

## Documentation

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### Reconciliation of Denmark's external assets and liabilities

*The publication of quarterly financial sector accounts from January 2010 creates integration between the real and financial sides of the quarterly sectoral national accounts. This has provided a consistent framework for analysing developments in key financial and real macroeconomic concepts, which in turn may contribute to a better understanding of the interaction between the financial sector and the real economy.*

*To ensure consistent compilation of external debt across Danmarks Nationalbank's statistics, Denmark's external assets and liabilities were thoroughly revised in connection with the change.*

*This has improved coherence between developments in the current account and Denmark's external assets and liabilities.*

*In the period from January to June 2010, Danmarks Nationalbank implemented a consistent reconciliation method for all breakdowns by sector, currency and country included in the compilation of Denmark's external debt. This paper describes and documents the methodology chosen.*

#### 1. Background

Denmark's external assets and liabilities are known as the *international investment position* (IIP), which is a stock statement<sup>1</sup>. It shows the value of a country's financial assets and liabilities vis-à-vis abroad at a given time. If liabilities exceed assets, it is known as foreign debt.

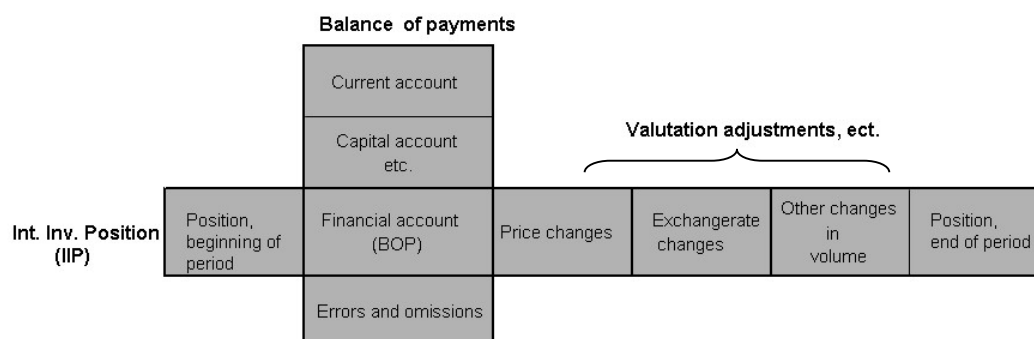
Likewise, the *balance of payments* (BOP) shows the flow of economic transactions between a country (in this case Denmark) and abroad within a given period – typically one month. The international investment position changes with every transaction. Moreover, valuation adjustments affect the value of the total stocks and thus the IIP. The relationship between the IIP and the balance of payments is given by:

$$\begin{aligned} & \text{stock, beginning of period (IIP)} \\ & + \text{financial transactions within the period (balance of payments)} \end{aligned}$$

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<sup>1</sup> See also "Denmark's balance of payments and international investment position", Danmarks Nationalbank, January 2007.

+ valuation adjustments during the period (price, currency and other changes in volume)  
 stock, end of period (IIP)



The balance of payments comprises the following three accounts:

1. Current account
2. Capital account, etc.
3. Financial account.

The balance of payments is compiled on the basis of the double book-keeping principle. This entails that the balance of the current account and capital account matches the balance of the financial account. In other words:

1. + 2. + 3. equals zero.

In practice the two sides often differ as result of errors and omissions or statistical discrepancy. Errors and omissions are defined as:

- ◆ the difference between registered transactions under the financial account on the balance of payments on the one side – i.e. 3.
- ◆ and transactions relating to the current account plus the capital account (net lending/net borrowing) on the other side – i.e. 1. plus 2.

For example, different compilation methods and value dates could mean that errors and omissions differ from zero. Due to cumulative errors and omissions, registered stocks may not always reflect the underlying real economic transactions. Reconciliation ensures that errors and omissions are distributed, thereby ensuring greater coherence between the current account and the IIP. In the period from January 2005 up to and including March 2010, aggregate errors and omissions total kr. 154 billion. This should be seen in relation to a cumulative current account surplus of kr. 252 billion in the same period.

