The reliability of today's financial macro-indicators

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Norges Bank's key rate (sight deposit rate) is set on the basis of information concerning developments in a number of economic and financial variables. In order to provide the optimal basis for monetary policy decisions, it is important that these key indicators show results that are as correct as possible at the earliest possible point in time. The credit indicators C2 and C3, the money supply M2 and household net lending are important financial variables underlying monetary policy decisions. This article presents an analysis of the data quality of these indicators when they are initially published. Figures for household net lending in Norges Bank's financial accounts are also compared with corresponding data calculated in the income account in the national accounts, which have been used as a reference in this discussion.

We conclude that there are relatively small revisions to the C2 and M2 figures, and that the size of the revisions has been gradually reduced over the past few years. For credit from foreign sources, and thereby for C3, revisions of the figures are larger and more frequent. Household net lending is also revised over time, but the initially published figures capture the main features of the final figures relatively well.

Introduction

The quality of initially published data for an indicator is often referred to as its "real time properties". More precisely, the real time properties of an information source refer to its ability to measure the "true" movements in the area covered at the earliest possible point and in the most accurate manner possible. An indicator where it is unlikely that initially published figures will be subsequently revised, where any corrections can be expected to be minor and where the change from one period to the next that is indicated by the figures is seldom reversed as a result of revision, may be said to have good real time properties.

Monetary policy decisions (interest rate setting) are taken on the basis of information concerning developments in a number of economic and financial variables, which is combined to provide a picture of the inflation outlook. The interest rate is set on the basis of the relevant information that is available at the time the decision is taken. A necessary precondition for setting the "right" interest rate is therefore that the real time properties of these variables are good. The credit indicators C2 and C3, the money supply M2 and household financial accounts are important financial variables underlying monetary policy decisions. An analysis of real time properties for these financial indicators is therefore of particular interest from a monetary policy point of view.

In July 2003, the International Monetary Fund (IMF) published Report on the Observance of Standards and Codes, which includes an in-depth data quality assessment of a range of Norwegian statistics compiled by the Ministry of Finance, Norges Bank and Statistics

Norway. One of the areas assessed was monetary statistics, including money supply and credit indicator statistics, and the Norwegian statistics achieved a very high score in most data fields. The IMF has a number of criteria that must be met before a statistics producer can be said to follow best international practice. One of these criteria is that revisions of the various statistics are regularly analysed and the results published. A detailed description of what the IMF regards as sound revisions policy is provided in Carson, Khawaja and Morrison (2003, pp. 13–19).

Principles for analysis

In a monetary policy context, figures for both levels and growth rates for credit indicators and the money supply are of interest. However, the assessment of ongoing economic developments is primarily concerned with growth rates. In our study of the real time properties of the credit indicator C2 and money supply M2, we have therefore based our study on the published monthly figures for growth rates in the period January 1997-June 2003, focusing on any differences between initial and "final" figures. In addition, we have studied these differences to discover any systematic deviations. As a measure of the degree of revision, we study the difference in percentage points between initial and final figures for twelve-month growth rates. Under Norges Bank's revisions policy, the time series for credit and money supply variables are routinely revised in the monthly publications. This means that the latest publication contains the figures that in our view are most correct at any given

time. To establish more precisely how much of the difference between initial and final growth rates is due to revisions in the source data, however, the final figures (the answer) must be adjusted to accommodate changes in definitions, methods and sources. The idea is that the definitions, methods and sources that were used when the figures were initially published, i.e. in real time, are used for the whole period.

There are no "absolutely final figures" in a series of economic figures. It will always be possible to change the figures at a later stage as a result of revisions in the source data (ordinary revisions) or when series are readjusted after the introduction of new definitions, methods and sources. These reorganisations are made to obtain more correct and consistent historical series. In our experience, most ordinary revisions in C2 and M2 occur in the first three months after initial publication, while there are very few revisions later than this. Our normal practice will therefore be to regard the time series for C2 and M2 published in June 2003 as the "final answer" for a study period up to March 2003.

For credit from foreign sources, and thereby also C3, publication involves a time lag that is just over a month longer than for C2 and M2. At the time of writing, data have only been published for credit from foreign sources and C3 up to end April 2003, and in principle final figures only up to end January 2003. In this article, we have therefore chosen to regard figures up to end December 2002 as final for C2, M2, credit from foreign sources and C3.

Another set of key statistics underlying monetary policy decisions is household financial accounts. These statistics provide a description of households' financial position and summarise this sector's behaviour in financial and credit markets by calculating net lending for this sector.

