

DRAFT

**ASSESSING THE FEASIBILITY OF AN OECD MICRO-DATABASE FOR RESEARCH
ACROSS CONTRIBUTING COUNTRIES VIA REMOTE ACCESS**

Paper presented to the OECD Conference:

**ASSESSING THE FEASIBILITY OF MICRO-DATA ACCESS,
LUXEMBOURG 26-27 OCTOBER 2006**

Giuseppe Bruno * and Nadim Ahmad**

* Bank of Italy Research Dept and OECD ITN Directorate, ** OECD, Statistics Directorate

ASSESSING THE FEASIBILITY OF AN OECD MICRO-DATABASE FOR RESEARCH ACROSS CONTRIBUTING COUNTRIES VIA REMOTE ACCESS

1. Introduction

1. The development of macro-based statistics and indicators has rightly formed the focus of statistical development and resources, particularly in an international context, for many decades now. But as the world becomes increasingly complex and computational capabilities increasingly advanced it is also right to start considering whether the role of micro-data in international statistics should not also be increased. Many recent policy developments and initiatives have highlighted the need for better quality and more comprehensive micro-data to provide the tools for evidence based decision making and to tackle complex issues such as understanding innovation, balances and imbalances in economic statistics, and the many implications of globalisation. Moreover a large share of research studies now carried out by the OECD and many other national and international institutions and analysts involve country level micro-data.

2. Much of the information used or required for these analyses is already available (e.g. statistical or administrative business registers) but, in many cases, legal (confidentiality) restrictions mean that users cannot access the available data and, so the required analyses are not done, or, more typically, researchers conduct their own surveys to collect this information. This is unfortunate. Firstly because there is an unnecessary cost imposed on the economy (cost of conducting the survey and costs to respondents) and, secondly, because the statistical quality of the information collected via these surveys is rarely as good as the information already held within government institutions.

3. Many statistical offices have recognised this and now make their micro-data available to researchers through a variety of access modes. But this approach restricts the analysis to a single country, and, increasingly, the focus of researchers is the global economy, for example international production networks, migration, outsourcing etc. Further benefits from micro-data analysis could therefore be attained if micro-level statistics were derived through a more collaborative coordinated approach or framework that ensured greater coverage of countries and, indeed, harmonisation of concepts and statistics.

4. To gain a better understanding of the options and implications of micro-data access, on a more structured and co-ordinated basis, by the OECD, the Secretary General allocated means from the Central Priority Fund to carry out a feasibility study in 2006. The 2005 OECD Statistics Committee meeting also recognised the importance of this subject and recommended that the OECD organise a conference on micro data access in 2006 to exchange best practices and explore the role of the OECD in fostering work with micro data access. Five main options related to micro-data access have been formulated by the OECD.

Option (1) Decentralised work with indicators based on 'snapshot' information

5. This option builds on and expands what is already current practice. Statistics Institutions the world over already provide indicators based on micro-data, indeed, in extremis, even GDP can be considered to be an indicator based on micro-data. The option, in a nutshell, proposes that statistics institutes continue to expand the range of standard indicators typically demanded by analysts and users so

that they continue to be relevant and meet user needs. Structural business statistics for example, showing turnover, output, employment etc are now regularly produced and disseminated by statistics institutes but more indicators could be disseminated, whilst still preserving confidentiality of respondents. For example it should be possible to provide confidence intervals around estimates of average turnover, productivity etc by size class and industry grouping say. Composite indices, such as Concentration indices, should also be possible. The idea therefore is to explore with users and statistical offices the types of indicators that could readily be produced and disseminated without presenting disclosure problems.

Option (II) Decentralised work with longitudinal data

6. An extension of Option (I) above is to present disclosive indicators that are based on longitudinal micro-data. A number of countries for example, particularly in the EU, have already started to adopt this approach in the production and dissemination of business demography data (birth, death and survival rates) but even here more could be done, for example by providing the coefficients to standard and commonly performed regressions. This is the option that has been followed by OECD in previous longitudinal studies; the OECD plays a role in that it coordinates the research question and basic methodology and synthesizes the results. But micro-data are accessed and treated in a fully decentralized fashion. See also Bartelsman et al (2006) for a recent example of this approach.

