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Paper UNECE seminar on the Role of NSO in the Production of Leading, Composite and Sentiment indicators

Session no 1; Issues Specific to Economic Indicators

Activity index and Export manager's index - a case study of two types of Leading indicators in Sweden.

Abstract:

Demand for leading indicators from users is strong, especially for indicators of future GDP-figures. These indicators can be composite indicators based on available primary statistics – or simple barometer survey data from a sample of respondents.

Statistics Sweden has experience from both ways of developing Leading Indicators.

Case 1: The Activity index was published until 2010 as a composite indicator. This had a very good forecasting record from start, although a high complexity in the underlying methods also led to disadvantages such as revisions and a need for difficult methodological updates that made the composite index difficult to interpret.

Case 2: The Export manager index was developed as a client demand and is published on a coordinated base. It is a simple sentiment survey to export managers indicating the present stage in this industry. The indicator is timely, transparent and stable over time.

The Swedish experience shows that leading indicators should be made transparent and simple enough for users to understand. Complex method should be avoided and primary data shouldn't need to be revised. Accounting data or sentiment surveys will be preferable to composite indicators. The paper explains risks and opportunities in making these indices.



Background:

Leading indicators have existed in many forms over the years. The aim has been to have an indicator that warns of a cyclical turning point in an early conjectural phase. These can be simple indicators, such as order bookings or sales, or more complex indicators based on regression model calculations and similar methods.

The demand for this type of indicators has risen due to an increased demand for timeliness, but there are difficulties with this kind of indicators that needs to be taken into account.

Within Statistics Sweden, we have been working with both types of indicators, composite leading indicator models and more simple indices. There are advantages and disadvantages to both indices.

Two different cases of leading indicators are presented below;

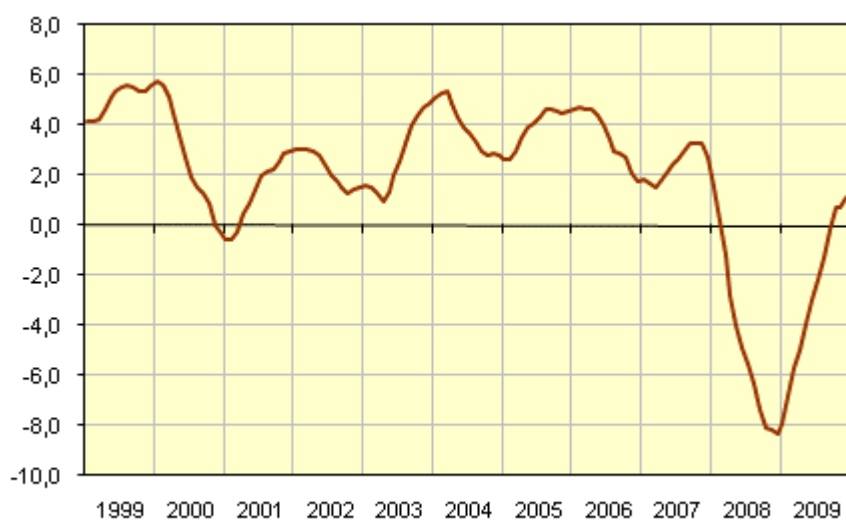
- The Activity Index(AI), which was a complex, model-based, composite indicator that was used during 10 years in Statistics Sweden
- The Export Manager Index (EMI), a PMI-type of index based on a simple interview survey with weighted parts.

A Swedish case study of leading indicators

1. The Activity Index (AI) - a leading indicator for GDP

The Activity index is a model-based leading indicator designed to provide an early outcome of the quarterly GDP. The model is a composite index based on a combination of existing statistics for the industrial production index (IPI), working hours for civil servants (SYS), sales in retail trade (OMS), exports (EXP) and imports (IMP). The AI was first introduced in 1993.

Graph 1: The Activity index 1999-2009, percentage change from previous period



Source: Statistics Sweden

Data up to and including December 2009

The underlying indicators - IPI, SYS, OMS, EXP and IND - are used in a linear regression model to estimate the change in the activity of the entire economy. The Activity Index has three sub-series: the original series, the seasonally adjusted series and an estimation of the trend. By making use of the trend estimate a reduction of the effect of temporary disturbances in the seasonally adjusted index could be done.

