

A Twelfth Application of ASPIRE for Statistics Sweden

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1. Executive Summary

The ASPIRE team reviewed four products in 2024: the Production Value Index (PVI), the Producer Price Index (PPI), the Population's Labour Market Status (BAS) and Gender Statistics (GS). The PVI and PPI have both been included in past ASPIRE rounds, while BAS and GS were both new products for ASPIRE. The products were selected by the Statistics Sweden Quality Committee, based on considerations set out in Section 2 of the report. The new approach for ASPIRE, developed in the review of 2023, was implemented in this twelfth application of ASPIRE. The key changes compared to previous ASPIRE rounds are listed in Section 2, together with general observations of the review process.

The key findings of the review are set out in two parts. Those findings that are of a cross cutting nature or might pertain to a number of product areas are covered in Section 3. Those findings that are specific to a particular product, are covered in Section 4.

As in past years, the review team noted the high level of professionalism evident in all product areas, and appreciated the openness and support given to the review team. Interviews were held both in Solna and Örebro, and the face-to-face meetings facilitated the co-operative and interactive nature of the meetings.

Statistical leadership was a cross cutting issue that has been raised in past reports and senior management at Statistics Sweden have taken significant initiatives to develop the level of statistical leadership across the organisation. There is evidence this is being understood and addressed, at an organisational level at least, but limited resources were perceived by many as a significant limiting factor. However, the ASPIRE review team felt there was more that could be done by product areas, particularly in taking the initiative to truly understand their data and its quality, and hence to have the expertise to provide leadership in its improvement and use.

The analysis of data, both exploratory for internal use in understanding the data, and also in order to provide users with greater insights into the resulting statistics, has been an area of focus for senior management. However, the review team found that the analysis being undertaken, particularly exploratory analysis for internal purposes, was limited and recommended a stronger focus on nurturing this work. The results of internal analysis should be documented in the Quality Reports and/or Production of Statistics Reports each product area prepares.

Another issue identified by the review team across a number of products was the lack of a well-articulated forward plan for their product which could form a basis for discussions with stakeholders, agreement on roles amongst partners, and provide an accountability check against use of allocated resources. While each area had plans and priorities for ongoing work, these tended to be short term and not easily shared and monitored.

The BOA programme is another major corporate focus for the future, aimed at ensuring a common production environment for processing and analysis within Statistics Sweden. In discussing processing risks to quality with product areas, it became clear that a number were aware of the corporate initiative, but unsure about how they fitted into it, which of their processing requirements were in/out of scope for BOA, and how they would acquire the skilled resources to transition to the new environment. It is understood it is early days in the programme development, but a sense of how and within what time frame the programme will be implemented to bring all products on board would be valued by currently worried product teams.

An issue which arose in relation to one product team, but which is likely to have implications for all business survey areas, relates to follow up of non-responding businesses. It appears that, as a cost saving measure, it has become standard practice for non responding businesses below the top 65 profiled enterprises, to only be followed up with two email forms. It was not clear this reduction in personal contact had been evaluated from a quality perspective, or that it constitutes best practice in terms of international experience. The team felt that such significant changes in methods should only follow an evaluation of the likely impact, and that there was scope to build on international experiences in these areas.

We were disappointed with the slow progress in taking forward a number of recommendations from previous ASPIRE rounds, undoubtedly the result of resource constraints. Also, we found Quality Reports to be out of date or inadequate, requiring a number of additional requests for further information to the ASPIRE team. These requests were met, and we were grateful for that, but keeping documentation up to date is essential as a way of ensuring users have the information, they need to assess the quality of statistics.

There has been good progress made on the production system for the PVI. It is hoped that implementation will now free resources and provide support for a higher level of analysis, particularly time series-based analysis. In particular, it would be good to see exploratory analysis of quality aspects of the statistics, including analysis of revisions, analysis of frame effects on series, and use of survey and tax-based data sources. The ASPIRE team also felt that the external presentation of statistical series in monthly releases would benefit from a greater focus on the current end of the series in terms of seasonally adjusted month to month movements, rather than the current emphasis on year-on-year movements, with such presentations being accompanied by the use of graphics.

The PPI has a full work program, implementing EU requirements, applying an updated classification and establishing a new base year, against a backdrop of tightened resources. Past initiatives attempting to develop quality measures and a structure for describing the multidimensional aspects of quality in PPI series have been largely unsuccessful to date and the ASPIRE team suggests the product group shares their experience within Statistics Sweden but also with other Statistical Offices in a bid to overcome some of the hurdles. There is a need for system development work for PPI, likely to significantly impact resources available for quality related initiatives, and the ASPIRE team recommend a longer-term plan be developed for the area. This would articulate priorities, resource requirements and allocations, and roles and provide a clear time frame for key activities.

BAS is a new product for Statistics Sweden, and the ASPIRE team was impressed with the substantial potential inherent in it, for informing policy development in both the economic and social spheres. Given the early stage of development of the product, and its promise when used in conjunction with other data sources, the ASPIRE team felt there needed to be a clear forward development plan, aligned with the vision and timeline outlined in the strategic plan. Relationships with key users on both the economic and social side need to be strengthened to ensure the value of the dataset is recognised and taken up. Additional analytic work using the BAS data, together with other sources would enhance an understanding of its quality, as well as demonstrate the value of insights that can be gained from it.

The Gender Statistics team is an outward looking group that aims to bring together information about gender statistics in Sweden. It already has strong relationships with both key users of the data, and with partners in statistical production, and the ASPIRE team felt their understanding of the important statistical leadership role they play in this space was very strong. A number of information gaps have been identified with key users and the ASPIRE team felt the GS role would be further enhanced if they led stakeholders in the creation of an information development plan, setting out by topic the work to be done, the responsible agency and the timeframe. It was also noted that there was a need for the GS team to take a lead in identifying, and sometimes undertaking, exploratory data analysis that would provide a deeper understanding of the strengths and weaknesses of alternative data sources and quality attributes of the data. This would be in addition to the analysis of data for external presentation, providing insights into the available statistics, that they are already starting to make available as part of the corporate push for analysis.

