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A Proposed Framework For business Demography Statistics

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Abstract

The creation of new businesses and the decline of unproductive ones are often regarded key to business dynamism in OECD economies. Understanding business behaviour, creative destruction and identifying successful and failing businesses, as well as fostering entrepreneurship and innovation, have become increasingly important objectives for policy makers in many OECD economies in recent years. However, despite its growing importance, the study of business dynamics, and entrepreneurship more generally, is hampered by the lack of truly internationally comparable indicators. That is not for a lack of data however, as many statistical institutions and private agencies produce statistics in this domain, but because they lack comparability, are of questionable quality, or are not able to tackle all of the policy questions related to these issues, they can often generate confusion, giving mixed messages to policy makers. The framework of business demography indicators presented in this paper is an attempt to fill this gap by providing a mechanism by which more comparable indicators of business demography can be produced across OECD countries in particular, considering both what is practically achievable and desirable.

La création des nouvelles entreprises, et le déclin de celles qui ne sont pas productives sont souvent considerées comme étant primordiales pour le dynamisme de celles des pays de l'OCDE. Ces dernières années, comprendre le comportement des entreprises, les « destructions créatives », et identifier les affaires qui fonctionnent ou pas, ainsi que la promotion de l'entreprenariat et de l'innovation, sont devenus des objectifs de plus en plus importants pour les décideurs dans les economies de l'OCDE. Cependant, en dépit de son importance croissante, l'étude de la dynamique des entreprises, et de l'entreprenariat plus généralement, est gênée par le manque d'indicateurs internationaux réellement comparables. Néanmoins, cela ne vient pas d'un manque de données puisque beaucoup d'instituts ou d'agences privées produisent des statistiques en ce domaine, mais du fait qu'ils manquent de comparabilité, sont de qualité discutable, ou ne sont pas à même de répondre à toutes les questions politiques relatives, ce qui est source de confusion et de messages éronés auprès des décideurs. La structure des indicateurs de la démographie des entreprises présentée dans ce document va tenter de combler les vides en fournissant un mécanisme par lequel plus d'indictateurs comparables de la démographie des entreprises peuvent être produits, en particulier parmi les pays de l'OCDE, considérant ce qui réellement faisable et ce qui est souhaitable.

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0. EXECUTIVE SUMMARY

0.1. The creation of new businesses and the decline of unproductive ones are often regarded key to business dynamism in OECD economies. Understanding business behaviour and (Schumpeterian) creative destruction and identifying successful and failing businesses, as well as fostering entrepreneurship and innovation, have become increasingly important objectives for policy makers in many OECD economies in recent years. Business churn (i.e. entry plus exit rates) is commonly viewed as a measure of the ability of economies to expand the boundaries of economic activity, to shift resources towards growing areas and away from declining areas, and to adjust the structure of production to meet consumers' changing needs. Moreover, higher rates of business creation and churning are generally held to benefit economic growth, job creation and poverty alleviation via increased productivity and innovation

0.2. However, despite its growing importance, the study of business dynamics, and entrepreneurship more generally, is hampered by the lack of truly internationally comparable indicators. That is not for a lack of data however, as many statistical institutions and private agencies produce statistics in this domain, but because they lack comparability, are of questionable quality, or are not able to tackle all of the policy questions related to entrepreneurship, they can often generate confusion, giving mixed messages to policy makers.

0.3. Many studies, for example, use labour force statistics to paint a picture of entrepreneurship but although these sources are generally comparable and often have relatively good coverage they suffer in other aspects; for example although they provide good information about the numbers of business owners and self-employed in an economy they are rarely longitudinal and, so, do not lend readily themselves to identifying or tracking successful or even failed businesses. Moreover they can not, on their own, typically provide information on the size or ages of the firms. One could use labour force surveys to provide a frame from which other surveys that specifically target business owners could be launched but this is resource intensive; many of the self employed for example will have little growth prospects beyond providing for their immediate employment. Moreover, one should recall that the primary purpose of labour force surveys is to measure employment and unemployment, and, although the sample sizes are sufficient to measure these variables they are unlikely to be large enough to provide statistically significant information on business owners and businesses. Ultimately the best way in which information on businesses (successful and failing) can be gained is to use information related directly to businesses.

0.4. The Statistical Office of the European Union, Eurostat, has recently developed an enterprise demography database that follows such an approach. This initiative has greatly improved the comparability of business demography data from European countries but comparisons of these statistics across non-EU countries remain difficult. The Eurostat framework and database has provided an important resource to compare business demography statistics internationally, but, by design, has been developed in a largely EU context reflecting the needs, data availability and business statistics regulations applicable to EU and Candidate countries. In theory there is no reason why the framework could not be applied in non EU countries but in practice this is easier said than done, since it requires, for some countries, fundamental changes to core data collection that are unlikely to occur in the short to medium term, if at all. The challenge, therefore, is to develop a framework that can be applied now across the OECD and other important global players, such as Brazil, China, and India. The OECD has an obvious role to play in bridging the gap between these countries.

