ESSnet on Linking of Microdata to Analyse ICT Impact (ESSLait)
Eurostat Grant Agreement 50721.2013.001-2013.082

Final Report on ESSLait Metadata Repository

December 2013

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Thanks
Special gratitude goes to ESSLait project leader Eva Hagsten for her guidance and support and to ESSLait steering group members Michael Polder, Eric Bartelsman and Patricia Kotnik for all the learning experiences in the metadata work. Also, I thank the project group for submitting answers to the metadata surveys and the input quality sub-team for their important input to harmonisation of definitions. Albrecht Wirthmann provided valuable feedback on ICT indicators from the ICT Usage and E-commerce in Enterprises. Finally, I thank Gaganan Awano for his contribution to metadata work in the ESSLimit round and the materials provided which served as an excellent basis for continuation of metadata work.

Objectives
The ESSLimit project built an extensive metadata repository on the sources underlying the microdata linking. A description is presented here of how the repository has been updated for the purpose of its successor, the ESSLait project, encompassing a discussion on possible additional variables and how to achieve reliable and comparable information. There is also a dialogue on how to deal with variables that change their definitions over time or suddenly disappear from the model questionnaires (or become biennial).

Achievements
The present report outlines the main results of metadata work in the lifetime of the ESSLait project. After the release of the mid-term report including an update of the metadata repository, a need for additional metadata inquiries was recognised. This is largely explained by the project structure with several activities being conducted at the same time where the requirements of a step-wise procedure cannot be fully foreseen.

Metadata exercises
The following exercises were performed in the project:

1. Update of data sources from the previous round with information on the 2010 data. The key sources remained the same: Business Register (BR), Production Survey (PS), Community Survey on ICT Usage and e-Commerce in Enterprises (EC) and Community Innovation Survey (CIS). Also, the project considered inclusion of data for 2011. Taking into account a relatively late release date of Structural Business Statistics (SBS) for 2011 the project decided to restrict the time series to 2010.

2. Discussion on inclusion of new variables for ICT usage: own account software (dummy, number of man-hours or monetary measure) and ICT investment and expenditure (monetary measure). Unfortunately, these variables have been surveyed on a voluntary basis. ICT investment and expenditure is collected by six project members, only two of them appear to have long time series, the rest four having figures from 2009. Hence, the decision was to leave these variables aside.

3. Analysis of comparability of variables and their definitions over time and across countries, with a particular focus on changes in the EC model questionnaire. Indeed, modifications in EC variables presented a challenge to calculation of ICT indicators defined in the ESSLimit project. Because of this a trade-off between the accuracy of ICT indicators and availability of longer time series had to be made. Interpolations of the 2010 values based on the 2009 and 2011 data and use of proxies were proposed as
solutions to filling the gaps. Both approaches are believed to affect the comparability of data. Interpolations would also create a bias towards big firms. To minimize negative effects on the comparability and representativeness of the EC data, a second best solution with the use of proxies was advocated. This implies that some time series end in 2009.

**Data collection tool**

Five metadata surveys have been distributed:

- mini-questionnaire on general availability of data for 2010-2011,
- metadata questionnaire on the Community Survey on ICT Usage and e-Commerce in Enterprises for 2010 and 2011 (EC),
- metadata questionnaire on the Community Innovation Survey for 2010 (CIS),
- two questionnaires on the Production Survey for 2010 (PS): the first one collecting data on all PS variables for 2010 and the second one on comparability of definitions of some PS variables.

Feedback from the project group indicated that a number of improvements to earlier metadata collection could be made, in particular to the design of the questionnaires. Nonetheless, it was decided to leave the general design unchanged. The rationale behind this approach was to ensure comparability of the answers for the whole period of the ICT Impacts, ESSLimit and ESSLait projects: 1999-2010. The questionnaires on EC and CIS contain a section with generic information and sections with variable-specific questions, similar to the questionnaires from ESSLimit. Also, the structure of the PS remains the same: a ReadMe section, a section on metadata guidance and variable-specific questions.

**ICT Usage and e-Commerce in Enterprises (EC)**

One of the early findings of the ESSLait project was that EC underwent extensive changes in contents regularly, most recently in 2010 and 2011 where variables either received new definitions or were dropped altogether. Dealing with these kinds of changes has been a challenge in the project work and several alternative remedies have been assessed, including interpolation of the 2010 values by using variables for 2009 and 2011. For this purpose the EC metadata survey was expanded to include questions on the 2011 variables. In later stages the idea of interpolation was rejected mainly due to comparability and representativeness considerations. Also, the EC metadata survey compiled information on ICT investment and expenditures and own software questions. Table 1 on p. 3 presents the answers to this survey. Availability of EC data by country for 2000-2010 is summarized in table I of Appendix.

Data on ICT expenditure/ investment have been optional to survey so far. Some project members have gained good experience in producing these statistics, also through participation in Eurostat pilot studies of ICT expenditure/ investment conducted for production years 2004 and 2009. Four project members reported availability of data starting from 2009. Only two project members have long time series of ICT expenditure/ investment- DK since 2003 and SE since 2005. Short time series and incomplete coverage by country and/or over time are

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1 Questions on ICT Investments/Expenditure are presented in table V in Appendix. They are taken from the Eurostat Methodological Manual for surveys on the ICT Investment/Expenditure, production year 2009. Question formulations in the previous surveys deviate from the 2009 model, though quite a few remain comparable over time.
the reasons to leave variables on ICT expenditure/investment and own software in reserve for future research.