Option (III) Special bilateral projects

7. This option includes the special case where OECD enters an agreement with one particular country to carry out micro-data analysis. A recent example is the study on productivity analysis for China carried out by the OECD's Economics Department: several officials from the Chinese National Bureau of Statistics spent several weeks at the OECD and analysed, jointly with OECD staff, micro data on Chinese firms from the economic census. In other words, micro-data resided at the OECD for a limited period of time and under the control of officials from the Chinese National Bureau of Statistics

Option (IV) Coordinated remote access

8. The coordinated access model corresponds to the suggestion made by Eric Bartelsman (see STD/CSTAT(2004)12 and more recently DSTI/EAS/IND/SWP(2005)12). The model does not explicitly call for the actual transmission of data from NSOs to the OECD, rather it envisages the transfer of metadata and the creation of a Centre for micro-data access that would allow researchers to create and use programmes that could interface with micro-data held at NSOs. There are a number of ways in which this option could work in practice. One of them relates closely to options (I and II) above. The two other main variants are for (i) the results of the programmes to be transmitted to statistics offices who would then ensure that the results did not breach confidentiality rules and (ii) for the programmes to be restricted such that they would automatically limit the results, such that they conformed to disclosure rules, agreed in advance with statistics offices.

9. All options however would require that contracts were drawn up between NSOs and OECD analysts, such that a degree of responsibility for validating and ensuring that results did not breach confidentiality rules rested with the OECD analysts. This would additionally require that managers of the micro-data access Centre ensured that OECD analysts were pre-vetted and trained in the competences required to validate and check their results for disclosure.

10. In order to fully explore the practical issues relating to the feasibility of this option, it is preferable that a pilot study be carried out in advance with two or three volunteer countries, which is the main purpose of this paper. One important aspect of such a study is to explore the possibilities for, and

practical difficulties inherent in, statistical offices producing accessible micro-data in a common format such that a common access programme could be used to access common micro-data sets.

Option (V) Transmission of micro-data to the OECD

Option (V: (1))

11. Examples for such transmission are national data that are provided to OECD (PISA), Eurostat and other institutions, such as the Luxembourg Income Study. Extending these situations significantly will require legal agreements to be drawn up with countries relating to data transmission to the OECD and how it (and what) can be used. Given the volume of data and its confidential nature this option would need to fully explore the costs involved in setting-up and managing such a database. One possibility would be to consider whether software such as μ and t-Argus, developed by the Dutch Central Bureau of Statistics and currently tested by Eurostat, could be used to preserve anonymity/confidentiality. It should be said however that the early indications from the Questionnaires sent out to statistical institutions to establish their views on the feasibility of this option are not too encouraging. In most cases the only files that could be transmitted are public-use files relating to social and not business statistics. (See the complementary paper, “Synthesis of Responses to the OECD Questionnaire on Micro-Data Access”, also presented at this Conference).

Option (V: (2))

12. Another, possibly complementary, approach is to rely on private sources for micro-data. Commercial datasets exist for business data (such as AMADEUS) that originate from credit rating agencies such as Dun and Bradstreet. The biggest advantage of such datasets is that there are no issues of confidentiality. Disadvantages include the sometimes significant cost of purchase and unknown quality, particularly concerning coverage, of the information.

2. Outline of a Pilot Study for Remote Access

13. This paper reports on initial exploratory work related to Option IV above, accessing micro-data remotely. The objective of this exploratory study therefore is to consider the various options that exist for remote access systems to be viable and to propose a preliminary infrastructure to provide remote access to individual country micro-data from the OECD. Specifically, this means creating a system that allows users to create their own tabulations and statistical analyses from micro-data survey data that precisely fit user needs rather than having to rely on aggregated tabulations made separately by national statistics institutions (which is in some respects similar to options (I) and (II)). The report does not consider the legal restrictions that exist in each country, which is the subject of a separate paper, but, rather, it assumes that access is legally permissible and so proposes options based on a generic access system.

14. The remainder of this report is composed of the following sections. Section 3 describes the various states of micro-data that could, at least in theory, be accessed; where ‘states’ refers to the different levels, or processes, by which anonymity is typically preserved. Section 4 provides an overview of the technical infrastructure that can be used to provide remote access, and gives some examples of these systems used in practice. Section 5 provides some concluding remarks.

