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LONG TIME SERIES ISSUES IN THE EU NATIONAL ACCOUNTS¹

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INTRODUCTION

1. This document falls into three main parts: the first part addresses some basic questions in the context of long time series: What are the reasons for having only short series? Why would one want to have long ones? And if so, how shall they be produced? The second part describes a number of recent or imminent changes that threaten the availability of backdata for the National Accounts of EU Member States in general and for accounts for the EU in particular. The third part outlines the compilation principles of EU accounts and which repercussions these have on the length of time series available.

¹ This paper has been prepared by Ingo Kuhnert at the invitation of the secretariat.

BASIC ISSUES IN LONG NATIONAL ACCOUNTS TIME SERIES

2. **Cui bono?** Basically, every user demands long time series. Cutting long series is easily done, extending short series is not. Strongest demand for long time series comes from users interested in business cycle analysis, such as economists at business banks, central banks and other actors on the financial markets. For them, however, the early availability of data for recent periods is of even higher priority. A second group of users, such as academic researchers and specialised media, are keen on analysis of long-term structural developments. Early availability of the most recent period is usually secondary to them.

3. Reservations about data quality tend to be disregarded, and such reservations are commonly due to retropolations. In some situations, having no backdata will do less harm than giving misleading indications about the past. There are limits to retropolation, and some breaks in time series are simply that: breaks.

4. **How far back shall we go?** From a user perspective, time series must be as long as possible. Most advanced users run econometric models, with no upper bound on complexity. Some of these may be inspired by approaches developed with financial markets data in mind, where daily or hourly readings rapidly accumulate long series. Reliable estimation of these models often demands a time series support that is beyond realistic reach in National Accounts.

5. Fifteen years is usually considered as the minimum requirement for (quarterly) data for serious formal analysis. This time span should cover at least two complete economic cycles. For a reasonably stable estimation of seasonal adjustment parameters, 10 to 15 years are required.

6. **Which series should be retropolated?** Obviously, the broad National Accounts aggregates such as GDP and GNI as well as the main expenditure components are the ones for which long backdata is most requested. Apart from that, however, there is also considerable demand for detailed structure in backdata, mainly for branches of economic activity and consumption subcategories. Series at higher frequencies are better suited for short-term analysis, so demand for long quarterly series is somewhat larger than for annual ones. However, backcasting quarterly series will naturally involve doing the same for the corresponding annual series.

7. A special case that deserves to be mentioned is the user requirement for long **forecast** series. Forecasting and backcasting problems have many properties in common, and the techniques that can be applied are, in part, the same. Obviously, methodological changes will not be considered in the forecasted periods. The EU Commission publishes regular forecasts for a number of National Accounts variables for the current year and the two following years, for Member States and for the EU. Eurostat presents the growth rates from these forecasts, applied to the latest level data actually available from Member States. There are, however, a number of users who expect detailed forecasts with a ten-year horizon.

8. **Why are there short time series?** The most obvious reasons for short time series are changes in methodology, in particular changes to the accounting framework, in the measurement methods, or to important classifications. A number of these are listed and treated briefly in the following pages.

9. Another reason for short length of series may be fundamental political changes. The

central and eastern European Member States of the EU as well as Germany are examples for this. Changes to the political and statistical systems were so fundamental that retropolations are not only difficult, but even of questionable value.

10. The introduction of genuinely new statistics or an extension of the National Accounts coverage (e.g. adding the income approach to expenditure and production) need not necessarily be accompanied by retropolations. Unlike the changes in methodology mentioned before, there is no loss of previously available temporal coverage, and the lack of long series will thus be more readily accepted – as a transient feature – by users.

11. **What can be done to produce additional backdata?** A detailed discussion of strategies and methods for time series retropolation is beyond the scope of this paper. In National Accounts, there is obviously a strong dependency on the way in which the issue is tackled in source statistics, or more precisely, on the availability of long series for basic data.

