ID 90: Quantifying the effects of exchange rate fluctuations on Swiss agro-food exports

Andreas Kohler and Ali Ferjani

Agroscope, CH-8356 Ettenhausen; andreas.kohler@agroscope.admin.ch, ali.ferjani@agroscope.admin.ch

Motivation & Research Question

The Swiss franc appreciated strongly against the currencies of Switzerland's most important trading partners after the global financial crisis in 2008, and more recently, after the Swiss National Bank (SNB) abandoned its cap against the euro.

Those episodes beg the question how sensitive Swiss exports are with respect to exchange rate fluctuations. In particular, we ask by how much Swiss agro-food exports decrease on average if the Swiss franc appreciates by 1%.

Data

The empirical analysis is based on quarterly exports in HS categories 01-24 to 36 countries from 1999-2012. Switzerland exports mostly processed products like cheese, coffee (Nespresso), chocolate, baby food, baked goods, beverages (Red Bull), and tobacco. The 36 countries include all OECD countries (except Chile and Greece) plus Brazil, Russia, India, South Africa and Indonesia. The data cover 80-90% of total Swiss agro-food exports. Exchange rate fluctuations are measured by the (effective) real exchange rate (index), and changes in demand are approximated by changes in trading partners' gross domestic product.

Joint evolution of exchange rate and exports

real export value (smoothed)
real effective exchange rate index
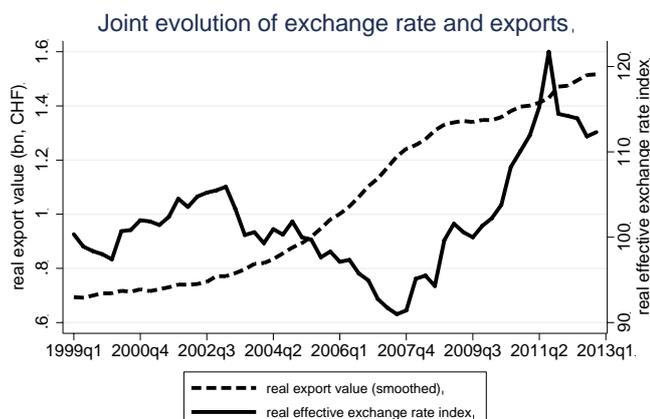
Sources: Swiss Customs Administration (2014), OECD (2014), SNB (2014), Eurostat (2014)
Note: Real export values are smoothed using a moving average filter with 4 leads and lags.
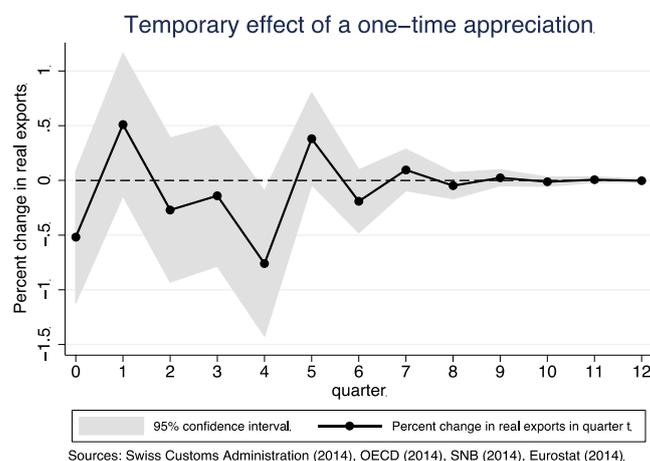

Methods

We estimate time series models (autoregressive distributed lag models) relating changes in real exports x_t to changes in the real exchange rate (index) rer_t and trading partners' gross domestic product gdp_t:

$$x_t = \alpha + \sum_{i=0}^{I} \rho_i x_{t-i} + \sum_{k=0}^{K} \beta_k \, gdp_{t-k} + \sum_{j=0}^{J} \gamma_{t-j} \, rer_{t-j} + A_t + v_t$$

To check the sensitivity of our results with respect to model specification and data structure we also estimate dynamic panel data models (Arellano and Bond 1991).

Results & Discussion

We find that a one-time appreciation of the Swiss franc of 1% leads to a *temporary* decrease in real agro-food exports of 0.8% after 4 quarters. However, an appreciation of 1% in every quarter leads to a *permanent* reduction in exports of 0.9% per quarter. These effects are relatively low and of the same order of magnitude as for exports of machinery, precision instruments or watches and jewellery (Hanslin *et al.* 2014). Our analysis suggests that Swiss agro-food products have a relatively low elasticity of substitution. It seems that businesses are pursuing a differentiation strategy based on product quality, which enables them to successfully avoid price competition abroad. But the effects might also be dampened as imported input goods become cheaper, and firms reduce their exposure to exchange rate risk by developing new markets in Asia and America (diversification).

Temporary effect of a one–time appreciation

95% confidence interval   Percent change in real exports in quarter t

Sources: Swiss Customs Administration (2014), OECD (2014), SNB (2014), Eurostat (2014)

Abstract

By how much do Swiss agro-food exports decrease on average if the Swiss franc appreciates? We find that a one-time appreciation of 1% leads to a *temporary* decrease in exports of 0.8% after 4 quarters. However, an appreciation of 1% in every quarter leads to a *permanent* decrease in exports of 0.9% per quarter. These effects are relatively low and of the same order of magnitude as for exports of precision instruments or watches and jewellery. It seems that agro-food businesses are able to avoid price competition abroad by pursuing a product differentiation strategy based on quality.

Literature:
Arellano M. and Bond S., 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and Application to Employment Equations. *The Review of Economic Studies* (2), 277-297.
Hanslin S., Lein S.M. and Schmidt C., 2014. Exchange Rate and Foreign GDP Elasticities of Swiss Exports Across Sectors and Destination Countries. Working Paper. Swiss National Bank, Zurich.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
Agroscope

Agroscope

good food, healthy environment