Real time properties are analysed by comparing initial figures for net lending with the most recently published time series. So far, the financial accounts have not been subject to major structural revisions, and the revisions discussed in this article are therefore ordinary revisions of the figures.

Net lending in the financial accounts is also compared with household net lending as calculated in the income account of the national accounts (Statistics Norway). We have not attempted to comment on the real time properties of the income account[1], but have used the income account as a reference in our discussion of the financial accounts. One of the main issues is whether the accounts reflect the same overall picture or whether the differences have widened over time. The differences between these two methods of calculating net lending have been relatively substantial in periods. Factors that may serve to explain some of the differences observed are also discussed in this article.

1. Real time properties of credit indicators

Introduction

As explained above, the real time properties of the credit indicators C2 and C3 are assessed based on an analysis of the degree of revision. Definitions and symbols used for the credit indicators are described in a separate box. For editorial reasons, the real time properties of the credit indicator C1 have not been analysed in this article. Nor have the revisions been decomposed by credit source or borrowing sector.

In the period 1997-2000, data for credit from foreign sources and C3 were only published every quarter, although figures for all the months in each quarter were included. For the period before 2001, the figures for these two indicators for the first two months in each quarter had therefore already been revised when they were published for the first time. For these series, only the figures for the last month in the quarter are real first version figures when published for the first time. For

Definitions and symbols used for the credit indicators

Norges Bank's credit indicators C1 and C2 are approximate measures of the size of the domestic gross debt of the public (households, non-financial corporations and municipalities). C1 is limited to domestic gross debt in NOK, while C2 also includes gross domestic debt in foreign currencies. Credit indicator C3 is more comprehensive than C2, as it is an indicator of the public's total gross indebtedness to domestic and foreign sources in both NOK and foreign currencies.

Sources of domestic credit in NOK (C1) are loans in NOK to the public from banks, state lending institutions, finance companies, life and non-life insurance companies, mortgage companies, private and municipal pension funds, the Norwegian Public Service Pension Fund and Norges Bank. C1 also includes the public's bond and short-term paper debt in the domestic market.

Domestic credit (C2) comprises, in addition to C1, the public's borrowing in foreign currency from Norwegian financial corporations.

Total credit (C3) consists, in addition to C2, of the sum of public borrowing from foreign sources with the exception of foreign shareholdings in Norwegian enterprises. This is consistent with the definitions of C1 and C2, which also exclude equities.

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[1] Statistics Norway explains the revisions from preliminary to final figures when new versions of the current national accounts are published. Statistics Norway has also analysed the revisions of the figures in connection with the general revision and numerical revisions of the figures in 1995 and 2002.

Table 1. Revisons of twelve-month growth for credit indicator C2. Percentage points

Year	Annual average for degree of revision	Smallest revision (numerical value)	Largest revision (numerical value)
1997	0.18	0.0	0.4
1998	0.16	0.0	0.3
1999	0.20	0.0	0.5
2000	0.11	0.0	0.3
2001	0.13	0.0	0.3
2002	0.07	0.0	0.2

Chart 1 Final annual rates and first-version annual rates for credit indicator C2. Per cent

Source: Norges Bank

credit from foreign sources and C3, therefore, we have only been able to compare figures for the quarterly months for the period before 2001. As from 2001, credit from foreign sources and C3 have been published every month and are therefore treated in the same way as C2.
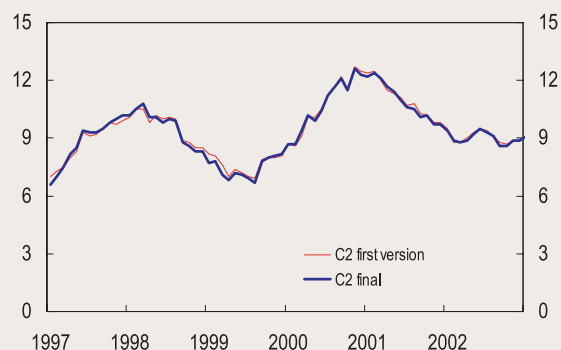
Results for C2 – domestic credit

Table 1 shows annual averages for the degree of revision and the smallest and largest revisions for individual months in C2, measured in percentage points through-out, based on published statistics for the period 1997-2002. As mentioned earlier, the degree of revision indicates the change in percentage points in the relevant indicator's twelve-month growth from initial publication of the figures until they were finalised for each month. The annual average for the degree of revision shows the arithmetic average for the degree of revision for all the months in the year in question.