## 2. Method of reconciliation

No link has been identified between errors and omissions and individual IIP items, so reconciliation is based on a simple distribution key. The point of departure has been the sizes of the individual items relative to the total balance (assets plus liabilities) at the end of a given period. Cumulative

errors and omissions have then been distributed as transactions under the individual items, depending on their share of the total balances.

The distribution key's weighting of item  $i$ ,  $W_i$ , is given as follows at the time  $t$ :

$$W_{it} = \frac{Stock_{it}}{\sum_{j=1}^n Stock_{jt}}$$

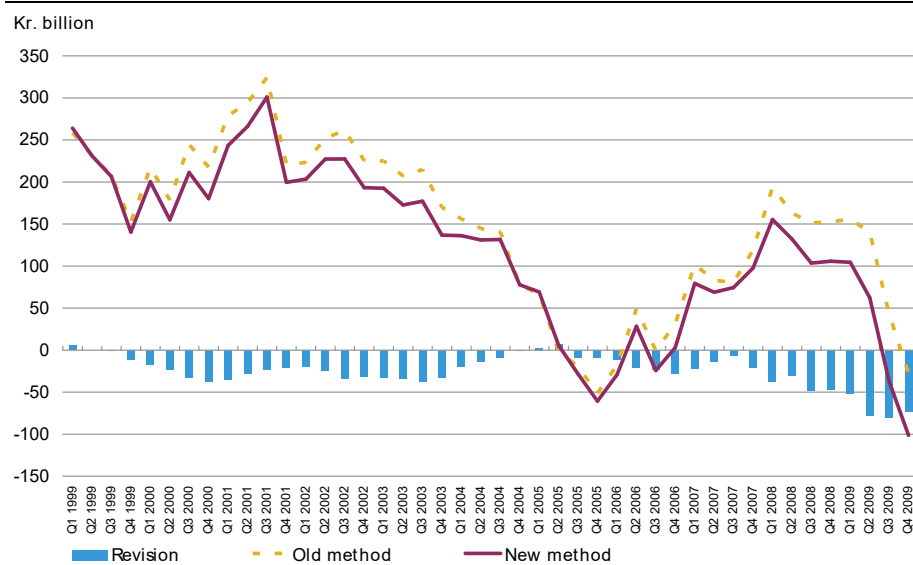
And adjustment of transactions (i.e. reconciliation) takes place by multiplying errors and omissions by these weights:  $E \& O \cdot W_{it}$

We have chosen to neutralise the impact of the MFI sector's balance sheets by letting the constructed reconciliation transactions be offset by valuation adjustments with the opposite sign. The reason is that we have more detailed information about this sector's stocks as Danmarks Nationalbank compiles monthly balance and flow statistics for the MFI sector.

Danmarks Nationalbank's stocks are not reconciled, as we have a full overview of all transactions and valuation adjustments. Nor is general government reconciled as this sector has already been reconciled by Statistics Denmark.

The consequence of keeping the impact on the MFI sector's balance sheets neutral and not including Danmarks Nationalbank and general government is that only around half of the cumulative errors and omissions – a good kr. 73 billion – are reflected directly in the stocks, cf. Chart 1.

DENMARK'S FOREIGN DEBT, NEW AND OLD COMPILATION METHODS Chart 1



Source: Danmarks Nationalbank.

### 3. Example of reconciliation

The reconciliation method can be illustrated by a simple numerical example. Assume that there are only two sectors in Denmark: non-financial corporations and financial corporations (MFI). The sectors' stocks comprise assets (claims on abroad, e.g. shares) and liabilities (foreign claims, e.g. loans). The fictitious stocks are shown in Table 1. Furthermore, assume that that unreconciled valuation adjustments are zero for both sectors in the period under review. Finally, errors and omissions for distribution have been set at -10. Non-financial corporations' stocks make up 500 out of the total of 1,000 (assets plus liabilities) at the end of the period. Therefore, in principle half<sup>2</sup> of the errors and omissions should be distributed to this sector. For the assets side, the weight is 1/10 (100 out of 1000) and for the liabilities side 4/10 (400 out of 1000). The weights are multiplied by errors and omissions – with a negative sign for the liabilities side. This means distributing -1 to the assets side and 4 to the liabilities side so that net assets are reduced by 5 (-10 x 0.5). This is added to transactions and is thus reflected in a change in stocks.