2. Introduction

In 2011, the Ministry of Finance directed Statistics Sweden to develop a system of quality indicators for a number of key statistical products. ASPIRE was developed to meet this need. Results were submitted to the Ministry annually between 2011-2022 with the exception of 2018 when a review was made of the ASPIRE approach regarding the scoring, the selection of products and the frequency for the reviews.

In 2023, another review (Linacre et al, 2023) was carried out by the ASPIRE team at that time – Stephen Penneck, Susan Linacre and Laurie Reedman – together with the quality group at Statistics Sweden’s Corporate Management Unit. It was ordered by the Director General of Statistics Sweden to address identified weaknesses in the ASPIRE approach in the context of Statistics Sweden’s present organisation and strategy. The review report recommended some changes in the ASPIRE process. The following changes have affected the results in this report:

- a shift in the user focus regarding the results of ASPIRE from the Ministry of Finance to Statistics Sweden’s top management group who wanted less emphasis on scores
- a risk analysis for the Accuracy component of quality for a more strategic selection of products
- a re-naming and re-grouping of the six so-called Quality Criteria to be replaced by six Quality Assurance Factors
- a significant simplification of the scoring system and so-called checklists changing the presentation of the results.

2.1 The current review round

The external review team for the ASPIRE review 2024 was augmented by one expert, Siobhan Carey.

The current round was carried out with a physical visit to Statistics Sweden in Solna as well as in Örebro. This allowed more in-depth discussions with all the product areas as well as with top management.

PPI was included in 2024 for the sake of continuity as it has participated in ASPIRE since 2015. The participation of the PPI this round enabled evaluation of the changes made to the checklists for the current round.

The PVI and GS were selected for the review on the basis of the risk analysis that was carried out in response to a recommendation from the ASPIRE review 2023 report. The aim of the recommendation was to add a risk approach to the annual Evaluation of the Official Statistics of Sweden (Statistics Sweden, 2023:1) – also called SOS-Q – in order to stimulate more reflection on quality but also to use the results to select statistical products which were more at risk, for a more in-depth review with ASPIRE. These products exhibited a noticeable level of risk for an error to occur in the statistics in the coming year, compared to other products that were included in the risk analysis. The PVI also participated in the ASPIRE review in 2020 and 2022.

The fourth product to be included in the 2024 review was BAS – a relatively new statistical product that was included for more strategic reasons. Statistics Sweden has invested much effort in this product in order to make use of new data sources and to strengthen the set of official statistics that describe the Swedish Labour Market, for the benefit of the users.

Each product team did their necessary preparatory work with the checklists and quality documentation which was sent to the expert team in advance of the review as usual. Thereafter, the review team had a written exchange with follow-up questions and answers with each of the product teams before the review.

The review team would like to express their gratitude to staff in Statistics Sweden who have participated in ASPIRE round 12. We are also grateful for the quick responses we got to our questions and for the open way that staff responded.

3. General observations and cross cutting recommendations

3.1 General Observations

This was the twelfth application of the ASPIRE process. The expert team were largely the same as most recent rounds with the addition of one new member. Overall, the process went well with great support from the Statistics Sweden internal ASPIRE team who were able to source additional materials, papers and people throughout the week.

We were interested to hear of the plans to update the Statistics Sweden strategy, to give it new energy and life for the next planning period, establishing the role of the NSI in the national data ecosystem. In the last few years, the continuing financial constraints have required the office to continue to look for new ways of doing things, and to find savings to invest in infrastructure and transformation. We became aware during our week of the impact of financial constraints in product areas, where lack of staff time inhibited some of the things they needed to do. During the week we heard that the government was investing additional funds in Statistics Sweden to support its leading role in the data-eco system, and we congratulate the office in securing this funding and look forward to seeing the results.

It is important in any strategic review to ensure that the top-level strategy is reflected in product workplans. We were interested to see that the current plan has four priority areas with milestones. For two of the priority areas, labour market statistics and secure data supply, the milestones are quite specific and concrete. Is the office confident that if these milestones are met, the priority objectives would be achieved- i.e., are these sufficient? For the other two priority areas, communication and economic statistics, the milestones are more cultural – more about how we do things than about what we do. In these cases, is the office confident that staff know what they have to do differently to achieve these milestones – e.g., how do we ‘capture change faster’? (Statistics Sweden, 2023:3).

It was useful to see the roadmaps, but in the coming strategic review a more consistent approach across the office should be the aim. A road map should show people how to get from where we are to where we want to be, in particular, what needs to be done differently. Also, Statistics Sweden needs to have a strategy for drilling down the cultural objectives into the product areas.

The plans for using machine learning algorithms as described in the AI portfolio (Statistics Sweden 2023) are excellent. An additional idea for a pilot, which arose in our review, could be to use machine learning to search the internet for “news” about topics that would be relevant to Statistics Sweden. For example, some PPI team members are doing this on their own time. It would be more efficient and effective for an algorithm to gather potential news articles for team members to review.

The experts were impressed with the level of engagement and openness of the product teams and appreciated very much the level of discussion given they were not operating in their first language. Similarly, the level of engagement in meetings with senior management could not have been greater.

The choice of products proved a good mix, providing some on the basis of continuity, some on the basis of their risk score and a new product. The fact that two of the products were analytical provided a good basis for assessment and comparison.

The opportunity to visit Örebro was welcome and the team felt it added to the richness of the discussions. Face to face meetings gave the expert team a much better understanding of the cohesiveness of each team. Where in-person meetings can be facilitated it makes the exchange of ideas more free flowing and more productive.

A strong sense emerged of the focus teams have on containing costs and this appears to constrain the ability to conduct internal analyses on their data and assess the quality of their outputs. Resourcing and access to specialist skills such as methodologists and IT professionals were a recurring theme.

The need to contain costs has impacted the capacity to pursue curiosity of the data. There are some really exciting areas to explore, and some excellent work being undertaken but this needs to be embedded in business as usual.

We were grateful for the extensive documentation we were provided with, often in response to our specific requests. We found that much of this material was not covered in the Quality Reports or the Production of Statistics Reports, and that many of these are not being updated. Keeping these regular reports updated with evidence of quality improvement activities and results of exploratory analyses (perhaps with links to more detailed reports) is essential for users and prevents the need for extensive requests for more material. The impact of scant Quality Reports in terms of this ASPIRE round resulted in more questions being generated, more documents being requested and provided. It also impacted on the schedule as some extra meetings were requested in order to ensure clarity of understanding of the processes and the rationale behind them. More thought might be given to what documents are provided at the beginning of the review process so that the review team have sufficient information to form a view including high level business plan milestones.