3. Possible solutions for accessing micro-data

15. National Statistical Offices (NSOs) are usually subject to a double conflicting constraint. On one hand their objective is to share and disseminate data with others, ideally, from a user’s perspective, in the form of detailed micro-data. On the other hand NSOs are typically required by law to preserve the confidentiality of the respondents who provided these data.

16. Two approaches are used in practice to resolve this dilemma. The first is to allow users to access confidential micro-data but to restrict the results that come out of their analyses so that anonymity is preserved. The second approach is to anonymise the micro-data before users are permitted access. In extremis this second approach delivers the standard statistics that are regularly published by NSOs such as the national accounts, labour force statistics etc. But, of course, the level of anonymisation can be much lower than this.

17. Typically in both cases the most obvious identification characteristics are removed, for example names and addresses but the second approach increases the level of anonymisation to further reduce the risk of identification.

18. The first approach is arguably the most resource intensive from the point of view of NSOs since it often requires experienced staff to scrutinise the results of researchers but the intensity of resources allocated to this task can be lessened if some of the burden involved in preserving anonymity is passed on to the users (usually through training courses, such as those used in the UK Office for National Statistics) in combination with a system of trust and penalties for breaches in confidentiality. In some cases part of the checking process can also be automated, for example by rejecting results where the number of individuals in a cohort is less than a minimum (for example three) or where the share of one individual to some variable is greater than some maximum.

19. The second approach is to further reduce the risk of identification by applying numerical techniques to the micro-data before access is granted. Public access micro-data files are the best example of this type of access. The types of numerical techniques used are varied, for example:

1. *Top and bottom coding* - that is, applying a threshold(s) to a continuous variable to cluster individuals above or below these thresholds;
2. *Global recoding* - that is, collapsing the domain of a categorical variable into a set with fewer elements; for example by collapsing the number of regions from 20 to 10 say.
3. *Local suppression* - that is, the replacement of a one or more values of key variables showing low frequency of occurrence with missing values;
4. *Post Randomization* - that is a sort of 'misclassification' introduced in some categorical variables by means of a known predefined Markov transition probability.

20. All these methods reduce the probability of record-identification but, in practice, they do not eliminate the probability and so mutual agreements are still needed between users and providing institutions, see for example the μ -Argus and τ -Argus software applications developed under the Computational Aspect of Statistical Confidentiality (CASC) project.

21. From a physical perspective micro-data can be accessed in two ways, by going to a designated Research Data Centre, (where users are subject to legal conditions on the use of data). At present, these centres provide access to national data within national boundaries. The second is to provide access to data using Remote Access Systems (RAS), for a pre-defined set of researchers.

22. From the OECD perspective the second approach is clearly of greater interest as it would be impractical for researchers interested in OECD cross-country studies to travel to each OECD country. It could of course be feasible to specify the analytical project and ask statistics institution to run the analyses themselves, as has been the case in a number of studies (e.g. CIS Survey) but this is not an approach considered in this report, which specifically focuses on remote access solutions (and because the approach itself places a resource burden on statistics institutions, that could be significant if the number of analytical projects is large, as it could well be).

23. Remote access solutions provide an, arguably, better solution for micro-data access by the OECD, and the development of an OECD micro-data analysis centre, as it imposes a much smaller burden on statistics institutions over the longer term and affords much greater flexibility on the nature of the econometric analyses that might be undertaken.

24. In the family of the RAS framework there are essentially two technical methodologies typically used for providing remote access:

- A web interface with custom built or commercial software that provides any kind of statistical and tabular results. These interfaces provide on-line processing and do not involve human intervention.
- The other, much more common, system consists of an e-mail interface allowing users to send their programs as part of the body of the e-mail. These systems can accept programs written with standard statistical packages such as SAS, SPSS and STATA. These e-mail based systems process user requests in batch mode and the provision of results back to the user is dependent on human intervention that ensures anonymity is preserved (and in some cases these are supplemented by automated checks, such as those described above or even by restricting the size of results files to a certain maximum)

25. Web-based systems require the user to learn how to use the interface and usually do not provide a fully fledged statistical application but only a pre-defined set of statistical operations. The output is usually based on tables with descriptive statistics generated on-line. The pre-defined processing capabilities of a web-based interface are designed to satisfy all the confidentiality rules, removing the need for human checking of the output. However, this approach clearly restricts the analytical possibilities.