The financial sector also holds half of the total stocks. However, in this case the end-of-period stocks are not to be affected by the reconciliation, so opposite valuation adjustments are added. This neutralises the changes from transactions, and assets and liabilities at the end of the period remain unchanged in the reconciled example.

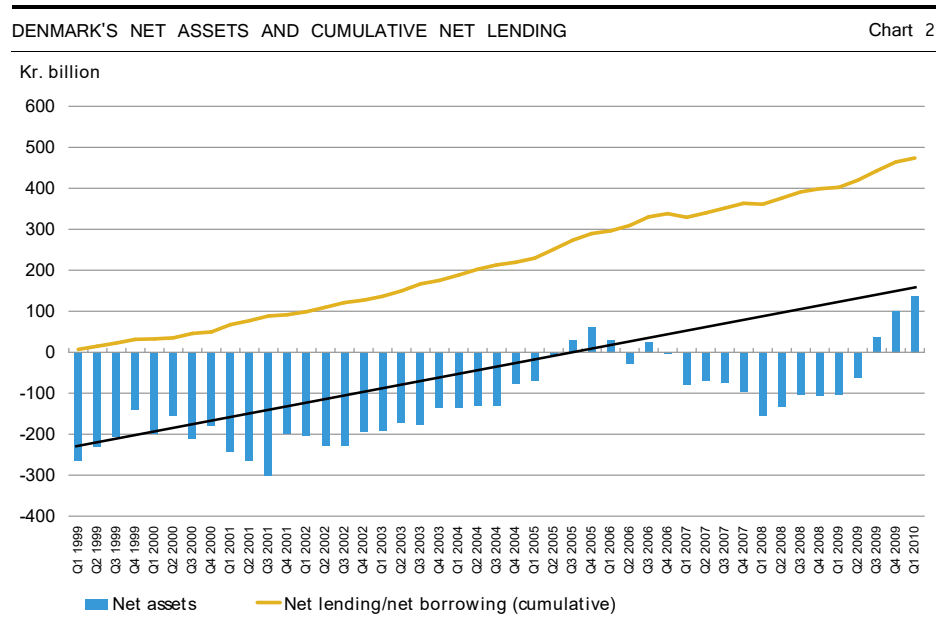
Unit	Start of period: Assets	Start of period: Liabilities	Transaction: Assets	Transaction: Liabilities	Valuation adjust-ment: Assets	Valuation adjust-ment: Liabilities	End of period: Assets	End of period: Liabilities
Unreconciled: Non-financial corporations ...	90	393	10	7	0	0	100	400
Unreconciled: Financial corporations .....	295	191	5	9	0	0	300	200
Reconciled: Non-financial corporations ...	90	393	9	11	0	0	99	404
Reconciled: Financial corporations .....	295	191	2	11	3	-2	300	200

### 4. What drives the net external position?

Developments in the net external position are practically identical with the new and the old method and are driven by the same factors. Developments are still driven by the current account surplus and valuation adjustments of assets and liabilities. However, the change of level reflects better coherence between the current account and long-term developments in net assets, cf. Chart 2.

<sup>2</sup>  $((100+400)/(100+400+300+200) = 0.5)$

Fluctuations in valuation adjustments may, especially in the short term, influence the value of assets and liabilities vis-à-vis abroad, but in the long term they often cancel out each other so that current-account developments drive developments in net assets.



Note: Net lending/net borrowing is given by the current account of the balance of payments plus the capital account, etc.  
 Source: Statistics Denmark, StatBank Denmark and Danmarks Nationalbank.