Last year we reviewed the ASPIRE process and recommended some changes, including tying the process in more closely with SOS-Q, using a more risk-based approach to selecting products, clearer roles and responsibilities and simplifying the scoring system. We noted that some of the questions on risk had proved difficult and we have not yet seen the impact of clearer delineation of roles. We would urge Statistics Sweden to continue to work on these. The simpler scoring system proved effective and easier to use both for the product areas and for the ASPIRE team. Teams commented that the checklist prompted useful opportunities for discussion that don't happen in the normal course of events. For the analytical products who use multiple sources it proved a less obvious fit; this may need further advice and guidance.

Overall, although it was a full and busy schedule, the team felt they got a good view of what they needed to see and appreciated the support they received from the Statistics Sweden team. For one expert, Stephen Penneck, it was the last meeting after seven years of ASPIRE participation.

3.2 Cross Cutting Issues and Recommendations

3.2.1 Statistical leadership

Statistical leadership has been a recurring theme in the last few ASPIRE reports and we are encouraged by the progress being made. Concepts and vision articulated by senior management are clear and on point. Senior management have a clear view of Statistics Sweden's role as a statistical leader. Material has been made available on the Statistics Sweden intranet and discussions among staff have been held in some areas, but not in others. The next step is to promote statistical leadership at the working level, and the first concrete step is for teams to fully understand their data. It's only when they've reached a level of mastery with their data that they can fully exercise a leadership role. In this ASPIRE round we heard from some teams who are striving to strengthen their engagement with their users and to share more analyses from their data.

The reorganization of methodologists within the organization was intended to facilitate collaboration between methodologists and to empower them in relation to the subject matter teams with whom they work. Again, here we saw some examples of methodologists exercising statistical leadership, and other examples of where they seem just too swamped with regular work to think about anything beyond production.

Recommendation 1

We recommend that Statistics Sweden help product teams to develop a clear view of what it means to be statistical leaders in their field, including expertise regarding their data and its uses, and the best practice methods to produce their outputs.

3.2.2 Analysis

Statistics Sweden recognises the value of analysis in providing insights into their data, both on the social and economic side and has strategies in place to improve and deepen this work. The ASPIRE experts noted some good examples of this and encourage the continuation of this focus. However, the team was concerned about the scarcity of internal exploratory analysis being undertaken by a number of the production areas.

Internal data analysis is essential for understanding the quality and particular characteristics of the products. This is necessary both for gaining expertise in the product and for improving it. This expertise allows the product team to discuss the data, and its weaknesses or strengths in answering the questions users have. It is this deep understanding of the sources, that allows the statistician to help find solutions for users' questions and which therefore underpins statistical leadership.

The sorts of internal data analysis that we were expecting to see from the work groups, as evidence of their understanding of its characteristics and quality, were relatively simple explorations of the data addressing quality-oriented questions. Examples might include:

- Graphs over the most recent 5 years of finalised value-added data from tax by size and broad industry grouping, of level and movement, highlighting any differences in business behaviour for different segments of business, at different parts of the business cycle. This might inform on any potential issues with the collection design in quickly measuring turning points in the economy;
- Graphs of new business units entering the tax population, by industry and size over 5 years, or of units that have become inactive by broad industry and size, as indicators of whether business demographics across the business cycle are being appropriately reflected in current practices;
- Graphical analysis of differences between data as first published and finalised;
- Analysis of time taken to correctly place turning points in different series. For example, for a given economic turning point in a specific month as indicated by the finalised data, how long did it take to become correctly placed in that month in estimates from PVI, BAS, LFS, and was this faster in the estimates as presented i.e., often year on year movements, or in month-to-month trend or seasonally adjusted data;

- Summary statistics such as totals, means, ranges, and percentiles for numerical data, and frequency distributions and counts for categorical data could be tracked through time for key variables of interest. Cross tabulations by geographic regions, gender, age groups and other demographic variables could also be tracked over time. Comparisons would be interesting month to month and on the same month in the previous year. We suggest using graphical representations wherever possible rather than tables of numbers as trends and outliers are more easily noticed visually.

These are just a few examples; by no means is this an exhaustive list, and nor are these necessarily appropriate for all types of data. When probed on the reasons for the very limited internal analysis being undertaken by work areas, it appeared that tools and skills were not always an issue, so much as prioritising space for this type of work. There appeared to be limited time available to delve into their data, and to plan and prepare for regular meetings with users including discussions on the quality of the data, user needs, data analysis, further ways to exploit the data, etc.

While there may be limited time available to delve into their data, there is a need to generate enthusiasm for hands on analysis the data in order to understand it and potentially improve. Their increased insights into the data and its quality attributes would also allow richer discussions with users.

The results of internal analysis should be documented in the Quality Reports and/or the Production of Statistics Reports each product area prepares.

Recommendation 2

We recommend that the corporate thrust to improve analysis within Statistics Sweden should not only provide mechanisms for externally focussed analysis, but also ensure internally focussed work is nurtured, valued and celebrated. This will enable product area statisticians and methodologists to be statistical leaders with their internal and external data users.

3.2.3 Product Development Plans

At the product level we saw that subject matter experts had a good idea of what future developments were planned but we did not always see evidence of this written down. Other statistical offices have set up information development plans for product areas which provide a focus for discussion with users, and internally for discussion on resource allocation or to identify areas of common interest or potential collaboration. These should be allied to the Operational Plan and the Road Maps to ensure that all areas are contributing to the forward direction.

Recommendation 3

We encourage Statistics Sweden to ensure that all products have a strategic work/development plan with milestones and a timeline, showing who is responsible/accountable for each activity, and how this fits in with the roadmaps. Progress against plans should be monitored on a regular basis.

3.2.4 IT platforms and tools

There is currently no common production environment for processing and analysis within Statistics Sweden. The BOA programme aims to address this by providing a platform that can facilitate replacing unique product systems with common solutions, and the phasing out of older systems that are past their sell by date while ensuring compliance with requirements for quality, security, and efficiency in statistical production.

