The household balance sheet and the macroeconomic assessment

There is a mutual interdependence between the households' assets and liabilities and the households' consumption and saving. Changes in the value of the households' assets thus have direct effects on the development of the economy via consumption and saving. The Riksbank therefore makes forecasts for the households' assets and liabilities. One way of illustrating the relationship between the households' liabilities and assets is to compile a balance sheet for the households. However, there is no accepted definition that shows which assets and liabilities should be included in such a balance sheet. In this article, we present how the Riksbank compiles information for a household balance sheet, what factors affect the balance sheet and what changes in the balance sheet may have a significant impact on economic development.

The Riksbank's compilation of a balance sheet for the Swedish households

"Balance sheet" is a term used in bookkeeping, for example, to illustrate the relationship between assets, liabilities and capital. One of the problems with compiling such a balance sheet for the households is that since 2007 there has been no regular official compilation of the households' assets and liabilities. There are a number of compilations in which the household balance sheet is estimated, most recently by Statistics Sweden in 2010, for example.[10] However, if one wants to follow the development of the household balance sheet on an ongoing basis then this must be compiled from a number of different statistical sources.

Household assets can be divided into financial and real assets. Statistics on the households' financial assets are published in the Financial Accounts every quarter.[11] The financial assets include the households' holdings of shares, bonds, funds, bank deposits and so on. In 2011, these liquid assets constituted approximately half of the financial assets. The other half consists of insurance saving, which includes private pension saving (see Table A1). Since the mid-1990s, collective insurance saving (including the premium pension system, PPM) has also been booked as part of the households' assets.

The proportion of directly-owned shares and funds in total wealth is relatively small (see Table 1). On the other hand, insurance saving and the PPM system include a significant proportion of shares. The households thus own many more shares than is reflected in their level of direct shareholding.

[10] See "Assets, liabilities and holding gains - Role of balance sheets underestimated in statistics ", Statistics Sweden 2010.
[11] The Financial Accounts are part of the National Accounts system and are published by Statistics Sweden.

Table A1. Household assets
Per cent of total assets

	Q1 1990	Q1 2000	Q4 2011
Financial assets			
Shares and mutual-fund units	14.5	25.4	10.2
Bonds	4.1	2.3	1.1
Bank deposits*	19.6	10.4	12.0
Private insurance saving	5.6	11.1	6.5
Collective insurance saving	0.0	10.7	17.9
Other	0.4	4.0	3.3
Real assets			
Single-family dwellings and second homes	48.0	30.7	36.8
Tenant-owned apartments	7.8	5.4	12.3
Total	100.0	100.0	100.0

Note. * including banknotes and coins. The percentages do not add up exactly to 100 due to rounding off.
Sources: Statistics Sweden and the Riksbank

The households also have **real assets** (see Table A1 and Figure A3). However, no statistics on real assets are published, they have to be calculated instead. The Riksbank calculates the value of single-family dwellings and second homes on the basis of taxation outcomes and prices (in accordance with so-called purchase price coefficients). This calculation constitutes a measure of the market value of the total housing stock.[12] The Riksbank also includes holdings in tenant-owned apartments among the real assets. This data is available in Statistics Sweden's Financial Accounts, where the households' holdings in tenant-owned apartments are instead defined as a financial asset.[13]

To get a picture of the household balance sheet one must also get an idea of **the households' financial liabilities**. It is above all the real assets that are associated with loans, as housing purchases are often financed by taking mortgages.

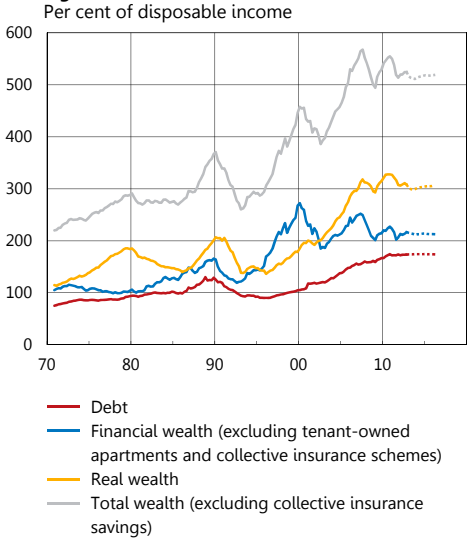
Table A2. Household balance sheet 2011
Percentage of disposable income and SEK billion