The AI is seasonally adjusted on a monthly basis with the programs TRAMO / SEATS using the model approach ARIMA (111) (010). Prior to the publication of the AI an analysis meeting is conducted, with the national accountants responsible. A judgment of the results and the variables performed. The production time is short, substantially only two days, as the preparation of the results depends on values of input variables already available.

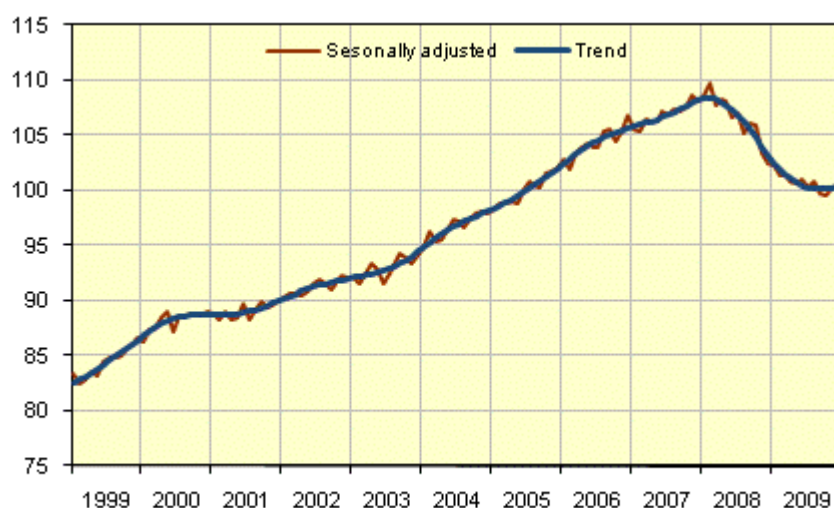
On publication, information is given of the contribution from each of the explanatory indicators, in terms of the total percentage change in the trend. The contributions from the underlying indicators are obtained by usage of the trend for each indicator. These values are

weighted by coefficients in the regression model, and normalized so that the sum of the contributions would be equal to the trend in the AI, at an annual rate

The original series of the index are compared to the actual GDP-estimates, so that GDP and the AI are equal for all quarters. The monthly means for the AI original series will then be equal to GDP for the quarter. The model explained approximately 99 percent of the variation in GDP, when first published.

The model thus provided some deviations (bias) in conjunction with actual GDP. When GDP for a quarter is not known, the deviation between the AI and the most recently published GDP has to be extrapolated.

Graph 2: Divergence between the seasonally adjusted Activity Index and trend



Source: Statistics Sweden

Data up to and including December 2009

Risks and opportunities

When the AI for a new month is published normally revised indices for the previous months are included. New / revised GDP information also affects the series backwards in time. A revision is also done in performing a new seasonal adjustment.

As a judgment from the reconciliation team was part of the first calculation, this is also an uncertainty as input to the index.

The revisions mentioned above give discrepancies between GDP and the AI (Bias), especially when GDP for a quarter was unknown and the deviation between the AI and the most recently published GDP had to be extrapolated.

The fact that certain GDP components are not measured in the AI, such as investments and exports and imports of services, give discrepancies in the index. When these components develop differently than GDP in general, the deviation between the AI and GDP would rise.

The problems with revised data gave rise to a lot of user's complaint as the revisions seemed to be too large in relation to GDP. Over time discrepancies grew as the model was not adapted to structural change in the economy, e.g. production of services was not included. At the time of the financial crisis in 2009 this became very clear.