12. The most reliable approach is obviously to recompile the accounts for past periods from basic source data at the lowest level possible. Apart from resource constraints, this will often be complicated by the unavailability of part of the data needed.

13. A somewhat lighter approach requires re-compilation of accounts from grass-root level only for a number of benchmark years, with interpolation in between.

14. Without these benchmark points, the interpolation techniques can be adapted to pure retropolation. The quality of results then greatly depends on the nature of the changes that created the breaks, and on what information is available. This information may comprise the data actually required but with a different methodological base, on a higher or lower level of aggregation, at a higher or lower frequency, or simply related indicators.

15. The simplest approach is backcasting, starting from new data by simply applying the growth rates of previously available data. While not satisfactory from a methodological point of view, this approach does have the bivalent charm of quick-and-dirty solutions.

ISSUES IMPACTING ON LENGTH OF SERIES IN THE EU

16. Eurostat collects statistical data from Member States' National Statistical Institutes (NSI) on the basis of **legal acts** (usually a Regulation of the European Council and the European Parliament or a Commission Decision). By default, these acts specify the transmission obligations with respect to transmission delay and minimum length of series required. Providing series of the length requested is thus a legal obligation.

17. In consequence, the legal backcasting requirements are subject to intensive discussion in the European Statistical System (ESS) before being fixed, and extreme demands have little chance of surviving the negotiations. In addition, Member States may be granted derogations, relieving them of part of the backcasting obligations.

18. **ESA95** is specified as a binding legal act in Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community. Annex B of this regulation describes the obligations in the field of data transmission by NSI to Eurostat. By default, data was only requested from 1995 onwards, but table 23 in that annex specified additional requirements for backward calculations for some important elements of National Accounts. For example, the requirements for GDP and other main aggregates were set as follows: The period 1995 to 1999 had to be covered with the first transmission under the new regulation scheduled for April 1999. Immediately with this first transmission, backdata for 1988 to 1994 was requested. Additional data back to 1970 (annual accounts) and 1980 (quarterly accounts) was due by the end of 1999. For other elements of National Accounts, the time foreseen for additional backdata was slightly more generous. Following negotiations, a number of derogations were granted by the ESA95 regulation. Some of them also concerned the length of back series and/or the time when they were due. Most of these have, however, expired in the meantime.

19. Changing policy needs and new user needs necessitated a review of the current **ESA95 data transmission programme**. A revised programme in the form of a Regulation has been proposed and is currently under discussion in the European Council. Examples for extensions of the current programme are quarterly sector accounts, more detailed breakdowns by investment product and by industry, employment by sector. Examples for reductions are the suppression of voluntary tables, of constant price Input-Output tables and some reduction in details requested.

20. The proposed Regulation acknowledges that the new transmission programme is demanding and that its implementation represents a considerable workload. An extension of the backdata requirement for National Accounts main aggregates beyond 1970 was never envisaged in this context. Where the new transmission programme proposes an extension of detail (e.g. in the breakdown of gross fixed capital formation by type of asset), this was not accompanied by an extension of the backdata requirements to the newly added elements. Furthermore, the complete provision of current data and data of the recent past was considered more important than the calculation of long back series. Therefore, Eurostat proposed to implement the programme in two steps, asking for data back to 1990 only (unless shorter time series are requested for specific tables) in the first step. Moreover, in the case of the new EU Member States of central and eastern Europe, compulsory time series are not requested to start earlier than 1995. In the German case, data for Germany after unification are requested only from 1991 onwards. The final regulation will likely also include other country-specific derogations, part of which may concern the backdata obligations (with respect to length and/or delay).

21. The treatment of financial intermediation services indirectly measured (**FISIM**) has been the subject of debate for a long time. ESA95 initiated some further testing, which finally led to Commission Regulation (EC) No 1889/2002 of 23 October 2002 on the implementation of the allocation of FISIM within the European System of Accounts (ESA). Article 1, § 2. of this regulation demands that "Member States shall transmit to the Commission the results of the calculations ... including backwards calculations from 1995 onwards."