BOA is in relatively early stages of development and no decision has yet been made on the choice of platform, currently out for consultation.

At the product level we saw that teams have requirements to develop their systems or to find new tools. Indeed, some are working on a proof of concept and feel well able to articulate their requirements. However, they do not have a clear line of sight as to how their systems requirements fit into the bigger picture or what solutions will be provided to their business area through the new platform. Other product areas know they need better tools for managing multiple data sources and publishing but do not have a clear idea of what the tools are or how they can source them. While some areas feel well placed to specify the requirements, if less certain as to how they build and deliver those systems, other areas feel that specifying requirements and finding solutions are not within their current team skill set.

Recommendation 4

Even though it is early in the development process, we encourage Statistics Sweden to ensure that all staff are aware of the BOA programme and ensure that the functionality it will (or will not) provide is understood by product teams with associated delivery timelines.

Ensure any new systems being developed by product teams are fully aligned with the new infrastructure.

3.2.5 Nonresponse in business surveys

There has been a considerable focus in recent years, on cost reductions. As part of this there have been changes to follow up arrangements for business surveys such that there is no longer any personal contact by phone made for other than the very biggest businesses, with reminders otherwise being in the form of an email. When there is a change in the follow-up protocol for business survey non-respondents, due to cost-cutting measures or for any other reason, there could be unintended impacts on data quality. It would be prudent to analyse the impact not only on response rates but also on the quality of estimates in key domains of interest.

Recommendation 5

We recommend there be an investigation into the extent and impact of business survey nonresponse. We also suggest looking into best practice for business survey data collection in other countries. Depending on the findings of this investigation, there could be an adjustment to the follow-up strategy particularly where it affects the quality of estimates.

4. Product scores and recommendations

4.1. Interpretation of the scores

The scoring system was simplified for this review round. This involved replacing the previous 10 rating levels with the following four compliance levels with respect to the statements provided for each of the six Quality Assurance Factors:

1. Do not agree
2. Agree partially
3. Agree fully
4. Agree fully, and more is done over and above this level

Level 3 in the list above is considered as being “fit for purpose” which is the explicit objective of Statistics Sweden according to the quality concept of Sweden’s official statistics.

Given the change in the ratings system it is not possible to compare the scores in this report with the ratings previously achieved for products also assessed in earlier rounds of ASPIRE.

The ratings assigned to a particular source of uncertainty for a product have however an unknown level of uncertainty due to some element of subjectivity in the assignment of ratings as well as other imperfections in the rating process.

The assessment of low, medium, or high importance to overall accuracy is done within a product, not across products. Thus, it is possible that a highly important source of uncertainty for one product could be of less importance to Statistics Sweden than a medium important source of uncertainty for another product if the latter product carries greater importance to Statistics Sweden or for official statistics. The assessment of the importance should reasonably reflect the evidence in their Quality Report and it may aid the product in prioritising improvement work.

The results of the review are presented below for each product. All of the products that were reviewed face different production conditions and challenges. The sources of uncertainty included in the Accuracy component also vary in importance for each respective product. This means that comparisons between products are not deemed to be meaningful and will not be shown in this report.

Comparisons over time can be made in the future to the extent that the same products are selected more than once over time.

4.2. Production Value Index (PVI)

The PVI is a monthly index showing the economic progress of the business sector, broken down by industrial sector. The quarterly index is an input into GDP. Surveys have traditionally provided the main sources, though tax data is increasingly being used for smaller and middle-sized businesses. There is good dialogue between the PVI product area and the national accounts, whose interest is in quarterly growth rates. Other users are the Riksbank and the National Institute of Economic Research (NIER), which are again interested in growth and the identification and assessment of turning points in the economy.

Update on previous recommendations

In our last (2022) review we recommended that the team continue to engage actively with all users to better understand uses and focus on a time series graphical representation of the statistics, including seasonally adjusted series and month-to-month movements.

The team told us that they continue to engage with users before making significant changes to the statistics. We were disappointed that the form of the monthly publication had not changed in recent years and looked dated with an absence of graphics (although these are present on the product webpage). Furthermore, although the release leads with the latest seasonally adjusted month to month change, the rest of the publication features annual changes on the month a year earlier. These do not of course reflect the most recent movements. Given the PVI is part of the suite of short-term indicators used to identify recent movements and turning points in the economy, we feel that it is the role of Statistics Sweden to lead users into looking first at month-on-month changes. We feel there is scope to review the publication, to make it more visual and use monthly movements more extensively.

We note the increased dependence of the PVI on tax data. Since April 2023 VAT data has been used in place of survey data for small and medium businesses in the production sector, and there are plans to conduct a study of some service sector industries next year (Lindblom, 2024). Understanding the accuracy of source data is key to understanding the accuracy of the PVI. We understand that due to the time lag in submitting tax returns, there is a need to impute for missing data. We previously recommended a dialogue with the tax authorities on the quality of their data and to monitor measurement error in their data. We were pleased to see, following our recommendation, that the implications of errors due to late VAT data have been studied, with the conclusion that these delays will not significantly increase model and measurement errors. We understand that although a visit to the Tax Office has been made and that this has increased expertise in this area, no further dialogue has taken place.

For some years now we have argued that using a quarterly updated business frame is likely to improve the accuracy of short-term movements, particularly around turning points, and in our last report called for analysis by Statistics Sweden of the value of using a quarterly frame for the PVI. We were pleased to note that a report had concluded that such a development would improve quality, but the report noted the costs involved without an attempt to set this against quantifiable benefits. We had discussions with some of the methodologists working with business surveys, who agreed that it would be possible to implement a more cost-effective approach than was considered in the report, and also to evaluate the quality benefits of quarterly frame updates so this could be assessed against the costs.

In our last review we recommended that the team consider what the editing approach should be for the VAT data, as part of the new editing strategy. We were pleased to note that the new production system facilitated VAT data editing. It is now easier to compare VAT data with survey data, and it is possible to see how much of an industry is covered by VAT data, and how this changes over time.

For some years we have been pressing for publication of a regular analysis of revisions, using a graphical time series presentation, to make it easier for users to understand the trends, using a longer time series where possible, and developing analysis of the reasons for revisions.

