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DEVELOPMENT OF STATISTICAL OUTPUTS FROM BUSINESS REGISTERS

BETTER UTILISING BUSINESS REGISTERS AND BUSINESS STATISTICS

Submitted by Organisation for Economic Co-operation and Development

The meeting is organised jointly with the Commission of the European Communities (Eurostat) and the Organisation for Economic Co-operation and Development (OECD)

Summary

The present paper was prepared on request from the CES Steering Group on Business Registers for presentation and discussion at the joint UNECE/Eurostat/OECD Meeting in Geneva, 18-19 June 2007. It brings-up an issue of heterogeneity in developing business statistics from business registers that potentially limits cross-country comparability of data, including that on business demography.

By introducing a framework for commonly constructed business demography indicators, the paper provides the basis for an in-depth discussion on understanding the necessity to create harmonised concepts for the main business demography indicators to be maintained in statistical business registers.

I. INTRODUCTION

1. As computing power and the demands of policy makers for evidence-based policy grow the requirements of statistical offices to make a wider array of data available also grows. Statistical offices the world over are increasingly considering ways in which they can better meet the needs of policy makers and analysts alike to better utilise the data they collect, importantly this is happening without associated increases in respondent burdens; another area where there is pressure on statistical offices.

2. One area where there has been an explosion in recent years is business statistics, and, in particular, what have become known as business demography statistics, in particular the production of business birth, death and survival rates, a relatively new area of statistical output based on business registers.

3. However, welcome, as this development has been, the concepts that underpin these new statistics have been developed across countries, with the exception of EU countries, in a largely heterogeneous way, limiting their potential to investigate cross-country differences, as confirmed in a recent OECD study (OECD 2006a). The main reason for this reflects the fact that business registers across countries are developed and maintained in different ways, and most importantly, impose different thresholds to exclude certain (economically insignificant) enterprises, and these thresholds can differ significantly. Some countries for example collect information only on enterprises with employees, others, however collect information only on enterprises with turnover above a certain (usually VAT based) threshold. Importantly these differences exist even within EU countries, despite the common framework for business demography indicators and the common rules governing the maintenance of business registers.

II. A NEW FRAMEWORK FOR BUSINESS DEMOGRAPHY STATISTICS

4. In response to these differences and the growing needs of analysts the OECD has developed a framework (OECD, 2006b) that seeks to improve the comparability of commonly constructed business demography indicators, such as birth, death and survival rates and also taken the opportunity to create harmonised concepts for other important but less commonly created indicators, in particular indicators of high-growth enterprises.

5. The indicators proposed by the OECD in its framework paper, and summarised below, build on those currently collected by Eurostat, and have a fundamental objective of improving the comparability of business demography indicators across OECD and non-OECD countries. OECD and Eurostat have worked in close collaboration in developing these indicators and are now working together to develop a common business demography framework, which will form the basis of data collection across OECD countries. Indeed the OECD has already started to collect these indicators from non EU OECD countries and the returns so far have proved encouraging. The following list summarises the indicators and definitions described in the OECD-framework,

(a) Businesses

6. A pre-requisite for the study of business demographics is the definition of a business. Many different definitions exist and are used nationally and internationally. This framework defines a business in accordance with the 1993 System of National Accounts, International Standard of Industrial Classifications and Eurostat's definition of the Enterprise.

“An enterprise is an institutional (legal) unit or the smallest combination of institutional units that encloses and directly or indirectly controls all necessary functions to carry out its production activities. An enterprise may be a corporation, a quasi-corporation, a non-profit institution, or an unincorporated enterprise. The requirements of an enterprise are that it has one ownership or control. It can however be heterogeneous with regards to its economic activity as well as its location.”

7. Recognising the importance of indicators by regional or local levels, the framework also recommends that supplementary indicators are also produced using Enterprise definitions at the sub-national level. Defining enterprises at this level is non trivial and a practical alternative is to use estimates of establishments or local units as proxies for enterprises defined at the sub national level.

(b) Births

8. The point at which the birth of an enterprise occurs is when employees and turnover are both greater than zero for the first time. A merger of two enterprises for example does not result in the birth of an enterprise. Births only occur when new combinations of production factors, such as location, organisational structures, legal form etc are produced. Enterprises with no employees that become enterprises with employees are also births.

9. The exclusion of firms with no employees is deliberate in this definition, partly because this measure provides the simplest and most practical way in which OECD country comparisons can be conducted but also because there is considerable policy interest in this measure. That is not to say that definitions that include firms with no employees are not important, the definition of which is given below (as (b)(ii)), since both indicators have a role to play, although it is recognised in advance that many non EU OECD countries will not be able to produce estimates of Eurostat Births.