As shown in Table 1, twelve-month growth in C2 was revised by approximately 0.2 percentage point on average for the months in 1997, 1998 and 1999. The annual average has since been reduced and was 0.07 percentage point in 2002. The largest revisions in monthly figures for each year have also gradually been reduced in the course of these six years, while the smallest revisions have been 0.0 percentage point throughout the study period.

Only twice in the course of the six-year period has the sign for the change in growth rates from one month to the next been reversed as a result of revision. The initially published growth rates have thereby provided a very good indication of the direction of changes in growth rates in the period.

Chart 1 shows final annual rates and first-version annual rates for C2, and shows that only very slight revisions are made to C2. Nor are there any indications that revisions are systematic. In other words, there does not seem to be a tendency for initially published growth rate figures to either overestimate or underestimate the "final" figures.

Results for credit from foreign sources

Table 2 shows annual averages for the degree of revision and smallest and largest revisions for individual months in credit from foreign sources, measured in percentage points throughout, based on published statistics for the period 1997-2002.

Twelve-month growth in credit from foreign sources was revised by an average 3.90 percentage points for the months in 1997. The annual average for the degree of revision fell in 1998 and 1999, but increased sharply again in 2000. In 2001 and 2002, the degree of revision was lower again, close to the 1999 level. The year 2001 is the last year figures from the census of foreign assets and liabilities[2] were used. When these figures are also included for 2002, the degree of revision will probably increase for this year.

The maximum and minimum values for the degree of revision in credit from foreign sources generally follow the same pattern as the average figures.

Table 2. Revisions of twelve-month growth for credit from foreign sources. Percentage points

Year	Annual average for degree of revision	Smallest revision (numerical value)	Largest revision (numerical value)
1997	3.90	1.8	6.3
1998	2.98	0.4	4.9
1999	1.70	0.8	2.7
2000	4.70	2.8	6.0
2001	1.68	0.6	3.1
2002	2.30	0.1	3.7

[2] Stock data for credit from foreign sources are calculated by combining stock data from the census of foreign assets and liabilities (annual data) with data for transactions and valuation changes (monthly data) from the balance of payments statistics.

Table 3. Revisons of twelve-month growth for Credit indicator C3. Percentage points

Year	Annual average for degree of revision	Smallest revision (numerical value)	Largest revision (numerical value)
1997	0.65	0.3	1.0
1998	0.55	0.1	1.0
1999	0.33	0.1	0.7
2000	1.23	0.9	1.5
2001	0.53	0.0	1.0
2002	0.57	0.0	0.9

Chart 2 Final annual rates and first-version annual rates for credit indicator C3. Per cent

Source: Norges Bank

Results for C3 – total credit

Table 3 shows annual averages for the degree of revision and smallest and largest revisions for individual months in C3, measured in percentage points throughout, for the period 1997-2002.

The degree of revision in C3 lies, as might be expected, between the degree of revision in C2 and the degree of revision in credit from foreign sources and closest to the C2 results. The degree of revision in C3 has tracked the degree of revision in credit from foreign sources. The annual average for the degree of revision fell in 1998 and 1999 and rose in 2000, falling again in 2001 and 2002, although not to the low level reached in 1999.

The maximum and minimum values for the degree of revision in C3 have gradually improved through the six-year period with the exception for the temporary deterioration in 2000. In particular, the size of the smallest revision was reduced from 1997 to 2002.

Only four times in the course of the six-year period has the sign of the change in growth rates from one month to the next been reversed as a result of revision. In other words, the initially published growth rates have generally indicated the correct direction of growth from month to month in the study period.

Chart 2 shows final annual rates and first-version annual rates for C3.

Charts 1 and 2 show that there are generally larger revisions in C3 than in C2. As we have seen, revisions are in particular the result of changes in the figures for credit from foreign sources. The C3 chart also shows that growth in C3 was largely revised upwards in the period 1997-2000. In other words, the final growth rate figures were higher than the initial figures that were published. The chart indicates that C3 has been revised downwards as from 2001. The reason for these deviations is that additional information concerning credit from foreign sources often has to be supplied at a later time due to incomplete information at the time of initial publishing.
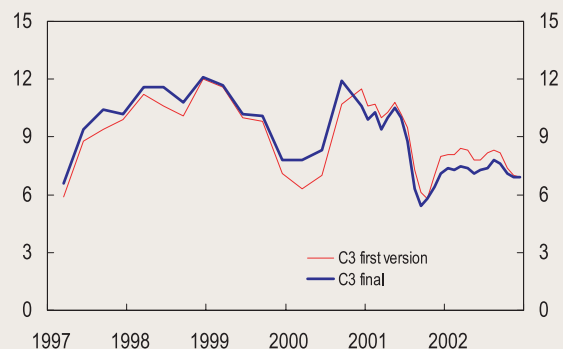
Source of "ordinary" revisions

