***	0.16	0.92***	0.07	0.208
Food Products	-0.52***	0.13	0.29***	0.05	0.492
General Industrials	-0.83**	0.33	0.84***	0.10	0.378
Healthcare	-0.66***	0.09	0.59***	0.04	0.324
Hotels and Motels	-0.33	0.80	-0.13***	0.18	0.307
Household Furnishgs	-0.62**	0.31	1.02***	0.12	0.279
Industrial Engineering	-0.94***	0.21	1.03***	0.07	0.352
Industrial goods and services	-0.88***	0.18	1.00***	0.06	0.361
Industrial Support Services	-0.74***	0.23	0.78***	0.08	0.264
Industrial Transportation	-0.49***	0.26	0.92***	0.11	0.227
Investment Banks and Brokers	-0.98***	0.18	0.98***	0.08	0.245
Investment services	-0.83**	0.35	0.99***	0.10	0.430
Lifeinsurance	-0.61*	0.36	1.30***	0.17	0.024
Luxury Goods	-0.7388	0.33	1.03***	0.12	0.219
Machinery&Construction	-1.10***	0.23	1.16***	0.09	0.407
Machinery: Engines	1.08	1.56	0.89***	0.27	0.263

Machinery: Industrial	-1.02***	0.23	1.01***	0.07	0.314
Machinery: Specialized	-0.77**	0.33	1.03***	0.08	0.114
Marine Transport	-0.42	0.27	0.783***	0.09	0.239
Media	-0.53**	0.26	0.68***	0.10	0.261
Medical Supplies	-1.02***	0.24	0.76***	0.10	0.236
Nonlifeinsurance	-1.09***	0.16	0.86***	0.11	0.127
Pharmaceuticals	-0.59***	0.15	0.26***	0.06	0.286
Production Technology Equip.	-1.01***	0.35	1.30***	0.14	0.257
Railroad Equip	-0.24	0.59	0.36**	0.17	0.261
Real estate	-0.094	0.17	0.41***	0.08	0.029
Retailers	-1.19***	0.31	1.10***	0.22	0.380
Semiconductors	-0.93*	0.54	1.74***	0.26	0.274
Software and Computer Services	-0.93*	0.49	1.20***	0.13	0.175
Specialty Chemicals	-0.37**	0.15	0.54***	0.08	0.094
Specialty Retail	-1.87***	0.56	1.68***	0.22	0.259
Technology Hardware	-0.66*	0.36	1.20***	0.10	0.140
Telecom	-0.13	0.22	0.15***	0.08	0.018
Telecommunications Equip	-0.77*	0.43	0.97***	0.12	0.343
Transport Services	-0.73*	0.29	0.90***	0.14	0.317

Notes: Column (2) reports the exchange rate coefficient and column (4) the coefficient on world stock returns in a regression of monthly stock returns for the sectors listed in column (1) on the change in the log of the Bank for International Settlements real effective exchange rate, the return for the world stock market, the change in the log of the spot price for Brent crude oil, residuals from an ARMA model of inflation, and the change in the Swiss National Bank policy rate. The sample period extends from February 2003 to December 2025. Heteroskedasticity and autocorrelation consistent standard errors are reported in parentheses.
Source: Datastream Database, CEIC database, Swiss National Bank database, Bank for International Settlements database and calculations by the authors.
*** [**] (*) denotes significance at the 1% [5%] (10%) level.

