



The new SNB exchange rate index

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The Swiss National Bank (SNB) is putting the exchange rate indices it calculates and publishes on a new footing. This article describes the construction elements of the new exchange rate index and the results obtained from it. The key aspects of the revision are, first, a weighting of countries on the basis of imports, exports and so-called third-market effects; second, the inclusion of trade in services in the weighting; and third, a continuous updating of the countries incorporated into the index. The methodological changes in the calculation of the new index have almost no effect on the development of the nominal index. The difference between the nominal and real index (CPI-based) has increased slightly with the new calculation. This is explained by the fact that a number of countries with above-average rates of inflation have been allotted a greater weighting in the new index.

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The Swiss National Bank (SNB) has calculated and published effective exchange rate indices for many years. Exchange rate indices serve as an indicator of the price competitiveness of a country. They are calculated on the basis of bilateral exchange rates, information on trade flows, and – in the case of real effective indices – information on price developments.

The SNB has decided to put the exchange rate indices it calculates and publishes on a new footing. Due to the improved data situation, it can draw on new calculation methods in this respect. These methods are applied internationally – such as by the International Monetary Fund (IMF) and the Bank for International Settlements (BIS) – and are viewed as the standard for the calculation of exchange rate indices. Where implementation is concerned, the SNB has sought to design the index in such a way that it is transparent and robust with regard to methodology and data sources, and can be calculated on a daily basis.

The key aspects of the revision are:

- Application of the weighting method used by the IMF, which takes into account so-called third-market effects.
- Continuous updating of the countries incorporated into the index.
- Calculation of a chained index.

As a result of these adjustments, the new effective exchange rate index replicates the multifaceted competitive and trading relationships of the Swiss economy in a more comprehensive and up-to-date way. In addition, the SNB now also provides exchange rate indices that have been deflated with producer prices.

Section 1 of this article describes the main elements of the new effective exchange rate index, while section 2 sets out the corresponding results. Finally, section 3 provides information on the future publication of these data. More detailed information on the methodology applied can be found in the *SNB Economic Studies* (11/2017). The new exchange rate index is also commented on in the monetary policy report section of this *Quarterly Bulletin* (cf. p. 23).

KEY ELEMENTS OF THE NEW EFFECTIVE EXCHANGE RATE INDEX

More comprehensive incorporation of competitive relationships and trading in services

In the calculation of the effective index, bilateral exchange rates are weighted in keeping with the significance of the trading partners as competitors of the Swiss economy. In the previously published effective exchange rate of the SNB, the country weightings were based solely on Swiss goods exports. However, an export-weighted index of this kind only reflects the competition between Switzerland and its trading partners in the latter's domestic markets. In reality, competition between trading partners A and B can be found not only in B's domestic market, but also in A's domestic market and in third markets where A and B compete with one another.

The IMF's 'weighting scheme'¹ – or weighting method – replicates these multifaceted competitive relationships. Three aspects play an important role here: First, competition with foreign suppliers in their own domestic markets (bilateral export competition); second, competition between domestic suppliers and foreign suppliers in the Swiss domestic market (import competition); and third, competition between foreign suppliers in third markets (export competition in third markets).

For the calculation of the weightings, data on global trade flows are used – which now also include trade in services, which is significant for Switzerland.

Variable group of countries

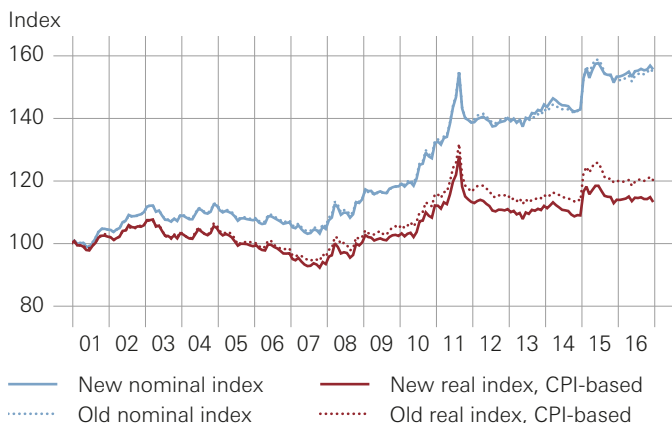
The global economy has experienced some major upheavals in recent decades. Countries that formerly played only a minor role in the international flow of services and goods have become important trading partners for Switzerland. The fixed group of countries that was previously used to calculate the effective exchange rate index failed to take sufficient account of this development. Accordingly, from now on all countries that account for an export share or import share of more than 0.2% in either the current or the previous period will be included. The threshold of 0.2% ensures that all key countries are represented in this group of countries. If the threshold were to be set lower, problems would rapidly emerge with respect to the availability of data. This would run counter to the SNB's objective of being able to calculate an index on a daily basis that is robust from a data standpoint. On average, 43 countries are included in the new calculation, of which a core group of 39 has been permanently represented in the index since 2000.