26. E-mail based systems on the other hand provide users with all the capabilities of comprehensive statistical applications but usually require some human intervention to ensure anonymity is preserved.

4. Cost implications for micro-data computing infrastructure

27. This section provides a tentative cost indication for the different hardware/software infrastructure needed in providing micro-data access via remote systems.

28. A common architectural element of the infrastructure, in the two approaches outlined above is a server running a Relational Database Management System (RDBMS). Examples might be MySQL (free software), Oracle or SQLserver. A relational structure is relevant when relationships exist within the micro-data.

Web based set-up

29. At present web based systems for micro-data remote access are not common for both technological and flexibility reasons. A researcher might require, for example, an interactive task which might be out of the scope of the web-based package. That said a great deal of pre-coded java applet is available for providing basic descriptive statistics (averages, standard deviations, correlations and co variances) or pictures (histograms or pie charts). A Web based infrastructure is schematically indicated in Figure 1 below.

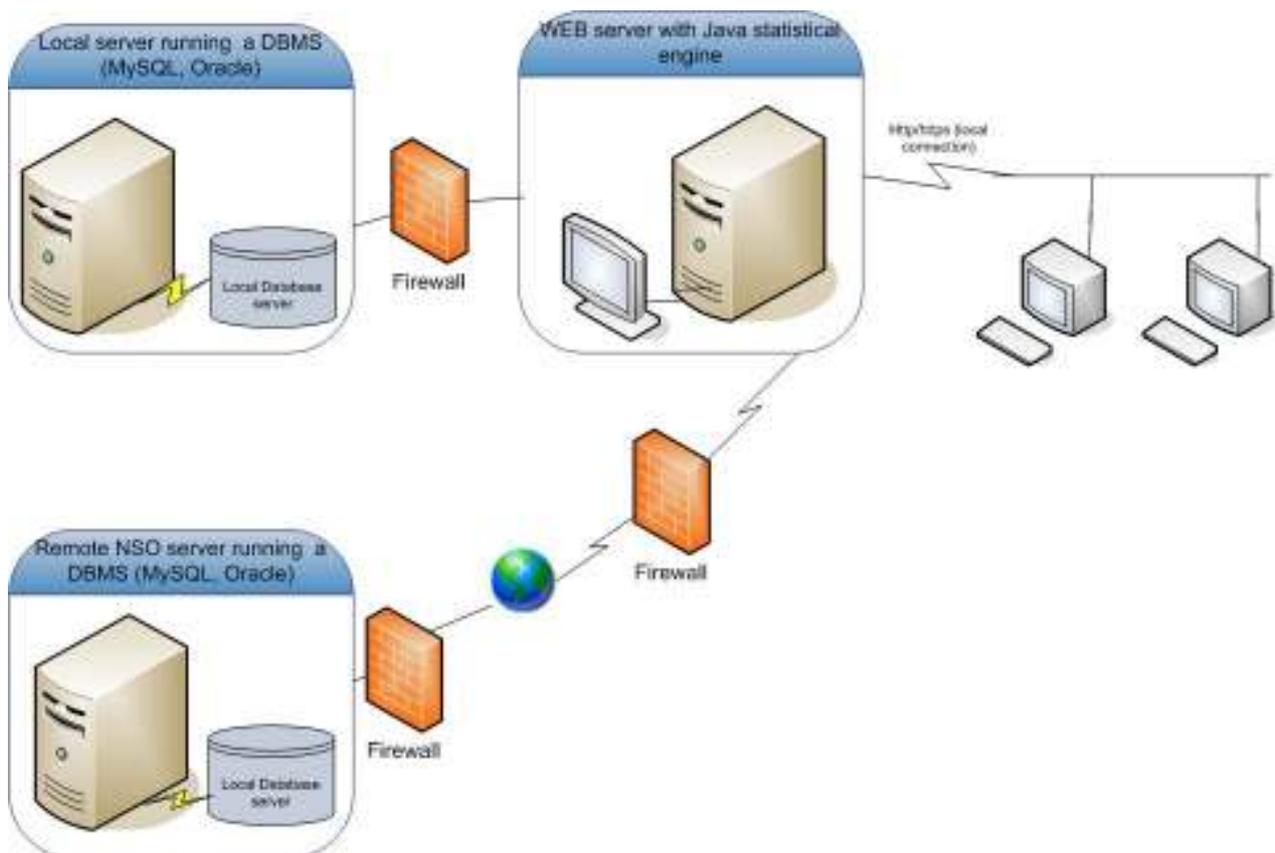


Fig. 1

Description of the building blocks:

- a) **Database server:** a computing system hosting the micro-data in a Database system with a suitable querying structure;
- b) **Firewall:** a computing system providing security services for a private network from users from other networks;
- c) **Web Server:** a computing system providing users with a common interface (browser) toward the Database server;
- d) **https connections:** links providing secure communication with a Web server

30. This infrastructure allows a standard interface (a web browser) for OECD researchers accessing and analysing the micro-data files. The framework can host two polar configurations: one with the pooling of anonymised data and the other allowing some processing tools producing only country specific indexes.

E-mail based set-up

31. A general picture of an e-mail based remote access system is given in Figure 2. In this infrastructure the user sends output to be validated by the NSO by means of an e-mail structured according to predefined rules. Under this system contributing NSOs have the option of sharing the micro-data with OECD, thus making it visible to the user, even if the data itself cannot be saved or printed, or simply, and perhaps more practically by granting access only to specific application programs. In this latter case there will be an additional software layer on the NSO side. This option would entail additional management and coordination efforts with the partner NSO.

32. The most important difference of this architecture with respect to web-based system lays in the capability to submit a statistical job written in one of the statistical applications that are available on the OECD side ²(SAS and STATA are two examples). The jobs would be processed in a batch fashion according to a defined policy (a simple example is FIFO First In First Out).