Table 1. Answers to EC Metadata Survey (Y=yes, N=no)

<table>
<thead>
<tr>
<th>NSI</th>
<th>EC 2010</th>
<th>ICT expenditure/investment</th>
<th>Own software from EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>DE</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>FI</td>
<td>Y</td>
<td>N</td>
<td>Y, 2005-2011</td>
</tr>
<tr>
<td>FR</td>
<td>Y</td>
<td>Y, 2010</td>
<td>N</td>
</tr>
<tr>
<td>IE</td>
<td>Y</td>
<td>N</td>
<td>Y, 2004-2005</td>
</tr>
<tr>
<td>IT</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>LU</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>UK</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

Note: With “Own software from EC” we refer to an optional module *Additional questions introduced in the national questionnaire* in EC surveys for years 2004-2008. From 2008 onwards, these questions are no longer included in the Eurostat quality report templates.

Changes in EC 2010 variables

The project members reported no deviations in collection of mandatory variables and some variations in collection of optional variables. A complete list of EC 2010 variables is available in table IV in Appendix. A comparative study of the Eurostat model questionnaires for 2009 and 2010 allows grouping the EC variables in the following way:

- Variables in EC 2010 with no changes compared to 2009,
- Variables collected in EC 2009 and dropped from EC 2010 and
- Completely new variables compared to EC 2009.

This report focuses on the parts of EC 2010 that suffered changes, that is variables from groups b) and c).

1. Intranet

Dummy on intranet INTRA is not collected in EC 2010. The time series of this variable extends only to 2009.

<table>
<thead>
<tr>
<th>ESSLait name</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRA</td>
<td>Dropped in EC 2010</td>
<td>Firm has intranet</td>
</tr>
</tbody>
</table>

2. Automated data exchange (ADE)

The first four variables in the list below ADESU, INVREC, INVSND and ADECU are dropped from EC 2010. INVSNDAP and INVRECAP appear in EC 2010 for the first time. Though comparability tests carried out by Eurostat show that INVSNDAP and INVRECAP cannot be regarded as perfect proxies for INVSND and INVREC, the project went for this solution in order to keep year 2010 in the analysis.

The list of the variables on own software is available in table VI in Appendix.
Following the discussions at the Amsterdam Steering group and the Oslo launch meetings, new variables for ADE were introduced into the project analysis: ADENGOV and ADEGOV. The former is created for the purpose of the project to replace the missing ADE and is derived from three underlying variables: ADEPAY, ADEINFO and ADETDOC. All these variables as well as ADEGOV have been surveyed since 2007. Though ADEGOV and ADEPAY (unlike ADEINFO and ADETDOC) were optional in EC 2008 and EC 2009, they were provided by most project members for the whole time period 2007-2010.

3. Supply Chain Management (SCM), Enterprise Resource Planning (ERP) and Client Relationship Management (CRM) software

These are the major e-business systems variables that suddenly disappear from the 2010 model questionnaire. While SISAPU (sharing information for a number of business functions) was suggested as a proxy to missing ITERP, no good proxies for SCM and CRM were available in the EC 2010 data. The time series of these variables end in 2009. So does the time series of ICT intensity indicator, ICT1, calculated in the ESSLimit project and based on CRM, ERP, SCM and ADE. A solution to this is a new ICT intensity measure created in the ESSLait round, ICTi2, which builds on MOB, SISAPU, ADENGOV and ECOM and stretches to 2010.

4. E-commerce variables

The e-commerce questions in the Eurostat model questionnaire were changed several times during the period studied in the project. Until production year 2007 the National Statistical

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3 The information on these variables is taken from the cross-country ECSTAT table produced by the common code, version 4.1, and containing data for 12 project members. ADEGOV is missing for IE and UK in 2007-2010 and for FR in 2008-2009. ADEGOV was provided by all but IE.

4 MOB is a dummy for mobile access to Internet, ECOM is a dummy for use of e-sales and e-purchases. ECOM, SISAPU and other variables created for the purpose of the ESSLait project are presented in the section on Workpackage II- Impact Analysis in the ESSLait midterm report.
institutes (NSIs) had to report e-commerce via internet and EDI/other networks as two separate variables. In EC 2007- EC 2009 the model questionnaire contained one question on commerce via computer networks.

In EC 2010, the question on sales through the internet (or EDI), AESELL, is again split in two: sales via a website or sales via EDI-type messages. Both questions are obligatory and for 2010 AESELL is derived from AWSELL and AXSELL. The same holds for percentage of sales via Internet (or EDI), AESVALPCT, which is based on AWSVALPCT and AXSVALPCT. The split of AEBUY, firms’ orders through internet, is optional in EC 2010. Half of the project countries chose to include optional questions on AWBUY and AXBUY, while the other half stuck to the 2009 question on AEBUY. Apart from these splits, there are no changes in the formulations of the e-commerce questions in EC 2010, implying that it is possible to keep the same set of e-commerce variables as in the ESSLimit project. However, we would like to bring to notice the fact that even slight question modifications may affect the responses. For example, variations in percentage of sales via Internet AESVALPCT from 2009 to 2010 may be caused either by real changes in e-sales or by the change in data collection.

<table>
<thead>
<tr>
<th>ESSLimit name</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESELL</td>
<td>Dropped in EC 2010</td>
<td>Firm sells through internet (or EDI)</td>
</tr>
<tr>
<td>AESVALPCT</td>
<td>Dropped in EC 2010</td>
<td>% of sales through internet (or EDI)</td>
</tr>
<tr>
<td>AWBUY*</td>
<td>New in EC 2010</td>
<td>Firm orders via a website</td>
</tr>
<tr>
<td>AXBUY*</td>
<td>New in EC 2010</td>
<td>Firm orders via EDI-TYPE messages</td>
</tr>
<tr>
<td>AWSELL</td>
<td>New in EC 2010</td>
<td>Firm sells via a website</td>
</tr>
<tr>
<td>AXSELL</td>
<td>New in EC 2010</td>
<td>Firm sells via EDI-type messages</td>
</tr>
<tr>
<td>AWSVALPCT</td>
<td>New in EC 2010</td>
<td>% of sales via a website</td>
</tr>
<tr>
<td>AXSVALPCT</td>
<td>New in EC 2010</td>
<td>% of sales via EDI-type messages</td>
</tr>
</tbody>
</table>

* Optional question

Production Survey (PS)

The Production Survey contains a number of firm-level economic variables. Some of them are collected via the SBS, others come from different sources including the Business Register, education statistics (human capital HK) and trade surveys (dummy for exporting firms EXPORT and monetary measure of export NX). The list of PS variables in the metadata survey has been kept unchanged since ESSLimit, with the exception of two new questions: the link between Business Register and Employer- Employee Register and a possibility of extending long panel data set from the ESSLimit project. Table 2 on p. 6 shows availability of the PS variables\(^5\).