¹ Cf. Zanella and Desruelle (1997), A primer on the IMF's information notice system, *IMF Working Papers*, WP/97/71.

Chart 1

COMPARISON OF OLD AND NEW EFFECTIVE EXCHANGE RATE INDEX

December 2000 = 100



Source: SNB

Chained index

The new index is a chained Törnqvist index. The country weightings are calculated as the arithmetic mean of the weightings from both the current period and the previous period. By contrast, the previous Törnqvist index had a fixed basis. Here the weightings were an arithmetic mean of the weightings of the current period and a base period (1999).

The selection of a chained index ensures that the group of countries can be variable, so that current developments in the trading of goods and services can be rapidly replicated in the index. If the significance of a country for Swiss foreign trade rises sharply (e.g. in the case of China), the previous index would only capture this development with a time lag. Now, changes in the structure of international trade flows show up quickly in the index weightings, as the base period for the comparison of current observation values no longer lies far in the past.

Real indices now also based on producer prices

The SNB will continue to calculate not only a nominal but also a real effective exchange rate index. Up until now, the only deflator used has been the consumer price index (CPI). In future, the SNB will also calculate and publish a real effective exchange rate index which is deflated with the producer price index (PPI). The CPI has the advantage of being internationally harmonised to a significant degree, and also available rapidly in most cases. However, it also includes the prices of goods that are not traded internationally. Moreover, the prices of capital goods are not taken into consideration. While the PPI does capture capital goods, it is only comparable internationally to a limited extent, as the underlying basket of goods is heavily influenced by country-specific production structures. In addition, it is only available with a time lag. These advantages and disadvantages need to be weighed up when using a real exchange rate index.

RESULTS

The methodological changes in the calculation of the effective index have virtually no effect on the development of the new nominal index. As chart 1 shows, however, the difference between the nominal and real index (CPI-based) has increased with the new calculation. This is explained by the fact that countries with a greater weighting in the new index have higher average rates of inflation than those whose weighting has been reduced.

The above-mentioned shift in country weightings is essentially attributable to two factors.

- The new index uses the IMF weighting method, whereas the weightings of the previous index were exclusively export based. The additional incorporation of import and third-market components has an impact on the country weightings.
- As the new index is a chained index, any change in the foreign trade importance of a trading partner feeds into the new index more quickly than in the previous version.

Table 1 shows the resulting changes in the weightings of Switzerland's key trading partners.

Finally, chart 2 compares the new real exchange rate indices on the basis of consumer prices (CPI-based) and producer prices (PPI-based).

PUBLICATION OF DATA

Data for the new exchange rate indices from 1973 onward are available on the SNB's data portal (data.snb.ch). In order to help data users adjust to the new indices, the SNB will continue to calculate the exchange rate index under the previous method for one more year. These results will likewise be published – alongside the new data – on the SNB's data portal.

Chart 2

REAL EFFECTIVE INDEX

December 2000 = 100



Source: SNB

Table 1

WEIGHTINGS OF KEY TRADING PARTNERS IN THE OLD AND NEW INDICES FOR 2016

Weightings in percent

	Germany	France	Italy	Euro area	United Kingdom	United States	Hong Kong	China	Japan	India
Old index	22.0	8.9	7.6	52.9	10.1	14.8	2.2	2.6	3.9	0.6
New index	17.2	6.6	6.1	42.7	8.3	13.9	2.9	8.1	2.5	3.7