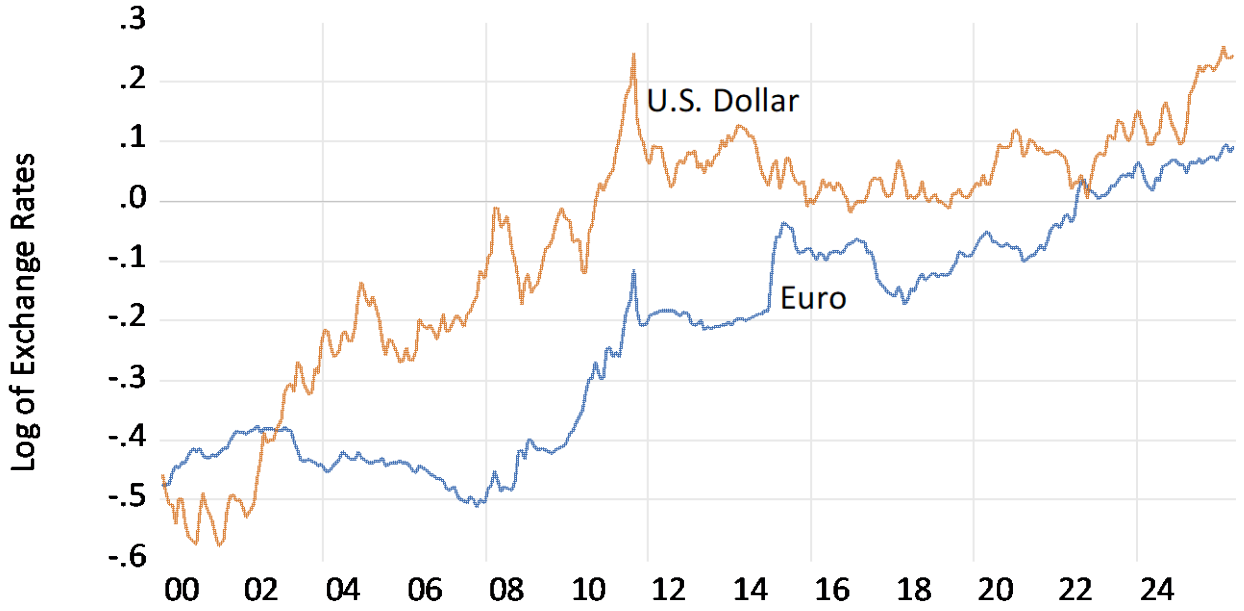

Figure 1. The Euro/Swiss Franc and U.S. Dollar/Swiss Franc Exchange Rates.
Source: CEIC Database.

