

Residual method – an alternative approach to compilation of foreign liabilities

Data on Finnish portfolio investment liabilities in the balance of payments are being revised on the basis of an alternative methodology. These significant revisions reduce the balance of payments net errors and omissions.

The sum of the components of the balance of payments (BOP) – current account, capital account and financial account – is by definition zero. This is rarely realised in practice, and the statistical discrepancy is recorded as a separate BOP item, net errors and omissions. This residual item consists of data that cannot be allocated elsewhere in the BOP, erroneously recorded data and other deficiencies and inconsistencies. In the long term, the cumulated residual item should approach zero. The residual item has traditionally been small in the Finnish BOP, but especially since the end of 2008 net errors and omissions have increased and the cumulated residual item has been negative. An expert group at the Bank of Finland has been analysing the possible reasons for the growing residual item using several different approaches.¹ One of the specific areas of analysis featured the statistical compilation of portfolio

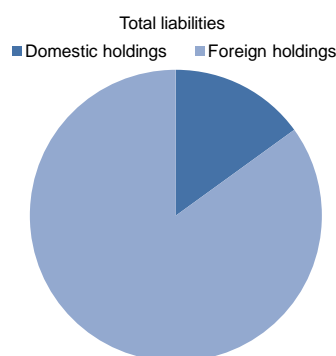
investment liabilities and the question of whether the current BOP compilation method overestimates the share of foreign holdings in total portfolio investment liabilities. The results of the residual method based on alternative sources showed that the current statistical method indeed overestimates foreign portfolio investment liabilities.

Residual method

The residual method essentially affords a simple way to calculate the foreign share of portfolio investment liabilities. Instead of collecting data directly on foreign holdings of domestic securities, the focus is on the domestic counterpart. The method requires reliable data on both the total amount of portfolio investment liabilities issued and the domestic share of such liabilities. Deducting the domestic share of debt securities from total liabilities yields a residual that is the amount of foreign holdings (Chart 1).

¹ See Finland's balance of payments – Annual review 2011–2012/I–II, <http://www.suomenpankki.fi/en/tilastot/maksutase/Pages/vuosikatsaukset.aspx>.

Chart 1. Principle of residual method



What appears to be a simple calculation involves in practice a complex analysis that must take account of a large array of different types of variables. The calculations for borrowing sectors and stocks and flows of portfolio investment liabilities are done separately for each instrument. Besides the challenges of source selection and harmonisation of frequency, there are also instrument- and sector-specific problems. Even though there are fundamental differences in the treatment of stocks and flows, these cannot be treated separately from each other. Changes in stocks and flows must be consistent, and therefore the interrelations must be taken into account.

Once source data are selected and processed for calculation, domestic holdings from the selected sources are summed and deducted from the total amount of liabilities issued. This gives the foreign holdings by the residual method, which are compared with foreign holdings for the current statistical method. The difference between these two figures is the revision. Finally, it must be confirmed that the new stocks and flows are consistent and that there are no dubious valuation changes. Such changes can be levelled out by fine-tuning the estimation of monthly stocks and flows.

Selection of sources and treatment of source data

Many of the challenges relate in various ways to the selection of sources and treatment of source data. Possible sources were the Bank of Finland's own surveys for banks, investment funds and custodians, Statistics Finland's financial accounts and outstanding credit statistics, and data published by the State Treasury.

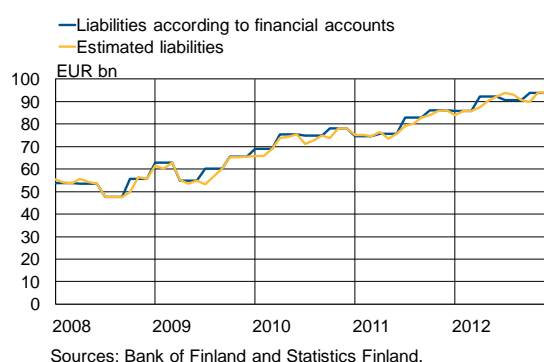
Attention must be paid to the valuation of figures and accrued interest, since the analysis requires market values that include accrued interest. For the reliability of the calculation, the total amount of liabilities issued is of particular importance, since every inconsistency therein will affect the outcome. Consequently, particular attention has to be paid to the source of the total amount of liabilities issued. Selecting the best and most appropriate source was not entirely obvious for all domestic holder sectors, since the sources provide diverging figures for sectors that are more difficult to treat statistically, such as households. Because of the relatively long review period – years 2008 to 2013 – the available sources also change over time. For the first years of the revision, the source for total portfolio investment liabilities was the securities issuance statistics. As of mid-2010, these statistics were supplemented with data from the Bank of Finland's statistics on monetary financial institutions' balance sheets. Source data on domestic holdings have also improved over time. For year 2008 data, the quarterly financial accounts were the only source used. Thereafter, source data were supplemented with data collected by the Bank of Finland from custodians, investment funds and MFIs.