(i) Economic Births

10. The point at which the economic birth of an enterprise occurs is when employees are greater than one and turnover greater than zero for the first time. Enterprises with one or no employees that become enterprises with two or more employees are also economic births.

11. This indicator has, at least, equal importance to the definition of births given above. The criterion of two or more employees is again related to interpretability and improved international comparability. In many countries governments will implement policies, some related to entrepreneurship some to fiscal policy, which will create incentives for the self-employed to move from unincorporated to incorporated status. As such the definition for births given above

could be affected by these, potentially volatile, changes, which may have little to do with entrepreneurship say. The use of a 2+ threshold greatly reduces this potential ‘noise’.

(ii) Eurostat Births

12. The point at which a ‘Eurostat birth’ of an enterprise occurs when the enterprise is created, and so includes unincorporated enterprises without employees. A merger of two enterprises for example does not result in the birth of an enterprise. Births only occur when new combinations of production factors, such as location, organisational structures, legal form etc are produced.

(c) Deaths

13. The corollary to a birth is a death, which occurs when a business that previously had one or more employees ceases to trade or have employees. A case can be made to extend this corollary to economic births and so economic deaths but is not made in this paper partly for simplicity but also partly because the relevance of such a measure is more limited.

(i) Eurostat Deaths

14. A Eurostat death occurs when a business ceases to trade.

(d) Birth Rates

15. Birth rates should be calculated by taking the number of births in an observation period (one calendar year) as a percentage of the entire population of businesses with one or more employees active in the calendar year at a reference point-in-time; the OECD’s preference. Eurostat prefer a live-during period approach. This difference is expected to be resolved in the near future. Birth rates should also be calculated as a percentage of the entire human population of working age. Enterprises that are born and die within the same calendar year should be separately identified.

(i) Economic Birth Rates

16. Economic Birth rates should be calculated by taking the number of economic births in an observation period (one calendar year) as a percentage of the entire population of businesses with two or more employees active in the calendar year at a reference point in time. Economic Birth rates should also be calculated as a percentage of the entire human population of working age. Enterprises that are born and die within the same calendar year should be separately identified.

(ii) Eurostat Birth Rates

17. Eurostat Birth rates should be calculated by taking the number of Eurostat births in an observation period (one calendar year) as a percentage of the entire population of businesses active in the calendar year. Eurostat Birth rates should also be calculated as a percentage of the

entire human population of working age. Enterprises that are born and die within the same calendar year should be separately identified

(e) Death Rates

18. Death rates should be calculated by taking the number of deaths in an observation period (one calendar year) as a percentage of the entire population of businesses with one or more employees active in the calendar year at a reference point-in-time. Death rates should also be calculated as a percentage of the entire human population of working age. Enterprises that are born and die within the same calendar year should be separately identified.

(i) Eurostat Death Rates

19. Eurostat Death rates should be calculated by taking the number of Eurostat deaths in an observation period (one calendar year) as a percentage of the entire population of businesses active in the calendar year at a reference point-in-time. Eurostat Death rates should also be calculated as a percentage of the entire human population of working age. Enterprises that are born and die within the same calendar year should be separately identified.

(f) Percentage (Direct) Contribution of Births to Employment

20. Birth Rates should be supplemented by indicators showing the number of employee jobs created by births as a percentage of total employees. Total employees should be calculated using a point-in-time approach.

(g) Percentage (Direct) Contribution of Deaths to Employment

21. Death Rates should be supplemented by indicators showing the number of employee jobs lost by deaths as a percentage of total employees. Total employees should be calculated using a point-in-time approach.

(h) Survival Rates

22. The framework recommends that two measures of survival are developed:

- (i) The first is the year- t τ survival rate, which shows enterprise births in year t that have not died τ years later as a per cent of all enterprise births in year t ;
- (ii) The second is average τ -year survival rates which shows all births in period t_1 to $t_2 - \tau$ that have not died τ years after their birth as a per cent of all enterprise births in years t_1 to $t_2 - \tau$. This corresponds approximately to the un-weighted average year- t τ survival rate over periods t_1 to $t_2 - \tau$. The periods t_1 and t_2 should correspond to one economic cycle.

23. Rates should be calculated for $\tau = 0$ to 5.

(i) High Growth Enterprises

24. All enterprises with average annualised growth in employees greater than 20 per cent per annum over a three-year period and with 10 or more employees in the beginning of the observation period should be considered as high growth enterprises. These enterprises should be shown as a percentage of all enterprises with 10 or more employees at the start of the observation period and as a percentage of the human working age population.