22. Some EU Member States found implementing the FISIM regulation more difficult than expected, and have not yet managed to do so, while others have done it for the most recent

periods only. The actual availability of backdata therefore varies considerably and currently only goes back to 2001 in some cases.

23. The changeover from expressing volumes in prices of a fixed base year to **chain-linking** data expressed in previous year's prices is a process under way among EU Member States for several years now. Commission Decision (98/715/EC) of 30 November 1998 on the principles for measuring prices and volumes made this change mandatory, but allowed for a transitional period as long as 2005. Concerning backdata, the legal document demands that "this Decision shall be used for the data transmitted to Eurostat at least for the data referring to the years 1995 and later."

24. A profound **revision of NACE/CPA** is currently under way. Harmonising the introduction of the new classification between all statistical areas concerned is a daunting task at national level. National Accounts tend to be at the end of the statistical food-chain, and ideally requires the new classification to be fully implemented in the source statistics before it can be introduced in the accounts. On the other hand, the prospect of a prolonged transition period with different classifications in different domains is not very tempting. The need for further harmonisation of the introduction between EU Member States is generally accepted in principle, but cumbersome to actually achieve.

25. The need for prior application in the basic statistics also applies to backward calculations. Ideally, National Accounts would base their backdata on the backdata prepared in the statistical source data domains. When asked about plans to backcast National Accounts data after introduction of the NACE Rev. 2 in 2011, EU Member States tentatively indicated intentions varying between 1978 and 2008, with clusters at 1995, 2000 and 2005. Eurostat considers that data at least from 1995 onwards are needed so that appropriate time series for European aggregates can be calculated.

26. To achieve this, Eurostat also considers giving recommendations for a common backcasting approach across statistical domains. On the formal side, the proposal for a regulation establishing the revised NACE classification explicitly undertakes to also amend most related regulations that make reference to the NACE. Each of these proposed amendments explicitly addresses the issue of minimal length of time series. The following examples give an idea of the approach:

- Regulation (EC) No 450/2003 (concerning the labour cost index) is amended as follows: "Back data from the first quarter of 1996 to the fourth quarter of 2008 shall be made available by the Member States.";
- Regulation (EC, Euratom) No 58/97 (concerning structural business statistics) is amended as follows: "The first reference year for which statistics are to be compiled is the calendar year 1995.";
- Regulation (EC) No 1165/98 (concerning short term statistics) is amended as follows: "... The first reference period for which all variables are to be transmitted in NACE Rev. 1 is January 1998 for monthly data and the first quarter for quarterly data. The first reference period for which all variables are to be transmitted in NACE Rev. 2 is January 2009 for monthly data and the first quarter 2009 for quarterly data.".

27. Given the current status of discussion of the implementation of the new NACE in the National Accounts, the matter is effectively delegated to a separate future regulation, which will aim at harmonising as far as possible the month of introduction in 2011 and the length of backseries. Important users of Eurostat data have expressed their views in this respect, with the unsurprising demand that “the implementation of new statistical classifications should not lead to a significant loss of available backdata”.

28. Changes in the geographical composition by successive **enlargements of the European Union** pose specific problems for Eurostat. Usually, there is demand for the new, enlarged aggregate even before accession of new Member States actually takes place, and demand for the old, smaller aggregate will continue for a considerable time. In addition, for political and administrative reasons rather than for economic analysis, there is also demand for National Accounts data reflecting the enlargements as they occur over time, i.e. series with a time-dependent geographical reference.

29. Countries joining the EU go through an accession phase, during which their statistical systems must be adapted to the requirements of community statistics. However, National Accounts source data collected under EU legislation may be difficult or impossible to establish retroactively, so time series for new Member States will ceteris paribus often be shorter than those available for old Member States. Thus, after accession of ten new Member States in 2004, time series for the new EU25 were four years (sixteen quarters) shorter than for the euro-zone and the EU15.