The main data source for credit indicators is official financial statistics, where most data are transferred electronically to statistical authorities (Statistics Norway and Norges Bank) via financial corporations' computer centres. Ordinary revisions will therefore have to include ongoing revisions due to incorrect entries or incorrect use of codes in the reporters' accounting and statistical systems, errors in connection with delivery/receipt of data between reporters and computer centres, errors in connection with delivery/receipt of data between reporters/computer centres and statistical authorities and any errors in data processing by statistical authorities. Generally, revisions in these data are small in number and size.

The credit indicators are also based on statistics from the Norwegian Central Securities Depository, Norges Bank's bond issue statistics and the Norwegian Public Service Pension Fund. Revisions in the figures from these sources will also result in ordinary revisions.

For some of the credit sources for C2, data are only available every quarter or at the end of each year. Figures must be estimated for the intermediate months. This applies to

• bond debt (quarterly figures only prior to 2002, but monthly figures as from 2002)
• life insurance companies' lending (monthly data prior to August 2000, quarterly as from August 2000)
• non-life insurance companies' lending (quarterly figures)
• pension fund lending (annual data)
• intercompany loans (annual data, but not included in C2 as from figures for January 2000)

Revisions in C2 growth stemming from these sources are not necessarily related to the quality of the primary data, but may also reflect insufficient accuracy in the estimates.

Because of the transition to quarterly source data for life insurance companies' lending, figures for the intermediate months must be estimated. In isolation, this results in a somewhat higher degree of revision in C2 than previously. The fact that we no longer update pension fund lending monthly on the basis of sample figures, but as of January 2001 only make estimates for these figures, has the same effect. As previously, the figures are subsequently revised when the annual total figures are available. The degree of revision has been, however, reduced somewhat by the introduction of monthly figures for bond debt as from 2002.

There is a considerable difference between underlying data for domestic credit and credit from foreign sources. Data for domestic credit are mainly based on uniform accounts statistics for financial enterprises, which are only revised to a very limited extent. Data for credit from foreign sources are based on balance of payments statistics and the annual censuses of foreign assets and liabilities. Due to the complexity of data collection, data often have to be subsequently revised or supplemented, and these revisions can sometimes extend back over a lengthy period.

Adjustments

The "final answer", used in the comparison with initially published growth rates, is calculated on the basis of the last published time series ("unadjusted final answer"). In addition, these growth rates are adjusted for changes made in definitions, methods and sources in the course of the period to establish more precisely how much of the difference between initial and "final" growth rates is due to "ordinary" revisions.

The only adjustment in the credit indicators in the period 1997-2002 was made when the Norwegian Public Service Pension Fund was included in C2, and thereby also in C3, from July 2000 and incorporated in the data back to December 1995. The revisions as a result of this have been disregarded in this analysis.

C3 in more detail

All annual growth rates for the period December 2000-September 2001 for credit from foreign sources were revised down by about 2.5 percentage points in October 2001. This was due to corrections of errors in reports from a major reporter. These revisions resulted in turn in a downward revision of C3 growth by about 0.6 percentage point. However, other revisions have subsequently been made for credit from foreign sources that have had the opposite effect and have thereby neutralised the impact of this large revision.

The figures have also been influenced to some extent by the fact that the censuses of foreign assets and liabilities for the years 1998, 1999 and 2000 were only

incorporated into the data as from the publication of the C3 figures for January 2002. Even though the transaction figures for credit from foreign sources are not influenced by the census figures, the revisions in the stock data change the growth rates. However, this effect did not apply to any great extent to the period before December 1999. It should also be mentioned that the degree of revision was influenced by Statistics Norway's revisions of the national accounts figures, completed in summer 2002. This resulted in changes in transaction data, on which the figures for credit from foreign sources are based, as from March 2002. The revisions increased the growth rates for credit from foreign sources by up to 0.9 percentage point and the growth rates for C3 by 0.1 to 0.2 percentage point.