25. Understanding the mechanisms that lead to enterprises contracting is also of considerable policy interest. The study of enterprise failure has long been of interest but is complicated by the difficulty in obtaining information from entrepreneurs about the factors that caused failure, since commonly the information concerning the entrepreneur, such as address, is related to the enterprise, and, so, the entrepreneur is difficult to track. It may be easier however to track 'failing' enterprises. As such national statistics institutes should be encouraged to additionally record those enterprises, and their characteristics, that reduce employment by more than 15 per cent per annum on average over a two-year period.

(j) Gazelles

26. All enterprises less than 5 years old with average annualised growth in employees greater than 20 per cent per annum over a three-year period and with 10 or more employees in the beginning of the observation period should be considered as gazelles. These enterprises should be shown as a percentage of all enterprises, with 10 or more employees at the start of the observation period and as a percentage of the human working age population.

III. POLICY DRIVERS

27. But developments in this area continue apace. The growing interest of policy makers in entrepreneurship has led to an almost insatiable demand for new types of indicators that help to answer the questions posed by policy makers, and, in order to meet these needs statistical offices are being asked to tap further into the data they typically collect; again, business registers are at the forefront of these developments.

28. To meet these challenges head on, the OECD launched an Entrepreneurship Indicators Project, funded almost exclusively from voluntary contributions from Institutions such as the Kauffman Organisation¹ and the ICE consortium,² in 2005, tasked with developing a framework that would allow entrepreneurship to be measured in a comparable way across the world.

29. The project continues, and, in December 2006, the formation of a Steering Group³ to this project was set up to develop a working definition for entrepreneurship and a list of indicators that could measure the phenomenon. The list of indicators is still being developed but one thing is already clear, business registers have a crucial role to play. In recent months, Steering Group members, members of the ICE consortium, and members of a joint OECD-Eurostat Task Force

¹ See www.Kauffman.org

² See <http://ice.foranet.dk>

³ See http://www.oecd.org/document/3/0,2340,en_2649_201185_35377795_1_1_1_1,00.html

have been providing views to the OECD Secretariat on the types of indicators that will be needed, and many are based on business registers. Not surprisingly information on births, deaths and high-growth enterprises consistently appear in the top-ten of indicators needed but many others, dependent on business registers, also score highly; particularly those that relate to the characteristics, such as legal form and control, of enterprises.

30. Indeed at the most recent meeting of the OECD EIP Steering Group, participants expressed a desire to see high-growth enterprises also measured using a monetary variable that better reflected economic growth, such as turnover, or profits, rather than merely employment. In response the OECD prepared a paper (OECD 2007) that tackled the difficult issues related to the measurement of high-growth, in particular, those issues relating to monetary variables and proposed a number of complementary indicators that could improve our collective understanding of high growth enterprises, a paper that was well received when presented to the ICE consortium earlier this year. The paper concluded that, although monetary variables, such as value-added and operating surplus for example, provided more meaningful measures of growth than turnover say, their use as target variables was limited due to the practical constraints of measuring these variables consistently across countries and across size-classes of businesses, particularly when one considered constant price growth. These issues are described in more detail in the paper, for convenience, the complementary indicators recommended in the paper are summarily described below.

31. The first recommendation is to collect information on high-growth enterprises using a turnover based corollary to the employment based measure, such that high-growth enterprises could also be measured on the following basis:

32. All enterprises with average annualised growth in turnover greater than 20 per cent per annum over a three year period and with 10 or more employees in the beginning of the observation period should be considered as high growth enterprises. These enterprises should be shown as a percentage of all enterprises with 10 or more employees at the start of the observation period and as a percentage of the human working age population.

33. Clearly there are pros and cons with both turnover and employment based measures. Employment based measures are preferable from a practical perspective because they are easier to measure, and, indeed, they are preferable if the policy objective is increasing employment. Turnover based measures are more closely linked to what the entrepreneur is trying to grow however. A key question therefore is: Is it possible to create a composite indicator that marries turnover and employment concepts?

34. One relatively simple possibility is to take the square root of Employment and Turnover based indicators (similar to the Fisher price index, which takes the square root of Paasche and Laspeyres price indices).

35. In other words enterprises would be defined as high-growth when the composite indicator

$$\sqrt{\frac{\text{Emp}_{t+n}}{\text{Emp}_t} \frac{\text{Trn}_{t+n}}{\text{Trn}_t}} \quad (i)$$

was greater than some predetermined threshold (where Emp_t is employment Trn_t is deflated turnover in time (year) t).

36. This can be decomposed to

$$\frac{\text{Emp}_{t+n}}{\text{Emp}_t} \sqrt{\frac{\text{Emp}_t}{\text{Emp}_{t+n}} \frac{\text{Trn}_{t+n}}{\text{Trn}_t}} = \frac{\text{Emp}_{t+n}}{\text{Emp}_t} \sqrt{\frac{\text{LPr}_{t+n}}{\text{LPr}_t}}$$

where LPr_t is equivalent to labour productivity in year t , and LPr_{t+n} is equivalent to “labour productivity”, with turnover, rather than output or value-added say, in year $t+n$ at year t prices.

