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Seminar on the Role of National Statistical Offices in the Production of Leading, Composite and Sentiment Indicators

Geneva, 6-7 July 2017

Report

Note by the secretariat

Summary

The Seminar on the Role of National Statistical Offices in the Production of Leading, Composite and Sentiment Indicators, 6-7 July 2017, was organized following the decision of the Conference of European Statisticians in June 2017.

The present document is the report of that seminar, and is provided to inform the Conference of European Statisticians of the organization, outcomes and recommendations of the seminar.

I. Introduction

1. The Seminar on the Role of National Statistical Offices (NSOs) in the Production of Leading, Composite and Sentiment Indicators (LCS indicators) was held in Geneva on 6-7 July 2017.
2. The seminar was attended by representatives from Canada, Chile, Denmark, Hungary, Israel, Italy, Latvia, Mexico, Netherlands, Poland, Russian Federation, Slovakia, South Africa, Sweden, Turkey and United States of America. The seminar was also attended by representatives of the European Commission, The European Central Bank (ECB) and the Organisation for Economic Cooperation and Development (OECD). Academia were represented by Fondazione Eni Enrico Mattei, Konjunkturforschungsstelle (KOF) Swiss Economic Institute, the Netherlands Institute for Social Research, Università degli Studi di Roma "La Sapienza" and University of Geneva.
3. The seminar was organised by the Task Force on Leading, Composite and Sentiment indicators, consisting of Denmark, Hungary, Israel, Italy, Mexico, Netherlands, Sweden (chair), Eurostat, OECD and UNSD.
4. Ms. Monica Nelson Edberg (Sweden) chaired the seminar. The sessions of the seminar were chaired by Mr. Daniel Roash (Israel), Mr. Leendert Hoven (Netherlands), Ms. Monica Nelson Edberg (Sweden), Ms. Arzu Aratak (Turkey), Ms. Rosa Ruggeri Cannata (Eurostat) and Mr. Pierre-Alain Pionnier (OECD).

II. Organization of the seminar

5. The seminar was structured in the following sessions and activities:
 - (a) Session 1: Introduction
 - (b) Session 2: The role of national statistical offices in producing LCS indicators
 - (c) Session 3: Typology of LCS indicators
 - (d) Session 4: Sentiment indicators
 - (e) Session 5: Composite economic indicators
 - (f) Session 6: Composite socio-economic indicators
 - (g) Session 7: Case studies
 - (h) Conclusion of the seminar

III. Summary of the main conclusions reached at the seminar

6. The main conclusions and recommendations for future work are listed below. More details are provided in the summary of the discussion in Annex I. All documents from the seminar are available at www.unecce.org/index.php?id=43847.

Conclusions and recommendations for future work

7. In the discussion of the draft chapters of the guidelines on producing leading, composite and sentiment indicators, the participants of the seminar agreed on the following main conclusions:

Chapter 1: Introduction

- (a) The scope of the recommendations (excluding traditional measures such as GDP, CPI etc. and non-sentiment single indicators) should be clarified.
- (b) The task force should consider whether to include material on dissemination and communication in one chapter.

Chapter 2: The role of NSOs in producing LCS indicators

- (a) The growing demand for LCS indicators is an opportunity for NSOs to meet user needs and gain visibility. NSOs are in a good position to produce LCS indicators, based on the principles of official statistics and utilising their statistical expertise and wide access to data.
- (b) NSOs will have an important role to play to ensure appropriate dissemination and communication of LCS indicators.

Chapter 3: Typology of LCS indicators

- (a) The distinction between indicators with and without reference series is useful and has implications for compilation and quality assessment methods. The distinction between the two types of indicators should be strengthened.
- (b) The chapter should make better use of the information published in Eurostat's "Towards a harmonised methodology for statistical indicators" series.

Chapter 4: Sentiment indicators

- (a) Examples from more countries should be included.
- (b) The chapter should provide more details about the specific problems with international comparability of sentiment indicators.
- (c) More guidance and explanations on comparison with reference series should be provided and pitfalls highlighted.

Chapter 5: Composite economic indicators

- (a) The proposed structure for discussing composite economic indicators should be clarified and explained better.
- (b) More guidance on the theoretical/statistical framework and weighting issues should be provided.
- (c) The text on dissemination/communication should be further elaborated.
- (d) The wording of the chapter should be reviewed, and e.g. careful use of terms such as e.g. 'forecasting' be ensured.