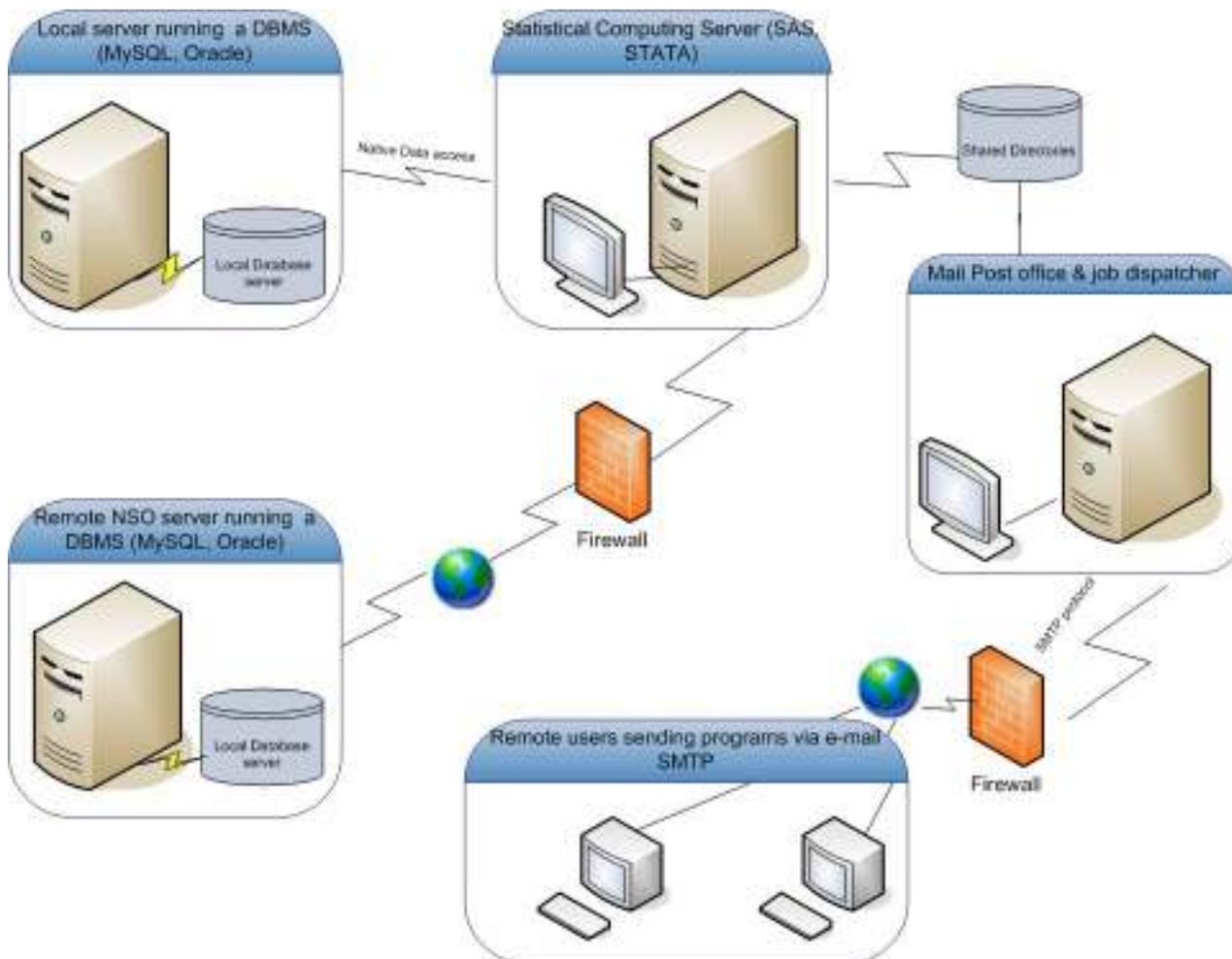


Figure. 2

Description of the building blocks:

- a) **Statistical computing server:** a computing system equipped with some statistical package (SAS, Stata are two examples);
- b) **Shared directories:** a shared repository holding pooled datasets;
- c) **Remote NSO DBMS:** a not pooled country database;
- d) **Mail post office:** the central repository for electronic mail;
- e) **Job dispatcher:** a software tool for managing resources allocations.

² A software interface will be required in case the data reside on the remote NSO side.

33. The infrastructure in Figure 2 envisages a clear separation between the request of statistical analysis, the actual processing and the sending of the output report. This segmentation provides a greater security against statistical disclosure and therefore provides flexibility to use a complete statistical package³. The same cost considerations concerning the database apply to this solution. The structure of e-mail based systems is simpler than web based systems from both a coding and a security standpoint (only the SMTP ports are opened). On the other hand a web interface might be enriched with many statistical applications without requiring complex agreements with NSOs for the management of pieces of applications present on the NSO sites.

34. The web and the e-mail-based solutions can both be reconfigured to different implementations according to whether the OECD has remote access for processing only individual country or pooled country data.

Solutions adopted by some Institutions

35. There are a number of institutions already providing Remote Data Centres (RDC) for accessing micro-data for statistical purposes. For example:

Statistics Sweden

36. Statistics Sweden adopts a hybrid web-input e-mail output system called MONA (Micro-data ON-line Access). Once users meet all the required confidentiality requirements they can access a wide range of micro-datasets through a web browser from their workstation.

37. The system was put into production in 2005. The MONA-system works around the communication between a client and a terminal server. The main idea is that when a client is connected to the server, the client's computer behaves like a dumb terminal of the server.

38. Strong user authentication is granted by membership to a given Windows Domain and an individual RSA security token. Communication confidentiality, to prevent eavesdropping, tampering, or message forgery, is provided by encrypting the communication with the Secure Socket Layer (SSL) protocol.

39. Statistical processing is carried out with the following packages: SAS, SPSS, STATA, GAUSS, Microsoft Office or Super Cross. The results are then automatically sent to the user's predefined mailbox.

Statistics Denmark

40. Statistics Denmark adopts an architectural solution similar to Sweden (some software components are different). Great emphasis is given to the agreement between the research institution and Statistics Denmark on the confidentiality rules. Unfortunately however access is restricted to Danish (resident) researchers.

