



Real time indicator for Household consumption in Sweden

Daniel Lennartsson, daniel.lennartsson@scb.se, Tod Salomonsson Segerby, tod.salomonssonsegerby@scb.se, Björn Forssell, bjorn.forssell@scb.se, Thorsten Holzer, thorsten.holzer@scb.se

1 Introduction

1.1 Background

During the past 10–15 years, Statistics Sweden (SCB) has had a focus on finding new data sources. To an increasing extent, direct data collection from enterprises and households has been replaced with administrative data as a basis for the statistics, leading to reduced manual data collection and increased automation. For example, in the Consumer Price Index (CPI), traditional price collection has been replaced with cash register data for more than a third of the statistical shopping basket, resulting in efficiency gains.

Short-term economic statistics reflect recent economic developments. Among its main users are the European Central Bank, national central banks, the European Commission, and national governments. There is an increasing demand for earlier and more frequent indicators for the economy and especially for household consumption. To meet that need, users of SCBs statistics are making their own early forecasts, using data from card issuers and card acquirers. Because the Swedish economy and more specifically payments, are highly digitalized, it may be possible for SCB to utilize these new data sources for measuring household consumption.

2 Data sources

2.1 Card payment data from card issuers

Card issuers, i.e., banks, have data on the purchases of their customers. There are many card issuers, but the main part of the cards issued comes from a small



number of banks. Information from card issuers covers all card payments made by a customer in that bank. A single customer can have cards in many banks.

2.2 Invoice payments

Card data and cash payments¹ do not cover all parts of household consumption. Invoice payments are also part of the consumption, for example payments for rent or electricity and heating. Four items paid by invoice are of great importance in Sweden: housing, energy and heating, consumption of passenger cars, and telecommunication services. Models have been developed to estimate consumption of these items in the weekly statistics.

Housing consumption can in turn be divided into three parts: cold rent, electricity and heating, and maintenance and repairs. Since use of district heating correlates strongly with the outdoor temperature, the part of housing consumption that relates to district heating is estimated using the daily average temperature per measuring station, where each measuring station is assigned a weight based on population density. Electricity is estimated based on daily open data over consumption in GWH from eSett².

The second part of housing consumption that relates to rent is estimated in the National Accounts based on the number of completed apartment buildings and single-family homes. Since this information is not available on a daily or weekly basis, this expenditure item must be estimated using a model. Since change in volume in the housing item is slow, a regression model is used based on historical data on electricity and heating consumption, distributed by day. The third item within housing consumption, maintenance and repairs, is captured via transaction data.

Purchases of new cars are estimated using the number of new car registrations by households per day. The model is a simplified version of the calculations in National Accounts. Purchases of used cars is estimated based on new car registrations by juridical persons under the assumption that when a juridical person buys a new car their used car is bought by a household.

¹ In Sweden, the share of cash payments is rather small, about 5 percent of total household consumption. Cash payments are captured in VAT data but not in transaction data

² eSett Oy (Imbalance Settlement Responsible, ISR) is responsible for performing imbalance settlement and invoicing BRPs for imbalances on behalf of the four Transmission System Operators (TSOs); Energinet, Fingrid, Statnett, and Svenska kraftnät.



Consumption of telecommunication services is estimated with a forecast model based on historical information.

2.3 VAT data

Value added tax (VAT) data is collected by the tax authority and delivered to SCB daily. With VAT data, turnover can be estimated for all enterprises in Sweden with some exceptions. The VAT data consists of detailed information that makes it possible to calculate turnover including value added tax on the domestic market. The calculated domestic turnover is close to the concept of household consumption. The domestic turnover can be estimated for different NACE activities that sell to households. Enterprises can declare VAT on monthly, quarterly, and annual basis. The main share of the values is declared monthly.

3 Methods

3.1 National Accounts estimates

The yearly estimates of household consumption in the National Accounts are based on the yearly survey of Household consumption which is a system of different statistical surveys rather than a separate statistical survey. Data from many sources are combined to produce these statistics, where the Structural Business Statistics (SBS), Food sale statistics, and transaction data from financial institutes are the most important sources. Based on the data sources, household consumption is estimated in a three-step process:

Step 1: Sales by activity (NACE)³ and product (COICOP)⁴

These statistics are estimated in SBS and Food sale statistics. Together, these surveys cover 81 activities⁵ that sell products to households. With the help of these statistics, a sales matrix is created, with 81 activities and 163 products.

Step 2: Sales are divided into private and other consumption by activities.

Based on transaction data from card issuers, card acquirers, and other payment institutions, sales in the SBS are divided into two categories, households and others.

³ [NACE Rev.2](#)

⁴ [COICOP 2018](#)

⁵ [Statistikens framställning Hushållskonsumtion, 2023](#)



Step 3: Estimation of household consumption at product level

The share of household consumption from step 2 is multiplied by sales by activity and product from step 1. All products within an activity receive the same share of household consumption.