Chapter 6: Composite socio-economic indicators

- (a) The chapter should give more advice on communication, e.g. on uncertainty.
- (b) Issues on the availability of micro data should be mentioned.
- (c) Ensure coherence between chapter 4, 5 and 6.

Cross-cutting and other issues

- (a) Chapters 4, 5 and 6 should give more guidance on the maintenance of the indicators.
- (b) Chapters 4, 5 and 6 should address issues related to international comparability.
- (c) Ensure coherence across chapters, particularly chapters 4, 5 and 6.

- (d) Recommendations should be provided in the same form across chapters.
 - (e) Guidance on how to follow/evaluate the development of indicators without reference series should be given in the relevant chapters.
 - (f) Quality assurance issues should be included in the chapters.
 - (g) A glossary should be included.
 - (h) Examples should include information on data, methods and production set-up to be more useful for countries.
 - (i) Thorough editing of the chapters is needed (clear language, coherence and consistency, recommendations, references and cross-references etc.).
8. For possible future work and research the following topics were suggested:
- (a) Terminology/typology issues.
 - (b) Informing NSOs and stakeholders of LCS indicators.
 - (c) Collect information of good practices in NSOs.
 - (d) Harmonize/standardize models for producing LCS indicators, including selection of dimensions and indicators.
 - (e) Further guidance on weighting, data harmonisation and aggregation.
 - (f) Development of quality framework for LCS indicators.
 - (g) Explore relation between objective and subjective measures.
9. The participants supported organising a future seminar on LCS indicators to follow-up on the above mentioned issues.

Annex I

Summary of the discussion

A. Session 1: Introduction

1. The seminar was organised to discuss the role of national statistical offices (NSOs) in producing leading, composite and sentiment (LCS) indicators. In particular, the seminar aimed at presenting the draft chapters of the Guidelines on producing LCS indicators that is being produced by the Task Force on Leading, Composite and Sentiment indicators established by the Bureau of the Conference of European Statisticians, and soliciting comments and proposals from the participants. In addition to this a number of country examples and case studies were presented and discussed.

B. Session 2: The role of national statistical offices in producing leading, composite and sentiment indicators

Session Chair: Leendert Hoven, Statistics Netherlands

2. Monica Nelson Edberg, Statistics Sweden presented the draft chapter on the role of NSOs in producing LCS indicators. The presentation of the draft chapter was followed by a panel discussion. The panel consisted of George Sciadas, (Statistics Canada), Mate Farkas (Hungarian Central Statistical Office), Fabio Bacchini (Italian National Institute of Statistics), Arzu Eratak (Turkish Statistical Institute) and Dennis Fixler (Bureau of Economic Analysis, USA).

3. The panel addressed the following questions:

4. Question 1. LCS indicators are not part of what could be considered the traditional or well-established set of official statistics, and practices vary between countries. Should NSOs engage in the production of LCS indicators, or should this be left to others? In the discussion of this question, the participants of the seminar:

- Acknowledged that there is a case for NSOs engaging in the production of LCS indicators, based on the principles of official statistics, in order to meet growing and changing user demands.
- Highlighted important issues on dissemination and communication (uncertainty, interpretation, documentation, transparency etc.).
- Underlined the need to base the production of the indicators on a sound theoretical framework.
- Noted that uncertainty is sometimes used as an argument for not engaging in the production of LCS indicators. However, other official statistics may also be subject to uncertainty.
- Pointed out that this is also a matter of resources; lack of resources or budget constraints may keep NSOs away from LCS indicators.
- Noted that many NSOs already produce model based statistics (nowcasts, flash estimates), but that they generally refrain from forecasting. It should be stressed that forecasting is not in the scope of the guidelines.
- Found that it would be useful if the guidelines could give more guidance on how to organise the production of LCS indicators in the NSOs.

5. **Question 2. What are the main opportunities and the main risks of NSOs in engaging in the production (compilation and dissemination) of LCS indicators?** In the discussion to this question, the participants of the seminar:

- Pointed out that NSOs can use their role of independent statistical organization and in-house experience, expertise and data sources. Most other (private) institutions may not invest the necessary resource to ensure the production of high quality indicators, nor disseminate sufficient documentation of data sources and methods.
- Noted that new LCS indicators can be produced as experimental or satellite statistics that experts and users can comment on.
- Stressed the importance of highlighting and explaining those issues that are specific to LCS indicators (including on uncertainty and interpretation of the indicators).
- Recognized that there is a risk of misinterpretation/misuse; this may be prevented by applying sound frameworks and methods, good communication and transparency.
- Noted that poor performance of leading indicators may lead to criticism.
- Recommended to take the EU experience on business and consumer tendency surveys into account.