The only disparity between the list of the variables in the PS metadata survey and the code is that variable AGE is replaced by BIRTH. This change follows from the need for harmonising the definition of AGE across countries. It is derived from BIRTH defined in Eurostat – OECD Manual on Business Demography Statistics as a firm's first year of economic activity.

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\(^5\) Table VIII in Appendix presents a more detailed description of the PS variables. Table VII (ibid) contains a list of questions from the variable-specific section of the PS metadata survey.
Table 2. Availability of PS data based on 2010 Metadata Survey and Output from Code Version 4.1 (Y=yes, N=no)

<table>
<thead>
<tr>
<th>ESSLaït name</th>
<th>Description</th>
<th>AT</th>
<th>DE</th>
<th>DK</th>
<th>FI</th>
<th>FR</th>
<th>IE</th>
<th>IT</th>
<th>LU</th>
<th>NL</th>
<th>N</th>
<th>O</th>
<th>PL</th>
<th>SE</th>
<th>SI</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>NV</td>
<td>nominal value added (in national currency)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>NQ</td>
<td>nominal gross output (in national currency)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>full-time employment</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAY</td>
<td>total wage bill (in national currency)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>NM</td>
<td>nominal expenditures on intermediates (in national currency)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>capital services measure (in national currency)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HKPCT</td>
<td>pct workers with post upper secondary education</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HKITPCT</td>
<td>pct workers with post upper secondary IT education</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HKNITPCT</td>
<td>pct workers with post upper secondary non-IT education</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPORT</td>
<td>firm exports of goods and services</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX</td>
<td>firm exports of goods and services (in national currency)</td>
<td>Y*</td>
<td>N</td>
<td>Y</td>
<td>Y*</td>
<td>Y</td>
<td>Y</td>
<td>Y*</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wgt_PS</td>
<td>sample weight on business survey</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>EMP_BR</td>
<td>number of employees given in Business Register</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRGN_OW</td>
<td>dummy for foreign ownership</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>MNC</td>
<td>dummy for multinational corporation</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>age of firm in given year</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>BIRTH</td>
<td>year of birth (first year of activity)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Link between Business Register and Employer-Employee Register</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long panel data set (at least 16 years 1995-2010)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All the variables are available for 2001-2010 except in Germany and Ireland where the series start in 2002 and in Luxembourg and Slovenia where data are available from 2003. An asterisk (*) denotes firms with information on exports of goods only.

The most recent metadata collection in the project was initiated after the input quality sub-team called attention to comparability of definitions for several PS variables:
- NQ, gross output/sales/turnover,
- NM, material inputs,
- NV, value added,
- E, full-time employment.

Indeed, production value and turnover which both may be used as inputs to NQ are calculated differently, according to Commission Regulation (EC) No 250/2009 of 11 March 2009. Goods for resale are subtracted from production value 12120 and included in turnover 12110. The project agreed on a consistent approach to treatment of goods for resale in calculating NQ, NM and NV. Either both are included in NQ and NM or excluded.

There are variations in inputs to the project’s employment variable E. Half of the project countries use full-time equivalents (FTE) while the rest provide head counts of number of employees or persons employed. Use of other variables instead of FTE is explained by data quality considerations when the general recommendation is to use the most stable proxy over time. However, for productivity calculations FTE is a more desirable variable.
Use of harmonized definitions is presented in the table below. It shows that NV and Emp_BR are the most consistent variables.

Table 3. Comparability of Output and Employment Variables across Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>NQ</th>
<th>NM</th>
<th>NV</th>
<th>E</th>
<th>Emp_BR</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of persons employed 16110</td>
<td>Number of employees</td>
</tr>
<tr>
<td>DE</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees, number of persons employed if N employees is missing</td>
</tr>
<tr>
<td>DK</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees in FTE</td>
</tr>
<tr>
<td>FI</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees in FTE</td>
</tr>
<tr>
<td>FR</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees 16130</td>
<td>Number of employees</td>
</tr>
<tr>
<td>IE</td>
<td>12120</td>
<td>Production value</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees</td>
</tr>
<tr>
<td>IT</td>
<td>12120</td>
<td>Production value</td>
<td>13110 Total purchases of goods and services -13120 Goods for resale</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees</td>
</tr>
<tr>
<td>LU</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees 16130</td>
<td>Number of employees</td>
</tr>
<tr>
<td>NL</td>
<td>12110</td>
<td>Turnover</td>
<td>13110 Total purchases of goods and services</td>
<td>NQ-NM Number of employees</td>
<td>Number of employees</td>
</tr>
<tr>
<td>NO</td>
<td>12120</td>
<td>Production value</td>
<td>13110 Total purchases of goods and services -13120 Goods for resale</td>
<td>12150 Number of persons employed 16110</td>
<td>Number of employees</td>
</tr>
<tr>
<td>PL</td>
<td>12120</td>
<td>Production value</td>
<td>NQ-NM</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees in FTE</td>
</tr>
<tr>
<td>SE</td>
<td>12120</td>
<td>Production value</td>
<td>13110 Total purchases of goods and services -13120 Goods for resale</td>
<td>12150 Number of employees in FTE 16140</td>
<td>Number of employees</td>
</tr>
<tr>
<td>SI</td>
<td>12120</td>
<td>Production value</td>
<td>13110 Total purchases of goods and services</td>
<td>12150 Number of employees 16130</td>
<td>Number of employees from the Statistical Register of Employment</td>
</tr>
<tr>
<td>UK</td>
<td>Turnover</td>
<td>Materials incl. purchases of non-traded goods</td>
<td>NQ-NM change in inventories</td>
<td>Number of persons employed</td>
<td>Number of persons employed</td>
</tr>
</tbody>
</table>