In the quarterly National Accounts, turnover by activity is used in combination with the yearly matrix from step 1 to estimate household consumption by product. The yearly matrix is important for the quarterly estimates in the National Accounts, and for the estimates in this project.

3.2 Daily estimates based on card data

Data from card issuers are weighted by size for the issuer, using the yearly statistics. The estimates are provided for 69 activities.

In a second step the daily activity estimates are used with the yearly consumption matrix described in 3.1 and summed up by product.

A challenge for high frequency statistics is the calculation in constant prices. Price statistics are available monthly, but not on a daily or weekly basis. Furthermore, monthly price statistics are not as timely as the transaction data. The price indices used in the daily estimates will be produced based on simple forecast models of monthly price indices. The models for price forecasts have been reviewed by Tanski and Karlsson (2025) with machine learning techniques. The actual and projected monthly price indices are used for deflation of household consumption in current prices for all days in an actual month. In times when prices do not change much, the price projections are relatively accurate. In the case of larger changes in prices, projections are more difficult, particularly in case of sudden changes. When actual prices are available, the daily estimates will be revised.

The daily estimates are currently collected and produced every week but published every second week, approximately nine days after the last reference day.

Based on comparison with National Accounts, the estimates using data from card issuers will be used in the new combined survey.



3.3 Monthly estimates based on VAT data

On a monthly basis, the domestic turnover estimate from VAT by activity is used in combination with the yearly matrix to calculate household consumption by product. VAT data are also the main source for the estimates in the quarterly National Accounts.

Daily estimates of household consumption based on transaction data are calculated as described in Section 3.2. The monthly estimates using VAT data are distributed by day, using the consumption share for different products from the daily estimates.

The VAT data is not as timely as the transaction data and can be produced approximately 40 days after the reference month. Therefore, the daily estimates based on transaction data are used to project the VAT data for the days when VAT data are not available. These projections could be up to 60 days ahead.

3.4 Projection method

An evaluation of different projection methods led to the decision to use quota estimates based on annual changes for projections, i.e. using the quota between consumption based on VAT and consumption based on transaction data.

Quota estimate 1 based on levels:

A quota estimate $\hat{c}_{p,d}^{NA,VAT,LV}$ based on levels for consumption by product is given by:

$$(1) \hat{c}_{p,d}^{NA,VAT,LV} = \frac{\frac{\sum_{d=392}^{d-365} \hat{c}_{p,d}^{NA,VAT}}{28}}{\frac{\sum_{d=392}^{d-365} \hat{c}_{p,d}^{NA,Trans}}{28}} * \hat{c}_{p,d}^{NA,Trans}$$

where

$\hat{c}^{NA,VAT}$ is the total consumption based on VAT data and National Accounts

$\hat{c}^{NA,Trans}$ is the total consumption based on transaction data and National Accounts

p is the product code on 2-digit level of COICOP (12 product groups), and

d refers to the calendar day.

The first part of (4) is the 28 days moving average for the same day the previous year.



Quota estimate 2 based on annual changes:

A quota estimate $\hat{c}_{p,d}^{NA,VAT,QU}$ based on annual changes by product for consumption is given by

$$(2) \hat{c}_{p,d}^{NA,VAT,QU} = \hat{c}_{p,d}^{NA,VAT,LV} / \left(\frac{\frac{\sum_{d=730}^{d-757} \hat{c}_{p,d}^{NA,VAT}}{28}}{\frac{\sum_{d=730}^{d-757} \hat{c}_{p,d}^{NA,Trans}}{28}} * \hat{c}_{p,d-365}^{NA,Trans} \right) * \hat{c}_{p,d-365}^{NA,VAT}$$

4 Results

As shown in Table 1, there is a rather high correlation between estimates in the new combined survey and National Accounts at product level (2-digit level of COICOP) for all products except for information and communication and housing (COICOP 04 and 08).

Table 1. Correlation and average absolute difference between the annual change of the quarterly estimate of total consumption in the new combined survey compared with the corresponding estimate in the National Accounts, by product and for all quarters 2020-2025 and measured in constant prices.

	01	02	03	04	05	06	07	08	09	11	13	Total
Average absolute difference	1,5	1,6	2,3	1,1	2,7	4,4	2,6	4,7	4,2	4,6	1,5	0,8
Correlation	0,93	0,81	0,94	0,49	0,96	0,88	0,91	0,53	0,9	0,94	0,89	0,97

Source: Statistics Sweden's weekly and monthly consumption statistics and the combined survey using VAT and card data.

Table 2 shows the results for projections of VAT data based on transaction data. The projections are compared with the final estimates from the combined survey.

Table 2. Average absolute difference per day and month and relative difference for different projections method compared with the monthly results

	Absolute difference per day (million SEK)	Absolute difference per month (million SEK)	Relative difference (percent)
Quota with levels	82	1710	0,9
Quota with changes	53	971	0,5

Source: Preliminary and final estimate for combined survey using VAT and card data.



References

Tanski, Christopher and Karlsson, Linus (2025). Korttidsprognostisering av prisindex i olika branscher. Linköping: Linköpings universitet.