6. **Question 3. For an NSO with little or no experience in producing LCS indicators, what are your advices on the steps to take to develop an LCS indicator to be produced by the NSO?** As regards the steps to take to develop an LCS indicator, it was mentioned that:

- User needs and a detailed investigation of user requirements should be the starting point.
- The questions the indicators are supposed to answer should be taken into consideration.
- A practical stepwise approach should be applied.
- Existing expertise in the NSO should be used.
- Due attention should be given to good communication.

C. Session 3: Typology of LCS indicators

Session Chair: Pierre-Alain Pionnier, OECD

7. Carsten Boldsen, UNECE, presented the draft chapter on typology of LCS indicators. The notions of *leading*, *composite* and *sentiment* indicators are not mutually exclusive but complement each other. For example, an indicator could be both *composite* and *leading*, or *sentiment* and *leading*. The typology introduces a fourth important dimension, allowing distinguishing between indicators with and without reference series. Indicators without reference series are specific for at least three reasons:

- NSOs are usually less familiar with these indicators for which user demand has grown in the last decade.
- Usual econometric techniques based on the minimisation of a distance cannot be used to construct composite indicators without reference series.
- Since users may feel that some subjectivity is involved in the construction of these indicators, communication may be more challenging for NSOs.

8. Economic composite indicators, introduced in Chapter 5, usually have a reference series whereas socio-economic composite indicators, introduced in Chapter 6 usually do not have a reference series. Sentiment indicators, introduced in Chapter 4, may be of both types. It is only when an indicator has a reference series that the notion of *leading* indicator makes sense.

9. The typology does not distinguish all possible case types. For example, making a distinction between sentiment composite indicators and non-sentiment composite indicators depending on whether all components are sentiment indicators or a mix of sentiment and non-sentiment indicators, was not considered useful by the Task Force.

D. Session 4: Sentiment indicators

Session Chair: Arzu Erataak, Turkish Statistical Institute

10. Erik Slentø, Statistics Denmark, presented the draft chapter on Sentiment indicators. In addition, there were presentations by Israel on *Sentiment indicators based on business tendency survey*, and by Canada on *Contemplating a new survey on business sentiments*.

11. The pros and cons of producing sentiment indicators were discussed, including the challenges of communicating such statistics to the users and the public in general. The following issues were raised:

- More country examples are advised to be included in the Chapter.
- More discussion about the problems with international comparability of sentiment indicators was recommended.
- Giving guidance/more explanations on comparing economic sentiment indicators with reference series and highlighting the pitfalls were recommended.
- Giving guidance on how to follow/evaluate the development of social sentiment indicators (without reference series) was recommended (e.g. on reference periods).

E. Session 5: Composite economic indicators

Session Chair: Rosa Ruggeri Cannata, Eurostat

12. Monica Nelson Edberg, Statistics Sweden, presented the draft chapter on composite economic indicators. There were to additional presentations on composite economic indicators: by Netherlands on *A business cycle tracer for small and medium sized enterprises*, and by Italy on *Italian leading indicators*. The following issues emerged after the presentations and discussion:

- The proposed structure for discussing composite economic indicators should be clarified and explained better. For instance, the distinction between non-cyclical and structural indicators was not found clear.
- Composite economic indicators are part of the regular production of several statistical offices. The chapter should give more guidance on the regular maintenance of the indicators and the indicators' performance.
- A distinction between nowcasting and forecasting can be useful for NSOs that are less keen on forecasting activities.
- The development of economic indicators can help in getting better information at a moderate cost for the respondent, limiting statistical burden and filling the gap in cases of lack of data.
- Although several methods and techniques can be applied for the production of composite economic indicators and progress towards harmonisation is still on the way, the availability of many manuals and handbooks shows that there has been lot of work around CEI in the scientific community at national and international level. Further research is needed on some methodological aspects such as the choice of a particular model, variables selection, weighting schemes and communication. Statistical Offices which wish to start the production of CEI should be able to

benefit of existing literature (manuals, guidelines) and experience of other institutes and institutions.