0.5. This document provides a step in that direction by proposing a framework of business demography indicators that can be applied across all OECD and large non OECD economies. The framework tries to provide a mechanism by which more comparable indicators of business demography can be produced across countries by considering both what is practically achievable and desirable. The framework deliberately sets out to measure business demographics. It does not therefore make proposals concerning

other important indicators of entrepreneurship such as the characteristics of entrepreneurs (age, sex, education, previous entrepreneurial experience etc), entrepreneurial and related policies (government policy, bankruptcy regulations, access to finance, fiscal policy – personal and business taxes – business administrative burdens, employment laws, social security safety nets etc) or the characteristics of businesses that may predetermine success, such as research and development expenditure; although this work is being pursued as part of the OECD's Entrepreneurship Indicators Project (see Davis, 2006). That said, the framework is able to provide information on types of businesses, successful, young, old, sector specific, etc, that can be used to provide the frame for dedicated surveys that attempt to determine what makes businesses succeed or fail.

0.6. An earlier version of this paper (March 2006) was circulated for comment to OECD Member Countries via OECD's SBSnet (Structural Business Statistics Network) and directly to Eurostat. At a meeting with Eurostat, convened to discuss the earlier draft, the OECD and Eurostat agreed to work together to develop a joint framework. This revised version of the paper reflects that position. The key change to the earlier draft is the addition of a recommendation to also produce estimates of business entries (and also exits) following the Eurostat definition of a business birth (death); which includes entries of unincorporated enterprises with no employees. This does not replace the recommendations made for 'births' and 'economic births' used in the earlier draft and that are retained in this document. Indeed they remain the primary measures for OECD purposes and OECD country comparisons. The inclusion of the Eurostat definition, which will be referred to hereafter, for convenience, as 'Eurostat births' is partly in the spirit of cooperation between Eurostat and the OECD but mainly reflects the outcome of recent work by Peter Boegh Nielsen of Statistics Denmark that looked into the possibilities of producing estimates of births for Denmark on the OECD employer basis, described below, but starting from the dataset used to produce estimates of 'Eurostat births'. This investigation demonstrated that it was relatively easy for countries that already produce indicators of 'Eurostat births' to also produce employer based estimates of births, thus allowing for comparisons to be made with other non-EU OECD countries.

0.7. Unfortunately it has not been possible to reflect this change in emphasis throughout the document for timing reasons and, so, the addition of the 'Eurostat birth' definition features only in this Executive Summary. The occasion to fully reflect this change will be in the drafting of the joint OECD/Eurostat framework. That is not to say that complete unanimity currently exists on all issues between the OECD and Eurostat. There are some other issues on which views have not yet converged, in particular the choice of point-in-time or live-during-period based estimates. But we fully expect these views to converge, since the different positions ultimately reflect differences in the simplicity and practicalities of the approaches rather than chasms in concept.[1]

0.8. A number of indicators are proposed in the following sections along with supporting arguments for their conceptual underpinning. These are summarily described below. In all cases each indicator should be broken down by as detailed an industry as possible (using the International Standard Industrial Classification of All Economic Activities (ISIC, Rev.3)), legal form (limited liability companies, sole proprietors, partnerships, public corporations and non-profit institutions serving households), employment size, turnover and ownership (foreign and domestic).

(1) Businesses

0.9. 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

[1] This paper was presented at the Eurostat Business Demography Working Group meeting, Luxembourg, June 20-21, 2006. Delegates welcomed the recommendations for the development of birth rates in enterprises with employees, to improve comparability with non-EU countries, and high-growth enterprise rates, and the agreement between the OECD and Eurostat to develop a harmonised framework that embodied these definitions.

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."*

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.

(2)Births

0.10. 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.

0.11. 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 2c), 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.

(2b)Economic Births

0.12. 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.

0.13. 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'.

(2c) Eurostat Births

0.14. 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.

(3)Deaths

0.15. 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.

(3b)Eurostat Deaths

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

(4a)Birth Rates

0.17. 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.

(4b)Economic Birth Rates

0.18. 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.

(4c) Eurostat Birth Rates

0.19. 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

(5)Death Rates

0.20. 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.

(5b)Eurostat Death Rates

0.21. 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.

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

0.22. 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.

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

0.23. 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.

(8) Survival Rates

0.24. This framework recommends that two measures of survival are developed:

0.25. 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.*

0.26. The second is *average τ-year survival rates* which shows all births in period t1 to t2- τ that have not died τ years after their birth as a per cent of all enterprise births in years t1 to t2- τ. This corresponds approximately to the un-weighted average *year-t τ survival rate* over periods t1 to t2- τ. The periods t1 and t2 should correspond to one economic cycle.

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

(9) High Growth Enterprises

0.28. All enterprises with average annualised growth in employees greater than 20% 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.

0.29. 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 annum on average over a two year period.

(10) Gazelles

0.30. All enterprises less than 5 years old with average annualised growth in employees greater than 20% per annum over a three year period and with 10 ore 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.