Some work has been done regarding the analysis of revisions. Every year, a revision meeting is held where the time series and any biases for each survey are reviewed. The work is continuing, and there are plans to

present graphical time series from 2015 and make the revision data more accessible in the January release. Analysis of revisions is an important source of information on data quality.

We were interested to see Appendix 1 of the Quality Report which chronicles the corrections made to the PVI over time. Translating this information into a table showing the industries affected, the size of the revision and the reason for it would enable users to have a better appreciation of this information. The value of the table would be enhanced if the reason for the corrections were also linked to the sources of uncertainty, and if the results were used to inform users of the relative importance of these sources.

Recent developments

We were pleased to see that good progress has been made in developing the new production system, which is being parallel run and is due to be operational by the end of the year. This should improve the resilience of the PVI. The new system will also enable the team to conduct more internal analysis of the data and to carry out more evaluations of the impact on quality.

We saw a useful paper on ‘Changes to Statistics’ (Statistics Sweden, 2023:2) which set out revisions to the PVI due to the introduction of new statistical units in 2023, and the extended use of VAT data described above. Most of the revisions were due to the new units, but these should lead to better defined estimates at industry level.

Recommendations

We recommend that the product area:

1. Looks at best practice in presenting statistical releases on other NSI websites and redesign the release so that the key messages can be more easily assimilated by users, through a more comprehensive use of seasonally adjusted month to month movements and the use of graphics.
2. Maintains a regular dialogue with the Tax Office with a view to both parties becoming better informed of the quality issues around tax data and undertake internal analysis of tax data to better understand any patterns in the differences between directly collected survey data and tax data, and differences between initially provided tax data and final tax data.
3. Evaluates the quality benefits of quarterly frame updates so this can be assessed against the costs.
4. Undertakes work to develop Appendix 1 as described above and uses a graphical approach to produce a regular analysis of revisions in the publication planned for January and uses it to further understand sources of uncertainty in the estimates.
5. Gives early consideration to how the new processing system can best be used to improve the team’s ability to conduct internal analysis of the PVI data, improving their understanding of relationships within the data, sources of uncertainty and current trends.

Score matrix, PVI 2024

Components of Accuracy	Quality Assurance Factors						Importance to Overall accuracy for single sources of uncertainty (Low, Medium or High - L, M, H)
	F1. Available expertis	F2. Compliance with standards and best praxis	F3. Communication with users and knowledge of quality requirements	F4. Knowledge of achieved accuracy and results of improvement activities	F5. Knowledge of quality improvements and plans for improvement activities	F6. Communication with representatives of data sources	
Overall accuracy	2	2	2	2	2	2	
Sources of uncertainty (average):	2,5	2,8	2,3	2,5	2,5	2,5	
Sources of uncertainty (mode):	2	3	2	3	3	2	
-Sampling	2	3	2	3	3	2	M
-Frame coverage	2	2	2	2	2	2	M
-Measurement	3	3	2	3	3	3	M
-Non-response	2	3	3	2	2	3	L
-Data processing	3	3	3	3	3	3	M
-Model assumptions	3	3	2	2	2	2	H
Preliminary statistics compared with final statistics	3	2	2	3	3	3	

Response options in relation to statements for Quality Assurance factors

- 1 Do not agree
- 2 Agree partially
- 3 Agree fully (considered as fitness for purpose level)
- 4 Agree fully but more is done over and above this level.

4.3. Producer Price Index (PPI)

The PPI measures the average price movement for producer and import prices, in total and for different product groups that are either sold by Swedish producers or bought from foreign suppliers. The PPI is an important input to the National Accounts when calculating GDP in constant prices and other economic statistics. PPI is also an important input in evaluating monetary policy.

The PPI has been reviewed in ASPIRE several times so this was familiar territory for some of the team we met. The expert team took the opportunity to discuss the product team's experience of ASPIRE, their views on the changed checklist and their past approach to implementing previous recommendations.

Overall, they felt the changes to the checklist were an improvement, made it easier to complete and facilitated a helpful, more in-depth, discussion about issues that don't come up naturally in the production cycle. It provided a different perspective in which to view production.

Update on previous recommendations

PPI was last included in ASPIRE in 2021. On the face of it progress in implementing the recommendations was limited, however in discussion it became clear that some consideration had been given to the recommendations. The discussion included the prioritization of ASPIRE recommendations alongside other pressing requirements and items in their five-year development plan. Implementing EU requirements, application of updated classification and establishing a new base year are their top priorities at present alongside the need to develop a new processing system. These are all against a background of static or reducing resources. The team acknowledge they are constantly making trade-offs between what they would like to do and what they must do. ASPIRE recommendations are seen as nice to do once the must do requirements are actioned. The team have no shortage of things they would like to do more of or do differently if they had more time.

Previous recommendations covered the application of the Index Auditing Model (IAM) and the Implicit Quality Indices (IQI). The team have clearly considered these and done some work to progress, but have encountered challenges in their application and use.

The IAM is intended to provide a structured way to view the quality of the index in total and for different subgroups. A score is generated, based on a number of criteria in each of five dimensions: sampling/coverage; pricing methods; specifications; response data; and quality adjustments. The aim is to use as much quantitative data as possible, and maximise transparency, sharing with users.

The team have also made efforts to implement the IQI, again with limited success. They found the results not very meaningful. In this case it was not a data problem but rather the complexity of products on the producer side as compared to consumer products. The index did not sufficiently distinguish between adjustments based on quality from those adjustments on volume or other changes in product characteristics. The team feel that this is not the correct tool for their application.

Recent developments

The product team demonstrated a good understanding of the issues on the various elements and the changes they have made in recent years such as monitoring the data monthly rather than annually. The response chasing protocol has changed and nonresponse has increased, the team identified they could do more to understand the impact of these changes but lack the time and the tools to do so.

The team showed awareness about the potential for measurement errors, especially in sectors with high nonresponse rates but were not optimistic about being able to make significant progress until they have new processing systems. Current IT systems lack the tools to investigate the data in production, but they are using the opportunity of system redesign to rethink the process. Frame and nonresponse issues within products are areas that they would like to understand better, resources and methodological resource permitting. The team need to migrate from their current system. This is an opportunity to increase the functionality of

their tools however they will need resource and expertise to do this. A plan needs to be developed with appropriate milestones and deliverables with responsible persons identified. This also needs to be positioned in terms of Statistics Sweden's wider infrastructure developments so there is a clear delineation between what the team must deliver and what infrastructure and tools will be provided on the corporate platform.