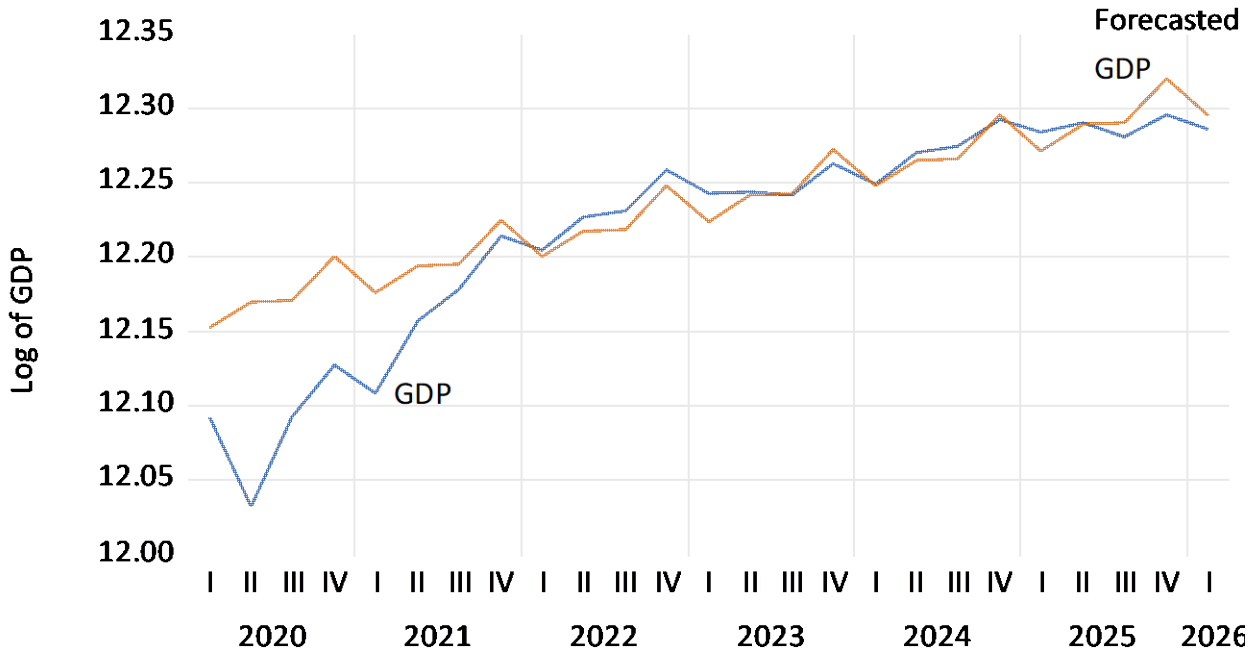

Figure 2. Actual and Forecasted Swiss GDP.
Source: CEIC Database and calculations by the author.
Note: GDP is forecasted by first regressing the log of GDP on a constant, quarterly dummies, and a linear time trend over the 2000Q1 to 2019Q4 period. The estimated coefficients are then used to forecast the log of GDP over the 2020Q1-2026Q1 period.

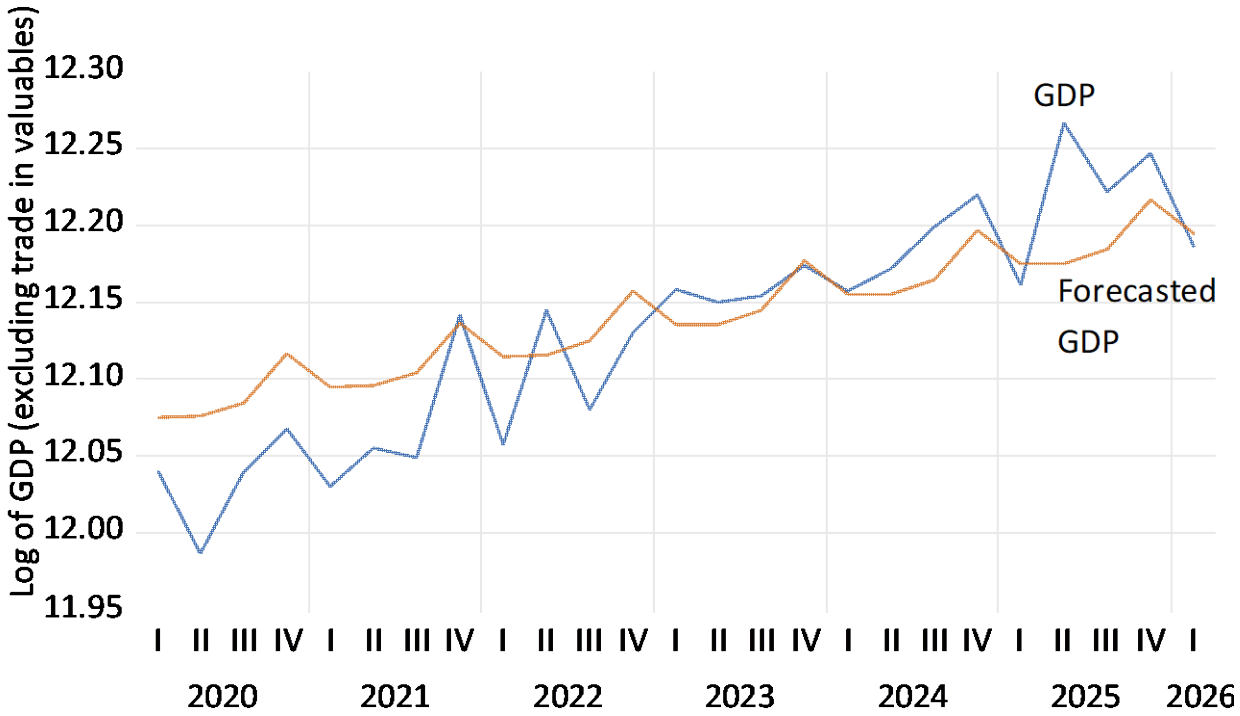

Figure 3. Actual and Forecasted Swiss GDP (excluding trade in valuables).
Source: CEIC Database and calculations by the author.
Note: GDP excluding exports and imports of valuables (i.e., precious metals, gemstones, works of art and antiques is forecasted by first regressing the log of GDP excluding trade in valuables on a constant, quarterly dummies, and a linear time trend over the 2000Q1 to 2019Q4 period. The estimated coefficients are then used to forecast the log of GDP (excluding trade in valuables) over the 2020Q1-2026Q1 period.