Harmonisation of frequency

The use of financial accounts as an important source poses a challenge relating to data frequency. The balance of payments is compiled on a monthly basis, as are other statistics produced by the Bank of Finland, whereas the financial accounts compiled by Statistics Finland are published at quarterly intervals. In order to use financial accounts as a source for monthly calculations, monthly changes need to be estimated from quarterly data in a reliable manner. Development of estimation methods, especially for monthly flows, proved to be one of the most difficult elements of the residual analysis.

Estimation of monthly changes in stocks from quarterly observations is based on benchmark monthly data that can be assumed to fluctuate much like the estimated data. Monthly changes are estimated by following the path of the benchmark data and fixing the last observation of a quarter at the original quarterly observation (see Chart 2 for an example of Q and M series of central government liabilities).

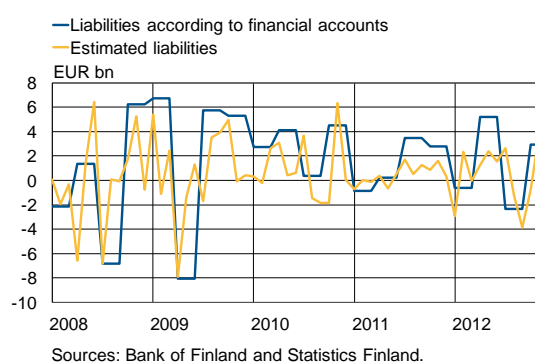
Chart 2. Central government's foreign portfolio investment liabilities according to financial accounts and estimated monthly stocks



Estimation of monthly flows from quarterly flows, in turn, is based on the distribution of differences in reliably-estimated monthly stocks, ie the distribution of total changes (see Chart 3 for an example of Q and M series of central government liabilities). This

estimation method performs well if there are no major valuation changes in the quarter. If the distribution of total changes reflects valuation changes more than actual flows, the method may produce doubtful flow figures within quarters. However, in such cases the error will only affect the quarter in question.

Chart 3. Flows of central government's portfolio investment liabilities according to financial accounts and estimated monthly flows



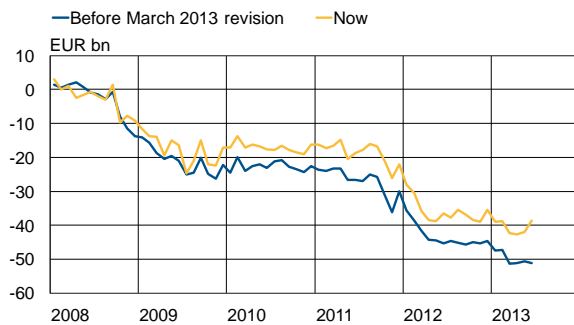
Revisions based on the method

Stocks and flows of liabilities of the central government, monetary financial institutions and non-financial corporations have been revised as of data for 2008 onwards based on results using the residual method. The first major revisions were published in March 2013², the second in September³. The revisions have substantially improved the cumulated residual item (Chart 4).

² See the monthly BOP news release, March 2013, Appendix, http://www.suomenpankki.fi/en/tilastot/maksutase/Documents/Appendix_methodology_27032013_en.pdf.

³ See Finland's balance of payments – Annual review 2013, <http://www.suomenpankki.fi/en/tilastot/maksutase/Pages/vuosikatsaukset.aspx>.

Chart 4. Cumulated net errors and omissions, 2008–2013/I, before and after revisions



Source: Bank of Finland.

The revisions are accomplished by revising data for the previous quarter according to the publication schedule of an important data source – Statistics Finland’s financial accounts. The Bank of Finland estimates the revisions to the stock of foreign portfolio investment liabilities already in the monthly statistical release, but revisions to flow data are at the moment not published before the quarterly revision to the statistics. The aim is to develop a method that enables forecasting of revisions to flow data and faster calculation of revisions affecting net errors and omissions.

Further information:

Anni Salo, tel. +358 10 831 2480, and

Elina Somervuori, tel. +358 10 831 2428,

e-mail: [firstname.surname\(at\)bof.fi](mailto:firstname.surname(at)bof.fi)