2. Real time properties of the money supply

Introduction

As from October 2000, the broad money supply concept (M2) is defined as the stock of notes and coins, unrestricted bank deposits and certificates of deposit owned by households, non-financial corporations, municipalities and "financial corporations other than banks and state lending institutions". Prior to October 2000, M2 also included "unutilised credit facilities."

The analysis of M2 studies the degree of revision in "change-based" growth rates, i.e. growth rates based only on changes in stock data in contrast to the analysis of credit indicators, which focuses on "transaction-based" growth rates. Transaction-based growth rates differ from change-based growth rates in that stock changes are adjusted for changes in the exchange rate and statistical breaks. The reason why we have not focused on transaction-based growth rates for the money supply is that these were first introduced as from September 2002. The length of this article does not permit an analysis of the real time properties of the other money supply aggregates (M0 and M1) or of which financial instruments have resulted in revisions, or to what extent some subsectors of the money-holding sector are revised more than others. This analysis only focuses on the real time properties of the broad money supply concept (M2) for 1997-2002, assessed on the basis of an analysis of the revision as it is defined for the credit indicators.

Results for the money supply

Table 4 shows annual averages for the degree of revision and the smallest and largest revisions for individual months in M2, measured in percentage points throughout, based on published statistics for all the months in the years 1997-2002.

**Table 4.** Revisons of twelve-month growth for the money supply (M2). Percentage points

Year	Annual average for degree of revision	Smallest revision (numerical value)	Largest revision (numerical value)
1997	0.53	0.0	1.4
1998	0.61	0.1	1.1
1999	0.38	0.0	0.8
2000	0.21	0.0	0.5
2001	0.08	0.0	0.2
2002	0.12	0.0	0.4

The table shows that the annual average for the degree of revision has been low for the past few years. In particular, the degree of revision has been clearly lower in the past two years, i.e. after the introduction of the new money supply definitions in October-November 2000. This applies to both the annual averages and the maximum and minimum values.

In addition, it has never been the case that the sign for the change in growth rates from one month to the next has been reversed as a result of revisions after this readjustment. This means that initially published growth rates have provided a good indication of the direction of changes in growth rates in the period.

Chart 3 shows final annual rates and first-version annual rates for the money supply (M2).The chart shows that there are relatively small revis-ions to the money supply (M2), i.e. that there is very close correspondence between the developments described by the initially published growth rates and those reflected in the "final" growth rates (the answer). The chart also shows that the difference between the curves has been reduced over the past few years. Nor is there any indication that initially published growth rates tend to either overestimate or underestimate the final figures.

Chart 3 Final growth rates and first-version annual rates for the money supply (M2). Per cent
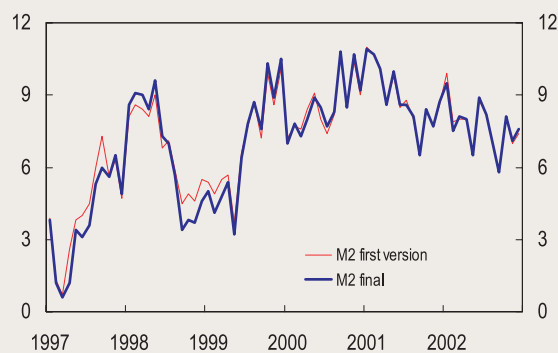
Source: Norges Bank

Source of "ordinary" revisions

As for credit indicator statistics, official financial statist-ics are the main source for monetary statistics. The same kind of revisions as mentioned during the discussion of credit indicator statistics are therefore applied to these statistics and the revisions are generally small in number and size.

Changes in additional sources – used in calculating stocks of notes and coins and holdings of certificates of deposit (CDs) as a result of inadequate sectoral information for these financial instruments – may also contribute to "ordinary" revisions in M2.