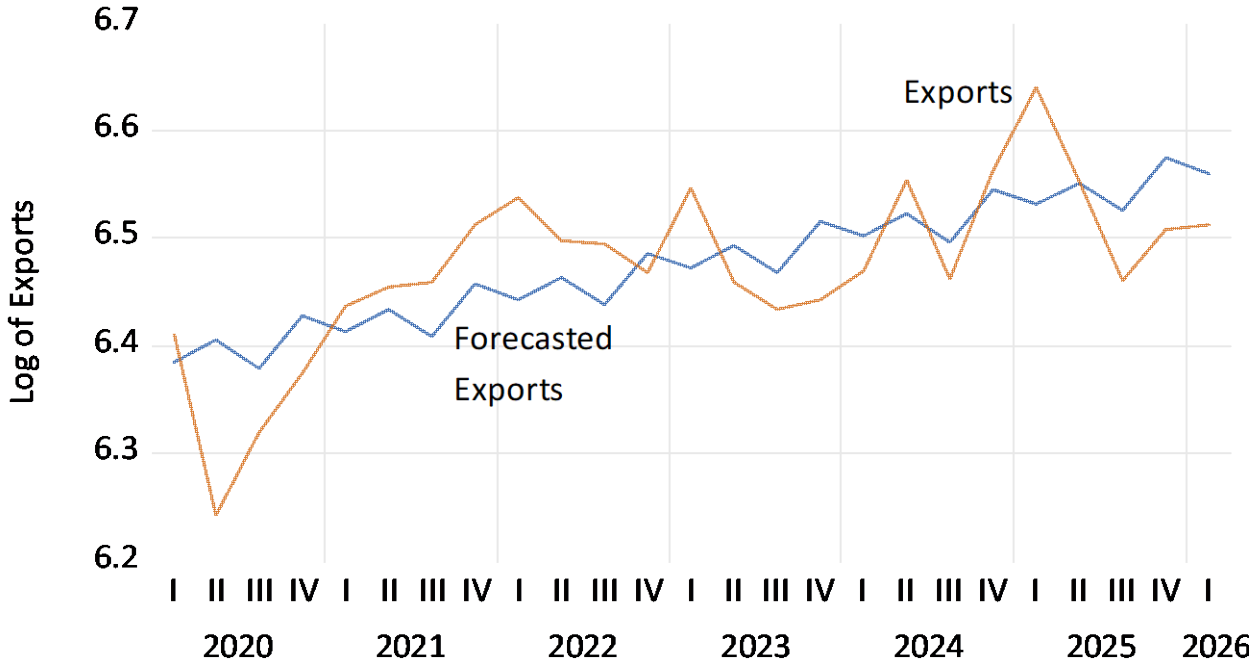

Figure 4. Actual and Forecasted Swiss Exports (excluding valuables).
Source: CEIC Database and calculations by the author.
Note: Swiss exports excluding valuables (i.e., precious metals, gemstones, works of art and antiques) are forecasted by first regressing the log of exports excluding valuables on a constant, quarterly dummies, and a linear time trend over the 2000Q1 to 2019Q4 period. The estimated coefficients are then used to forecast the log of exports (excluding valuables) over the 2020Q1-2026Q1 period. Swiss exports are deflated using the Swiss producer price index.