	Per cent	SEK billion
Financial assets*	319	5,527
Real assets	307	5,330
Financial liabilities	174	3,016
Net assets	452	7,841

Note. *including collective insurance saving.
Sources: Statistics Sweden and the Riksbank

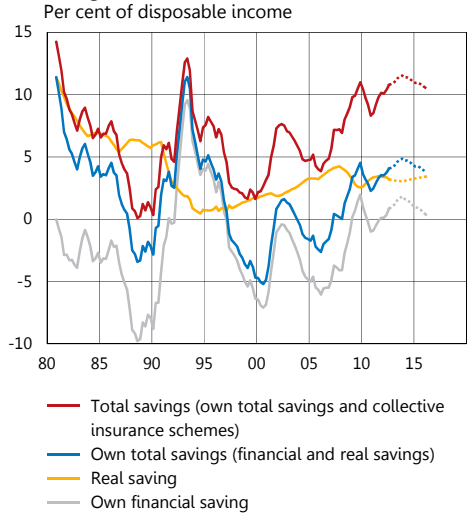
According to the Riksbank's measure of the household balance sheet, assets at the end of 2011 amounted to an estimated SEK 10,858 billion, while liabilities amounted to SEK 3 016 billion.[14] The net total of the households' assets and liabilities was thus just over SEK 7,800

Figure A3. Household wealth and debt
Per cent of disposable income



Sources: Statistics Sweden and the Riksbank

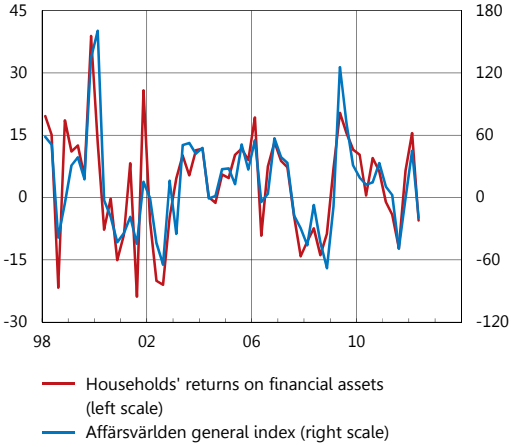
Figure A4. Different definitions of household savings
Per cent of disposable income



Sources: Statistics Sweden and the Riksbank

[12] The measure of real wealth does not include household assets in, for example, multi-family dwellings (that is privately-owned apartment buildings), land and forest but this estimate should nevertheless comprise most of the households' real assets.
[13] This thus means that Statistics Sweden uses a different definition of financial assets.
[14] One could also argue that the discounted value of future incomes should be included in a balance sheet as these reflect the households' human capital. Estimating this is of course difficult but there are many indications that human capital, if it was included, would in all likelihood be easily the largest item on the balance sheet.

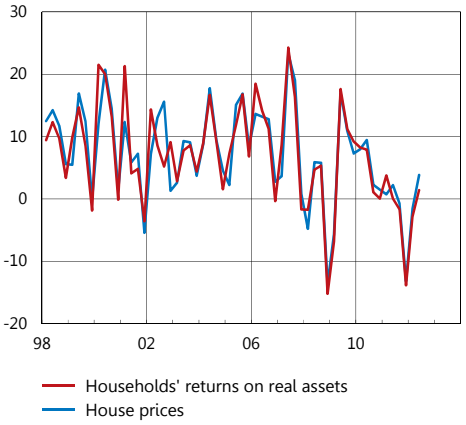
Figure A5. Households' returns on financial assets and the Affärsvärlden general index
Quarterly changes in per cent calculated in annualised terms



Note. The change in value is calculated as the difference in the outstanding value between two quarters, adjusted for the transactions that have taken place during the quarter.

Sources: Affärsvärlden, Statistics Sweden and the Riksbank

Figure A6. Households' returns on real assets and house prices
Quarterly changes in per cent calculated in annualised terms



Note. The change in value is calculated as the difference in the outstanding value between two quarters, adjusted for the transactions that have taken place during the quarter.