Adjustments

The "final answer", compared with the initially published growth rates, is calculated from the growth rates from the last published time series for M2 ("unadjusted final answer"). This is then adjusted for changes in definitions, methods and sources in the course of the period.
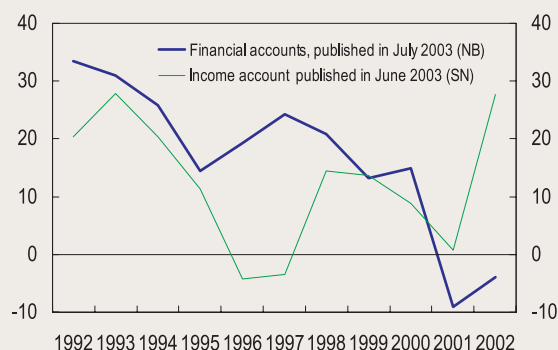
The most important change in definition is due to the reorganisation of money supply statistics in October 2000, in which "unutilised credit facilities" were removed from the broad money supply concept (M2). This reorganisation was based on the recommendations of an internal working group at Norges Bank and is in line with international recommendations for the calculation of money supply aggregates, cf. IMF (2000). In addition, corrections are made for the inclusion in the money supply of CDs in foreign currencies from November 2000. These were included because they are close substitutes for corresponding stocks in NOK. In addition, new sources were used from the same time. The third factor adjusted for is a change in the calculation of "unutilised credit facilities", made in January 2000. This change consisted of including figures for a bank that had previously been excluded from the calculations.

3. Real time properties of household net lending

Differences between income account and financial accounts

Household net lending is estimated in both the income account of the national accounts (Statistics Norway) and the financial accounts (Norges Bank). In principle, the figures for net lending in the income and financial accounts should be identical, but in practice some discrepancies are observed which vary in magnitude over time. It is important to point out initially, however, that these discrepancies are due to errors and deficiencies in both sets of accounts, and that neither provides a final answer.

Chart 4 Annual figures for household net lending. Income account (Statistics Norway) and financial accounts (Norges Bank). In billions of NOK

Sources: Statistics Norway and Norges Bank

Definitions of household net lending

In billions of NOK

Income account (Statistics Norway)	2001	2002
Disposable income	671,9	721,9
+ Adjustment for saving in pension funds	12,5	14,7
- Consumer expenditure	657,0	685,2
= Saving	**27,4**	**51,4**
- Net investment in non-financial assets etc.	26,7	23,7
= Net lending	**0,7**	**27,7**

Financial accounts (Norges Bank)	2001	2002
Assets	1339,9	1392,5
- Liabilities	982,8	1073,3
= Net financial assets	357,1	319,2
Net change in financial assets on previous year	**−44,7**	**−37,9**
- Valuation changes (gains less losses, other changes)	−35,7	−34,0
= Net lending	**−9,0**	**−3,9**

Comments:

1. In the income account, net lending is estimated as the difference between all income and expenses including consumer expenditure and expenditure on investment in non-financial assets.

2. In the financial accounts, net lending is calculated on the basis of aggregate financial assets and liabilities at the beginning and end of the accounting period. Changes in holdings are adjusted for capital gains and losses and other changes in financial assets and liabilities that are not due to households' own investments.

Source: Statistics Norway and Norges Bank

Chart 4 shows annual figures[3] for household net lending in the two sets of accounts for the years 1992 to 2002. As the chart shows, the accounts present roughly the same overall picture for the whole ten-year period 1992-2001, with the exception of the three years 1992, 1996 and 1997.

The figures for 2002 differ substantially, however. According to the income account, household saving rose sharply compared with the previous year, and more than the whole of this increase was attributable to net investments in financial assets, while investment in non-financial assets showed a decline in nominal value on the previous year (see box). Household financial accounts, on the other hand, indicate a far weaker trend for investment in financial assets. The results of the two methods of calculation differed by as much as NOK 32 billion in 2002, which is the largest discrepancy in the whole period. However, it is important to point out that figures for 2002 are preliminary in both accounts.

Definitional relationships underlying net lending in the two accounts are described in a separate box. The methods used for quantification differ. The income account is based on household income and expenses, and net lending is estimated as a residual item without an explanation in the accounts as to which financial transactions they are based on. The opposite approach is used in the financial accounts. Net lending is estimated as the difference between investments in financial assets (financial instruments) and debt raised during the accounting period. In contrast to the income account, the financial accounts explain the changes in net lending as a direct result of changes in behaviour in financial and credit markets for households.

In both the income and the financial accounts, net lending is estimated as a residual on the basis of large gross figures. The estimates are sensitive to statistical errors, and relatively small adjustments to the gross fig-

ures may have a substantial impact on investments in financial assets. For example, the value of household net lending in the financial accounts was only 0.16 per cent of households' aggregate assets and liabilities in 2002. Since the figures for net lending are so much lower than the figures on holdings, even a small percentage margin of error in the asset and liability calculations will change net lending substantially, not least if the revisions to assets and liabilities have the opposite effect.

Special factors that may explain the discrepancies between the income and financial accounts

In addition to factors that are due to very different statistical sources, there are five factors in the current

[3] Household financial accounts are published quarterly, but we have chosen to look at annual figures to allow comparison with the income account, which is only published annually.

statistical system that may explain the discrepancies between the income and financial accounts.