Luxembourg Income Study (LIS)

41. LIS is an association devoted to the collection of, and provision of remote access to, household's micro-data related to income and wealth. LIS collects harmonised data from 25 countries and is based on an e-mail system. It started in 1983 and boasts the longest experience in handling and processing micro-

³ Some printing and tabulation commands should be removed from the statistical package.

data. Candidate users must apply on behalf of their organisation to obtain a user-id and a password. The system offers a choice of SAS, SPSS, and STATA as statistical packages. Incoming e-mails are processed from a front end system that checks authentication, extracts the program from the e-mail text and puts it on a queue. A batch processor takes the jobs from the queue, executes them and checks their output against a set of confidentiality rules. If all conditions are met the output is e-mailed back by to the user.

National Center for Health Statistics (NCHS)

42. The NCHS developed its first data centre called ANDRE (Analytical Data Research by E-mail) in 1998, with new features recently added to facilitate Web interaction (and so a name change to ANDREW, the W standing for 'Web'). Users must first apply to NCHS to gain authorisation to use the system. The system provides users with a web-based Graphical User Interface (GUI) for posting their program in SAS, Sudaan⁴ or STATA. Output files (after being checked against attempts to breach disclosure rules) are sent back to researchers by e-mail. The system is designed to work without human intervention. At the present time some features of the system are still under development.

Australian Bureau of Statistics (ABS)

43. The ABS provides a fully web-based system for accessing their micro-data as a Confidentialised Unit Record File (CURF)⁵. All candidate users must apply on behalf of their organisation to obtain a user-id and a password. The system offers a web-based Graphical User Interface (GUI) for running programs written in SAS, SPSS and STATA. Input programs and output files must meet a predefined set of rules which are automatically checked. Upon successful completion of these tests the zipped output is made available for download only to the researcher who submitted the job.

Eurostat

44. Eurostat makes available, for purchase in some cases, some micro-data sets (European Community Household Panel ECHP, Labour Force Survey LFS, Community Innovation Survey CIS) under a well defined legal framework and only for scientific purposes. Remote access features are not yet available.

45. In order to complete the general picture of the available options, it is also important to mention another solution adopted by some institutions, that is, a micro-data research centre accessible at the NSO site, such as those centres created by the Italian and UK statistical offices. Aside from the technical implementation, access is provided to vetted and trained users only. Another plank that is used to safeguard the confidentiality of survey respondents is the output checks carried out by dedicated staff responsible for validating researcher output using clearly defined disclosure rules.

4. Concluding Remarks and Pilot Study Proposal

46. The approaches described above demonstrate that a number of possibilities exist for the development of an OECD micro-data Centre for analysis. Each option presents slightly different technical challenges but all of them are feasible. What differentiates them is (i) the level of trust imposed on the user, in this case the OECD Secretariat, who will use the Centre for cross-country studies that benefit all OECD governments; and (ii) the level of anonymisation inherent in the data, which in turn has consequences for the degree and types of analyses that can be performed.

⁴ Sudaan is a software package designed for analyzing clustered data. Sudaan is commercialized by RTI International.

⁵ Through confidentialisation it is reduced the likelihood of statistical disclosure.

47. Given the legal constraints imposed by OECD countries and the associated difficulty involved in making micro-data available to the OECD it seems probable that a system where the OECD can gain access to, and see, raw micro-data, facilitating the manipulation, harmonisation and analysis of micro-data will not be possible. The more realistic scenario for micro-data access is a system based on remote access in its strictest sense – that is, a system that permits access to micro-level data without it necessarily being seen, (and certainly without it being saved) that would allow the Secretariat to perform common analyses across all OECD, and some large non-OECD countries. From a legal perspective it is likely that this would be the best approach as in many cases it would satisfy the most simple legal requirement that users would not be allowed to see confidential data.