Sources: Statistics Sweden and the Riksbank

billion.[15] However, this of course says nothing about the balance sheets of individual households.

Saving affects the change in the balance sheet

Total household saving is the difference between income and consumption expenditure. Total saving has sometimes been negative in recent decades, but it has been positive since the financial crisis, see Figure A4. The official definition of total household saving in Sweden also includes allocations to the collective insurance schemes.[16] Total saving can also be divided up into financial saving and real saving, see Figure A4.

Real saving is that which the households invest in housing, for example in extensions to a second home. Financial saving, on the other hand, covers the total for changes in financial assets, amortisation and new debts: For example, a positive financial saving may mean that a household has deposited money in a bank account, purchased shares or made amortisation payments on an existing loan. If the financial saving is instead negative, the household may, for example, have withdrawn money from a bank account or taken a new loan. Total household saving is in other words the total of the financial assets bought or sold, the real investments made and the amortisation payments made or additional loans taken.

Asset prices affect the value of the balance sheet

Financial assets help to increase household incomes through interest earnings or when the households receive share dividends, while household incomes are reduced by the interest they pay on their debts.[17] The price change that takes place between two points in time also forms part of the return on an asset but does not directly affect household income (unless the asset is sold).[18] As the balance sheet is market valued, changes in asset prices will, on the other hand, affect the balance sheet.

Share prices, in particular, are closely linked to changes in the return on financial assets (see Figure A5). In the case of real assets, it is of course mainly changes in housing prices that lead to changes in value (see Figure A6). Historically, there has also been a clear link between saving and changes in the balance sheet. It thus appears that households have tended to save more when assets have fallen in value, and vice versa (see Figure A7). To assess the development of the balance sheet during a forecast period, one must thus get an idea of the development of saving, dividends and capital expenditure but, above all, of the development of assets prices.

[15] The net total, or the net assets, thus reflects the households' capital.
[16] The National Accounts include the saving that takes place in the collective insurance system as part of total household saving.
[17] The definition of the households' disposable incomes thus includes capital income and expenditure. Real assets (primarily property holdings) also affect the income calculations as they provide return in the form of the housing services that the properties provide.
[18] We ignore tax effects here.

Different measures of indebtedness

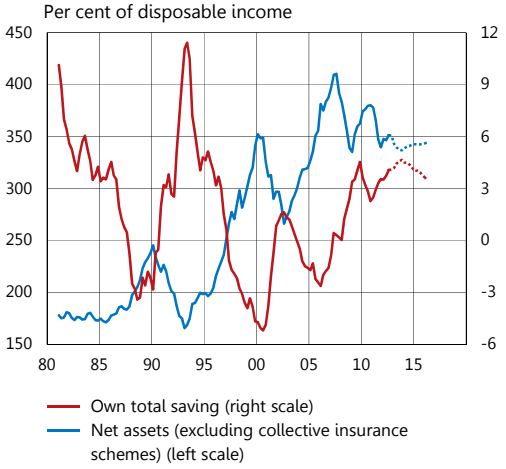
An analysis of the balance sheet is also in many respects an analysis of the indebtedness of the households. However, there is no unequivocal definition of household indebtedness. Three common definitions of indebtedness are shown in Figure A8. The measure of indebtedness in which debts are expressed in relation to assets is usually called the loan-to-value ratio (see the red and yellow lines in Figure A8). A broad measure of indebtedness, which is in the nature of a measure of solvency, is quite simply the balance sheet's liabilities side in relation to the assets side. Another measure that is used is the debt ratio, which relates debts to disposable income (see the blue line in Figure A8). When debts, or the interest that households pay on their debts, increase then the households' disposable incomes decrease at the same time.[19] The debt ratio thus illustrates how large a part of their income the households need to use to be able to service their loans. Different measures of indebtedness may thus develop differently if there are changes in the balance sheet, for example if there is a lasting change in asset prices.

The link between the balance sheet and the development of the economy

Household consumption constitutes a direct link between the balance sheet and the rest of the economy. According to a common theory, the households consume a proportion of expected future wealth in each period.[20] This wealth primarily consists of future earned income, but net assets also play a part.