LONG NATIONAL ACCOUNTS TIME SERIES FOR THE EUROPEAN AGGREGATES

30. The **basic approach** to the compilation of National Accounts for the EU is as follows:

- Eurostat compiles annual and quarterly accounts for the EU and the euro-zone. In practice, this involves four aggregates at least: EU25, EU15, the euro-zone including and excluding Greece (which joined one year after the other eleven members);
- the annual accounts are compiled by summing up the levels of National Accounts variables from all Member States concerned. It follows that, by default, the length of series available for the EU is identical to the minimum length available from Member States, and that no series is available at all if one of the corresponding Member States series is missing.
- the quarterly accounts are compiled by applying a temporal disaggregation to the annual levels. This disaggregation is guided by a quarterly indicator summed up from whatever Member States data is available. The indicator is expected to cover at least 65% of the total in order to give a reliable estimate. It follows that the length of quarterly series is constrained by the length of annual series and by the availability of a quarterly indicator of sufficient coverage, whichever is shorter.

31. Until the end of 2005, EU accounts series covered the period 1991 (1991Q1) onwards for the euro-zone and the EU15. This was motivated by data availability for Germany after unification. Revised data for the former Federal Republic is available back to 1970, which in turn would allow Eurostat to extend the EU series – including a break in geographical coverage

backwards. These longer EU series have, however, not been published yet. Accounts for the EU25 have not been established for periods before 1995.

32. The introduction of **important methodological changes** (FISIM, chain-linking) in the EU Member States has led to a sometimes heavy reduction in the length of time series available. Currently, a number of Member States have not retropolated beyond 2000, and many more cannot, as yet, go beyond 1995. Via the compilation principles outlined above for the EU accounts, this would result in poor temporal coverage for the EU accounts.

33. In order to assure a minimum length of main EU aggregates series of 1995 to 2005 (1995Q1 to 2005Q4), Eurostat proceeds as follows:

- for central variables, missing recent observations are imputed by applying growth rates forecasted by DG ECFIN;
- in a number of cases, revised national data does not extend back to 1995, and hence there is a break when combining the new short series with the old longer ones. Eurostat then extends the new series backwards to 1995, usually by simply applying the growth rates observed in the previously available data. Maintaining the growth rates available in the public domain is of prominent importance for most users;
- in very rare cases where part of the annual data back to 1995 is missing completely for single Member States, Eurostat imputes values from whatever proxy data are available (such as figures compiled under ESA79). These imputations for Member States National Accounts series are not published, and they are indeed very few;
- for quarterly data, available Member States data usually surpasses the coverage threshold back to 1995. If necessary, breaks are adjusted by lifting the old growth path to the level of the new post-break data.

34. The complexity of the retropolation techniques applied is obviously modest. The decision not to go back beyond 1995 partly reflects this assessment. Extending the series for the euro-zone and the EU15 aggregates back to 1991 is intended for summer 2006, provided the availability of data for the Member States is judged sufficient. Extending back beyond 1991 can reasonably only be done for aggregates including Germany in the form of the former Federal Republic before unification. With the possible entry of additional Member States into the Economic and Monetary Union, data availability for the euro-zone will most likely be reduced to series starting in 1995 again.

SUMMARY REMARKS

35. Changes in methodology that threaten the availability of long time series have been manifold, and others are expected. In the EU, the backdata requirements are usually treated on the legal basis for the new methodology.

36. Fast availability and correct representation of the economic situation often override considerations of time series homogeneity. Nevertheless, demand for long series is strong.

37. National Accounts for the EU are built from National Accounts for the EU Member States, not directly from source statistics at EU level. This poses specific problems for the EU accounts, which by default would always be as short as the shortest available Member State series.

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