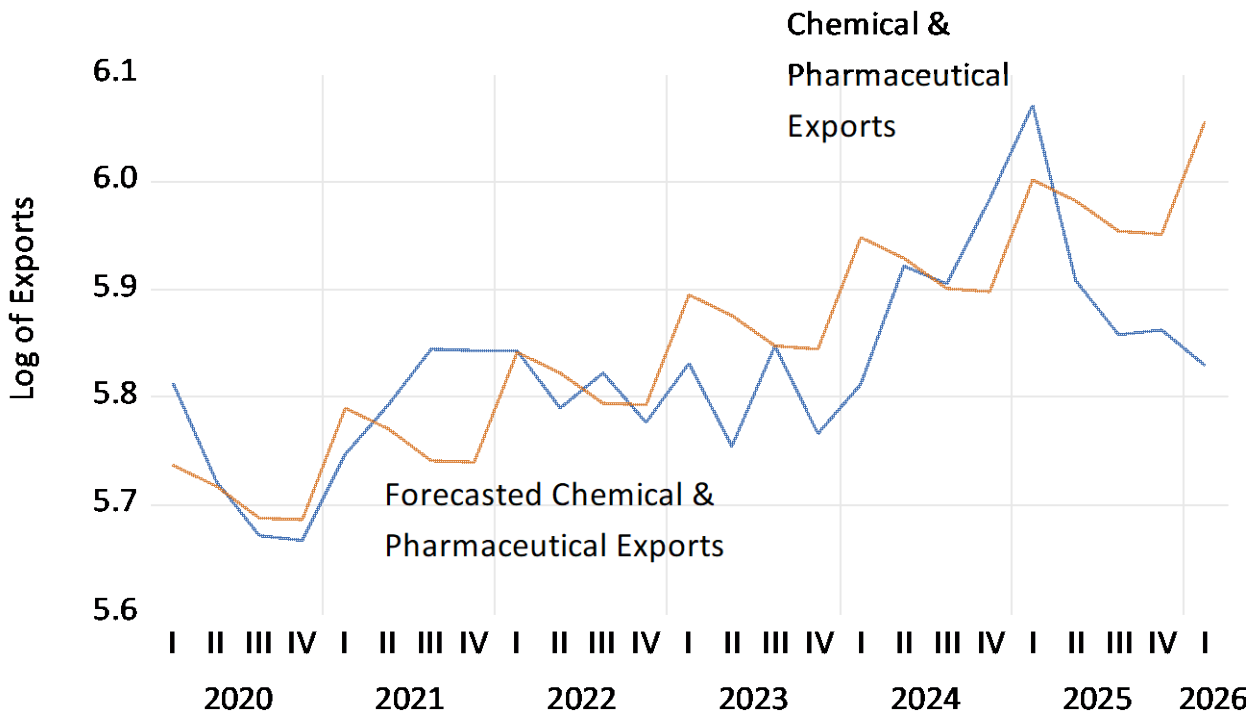

Figure 5. Actual and Forecasted Swiss Exports of Pharmaceuticals and Chemicals
Source: CEIC Database and calculations by the author.
Note: Exports of pharmaceuticals and chemicals is forecasted by first regressing the log of GDP excluding trade in valuables on a constant, quarterly dummies, and a linear time trend over the 2000Q1 to 2019Q4 period. The estimated coefficients are then used to forecast the log of pharmaceutical and chemical exports over the 2020Q1-2026Q1 period. Swiss pharmaceutical and chemical exports are deflated using the Swiss producer price index.