First, different emphasis is placed on the figures on changes and levels in the preliminary versions of the income and financial accounts. In the national accounts, a description of developments receives priority, and the focus is on time series and figures on changes. In practice this means that revised figures on changes are incorporated continuously, whereas the incorporation of revised figures on levels is often postponed until large structural revisions (for example general revisions), which are carried out periodically. The focus in the financial accounts is on stock data, and revised figures on levels are incorporated continuously. One of the reasons is that net lending is quantified based on stock data for financial instruments. Good stock data is an important precondition for the precise calculation of net lending. The different emphasis placed on figures on changes and figures on levels therefore results in differences in revisions policy, which creates differences between the accounts when the figures are published.

Second, different calculation principles can explain discrepancies. For example, some substantial differences can be observed between the two accounts in the quantification of net lending figures for individual sectors. These differences can probably to a large extent be attributed to non-harmonised methods of calculation.

A third factor that may result in discrepancies is differences in definitions and classifications. There are differences of this kind between the income and financial accounts (different sectoral definitions) and between statistics that cover the same areas/sectors in the economy.

Fourth, there are differences in the time of recording. Deviations arise because part of the underlying data (financial accounts statistics for the public sector and part of the balance of payments statistics) is based on the cash principle. Differences in accruals arise when the date of payment for the cash flow (used in the cash principle) occurs in a different accounting period from the time of the transaction. In the financial accounts, the main principle is that transactions are registered when they fall due (time of transaction) and not when the payment associated with the transactions is settled.

The fifth and last factor that can explain discrepancies between the income and financial accounts is differences in valuations. These differences arise because the accounts statistics, for example, use value concepts other than market value, which is a key concept in the financial accounts. An example of this is the calculations of market value for investments in unquoted shares in the household financial accounts. For listed securities, the market value of transactions is registered directly in available statistics.

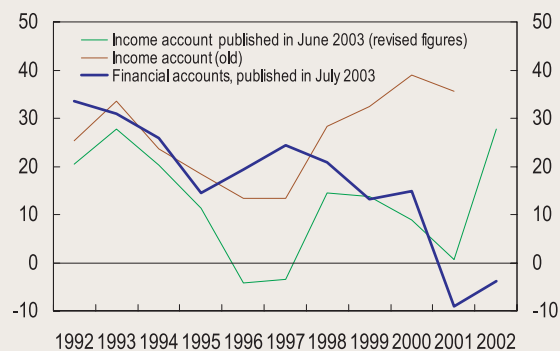## Revisions in the income account and financial accounts

In the past ten years, the national accounts have been subject to two large structural revisions, while revisions of a similar scope have not yet been carried out in the financial accounts. The first large revision was the general revision of the national accounts, completed in 1995. New definitions were incorporated in the general revision, and new statistics, previously only used in part, were systematically incorporated in the national accounts. After the general revision, a revision of figures was carried out, and new structural statistics for the business sector were incorporated. In the following, we shall focus on the overall picture before and after the revision of figures that was completed in 2002. In the financial accounts, the focus will be on a comparison of initially published and final figures.

The income account – revision of figures

Chart 5 shows household net lending before and after the revision of the figures in the national accounts, and the most recent figures from the financial accounts. Net lending in the income account has been revised downwards for the whole period. The revisions for the period 1996-2001 are particularly large. Net lending in the income account for the years 2000 and 2001 was revised downwards by NOK 30 billion and NOK 35 billion respectively.[4]

The chart shows a substantial reduction in the differences between the income and financial accounts for household net lending in the years 1991-2001, following the revision of figures. The overall picture for the other years showed little change, with the exception of 1996 and 1997, where the discrepancies increased following the revisions. However, there is particular uncertainty

Chart 5 Annual figures for household net lending before and after the revision of the national accounts figures and according to the financial accounts. In billions of NOK

- Income account published in June 2003 (revised figures)
- Income account (old)
- Financial accounts, published in July 2003

Sources: Statistics Norway and Norges Bank

surrounding the estimates for investments in unlisted equities in the financial accounts for these two years.

The results of the revision of figures are positive for the quality assessments of both the income and the financial accounts. As a result of the incorporation of new statistics in the national accounts for the past ten-year period, the income account describes an overall picture of household lending that is supported by the calculations in Norges Bank's financial accounts. The chart shows that the final accounts converge to a greater extent than the preliminary versions towards a common main picture. In this respect, the final national accounts figures from Statistics Norway are very important reference points for the financial accounts.