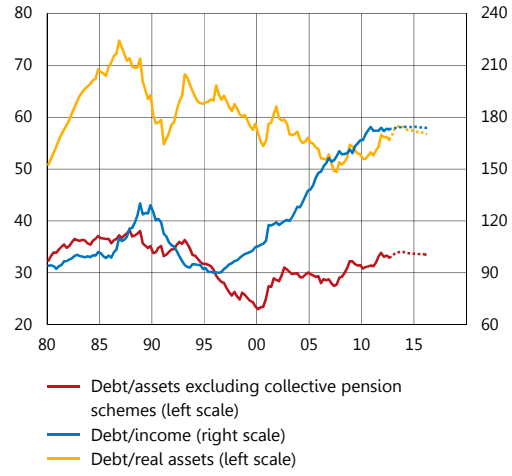
There are many international studies that indicate that the balance sheet, or parts of it, is important to how consumption develops.[21] Studies show that the balance sheet is important to the households' consumption decisions in Sweden too.[22] It has also been pointed out in some studies of the relationship between consumption and the balance sheet that it is above all lasting changes in asset prices that have an impact on consumption. However, most of the variations in asset prices are more temporary in nature and changes in the balance sheet would therefore normally have only a marginal effect on consumption.[23]

Figure A7. Own savings and net assets (excluding collective insurance schemes)
Per cent of disposable income



Sources: Statistics Sweden and the Riksbank

Figure A8. Three measures of the debt ratio
Per cent



Sources: Statistics Sweden and the Riksbank

[19] If debts constitute approximately 170 per cent of income and the nominal rate of interest paid on the debts is 3 per cent, 5.1 per cent of a household's income will be paid in interest expenditure. If for some reason the rate of interest increases to 4 per cent, expenditure will increase to around 6.8 per cent. This shows that with a debt ratio of 170 per cent interest payments increase by 1.7 per cent when the rate of interest increases by one percentage point.
[20] This theory is usually referred to as the "life-cycle hypothesis", see F. Modigliani and R. Brumberg, "Utility Analysis and the Consumption Function: an Interpretation of the Cross-Sectional Data" *Post-Keynesian Economics*, New Brunswick, New Jersey: Rutgers University Press 1954.
[21] See for example M.Palumbo, J. Rudd and K. Whelan "On the Relationships between Real Consumption, Income, and Wealth" *Working Paper*, Board of Governors of the Federal Reserve System, August 2012. Other studies that particularly highlight the role of real wealth in consumption decisions are K. Case, J.M. Quigley and R.J. Shiller "Wealth Effects Revisited: 1975-2012" *NBER Working Paper Series*, No. 18667, January 2013 and M. Iacoviello "Housing Wealth and Consumption", *International Finance Discussion Papers*, Board of Governors of the Federal Reserve System No. 1027, August 2012.
[22] See H. Johnsson and P. Kaplan "An Econometric Study of Private Consumption Expenditure in Sweden" *Working Paper* No. 70, National Institute of Economic Research, 1999 or M. Bjellerup "Do the Measures of Consumption Measure Up?" *Essays on Consumption: Aggregation, Asymmetry and Asset Distribution*, No 68, Acta Wexionensia 2005.
[23] See M. Lettau and S.C. Ludvigson "Understanding Trend and Cycle in Asset Values: Reevaluating the Wealth Effect on Consumption" *American Economic Review*, March 2004. See also M. Lettau, S.C. Ludvigson and N. Barczi "A Primer on the Economics and Time Series Econometrics of Wealth Effects: A Comment", *Working Paper*, Federal Reserve Bank of New York, May 2001 for a discussion of the methodological problems that can arise in the empirical work on measuring the balance sheet's effect on consumption.

What can happen with the balance sheet and consumption if house prices fall? An illustrative calculation

Empirical studies can only show how the average household has reacted on previous occasions when asset prices have changed. However, it is not given that households will always react in the same way and how the households choose to act following a change in the balance sheet may play a decisive role for how great the impact on the real economy will be.