The team have no shortage of ideas for improvements. In addition to their stated top priority items which are meeting EU requirements, implementing the new classification, rebasing to a new year and developing the new system they also mentioned the need to change the way they ask questions, more validation checks, changing of the currency exchange source among others. All of these developments require expertise and resources, so the team has to prioritise ruthlessly with little scope for doing anything over and above the developments that are unavoidable.

The main user of PPI is National Accounts however in discussion it was identified that there are other important users. A more active engagement strategy for users, including external academics and trade representative bodies may bring wider benefits, for example in encouraging response from businesses.

Recommendations

We recommend that the product area:

1. We acknowledge the efforts made in pursuing the IAM and IQI and note that this work is currently deprioritised to focus on more urgent requirements. The difficulties in interpreting the index, i.e., what is good enough, might be circumvented by focusing on how the values change over time. We continue to support a recommendation for a measure comparable to the Implicit Quality Index of the CPI for the PPI.
 - a. It is recommended that the feasibility of calculating implicit quality indices that focus more purely on quality adjustments, be studied, with a view to better understanding where and by how much, quality adjustments are impacting data, and as an input to the quality audit index.
 - b. The team's experience in sourcing the necessary input information for the models and in using the information they have seems important to capture and share more widely. We encourage the team to revive the work perhaps in a more focused way.
 - c. We recommend they write up and share their experience of this work.
2. The system development needs to tie in with wider developments in Statistics Sweden (BOA) and in other business areas to avoid duplication and to ensure a good strategic fit. We recommend that the proof-of-concept design and the milestones for decisions and delivery be shared and made visible both vertically and horizontally within Statistics Sweden.
3. We recommend that the product team draws up a five-year plan with timelines, responsible persons and resource requirements/allocations. This could be used as a means of gaining consensus about priorities and leveraging support for improvements if shared with users. We recommend the plan be included or referenced (hyperlinked) in the Production of Statistics Report.
4. We recommend a programme of user engagement activities be drawn up in consultation with managers and other interested teams within Statistics Sweden.
5. Resources for chasing nonresponse have been reduced and nonresponse has increased. We recommend further analysis be done to provide insight into any new bias this may have introduced. Some thought needs to be given to the response chasing strategy for PPI given the change in protocol that has reduced follow-up. Any analysis of the impact of declining response rates could usefully be included in the Quality Report.

Score matrix, PPI 2024

Components of Accuracy	Quality Assurance Factors						Importance to Overall accuracy for single sources of uncertainty (Low - L, M, H)
	F1. Available expertis	F2. Compliance with standards and best praxis	F3. Communication with users and knowledge of quality requirements	F4. Knowledge of achieved accuracy and results of improvement activities	F5. Knowledge of quality improvements and plans for improvement activities	F6. Communication with representatives of data sources	
Overall accuracy	3	4	2	2	3	3	
Sources of uncertainty (average):	3,2	3,4	2,0	2,2	2,6	2,2	
Sources of uncertainty (mode):	3	3	2	2	3	2	
-Sampling	4	4	2	3	3	2	H
-Frame coverage	3	3	2	2	3	2	M
-Measurement	3	3	2	2	2	3	H
-Non-response	3	3	2	2	3	2	M
-Data processing	3	4	2	2	2	2	L
-Model assumptions	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Preliminary statistics compared with final statistics	N/A	N/A	N/A	N/A	N/A	N/A	

Response options in relation to statements for Quality Assurance factors

- 1 Do not agree
- 2 Agree partially
- 3 Agree fully (considered as fitness for purpose level)
- 4 Agree fully but more is done over and above this level.

4.4. The Population's Labour Market Status (BAS)

The purpose of BAS is to provide information on the supply of labour in Sweden on a monthly, quarterly and annual basis. The statistics can be used to describe the current status as well as developments over time. It highlights the whole target population as well as smaller groups, such as detailed age groups at municipal level.

BAS is particularly valuable due to its ability to provide granular data that covers smaller regions, and small population groups, which is not possible through survey methods alone. It can be used as a basis for small area analysis of labour market supply, studies, research and policy decisions in the field of labour market and economic development. For example, statistics describing the labour market's current status and development are an important basis for the production and analysis of macroeconomic forecasts. The BAS data can be cross analysed with other sources, for example survey data on health, education, or economic activity, to add the dimension of labour market supply. It can also be used to provide feedback to the registers (both social and business) on accuracy and coverage; it can be used to validate other products such as the Labour Force Survey; and it can be used as a signal of turning points in key economic indicators. The BAS can also be used as a sampling frame for household surveys including auxiliary surveys to the Labour Force Survey.

The BAS frame is all persons aged 15-74 on the population register. Demographic and geographic variables are picked up from the register. Units are linked using the personal identification number to a variety of different administrative sources and the business register. From this linked data, three analytical variables are derived:

- Labour market status
- Main source of income
- Work-related income level

BAS was initially released in May 2022 for the reference period January 2020 to March 2022. Since September 2023, BAS has been published monthly, quarterly and annually.

Recent Developments

The document "Subject Area Design Labour Market final report May 2021" (Statistics Sweden, 2021) serves as a strategic plan for the modernization and futureproofing of the labour market statistics at Statistics Sweden. This plan includes the development of the BAS program in three phases. While the BAS team are working towards stabilizing their production systems and improving data quality, it does not appear that they have a development plan that will guide the work yet to be done to realize the vision set out in the strategic plan.

Users of the BAS data include regional and local governments, the National Institute for Economic Research, several Ministries, the Riksbank, and economists monitoring employment trends and turning points. In addition, the BAS data has significant potential use in the social policy space, with longitudinal data providing opportunities for such analyses as migrant settlement, criminal recidivism, or labour experience of people with a disability. The Swedish government is particularly interested in how people support themselves, for which BAS can provide valuable insight. Users are interested in both the aggregate statistics which can be generated on the BAS webpage and in using the microdata to do their own analyses. Before publishing, the data tables have been perturbed to prevent disclosure of sensitive information, but this does not hamper data utility. The BAS team assured us that they have frequent and productive communication with users of BAS data. We would like them to build on this foundation and include dialogue about data quality and further uses of the data. We also think that the BAS data could be exploited more as a resource within Statistics Sweden, in a variety of ways as mentioned above. More communication with internal partners would facilitate this.