The returned PS metadata questionnaires have not revealed any significant changes in collection of PS variables since the previous round. The observations in the ESSLimit Interim Report on Metadata Collection hold true for the 2010 metadata as well. It seems appropriate to only mention information which is new compared to ESSLimit user guide. It concerns data sources for three variables: dummies for foreign ownership and multinationals and value of exports. Table 4 on p. 8 provides updated information on these variables.

---

6 See Annex 3 in Annexes to the final report in ESSnet on Linking of Microdata on ICT Usage (Hagsten, E., Polder, M., Bartelsman, E. et al., 2012)
Table 4. PS Metadata Update for Foreign Ownership FRGN_OWN, Multinationals MNC and Export Intensity

<table>
<thead>
<tr>
<th></th>
<th>Dummy for Foreign Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRGN_OWN</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Definition</strong></td>
<td>Foreign ownership refers to whether a firm is owned and controlled by a foreign entity.</td>
</tr>
<tr>
<td><strong>Required Format</strong></td>
<td>Boolean</td>
</tr>
<tr>
<td><strong>Required range</strong></td>
<td>0 – 1</td>
</tr>
<tr>
<td><strong>How to derive</strong></td>
<td>(from ESSLIMIT)</td>
</tr>
<tr>
<td><strong>i.</strong></td>
<td>This can be derived from firm level Foreign Direct Investment (FDI) data where information on inward FDI can be obtained.</td>
</tr>
<tr>
<td><strong>ii.</strong></td>
<td>FATS (Foreign Affiliates Statistics). Norway and Romania use this source. Eurostat has high level Inward FATS data for most countries; as such it might be worth searching your NSI for the source data at firm level.</td>
</tr>
<tr>
<td><strong>iii.</strong></td>
<td>Trade data could also be a resource.</td>
</tr>
<tr>
<td><strong>ESSLAIT Update</strong></td>
<td>iv. NL reported CIS as a data source for this variable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Dummy if firm is multinational</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MNC</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Definition</strong></td>
<td>A multinational here refers to a firm that engages in FDI. As such a foreign owned firm (i.e. FRGN_OWN=1) is a multinational, but not vice-versa. E.g. ESSO UK (foreign owned/multinational) vs BP (not foreign owned/multinational).</td>
</tr>
<tr>
<td><strong>Required Format</strong></td>
<td>Boolean</td>
</tr>
<tr>
<td><strong>Required range</strong></td>
<td>0 – 1</td>
</tr>
<tr>
<td><strong>How to derive</strong></td>
<td>(from ESSLimit)</td>
</tr>
<tr>
<td><strong>i.</strong></td>
<td>FATS (Foreign Affiliates Statistics) data can also be helpful here. Eurostat website shows that there is data on Inward and Outward FATS. From our definition above, it can be inferred that while foreign ownership relates to Inward FATS, Multinational relates to firms either Inward or Outward FATS, (i.e., Inward: FRGN_OWN=1 &amp; MNC=1; Outward: MNC=1).</td>
</tr>
<tr>
<td><strong>ii.</strong></td>
<td>Trade data might also be a resource.</td>
</tr>
<tr>
<td><strong>ESSLait Update</strong></td>
<td>iii. NL reported CIS as a data source for this variable.</td>
</tr>
<tr>
<td><strong>iv.</strong></td>
<td>PL used SBS as a data source.</td>
</tr>
<tr>
<td><strong>v.</strong></td>
<td>SI derived MNC from FDI.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Export values relative to sales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Export intensity</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Definition</strong></td>
<td>What share of sales is exported</td>
</tr>
<tr>
<td><strong>Required Format</strong></td>
<td>Pct</td>
</tr>
<tr>
<td><strong>Required range</strong></td>
<td>0 – 1</td>
</tr>
<tr>
<td><strong>How to derive</strong></td>
<td>(from ESSLimit)</td>
</tr>
<tr>
<td><strong>This could be derived from trade surveys, business statistics or VAT registers with questions on export or export orders.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ESSLait Update</strong></td>
<td>SBS is used as a data source by LU and UK (UK only for services).</td>
</tr>
</tbody>
</table>

Community Innovation Survey (CIS)

In the design of the CIS 2010 metadata survey, the census approach from the ESSLimit project was followed. The CIS 2010 metadata questionnaire is largely based on the 2008 metadata survey from ESSLimit. In addition to data on variables collected in both waves, CIS 2008 and CIS 2010, information on new variables is compiled. Variable descriptions are completely harmonised with question texts in the Guidelines for the Transmission of National Metadata.
Data\(^7\). Availability of CIS data by country covering the whole period of study 2000-2010 is presented in table II of Appendix. Innovation data for DE is not available.

A comparison of the CIS 2008 and CIS 2010 model questionnaires reveals three types of changes\(^8\):

a) Variables that are collected in both waves, but with differently formulated questions that affect comparability of some project variables, for example INPDTW and INPCSW (questions on who developed product and process innovations),

b) Variables that are dropped from CIS 2010: MKTMET (new or significantly changed sales or distribution methods),

c) Completely new variables compared to CIS 2008: INPDC/ INPDFE/ INPDFW (product innovations that are first in the country/ in Europe/ in the world), EMPUD (percent of enterprise’s employees with a university degree) and a module on creativity and skills.