37. Another issue examined in the paper was the potential difficulty smaller countries would have in presenting information on high-growth enterprises where the indicator was conditional on a minimum employment size class (which is also the case for the turnover based measure), since smaller countries would be likely to have disproportionately fewer high-growth enterprises and so greater disclosure problems. As such the paper also recommends that measures based on the Birch index, for both turnover and employment are used that capture the top X per cent (to be determined) of enterprises on the following measure:

$$m = (x_{t_1} - x_{t_0}) \frac{x_{t_1}}{x_{t_0}}$$

where x_{t_1} and x_{t_0} denote size (typically employment but also turnover) at the end and the beginning of the sample period. It can be demonstrated that this measure, while still dependent on firm size, always gives rise to a smaller bias towards any size class than either the relative or the absolute measure of growth. This, of course, needs to be used in combination with a threshold that takes the top X per cent of businesses based on this index, whether the index uses employment or turnover as the growth variable.

IV. GOING FURTHER WITH SBS STATISTICS

38. What is also clear from the list of indicators being developed by the OECD and Eurostat is the need for stronger links between structural business statistics and business registers, such that analysts are better able to link demographic factors with those that relate to growth. Typically, most business registers are able to provide these links with respect to turnover and employment, say, but increasingly analysts require links to other information such as value-added and investment, which are admittedly much bigger challenges, particularly given the

quality of information that smaller businesses are able to provide in this area in a comparable way across and within countries.

39. But to satisfy many of these needs, links at the micro-level are not absolutely essential. Statistical Offices for example, typically provide information on the following variables based on Structural Business Statistics (SBS) surveys or economic censuses:

- (a) Turnover;
- (b) Production at producers' prices and/or factor costs;
- (c) Value added at basic prices and/or factor costs;
- (d) Gross operating surplus;
- (e) Total purchases of goods and services;
- (f) Change in stocks of goods and services;
- (g) Purchases of energy products;
- (h) Gross investment in tangible goods;
- (i) Gross investment in land;
- (j) Gross investment in existing buildings and structures;
- (k) Gross investment in machinery and equipment;
- (l) Sales of tangible investment goods;
- (m) Employment, number of persons engaged and number of employees;
- (n) Employment, number of females employees;
- (o) Employment, number of employees in full time equivalent units;
- (p) Hours worked by employees;
- (q) Compensation of labour, all persons engaged and employees;
- (r) Wages and salaries, all persons engaged and employees;
- (s) Other employers' social contributions, employees.

40. But further information could be provided in this regard that, thus far, is rarely ever provided. Statistical offices for example could provide information on the distributions of each of these variables, for example by providing simple medians, standard deviations, kurtosis coefficients etc in addition to the means that can already be derived, thus providing analysts with the means to better understand the nature of an industry's heterogeneity. Going one step further statistical offices could begin to provide similar statistics relating to composite indicators, for example providing information relating to the distribution of labour productivity within a particular industry, thus allowing analysts to explore the frontiers of productivity.⁴ In this sense statistical offices should be encouraged to provide "distribution information" (standard deviation, kurtosis, median, and quartile information, bottom 25 per cent, top 25 per cent, 95 per cent confidence intervals) relating to all of the variables described above and the following sets of indicators for example:

- (a) Labour productivity: (turnover, value-added, production) /employment (head count and FTE, hours worked) by 4 digit SIC and size class;
- (b) Labour productivity growth – (where SBS data can be linked longitudinally);
- (c) Social contributions as per cent of compensation of employees;
- (d) Labour-capital ratios.

⁴ Indeed just such an approach has been undertaken by academics, see for example Bartelsman, Haskel and Martin, 2006, "Distance to Which Frontier?"

41. This list is still being developed and, clearly, many other indicators can be included. For example a very obvious candidate is to utilise information on business registers to create Hirschman-Herfindhal concentration indices, an exercise that is already being trialled within non EU OECD countries. The OECD is investigating this issue more generally, in the context of its study on micro-data access (see http://www.oecd.org/document/27/0,2340,en_2649_201185_37502683_1_1_1_1,00.html) and the work on business demography indicators provides a promising example of what can be done. A final report of this paper will be presented at the OECD Statistics Committee meeting this year (June 13-14).

V. CONCLUSION

42. The benefits to statistical offices and users of official statistics that come from making better use of already existing data sources, in particular business registers are clear. A number of factors are now coming together that will hopefully be able to accelerate this process, and, thus provide greater incentives for statistical offices to further prioritise the role of business registers in the statistical information system and representatives are encouraged to support these many initiatives.

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