We learned of an initiative known as the "Friday diagrams" where on Fridays the BAS team are sharing on LinkedIn and the website an interesting analysis using BAS data. We applaud this excellent example of creativity and marketing. In fact, we think there should be Monday diagrams, Tuesday diagrams, etc. for every

day of the week, and by other teams as well! We suggest that in addition to the outward facing analyses covered in the Friday diagrams, there could also be inward-facing analyses using BAS data together with for example PVI or social statistics data to highlight current phenomena and demonstrate even more creative uses of the data.

The BAS team described for us the work they do to review/validate the input data as it is received, and we talked about the challenges of coverage and missing information on the frame. We encourage the continued dialogue and collaboration with the Population and Business Register teams to work towards data quality improvements. We also think there is scope for even greater mastery of the data through more exploratory analysis (summary statistics tracked through time) and also greater efficiency through the automation of these processes as they become more routine.

We noted that the team creates analysis largely using Excel and in databases. We are aware of the vulnerabilities of using Excel for regular important production work and suggest that the office might look at BAS suitability for inclusion in its new platforms approach.

Recommendations

We recommend that the product area:

1. Puts together a development plan with work activities, who is responsible/accountable, milestones and a timeline. The development plan should include the activities mentioned in the document “Subject Area Design Labour Market final report May 2021” as well as other analysis and quality improvement activities. This plan should align with the vision and timeline as outlined in the strategic plan. The plan should be included or hyperlinked in the Production of Statistics Report.
2. Puts together a communications plan for strengthening relations with stakeholders (both external and internal data source areas and users of BAS data). The plan should formalize the frequency of meetings and the topics to be discussed. An example of formalized communication would be to be alerted by the Population Register if and when an artificially large group of immigrants are birthed onto the register, so that the BAS team can smooth out the births and/or alert their users that this has happened.
3. The BAS team produces a weekly “Friday Diagram” which is a short analysis from the BAS data, released on LinkedIn. This is an excellent initiative. We encourage them to also exploit the BAS data by using it to confront/validate other Statistics Sweden products such as LFS and PVI. For example, use a time series to compare turning points in labour market status or main source of income as seen from BAS data to turning points in key economic indicators such as PVI.
4. Continues efforts to use automation and analytical techniques to deepen understanding of the data and to improve data quality. For example:
 - a. Automate the review/editing/validation of input data to make it more efficient, less time consuming, more systematic
 - i. Create edits to compare aggregates to previous month, same month previous year, within reasonable range limits
 - b. Cross-tabulations, time series, comparisons to other sources for the same population such as LFS
 - c. Measure the impact of imputation (marginal counts with and without imputation) and compare to other sources
 - d. Look at patterns in the differences between preliminary and final statistics.

Score matrix, BAS 2024

Components of Accuracy	Quality Assurance Factors						Importance to Overall accuracy for single sources of uncertainty (Low, Medium or High - L, M, H)
	F1. Available expertis	F2. Compliance with standards and best praxis	F3. Communication with users and knowledge of quality requirements	F4. Knowledge of achieved accuracy and results of improvement activities	F5. Knowledge of quality improvements and plans for improvement activities	F6. Communication with representatives of data sources	
Overall accuracy	2	2	2	1	2	2	
Sources of uncertainty (average):	2,8	2,6	2	1,4	2	2,4	
Sources of uncertainty (mode):	3	2	2	1	2	2	
-Sampling	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-Frame coverage	3	2	2	1	1	2	H
-Measurement	2	3	2	1	2	2	M
-Non-response	2	2	2	1	2	2	L
-Data processing	3	2	1	2	2	3	M
-Model assumptions	4	4	3	2	3	3	H
Preliminary statistics compared with final statistics	2	3	2	2	2	2	

Response options in relation to statements for Quality Assurance factors

- 1 Do not agree
- 2 Agree partially
- 3 Agree fully (considered as fitness for purpose level)
- 4 Agree fully but more is done over and above this level.

4.5 Gender statistics (GS)

The GS aim to describe how society is changing from a gender perspective. The area compiles statistics related to gender and gender equality, from various sources and makes them available to a variety of users. Areas of statistics covered are wide ranging and include health, education, caring, employment, income, crime and victimisation. The statistics disseminated can be used to monitor national gender-equality policy, and while there are many different users, a key user is the Gender Equality Agency which monitors the government's gender equality sub goals. The GS group is small, and its role is multifaceted. It must provide statistical leadership in this field, understanding the user environment in terms of key stakeholders and their priority needs. It must also have a comprehensive knowledge of the available data sources to meet these needs, regardless of source, and the strengths and weaknesses of these sources in answering different user questions. It must provide a leadership role in data development and a co-ordination role in ensuring different producer areas work effectively together to meet priority user needs, and that the statistics they produce are accessible. In addition, it also has responsibility for some data development and undertaking some analytic work to help extract the valuable stories from the statistics.

Playing these many roles in a small section is a challenge and priorities must be set and resources managed. In doing this the user consultation and producer support and co-ordination are time consuming but necessary activities. The group has tended to rate themselves as not fully meeting requirements here, although the ASPIRE team was impressed with the level of activity being undertaken, and the awareness of the role the group needs to play. There is a high level of expertise in the group, and the staff are experienced. If additional resources are not available, then it will need to continue prioritising its resources to gradually reach their goal.

The GS has not been reviewed in ASPIRE in previous years, so was new to the process and the fact that it is made up of a very large number of series provided a challenge in completing the checklist for the sub-components of accuracy like sampling and nonresponse. These are significant issues for some series, not for others. Instructions for completing the checklists for products like this may need to be reviewed.