Variables with changed definitions

Questions about who developed product and process innovations are present in both CIS 2008 and CIS 2010 but the way the questions are formulated makes them incomparable which the examples below demonstrate. First, in CIS 2010 a split in goods and services is introduced. Second, in 2010 firms are suddenly free to tick several options, while previously they were asked to choose one most representative answer. Hence, it was not feasible to provide good proxies for INPDTW (who developed new or significantly improved products) and INPSCW (who developed new or significantly improved processes) for 2010.

Extract from CIS 2008:

2.2 Who developed these product innovations?

<table>
<thead>
<tr>
<th>Select the most appropriate option only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainly your enterprise or enterprise group</td>
</tr>
<tr>
<td>Mainly your enterprise together with other enterprises or institutions</td>
</tr>
<tr>
<td>Mainly other enterprises or institutions</td>
</tr>
</tbody>
</table>

Extract from CIS 2010:

2.2 Who developed these product innovations?

<table>
<thead>
<tr>
<th>Tick all that apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods innovations</td>
</tr>
<tr>
<td>Service innovations</td>
</tr>
<tr>
<td>Your enterprise by itself</td>
</tr>
<tr>
<td>Your enterprise together with other enterprises or institutions*</td>
</tr>
<tr>
<td>Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions*</td>
</tr>
<tr>
<td>Other enterprises or institutions*</td>
</tr>
</tbody>
</table>

\(^*\) Include independent enterprises plus other parts of your enterprise group (subsidiaries, sister enterprises, head office, etc). Institutions include universities, research institutes, non-profits, etc.

---

\(^7\) See Eurostat (2013).

\(^8\) For the complete list of the CIS 2010 variables consult Table IX in Appendix.
New variables
The newly added variables are presented in Table 5 below. In general, NSIs’ flexibility with regard to what questions to include in their national questionnaires may restrict the scope of analysis in a project like this with a group of several NSIs agreeing on a set of variables which remain stable from one survey year to another. Metadata on newly added questions show that none of these variables are collected by the whole project group.

Table 5. Availability of Completely New Variables in CIS 2010 (Y=yes, N=no)

<table>
<thead>
<tr>
<th>Eurostat name</th>
<th>Question</th>
<th>AT</th>
<th>DK</th>
<th>FI</th>
<th>FR</th>
<th>IE</th>
<th>IT</th>
<th>LU</th>
<th>NL</th>
<th>NO</th>
<th>PL</th>
<th>SE</th>
<th>SI</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPDFC</td>
<td>Were any of your product innovations during 2008-2010 first in your country</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>INPDFE</td>
<td>Were any of your product innovations during 2008-2010 first in Europe</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>INPDFW</td>
<td>Were any of your product innovations during 2008-2010 world first</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>SGALA</td>
<td>Graphic arts/ layout/ advertising</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>SDSOS</td>
<td>Design of objects or services</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>SMED</td>
<td>Multimedia</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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</tr>
<tr>
<td>SWDS</td>
<td>Web design</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<td>Y</td>
<td>Y</td>
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<td>Y</td>
</tr>
<tr>
<td>SSWD</td>
<td>Software development</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<td>Y</td>
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<td>N</td>
<td>Y</td>
<td>Y</td>
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</tr>
<tr>
<td>SMKR</td>
<td>Market research</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>SENAP</td>
<td>Engineering / applied sciences</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>SMSDM</td>
<td>Mathematics / statistics / database management</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>EMPUD</td>
<td>% of employees in 2010 with a university degree</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Conclusion
The main benefit of the metadata work in the ESSLimit and ESSLait projects is the creation of an extensive repository covering all data sources the project builds upon for the period of 2000-2010. The structure of the repository highlights also a possibility of complementary use of EC and CIS in future research. In addition to the metadata update the effort of the metadata team has been put into studying stability of variables in model questionnaires and comparability of definitions across countries.

The metadata work has also drawn attention to the strong fluctuations over time in the design of the EC questionnaire. The ICT field has developed quickly and partly unexpectedly; however, it is desirable to allow variables to wear out instead of suddenly removing them or making them biennial. Without a core of stable variables over time, it is impossible to analyse trends. Mixing annual and biennial variables in the same survey is also something that should be discouraged. As a comparison, the CIS is fully designed for biennial responses, and as such, works well. The EC does not. Increased consistency in the datasets over time would also go well in line with certain intentions of the MEETS programme, by making better use of already existing data.
References

2. Eurostat (2013): “Community Innovation Survey (CIS) microdata, Note to the CIS researcher visiting Eurostat’s SAFE Centre, 15.7.2013 Eurostat – Unit G6 Innovation and information society”,
## Appendix

### Table I. Coverage for ICT Usage and e-Commerce in Enterprises (EC), by country and year

<table>
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</tbody>
</table>

### Table II. Coverage for Community Innovation Survey (CIS), by country and year

<table>
<thead>
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Note: In case a certain question was included in the R&D survey, it might be provided directly from that survey.
Table III. Generic Section from the EC Metadata Survey