48. This approach is of course dependent on the development of post-analysis analytical routines that would preserve anonymity, which might mean, at least in the short term, that the Centre would be restricted to providing relatively simple aggregated results, such as mean and variance of distributions, or regression statistics. But even here some safeguards would need to be implemented to ensure that the populations used in each analysis are large enough to ensure that even these relatively simple types of analyses do not disclose anonymised results. It should be theoretically possible to deliver these results but, in the short term at least, it would be wise to also ensure that there was some human interface in the OECD Secretariat who verified that the results remained anonymised, at least as a means to improving the automated anonymisation procedures

49. For this approach to succeed in the simplest way, statistics institutions will need to make micro-data accessible according to a common format, with specified variables. It is not envisaged that all micro-data will be required and certainly in the early days of development it would be sensible to limit the micro-data to information that is commonly collected in OECD countries.

50. The OECD will therefore need to specify these variables and the types of statistics and analyses that are likely to be calculated/conducted in the short-term allowing the development of anonymisation techniques and codes of conduct and governance within the OECD. These systems will need to be tested using actual data to demonstrate their efficacy to statistics institutions.

51. The OECD would therefore like to engage with 2, 3 or possibly 4 statistical institutions to test the feasibility of adopting such an approach. At this stage it is not of absolute importance that recent micro-data be made accessible. Historic data will be just as relevant in testing the efficacy as more recent data as there is unlikely to be considerable difference in the distribution of respondent variables according to time.

52. As a first step therefore the OECD wishes to explore whether access could be given to two periods of micro-data used in the construction and transmission of structural business statistics that are already made available to the OECD Statistics Directorate. The variables collected in this exercise are described below:

- Turnover
- Production at producers' prices and/or factor costs
- Value added at basic prices and/or factor costs
- Gross operating surplus
- Total purchases of goods and services
- Change in stocks of goods and services
- Purchases of energy products
- Gross investment in tangible goods
- Gross investment in land
- Gross investment in existing buildings and structures
- Gross investment in machinery and equipment

- Sales of tangible investment goods
- Employment, number of persons engaged and number of
- Employment, number of females employees
- Employment, number of employees in full time equivalent units
- Hours worked by employees
- Compensation of labour, all persons engaged and employees
- Wages and salaries, all persons engaged and employees
- Other employers' social contributions, employees
- Number of enterprises and/or establishments

53. The information is made available at the 4 digit International Standard of Industrial Classification (ISIC) Revision 3, and for most countries data is also broken down into the following enterprise employment size-classes: 1-9 , 10-19 , 20-49 , 50-99 , 100-199 , 200-249 , 250-499 , 500-999 , 1000+.

54. As a first step the OECD would develop access methods and dissemination software tools that ensured that the simple results based on the variables and industry/size class breakdowns described above were consistent with those already provided to the OECD as part of their structural business statistics returns; in other words that replicated the disclosure tools already put in place by statistical offices.

55. The second step would be to develop additional indicators describing the distribution of each cell available in structural business statistics returns, describing 95% confidence intervals and variances and, depending on the number of individual observations, medians.

56. Step 3 would be dependent on the ability to link individuals and so create a longitudinal dataset (over two or possibly more periods) that would allow the testing of regression coefficients and the development of longitudinal indicators such as turnover, output, value-added etc growth ranges, and indicators relating to business demography such as birth, death, survival and high-growth enterprise rates; where it might be necessary to introduce additional confidentiality mechanisms such as global recoding.

57. Statistical offices interested in exploring these possibilities are encouraged to contact nadim.ahmad@oecd.org/

REFERENCES

Abowd J, Kramarz, F. Margolis D. and Troske R. (2000) “Politique salariales et performances des entreprises: une comparaison France/Etats-Unis”; Economie et statistique N. 332-333

Bartelsman E.J, S. Scarpetta , F. Schivardi (2003) “Comparative analysis of firms demographics and survival : micro-level evidence from the OECD countries” ; OECD Economics department Working Paper, N.348, Paris.

Bartelsman E.J, J. Haskel, R. Martin (2006) “Distance to which frontiers? Evidence on productivity convergence from International firm-level Data”; downloadable from http://cep.lse.ac.uk/conference_papers/Cambridge2006/Martin.pdf .

Hundepool A. et alii (2003) “ μ -Argus User’s manual” version 4.0 downloadable from “<http://neon.vb.cbs.nl/casc/results.html>”

Hundepool A. et alii (2003) “ τ -Argus User’s manual” version 3.0 downloadable from “<http://neon.vb.cbs.nl/casc/results.html>”