If, for example, there was a lasting fall in house prices of 10 per cent, households may choose to act in different ways. One alternative is of course to do nothing. A fall in house prices would then lead to an increase in the loan-to-value ratio, a fall in net assets and a more or less unchanged debt ratio.

Another alternative would be for the households to strive to restore the original relationship in the balance sheet, for example by selling financial assets and paying off some of the debts. The loan-to-value ratio can then be reduced or, in some cases completely restored, at the same time as the debt ratio falls. The two different ways of reacting may ultimately result in roughly the same reduction in the household's net assets.[24] There are different estimates of how much consumption changes given a change in net assets. A possible estimate is that a 10 per cent fall in house prices could lead to consumption falling by approximately 1 per cent.[25] The effects on consumption could, in other words, be the same in both cases, even if the effects on the balance sheet and different measures of indebtedness were different.

A third alternative is that the households restore the relationships in the balance sheet simply by saving, for example by amortising their debts.[26] In addition to the initial effect of lower net assets on consumption, saving will now also be higher for some time. It is of course difficult to determine by exactly how much, but as an example we can say that if the households wished to return to the loan-to-value ratio that prevailed in 2011, then debts would have to be reduced by approximately SEK 300 billion if house prices fell by 10 per cent.[27] This is a relatively large sum (corresponding to around 17 per cent of disposable income) and consumption would probably therefore have to be lower over a longer period of time for saving to build up net assets. In this example the loan-to-value ratio would be decreased, or in some cases be completely restored, at the same time

[24] This requires of course that there are sufficient financial assets to sell and that the price of these assets has not radically changed. Although the aggregated household balance sheet contains sufficient financial assets for this example, the situation may be different for an individual household.
[25] M. Iacoviello "Housing Wealth and Consumption", *International Finance Discussion Papers*, Board of Governors of the Federal Reserve System No. 1027, August 2012 presents results that indicate that when real assets change by 10 per cent then consumption changes by just over 1 per cent. Results based on Swedish data give a more mixed picture. In "Konsumtion, försiktighetssparande och arbetslöshetsrisker" an article in *Konjunkturläget,* National Institute of Economic Research, June2012, a link is presented that suggests that a 10 per cent change in net assets leads to a more than 2 per cent. change in consumption. On the other hand, the results in H. Johnsson and P. Kaplan "An Econometric Study of Private Consumption Expenditure in Sweden" *Working Paper* No. 70, National Institute of Economic Research, 1999 indicate that consumption is less sensitive to changes in real assets. The effects in this study are less than 0.5 per cent. The results for Norway in Erlandsen, S. and R. Nymoen, "Consumption and Population Age Structure", *Journal of Population Economics*, 21, 2008 show that the corresponding effect on consumption is between 1.5 to just over 2 per cent.
[26] The higher savings can be used to purchase new assets or to amortise debts. As the example presupposes that assets have fallen in value, it is assumed in the example that the households will amortise their debts.
[27] The debts must be reduced from over SEK 3 000 billion to SEK 2 700 billion.

as the debt ratio would fall, but, as mentioned above, this would probably take place over a longer period of time. The households would thus act in the same way as they did after the crisis of the early 1990s when the debt ratio fell at the same time as saving increased substantially.[28] The decisive factor for the economy is thus whether such an adjustment takes place and, if so, how quickly.

Empirical relationships, in both Sweden and abroad, indicate that a change in the balance sheet does not normally have any dramatically large effects on consumption. However, empirical relationships reflect historically average behaviour and cannot be taken as given in each individual case. International experience indicates that in those countries where a fall in house prices has been preceded by a dramatic build-up of household debt, then the consequences for the real economy have been more costly and more prolonged than a fall in house prices would otherwise have been.[29] However, it is not automatically possible to draw conclusions for Sweden on the basis of experience abroad. The effect of a disruption in asset prices on the household balance sheet and the economy at large is thus ultimately a question of judgement.

[28] For a theoretical discussion of how balance-sheet effects can reinforce the effects of shocks to the economy, see M. Iacoviello "House Prices, Borrowing Constraints, and Monetary Policy in the Business Cycle", *American Economic Review,* June 2005.
[29] See the discussion in International Monetary Fund "Dealing with Household Debt" *World Economic Outlook* chapter 3, April 2012.