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<th>General Survey Information</th>
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<tbody>
<tr>
<td><strong>Year</strong></td>
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<th>Variables</th>
<th>Further Info</th>
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<tr>
<td>Number of observations</td>
<td>Please state the number of valid survey responses for the particular survey for which data will be used</td>
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<tr>
<td>Sample size</td>
<td>Please give the total sample size of the survey, i.e., the total number of questionnaires sent out</td>
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<td>Survey Frequency</td>
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| 'End of Reference Period' (e.g. 31/12/2008) | If the survey assumes a point in time, when is this? For example in Austria the e-commerce survey refers to January of the survey year (Jan T) |
| Financial data reference period (e.g. January-December Year T) | If financial data is being surveyed, when is the reference date? For example in Denmark the e-commerce survey refers to the year previous to the survey year (T - 1) |

| Level of firm surveyed (e.g. Enterprise Level, Reporting Unit Level or Local Unit Level)? | What sampling frame is used, i.e. from what source was the sample drawn? In most cases this has been the Business Register |
| Sampling Frame (e.g. Business Register) | At what level is this survey aimed? This is particularly relevant for large enterprises where one business entity may receive more than one survey. Firm level could be 'Enterprise Level', 'Reporting Unit Level' or 'Local Unit Level'. For example the U.K.’s e-commerce survey is aimed at the 'Enterprise' level. |

| Scope of survey, by economic activity: sections C, D, E, F, G, H, I, J, L, N, divisions 69-74, groups 95.1, 65.1, 65.2, classes 64.19, 64.92, 66.12, 66.19 | Indicate if some of these industries are not covered |
| Scope of survey, by enterprise size: enterprises with 10 employees or more | Indicate if there are deviations/ smaller enterprises are covered in addition |
| Industry Classification(e.g. SIC, NACE) | What type of industry classification is used to in the dataset (e.g. sic92, sic03, sic07, nace)? |
| Weighting scheme | How is the data weighted to whole economy level? E.g using a-weights, g-weights a combination of weights? |
### Table IV. Variables from EC2010 (Y- yes, N- no)

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<tr>
<td>AWSVALPCT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
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<tr>
<td>AXSVALPCT</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
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</tbody>
</table>
### Table V. ICT expenditure/investment

<table>
<thead>
<tr>
<th>Question nr.</th>
<th>Text (Y=yes, N=no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i1.</td>
<td>Purchases of IT goods (computers and peripheral equipment) and Communication goods (equipment), during YEAR</td>
</tr>
<tr>
<td></td>
<td>a) Purchases of IT goods</td>
</tr>
<tr>
<td></td>
<td>b) Purchases of Communication goods</td>
</tr>
<tr>
<td>i2.</td>
<td>Share (percentage) of purchased IT goods (computers and peripheral equipment) and Communication goods (equipment) included in the balance sheet (investment), during YEAR</td>
</tr>
<tr>
<td></td>
<td>a) Purchases of IT goods included in the balance sheet (investment)</td>
</tr>
<tr>
<td></td>
<td>b) Purchases of Communication goods included in the balance sheet (investment)</td>
</tr>
<tr>
<td>i3.</td>
<td>Purchases of other ICT goods (Consumer electronic equipment, Miscellaneous ICT components and goods, Manufacturing services for ICT equipment), during YEAR</td>
</tr>
<tr>
<td>i4.</td>
<td>Share (percentage) of purchased other ICT goods (Consumer electronic equipment, Miscellaneous ICT components and goods, Manufacturing services for ICT equipment) included in the balance sheet (investment), during YEAR</td>
</tr>
<tr>
<td>i5.</td>
<td>Purchases of software, pre-packaged and customised (Business and productivity software and licensing services), during YEAR</td>
</tr>
<tr>
<td>i6.</td>
<td>Share (percentage) of purchased software, pre-packaged and customised (Business and productivity software and licensing services) included in the balance sheet (investment), during YEAR</td>
</tr>
<tr>
<td>i7a</td>
<td>Labour input in own-account software, working hours or years FTE, during YEAR</td>
</tr>
<tr>
<td>i7.</td>
<td>Total cost for creation of own account software, during YEAR</td>
</tr>
<tr>
<td>i8.</td>
<td>Share (percentage) of total cost for creation of own account software included in the balance sheet (investment), during YEAR</td>
</tr>
<tr>
<td>i9.</td>
<td>Purchases of Information technology consultancy and service, Telecommunication services and other ICT services, during YEAR</td>
</tr>
<tr>
<td>i9a.</td>
<td>Purchases of Telecommunication services, during YEAR</td>
</tr>
<tr>
<td>i10.</td>
<td>Share (percentage) of purchased Information technology consultancy and services, Telecommunication services and other ICT services included in the balance sheet (investment), during YEAR</td>
</tr>
<tr>
<td>i10a.</td>
<td>Share of purchased Telecommunication services included in the balance sheet, during YEAR</td>
</tr>
<tr>
<td>i11.</td>
<td>Purchases of Lease or rental services for ICT equipment, during YEAR</td>
</tr>
<tr>
<td></td>
<td>a) Purchases of operating lease or rental services for ICT equipment</td>
</tr>
<tr>
<td></td>
<td>b) Purchases of financial lease services for ICT equipment</td>
</tr>
<tr>
<td>i12.</td>
<td>Share of purchased Lease or rental services for ICT equipment included in the balance sheet (investment), during YEAR</td>
</tr>
<tr>
<td></td>
<td>a) Share of purchased operating lease services for ICT equipment included in the balance sheet</td>
</tr>
<tr>
<td></td>
<td>b) Share of Purchased financial lease services for ICT equipment included in the balance sheet</td>
</tr>
</tbody>
</table>
Table VI. Optional questions on own software in EC surveys

<table>
<thead>
<tr>
<th>Question (Y=yes, N=no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does the enterprise have its own employees (exclude external consultants) who work with the development of software, e.g. system developers and programmers?</td>
</tr>
<tr>
<td>2. Estimate the number of man-labour years (a man-labour year is the work a full time employed person carries out in a year) for work on software development.</td>
</tr>
<tr>
<td>3a. Software development for the enterprise’s own usage, e.g. programs for financial control or administration</td>
</tr>
<tr>
<td>3b. Software development for external sales (including software which forms a part of the products your enterprise sells)</td>
</tr>
<tr>
<td>3c. Other, e.g. maintenance, support, repair, etc.</td>
</tr>
</tbody>
</table>