Information provided on key users and how the data is used, showed a clear understanding of their current priorities in helping inform government policy on gender statistics. However, in terms of information provided to the review team, the ASPIRE team found the quality report to be relatively uninformative in terms of information on quality. While the database that forms the Gender Statistics output contains many series, it is important that the unit understands the quality attributes of all key series, and that the Quality Report is able to point the user to significant quality issues in relation to all the series, for example, through links to relevant quality evaluations. Where such evaluations are warranted but do not yet exist, or the implications for gender comparisons have not been assessed, the unit should be proactive in advocating for the evaluations to be done.

While the GS program is a producer of statistics, and develops indicators and makes data accessible, it also has a significant role as an educated user of statistics from producer areas, and an advocate for external users. In this role as educated user and advocate it needs to be proactive in working with producers of gender statistics to understand the quality attributes of data particularly as they apply to uses for gender related purposes. The unit might map its relationship with stakeholders in the user and producer spaces and identify opportunities to influence improvements in gender statistics, for example as a member of a survey reference group during the development of a survey.

Currently a source of error in the output database is that producer areas are providing aggregated statistics for the unit as a second activity after standard processing of 'their own' estimates has been completed. This leads to errors as the key experts are no longer necessarily involved, the wrong scripts are sometimes used in outputs provided in Excel. This leads to a number of errors and also near errors that are mostly caught just in time. If data is to be loaded efficiently and error free onto the database, this needs to be recognised as a standard output from the producer area, and provided as part of their standard production, with standard output controls to the gender statistics area. This needs to be negotiated with producer areas but is important in providing a cost-effective solution to avoiding errors in output databases.

In terms of its own processing, analysis and publication of data, the section is unsure where it fits within the current Statistics Sweden systems architecture, nor that it has the skills to develop its own effective systems. There is a need for someone with an understanding of the proposed corporate architecture to walk with them through their needs which differ from those using microdata-based systems, to determine a plan for their move onto the new platforms. It may be that National Accounts or other sections with similar requirements based on drawing data series from various sources, might provide some insights into their needs and possible solutions.

The unit is relatively newly restructured within its current section and the arrangement appears to be working well, providing flexibility in resource use across the section. The unit is able to take on funded analytical and data development work which helps add value to the outputs and expertise to the unit. It is encouraged to plan for this work in its resourcing so that it does not take away from the core work but supplements and supports it. The team is sharing their experience in their ways of working in this field with other Nordic countries. This is encouraged.

Recent Developments

Gender Statistics has two key outputs to communicate gender statistics. The first is a biennial booklet Women and Men in Sweden. The second is the publication of indicators for monitoring the national gender equality policy.

The biennial booklet has a large, varied and generally non-technical following, and after analysing use of the data, the team is looking to replace the booklets and PDFs with a web-based solution providing searchable access to more frequently updated data. The ASPIRE team encourages this work.

The second product supports monitoring of national gender equality. The Gender Equality Agency was established in 2018 and the Gender Statistics team has ongoing dialogue with them, and other users, to establish data needs, data gaps and development priorities. Some key current data gaps identified relate to areas such as time use statistics where standards and methods have already been developed, others relate to data gaps where further research and development work is needed to establish widely accepted definitions, classifications and indicators. This work is ongoing with a view to cohesively document and communicate known data gaps in the Quality Report for each gender equality subgoal.

Given that a number of information gaps have been identified with key users of gender statistics, and given that there are a number of producers and potential producers involved in potentially filling these gaps, it would be useful to build an information development plan for gender statistics, showing by topic the work needed (from development of data concepts, definitions, classifications through to data collection), and the work being done, together with the responsible agency and the timeframe. This would help both with the organisation of work being done, and also with highlighting priority areas where no activity was occurring and help focus effort on building support from key stakeholders in these areas.

Recommendations

We recommend that the product area:

1. Ensures that relevant quality evaluations for component series are linked to the Quality Report. Where there is a need for quality studies to be undertaken, or for the implications for gender statistics in a broader evaluation to be identified, the section should be proactive in advocating their needs with producers.
2. Works with key users and producers to set out an information development plan covering all priority user needs, for the next 3 to 5 years.
3. Works with producer areas to understand and reduce impediments to treating the gender statistics as a component of their standard outputs. This would involve the statistics being provided at the same time and with the same focus on accuracy as their other outputs. Where it is not possible to

make this change immediately, a process and timeframe for making the change should be agreed with each producing area. In the meantime, all near misses should be fed back to the producing area, with a summary report to the Quality Committee on an annual basis.

4. Arranges a discussion/ workshop with IT experts on the new platforms to assess where they fit, and what the timeframe and process for their migration to these platforms might be and seeks advice on available tools for their needs.
5. Considers its positioning as a user as well as producer of gender statistics and identify where it can leverage opportunities to input to the development of quality gender statistics as a user, for example on user groups for the development of household surveys.
6. Undertakes funded statistical development and analysis work as part of its program to continue to build a robust level of expertise. To do this the section should see if it is possible to assume a level of funded work and resource the team accordingly in advance in anticipation of this user funded work, rather than risk needing to divert scarce resources from an already full core work program.

Score matrix, GS 2024

Components of Accuracy	Quality Assurance Factors						Importance to Overall accuracy for single sources of uncertainty (Low, Medium or High - L, M, H)
	F1. Available expertis	F2. Compliance with standards and best praxis	F3. Communication with users and knowledge of quality requirements	F4. Knowledge of achieved accuracy and results of improvement activities	F5. Knowledge of quality improvements and plans for improvement activities	F6. Communication with representatives of data sources	
Overall accuracy	3	3	2	2	2	2	
Sources of uncertainty (average):	2,5	2,5	2,0	2,0	1,8	2,2	
Sources of uncertainty (mode):	2	3	2	2	2	2	
-Sampling	2	3	2	2	2	2	M
-Frame coverage	3	3	2	2	2	2	M
-Measurement	3	2	2	2	2	2	M
-Non-response	3	2	2	2	1	2	M
-Data processing	2	2	2	2	2	3	M
-Model assumptions	2	3	2	2	2	2	M
Preliminary statistics compared with final statistics	N/A	N/A	N/A	N/A	N/A	N/A	

Response options in relation to statements for Quality Assurance factors

- 1 Do not agree
- 2 Agree partially
- 3 Agree fully (considered as fitness for purpose level)
- 4 Agree fully but more is done over and above this level

5. References

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