Real time properties of net lending in household financial accounts

Chart 6 shows the first and last version of net lending in the household financial accounts, and the most recent figures from the income account. The latest version refers to the annual figures published in connection with the release of the financial accounts for the first quarter of 2003. In the chart, this version of the financial accounts figures is compared with the figures initially published. We can use the figures for 2000 as an example. Net lending for this year was estimated at NOK 12.3 billion when figures were initially published in April 2001. When the July 2003 figures were published, net lending had been revised upwards by a good NOK 2.5 billion.

The chart shows that the first preliminary figures are reasonably consistent with the overall picture indicated by the last published figures. The chart also shows that the discrepancy between preliminary and "final" figures was largest at the beginning of the period (1992 to 1994) and in 2001. It is also clear that the first preliminary net

Chart 6 Annual figures for household net lending according to the preliminary and last published versions of the financial accounts and according to the income account. In billions of NOK

— Financial accounts, published in July 2003
— Preliminary financial accounts, first version
— Income account, published in June 2003

Sources: Statistics Norway and Norges Bank

lending figures in the period 1994-2000 were lower than the "final" figures. The picture changed in the period 2001-2002. Preliminary net lending figures for these years were gradually revised downwards as new information was incorporated into the financial accounts.

Sources of "ordinary" revisions in household financial accounts

The official financial statistics are the most important source for quantifying assets and liabilities in household financial accounts. As mentioned previously, these primary statistics have sound real time properties.

Statistics from the Norwegian Central Securities Depository are a key component in the calculation of household net lending. They provide direct information (transaction figures) about household investments in listed securities, and the high quality of these statistics and the official financial statistics is the most important reason for the sound real time properties of the financial accounts.

The statistics on foreign assets and liabilities are based on balance of payments statistics and annual censuses of foreign assets and liabilities. The size of households' foreign assets and liabilities is moderate compared with their other assets and liabilities in the financial accounts, but nevertheless cause considerable revisions. This is because the household figures are determined as shares of the assets and liabilities of a large combined sector (other Norwegian sectors) that is dominated by private non-financial corporations. In addition, delays in censuses of foreign assets and liabilities in the period 1998 to 2001 led to larger revisions than normal, because during this period the financial accounts were based on projections of the asset and liability figures for 1997.

The basis for the calculation of the financial accounts also includes the annual statistics for general government assets and liabilities and the assets and liabilities of government-owned non-financial corporations. The statistics are available with a lag of one to two years, and the incorporation of new annual figures is reflected in revisions of the financial accounts. The first set of statistics has become increasingly important for household financial accounts because lending from the Norwegian Public Service Pension Fund has increased sharply in recent years. The incorporation of final figures led to a substantial upward revision of the preliminary estimates for household loan debt. This is the reason that we have now chosen to use the monthly data on lending from the Norwegian Public Service Pension Fund which is collected in connection with C2 calculations.

Estimated variables are another type of data in the basis for household financial accounts. The two most important estimated variables are tax assets and liabilities and unlisted equities. Tax assets and liabilities are
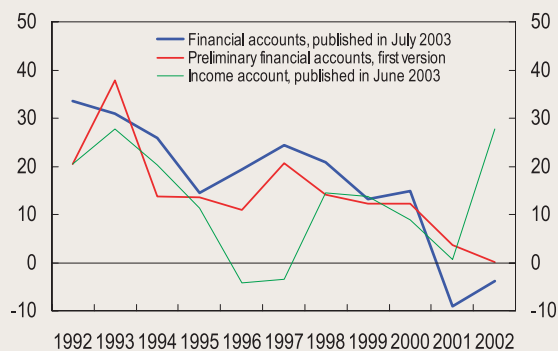
estimated as the difference between accrued taxes (assessed taxes) and tax transactions recorded in general government accounts. Statistics for taxes that have been paid are available monthly, while the figures for assessed taxes are annual and are incorporated later. In the preliminary financial accounts, accrued taxes are estimated on the basis of calculations and projections. These figures are therefore subject to considerable revision.

Estimates of investments in unlisted equities are based on inadequate background information. There are many indications that our calculation methods have resulted in excessively high figures for investments in these securities in the years 1996 and 1997, and this probably explains a good part of the discrepancy in relation to the income account for these years. We have therefore revised down estimated investments in unlisted equities in the years around the turn of the millennium.

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