Table VII. List of Questions from the Variable-Specific Section in PS Metadata Survey

<table>
<thead>
<tr>
<th>ESSLait Variable Name</th>
<th>Description of variables listed in previous column</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quote of survey question relating to variable (in English)</td>
<td>Please identify which question in the survey that the specified variable is linked with. Translated into English. If multiple choice, please include the options given.</td>
</tr>
<tr>
<td>Source Survey Name</td>
<td>What survey is the question linked to this variable found in? Please enter &quot;derived variable&quot; if not survey data, and provide a NOTE of how data are derived.</td>
</tr>
<tr>
<td>Format (and Units)</td>
<td>For example: Level, Percentage or Boolean. For Level and Percentage variables, please provide the UNITS. This is expected to be either count or currency, please confirm if units are in '000s, Millions (M), and the relevant currency (e.g. £, €). For Boolean variables, please confirm states represented by 0 and 1.</td>
</tr>
<tr>
<td>Range</td>
<td>Simply state the numerical range. For example, a Boolean variable might be 0 - 1. A percentage variable may be 0 - 100. Please indicate where level variables are non-positive.</td>
</tr>
<tr>
<td>Flow or stock?</td>
<td>Are data flows over periods of time, or snapshots at a point in time? (e.g. Turnover could be annual totals, while employment could be at a point in time).</td>
</tr>
<tr>
<td>Reference Period for Variable</td>
<td>When is the reference period? For example &quot;CY 2000&quot;, &quot;YE 2001&quot;, &quot;15/12/00&quot;. (CY= Calendar Year; YE= Year Ending)</td>
</tr>
<tr>
<td>Level of firm the survey is aimed at</td>
<td>At what level is this survey aimed? This is particularly relevant for large enterprises where one business entity may receive more than one survey. Firm level could be 'Enterprise Level', 'Reporting Unit Level' or 'Local Unit Level'. For example the U.K’s eCommerce survey is aimed at the 'Enterprise' level.</td>
</tr>
<tr>
<td>Sampling Frame (e.g. Business Register)</td>
<td>What sampling frame is used, i.e. from what source was the sample drawn? In most cases this has been the Business Register.</td>
</tr>
<tr>
<td>Additional metadata comments</td>
<td>Please use this space to identify any additional metadata concerns or comments.</td>
</tr>
</tbody>
</table>
### Table VIII. Guidance on PS Variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>Employment variable</td>
<td>Ideally, this refers to total full-time employees (including full-time equivalents for part-time workers). If full-time equivalents are not available, please give the closest figure that captures the total number of employees (head count) and indicate whether it is a point in time estimate or a period average.</td>
</tr>
<tr>
<td>Frgn_own</td>
<td>Dummy for foreign ownership</td>
<td>This should be a 'yes' or 'no' to whether the firm is owned and controlled by a foreign entity.</td>
</tr>
<tr>
<td>K</td>
<td>Capital stock measure</td>
<td>The capital stock measure refers to the stock (not flow) of productive capital which the firm has at the end of the referenced period. Might be survey based or could be derived. Survey estimates could include for instance book value or replacement value of assets such as structures, plant and machinery, vehicles, etc.</td>
</tr>
<tr>
<td>Mnc</td>
<td>Dummy if firm is multinational</td>
<td>This should be a 'yes' or 'no' to whether the firm has operations in other countries. A multinational here refers to a firm which engages in or receives Foreign Direct Investment. As such a foreign owned firm is a multinational, but not vice-versa. E.g. ESSO UK (foreign owned/multinational) vs BP (not foreign owned/multinational).</td>
</tr>
<tr>
<td>Nm</td>
<td>Intermediate purchases</td>
<td>Refers to the value of goods, materials and services bought by the firm in the reference period.</td>
</tr>
<tr>
<td>Nq</td>
<td>Gross output / sales / turnover</td>
<td>What was the firm's Gross output/Sales/Turnover in the reference period?</td>
</tr>
<tr>
<td>Nv</td>
<td>Value added</td>
<td>If a question on value added exists, please input the values, otherwise this can be derived by the formula (NQ-NM), i.e., Gross output - Intermediate Purchases.</td>
</tr>
<tr>
<td>Nx</td>
<td>Exports of goods and services</td>
<td>Refers to nominal value of exports.</td>
</tr>
<tr>
<td>Pay</td>
<td>Total employment expenditures or payroll</td>
<td>What was the firm's total employment costs for the referenced period?</td>
</tr>
<tr>
<td>Wgt_PS</td>
<td>Sample weight on business survey</td>
<td>Are weights available for the dataset and specifically can they be used to scale up the survey sample to the population total?</td>
</tr>
<tr>
<td>emp_br</td>
<td>Number of employees given in Business Register</td>
<td>Number of employees given in Business Register.</td>
</tr>
<tr>
<td>hk</td>
<td>Share of employees with post upper secondary education</td>
<td>By post upper secondary education, we generally mean university or similar education with the duration of at least three years. 'hk' refers to employees with post upper secondary education, and these are covered by:</td>
</tr>
<tr>
<td></td>
<td>i. National code SUN2000Niva ≥ 53 (i.e. 53, 54, 62, 64), or ii. ISCED97 levels: 5A and 6.</td>
<td></td>
</tr>
<tr>
<td>hit</td>
<td>Share of employees with post upper secondary IT education</td>
<td>'hit' refers to employees with post upper secondary IT education, and are covered by:</td>
</tr>
<tr>
<td></td>
<td>i. The following sub-groups within 'hk': National code SUN2000Inr - 440, 441, 449, 44, 46, 48, 52, 54, 58, or ii. with-in 'hk', ISCED97 narrow fields 44, 46, 48 and broad fields 5.</td>
<td></td>
</tr>
<tr>
<td>kni</td>
<td>Share of employees with non-IT post upper secondary education</td>
<td>'kni' refers to employees with post upper secondary non-IT education: These are covered by all other field definitions in the hk group apart from those in hit.</td>
</tr>
<tr>
<td>export</td>
<td>Export dummy, exporter = 1 non-exporter = 0</td>
<td>Export dummy, exporter = 1 non-exporter = 0</td>
</tr>
<tr>
<td>age</td>
<td>Age of firm in year</td>
<td>Age of firm in year</td>
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</table>
Table IX. Community Innovation Survey 2010 Metadata Questionnaire