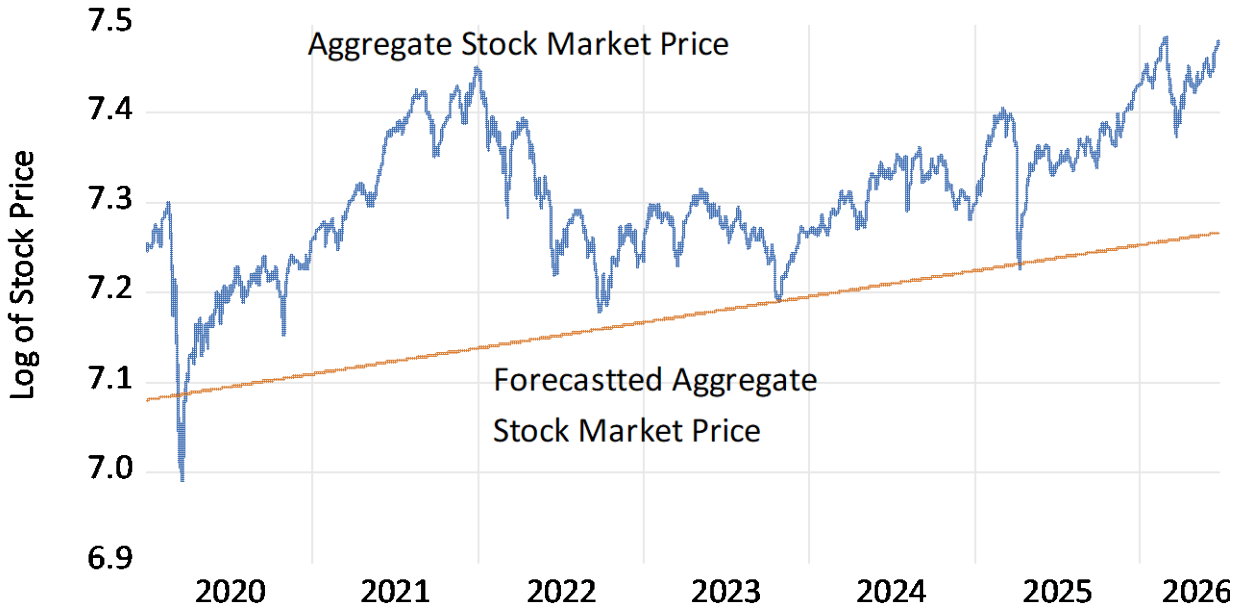

Figure 6. Aggregate and Forecasted Swiss Stock Prices
Source: Datastream Database and calculations by the author.
Note: Aggregate stock prices are forecasted by first regressing the log of stock prices on a constant and a linear time trend over the 1 January 2000 to 31 December 2019 period. The estimated coefficients are then used to forecast the log of aggregate stock prices over the 1 January 2020 to 23 June 2026 period.

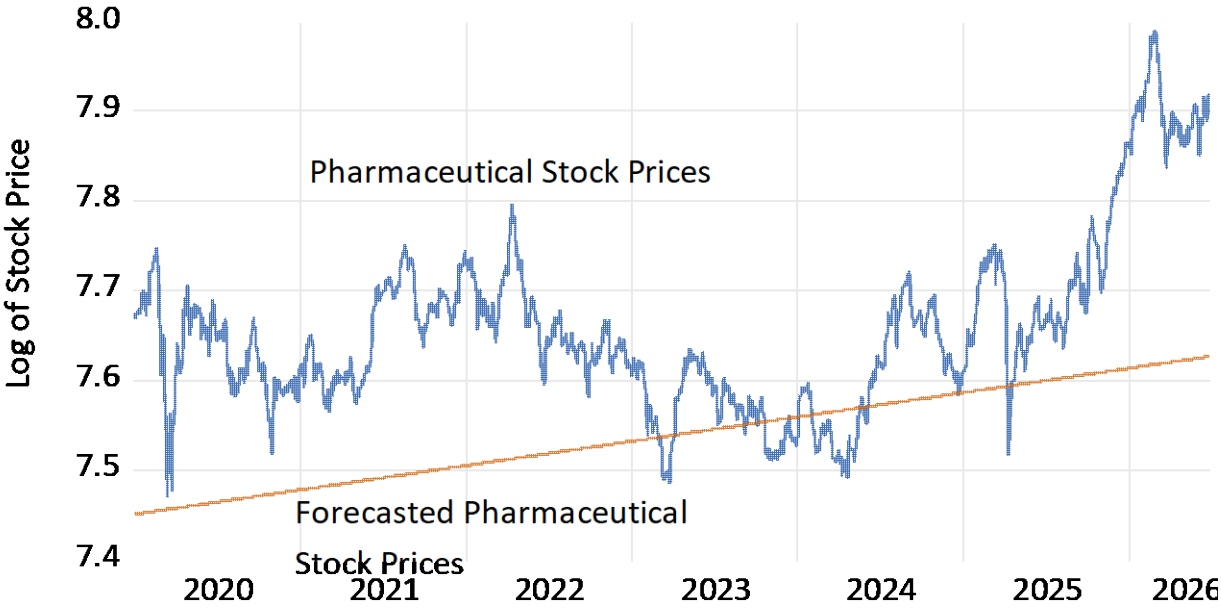

Figure 7. Actual and Forecasted Swiss Pharmaceutical Stock Prices
Source: Datastream Database and calculations by the author.
Note: Pharmaceutical stock prices are forecasted by first regressing the log of pharmaceutical stock prices on a constant and a linear time trend over the 1 January 2000 to 31 December 2019 period. The estimated coefficients are then used to forecast the log of pharmaceutical stock prices over the 1 January 2020 to 23 June 2026 period.

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