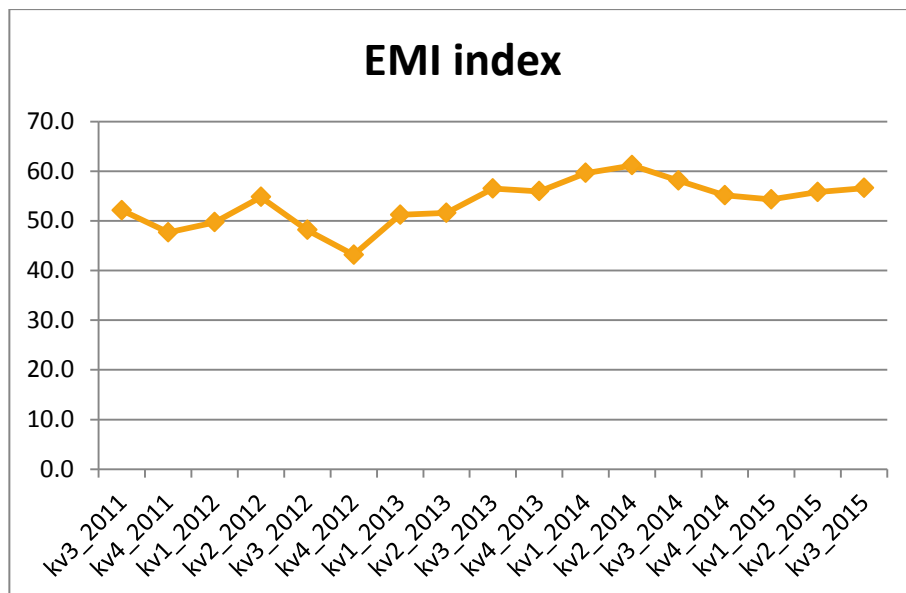
An assessment was made in 2010 and the conclusions from that was that the model was too complex for many users and did not give a correct picture of the development over time. Therefore it was decided to stop publishing the AI .

2. Export Manager Index (EMI)

The purpose of the EMI, produced by Business Sweden, is to draw more attention to exports and its role as a driving force for growth in the Swedish economy as well as showing the dependence of the outside world. It is also intended to provide greater attention to small and medium-sized enterprises and their relevance for Sweden. The EMI can also be used to give greater attention to how the economic development of different regions of the world affects Sweden and gives a greater understanding of how integrated goods and services are in an export framework.

This is a simple interview survey based on responses from export managers respondents in 225 companies divided into larger and smaller companies. The selection of companies in the EMI is based on information from the VAT register and thus covers both goods exports and service exports. The surveys are done quarterly. Statistics Sweden is conducted the interviews. The result from the survey is calculated from weights based on value added in exports. Analysis and compilation are made by Business Sweden.

Graph 3: Development of the EMI Index 2011-2015



The study is based on 8 questions to the respondents, as shown below

1. How do you assess the company's export sales last 3 months?
2. How do you assess the size of the company's export order book?
3. How do you assess the profitability of export sales is at present?
4. How do you assess the demand for the export market will develop in the next three months?
5. How do you assess that export sales will develop in the next three months?
6. How do you assess the profitability of export sales will develop in the next three months?
7. How do you assess that the company's delivery times for exports will be developed over the next three months?
8. The answers to the first three questions form the sub-index EMI current situation. The answers to questions 4-7 form the sub-index EMI forecast

The interview answers are a qualified prediction / assessment of the export market might evolve. This is presented along with all supporting data so other users can also make their own assessment,

Risks and opportunities

Advantages of the EMI are that this survey is transparent and reflects the export market as it looks right now. The data-set is presented along with the survey questions. An analysis is presented by Business Sweden. A big advantage is that the data set is fresh and can be published timely.

The disadvantage may be an increasing shortfall of respondents chooses not to respond to the survey. It is also about a snap judgment that can switch quickly. Uncertainties in the data material exist as it may be difficult to split exports in goods and services. Service income may also be transferred as capital income, and will then not be part of exports. Although, Business Sweden opinion is that the EMI give better indications than the PMI, which is an index with no weights.

Conclusions;

The user needs of leading indicators are increasing. Experience shows that many users demand timely indicators that are easy to understand. Overly complex models may create confusion among users and be difficult to understand, especially in situations when the economy is not developing as expected.

From this perspective, Export Manager Index (EMI) has been successful. The survey of 8 questions that are easy to understand for users and respondents find it easy to answer the survey. It does not require anything special from the respondents, though a weakness may be that it may be hard to get in contact export managers who are very busy people.

Statistics Sweden performs the interviews and the data-sets are analyzed by Business Sweden. Publication of the analysis and all supporting data are done as a press conference with a power point presentation. The users have the possibility to get a deeper insight into the data and they can make their own interpretation of the results.

The Activity index (AI) showed good results in the first publications when it coincided well with the recent GDP figures. The model was complex in its design and difficult to explain to users, since it was based both on a regression model and trend estimates with a seasonal adjustment calculation. The model showed several weaknesses in terms of revisions of input data. There were also great difficulties in

getting a good understanding over time of the functions of the model,
especially for structural change in the underlying economy.