F. Session 6: Composite socio-economic indicators

Session Chair: Monica Nelson Edberg, Statistics Sweden

13. Jeroen Boelhouwer, the Netherlands Institute for Social Research, presented the draft chapter on socio-economic indicators. In addition, there were two presentations, by Turkey on the Turkish *Well-Being Index for Provinces*, and by Italy on the index for *Equitable and sustainable wellbeing in Italy*. The Italian example included a well-developed conceptual model. The Turkish example is based on the OECD recommendations on composite indicators. The following comments and conclusions were made:

- The selection of dimensions and indicators and weighting is not undisputed. Hence, setting up a conceptual model is fundamental. Main challenges involve the selection of domains and indicators; weighting; and building of time series.
- It is important to give time for developing the conceptual and methodological framework underlying the indicator to ensure sound basis and appropriate compilation/production steps. This is to some extent an iterative process where, based on experiences with the produced indicators, the underlying model may need to be adjusted.
- It is useful to involve stakeholders in the development of the indicators.
- There is a risk of duplication in chapters 5 and 6 on a number of issues (modelling, weighting and aggregation, conceptual model). While the chapters should be able to stand alone, unwarranted duplication should be avoided.
- Main differences between economic and socio-economic indicators should be made clearer, including on issues such as the need for micro data, reference series or lack of reference series and statistical uncertainty.
- Concerning dissemination the applied methods, the component series and other relevant documentation should be made available to users.
- There may be criticism on the “subjectivity” of the indicators: to the extent possible this should be prevented by making the applied methods and data sources available to the public and by carefully communicating and explain the indicators, their interpretation and limits.
- Composite indices and scoreboards can be complementary tools in the dissemination of indicators. There seemed to be a demand for interactive dissemination as well.

G. Session 7: Case studies

Session Chair: Daniel Roash, Central Bureau of Statistics, Israel

14. The session included three presentations:

15. *Using rule-based updating procedures to improve the performance of composite indicators*, by Jan-Egbert Sturm, Konjunkturforschungsstelle (KOF) of the Swiss Economic Institute. Mr. Sturm provided an overview of the semi-automated method for constructing the KOF leading composite indicator for economic growth in Switzerland. The rule-based indicator selection updating procedure, performed at regular intervals, reduces the arbitrariness of the selection and updating of component series and reduces suspicion that revisions are only made because the results are not liked. It is based on bivariate associations of potential variables with a reference series reflecting the Swiss growth rate

cycle. The regular updating procedure preserves the leading properties of the composite indicator with respect to the reference time series. The model is based on some 200 individual variables. The large number of variables means that structural changes to some extent can be gradually incorporated by omitting or including variables.

16. *From indicators to synthesis. Methodological issues in the construction of complex indicators*, by Filomena Maggino, Università degli Studi di Roma La Sapienza. In her presentation Ms. Maggino stressed the need to clarify the methodological steps involved in developing and synthesising indicators. Developing indicators is essentially a normative process. Indicators should be developed and managed so that they i) represent different aspects of the reality; ii) picture the reality in an interpretable way; and iii) allow meaningful stories to be told. Indicators are designed hierarchical – from individual variables over dimensions and to the overall indicator. The need to ensure coherence across all levels was underlined. Data and the statistical model may not fully reflect the conceptual model/framework for which reason it will often be necessary to make approximations. Selection of component series and dimensions may be discussed with advisory boards and/or with researchers. While there are examples of good practices a more formal framework does not exist.

17. *High Dimensional-Non Additive Municipalities' Performance Index in a Two Levels Approach*, by Luca Farnia, Euro-Mediterranean Centre on Climate Change. Mr. Farnia presented an overview of the weighting technique (principal component) applied for the aggregation of high dimensions indices and non-additive aggregation functions (Fuzzy measure and Choquet integral, and preferences' elicitation). It was concluded that i) the use of principal components methods could be a good solution to take into account the correlation among variables and hence to reduce the risk of overweighting their influence; ii) more consensus among researchers is needed to derive the weights of individual indicators by means of principal components method; iii) Fuzzy measures and Choquet integral are powerful tool to model interactions among indicators; iv) it is important to take into account the consistency of the information received from respondents in evaluating survey results.