<table>
<thead>
<tr>
<th>Eurostat name</th>
<th>Question</th>
<th>AT</th>
<th>DK</th>
<th>FI</th>
<th>FR</th>
<th>IE</th>
<th>IT</th>
<th>LU</th>
<th>NL</th>
<th>NO</th>
<th>PL</th>
<th>SE</th>
<th>SI</th>
<th>UK</th>
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</thead>
<tbody>
<tr>
<td>ENTGP</td>
<td>Enterprise part of a group</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>HO</td>
<td>Country of head office</td>
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<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<tr>
<td>MARLOC</td>
<td>local/regional</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
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<tr>
<td>MARNAT</td>
<td>National</td>
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<td>N</td>
<td>Y</td>
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<td>Y</td>
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<tr>
<td>MAREUR</td>
<td>Other EU/EFTA/CC market</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
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<td>Y</td>
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<tr>
<td>MAROTH</td>
<td>All other countries</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>INPDGD</td>
<td>Introduced onto the market a new or significantly improved good</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>INPDSV</td>
<td>Introduced onto the market a new or significantly improved service</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
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<tr>
<td>INPDTW</td>
<td>Who mainly developed these products? Tick all that apply</td>
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<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<td>INPDTG1</td>
<td>Goods innovations- Your enterprise by itself</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>INPDTG2</td>
<td>Goods innovations- Your enterprise together with other enterprises or institutions</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
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<tr>
<td>INPDTG3</td>
<td>Goods innovations- Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
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<td>Y</td>
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<tr>
<td>INPDTG4</td>
<td>Goods innovations- Other enterprises or institutions</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
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<td>Y</td>
<td>Y</td>
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<tr>
<td>INPDTS1</td>
<td>Service innovations- Your enterprise by itself</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>INPDTS2</td>
<td>Service innovations- Your enterprise together with other enterprises or institutions</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
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</tr>
<tr>
<td>INPDTS3</td>
<td>Service innovations- Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
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</tr>
<tr>
<td>INPDTS4</td>
<td>Service innovations- Other enterprises or institutions</td>
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<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>NEWMKT</td>
<td>Did the enterprise introduce a product new to the market</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>NEWFRM</td>
<td>Did the enterprise introduce a product new to the firm</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>TURNNMAR</td>
<td>% of turnover in new or improved products introduced during 200-2010 that were new to the market</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>TURNNIN</td>
<td>% of turnover in new or improved products introduced during 200-2010 that were new to your firm</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>TURNUNG</td>
<td>% of turnover in unchanged or marginally modified products during 2008-2010</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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</tr>
<tr>
<td>Eurostat name</td>
<td>Question</td>
<td>AT</td>
<td>DK</td>
<td>FI</td>
<td>FR</td>
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<td>IT</td>
<td>LU</td>
<td>NL</td>
<td>NO</td>
<td>PL</td>
<td>SE</td>
<td>SI</td>
<td>UK</td>
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<td>---------------------------------------------------------------------------</td>
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<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>INPDFC</td>
<td>Were any of your product innovations during 2008-2010 first in your country</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>INPDFE</td>
<td>Were any of your product innovations during 2008-2010 first in Europe</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
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<td>INPDFW</td>
<td>Were any of your product innovations during 2008-2010 world first</td>
<td>Y</td>
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<td>Y</td>
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<td>INPSPD</td>
<td>Introduced onto the market a new or significantly improved method of production</td>
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<td>INPSLG</td>
<td>Introduced onto the market a new or significantly improved logistic, delivery or distribution system</td>
<td>Y</td>
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<tr>
<td>INPSSU</td>
<td>Introduced onto the market a new or significantly improved supporting activities</td>
<td>Y</td>
<td>Y</td>
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<td>INPCSW</td>
<td>Who mainly developed these processes? Tick all that apply</td>
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<td>Y</td>
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<td>INPSDV1</td>
<td>Process innovations- Your enterprise by itself</td>
<td>Y</td>
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<td>Y</td>
<td>N</td>
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<td>Y</td>
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<td>INPSDV2</td>
<td>Process innovations- Your enterprise together with other enterprises or institutions</td>
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<td>Y</td>
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<td>INPSDV3</td>
<td>Process innovations- Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions</td>
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<td>INPSDV4</td>
<td>Process innovations- Other enterprises or institutions</td>
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<td>INPSNM</td>
<td>Were any of your process innovations introduced between 2008 and 2010 new to your market</td>
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<td>INABA</td>
<td>Abandoned or suspended before completion</td>
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<td>Engagement in intramural R&amp;D</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Sources from within the enterprise or enterprise group</td>
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<td>SCLI</td>
<td>Sources from Clients or customers</td>
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<td>Sources from Competitors and other enterprises of same industry</td>
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<td>Sources from consultants, commercial labs or private R&amp;D institutes</td>
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<td>ORANGE</td>
<td>Increased range of goods or services</td>
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<td>OREPL</td>
<td>Replace outdated products or processes</td>
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<td>Enter new markets or increase market share</td>
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<td>Improve quality of goods or services</td>
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<td>Improve flexibility for producing goods or services</td>
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<td>Increase capacity for producing goods or services</td>
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<td>Reduce labour costs per unit output</td>
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<td>OHESEY</td>
<td>Improve health or safety of your employees</td>
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