1. INTRODUCTION

1. The creation of new businesses and the decline of unproductive ones are often regarded key to business dynamism in OECD economies. Understanding business behaviour and (Schumpeterian) creative destruction, and identifying successful and failing businesses, as well as fostering entrepreneurship and innovation have become increasingly important objectives for policy makers in many OECD economies in recent years[2]. Business churn *(i.e.* entry plus exit rates) is commonly viewed as a measure of the ability of economies to expand the boundaries of economic activity, to shift resources towards growing areas and away from declining areas, and to adjust the structure of production to meet consumers' changing needs. Moreover, higher rates of business creation and churning are generally held to benefit economic growth, job creation and poverty alleviation via increased productivity and innovation[3].

2. The growing interest in these issues, and entrepreneurship more generally, has also influenced statistical development in this area. For example, as shown in Section 2, many national statistical offices now provide official statistics on the exit, entry and turnover of businesses. The Statistical Office of the European Union, Eurostat, has recently developed an enterprise demography database that includes many EU countries and little of this development has led to increased burdens on businesses, since much of the information is provided by existing data sources, for example business registers and administrative tax sources. This initiative has greatly improved the comparability of business demography data from European countries but comparisons of these statistics across non-EU countries are more complex (see Vale 2006). This largely reflects that fact that national definitions and concepts of business demography statistics usually reflect domestic data availability and the fact that internationally recognised definitions and concepts, with the notable exception of Eurostat, are largely non-existent. The OECD has also conducted one-off collections and studies of business demography statistics in the past (e.g. Bartelsman et al, 2003) on a harmonised basis, for the purposes of productivity and economic growth analysis, but these datasets also contained data that was not strictly harmonised for all countries (Brandt, 2004).

3. Efforts have been made by the Global Entrepreneurship Monitor (GEM)[4] to develop an indicator of Early Stage Entrepreneurial Activity, formerly called the Total Entrepreneurial Activity (TEA) index, based on household interviews, that measures the number of entrepreneurs per capita (18-64 age group) that have started a business in the last 42 months. Useful as this measure is in providing some indication of the general level of new entrepreneurs it suffers through not being able to say much about the survival probability, employment, or growth potential of the newly created entrepreneurships; key issues of concern to policy makers interested in entrepreneurship. Moreover, a key issue concerns the types of entrepreneurs captured in the GEM survey. Many of the new start-ups will have very limited, if any, growth potential beyond satisfying the immediate, often subsistence, needs of the entrepreneur and, because these entrepreneurs are not tracked over time, the GEM approach is not able to identify the types and characteristics of businesses that are likely to succeed. Additionally, because it is a household based survey it cannot truly be used to estimate the numbers of new enterprises, which could be particularly problematic if business creations by serial (multi business owning) entrepreneurs are significant. Equally the sample sizes and the respondent's perception of what constitutes a new business and the sector in which it operates are not always the same across countries.

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[2] The Bologna Charter on SME Polices and the 'Bologna Process'; The 2nd OECD Ministerial Conference on SMEs, Istanbul 2004; European Commission Lisbon Summit and the "Lisbon Strategy', 2000.

[3] A number of studies also demonstrate strong correlations between turnover rates and GDP growth, see for example Barnes et al, 2002.

[4] See http://www.gemconsortium.org/ for more information.

4. The business demography database developed by Eurostat is better equipped to provide input into policy since: it is able to provide information on births, deaths and survivability at a relatively detailed sectoral level; uses common definitions for these variables as well as the definition of a business; and, is largely based on information coming from national business registers which, in theory, capture all new business entries and exits[5]. In addition, the database provides some information relating to the characteristics of the entrepreneurship; namely its legal form.

5. But more detailed information is required if one is to obtain a more comprehensive understanding of entrepreneurs and start-ups or, rather, the factors of success (and failure). For example: which start-ups are likely to grow fastest and provide the best long-term growth opportunities, and, specifically, what are the key characteristics that might determine success, such as foreign ownership, access to capital etc. Policy makers are also interested in the characteristics of entrepreneurship as outcomes too, and not only as inputs that might determine success, for example, increasing female or minority group entrepreneurship are policy objectives in many countries. Although this type of detailed information is not provided in the Eurostat database it can be attained indirectly, using survey based approaches that target successful and failed businesses[6]; an approach taken by Eurostat in their Factors of Business Success project and which is currently being considered by the OECD's Entrepreneurship Indicators Project.

6. The Eurostat framework and database has provided an important resource to compare business demography statistics internationally but, by design, the Eurostat framework has been developed in an EU context reflecting the needs, data availability and business statistics regulations applicable to EU countries. But business demography statistics between the Eurostat group of countries and other OECD economies, such as Australia, Canada, Iceland, Japan, Korea, Mexico, New Zealand Turkey and the United States, and other important global players, such as Brazil, China, and India, remain incomparable, see below (and Vale 2006). The OECD has an obvious role to play in bridging the gap between these countries. This document provides a step in that direction by proposing a framework of business demography indicators that can be applied across all OECD and large non OECD economies.

7. The framework is broken down into 7 main sections. The first, Section 2, provides a brief overview of business demography statistics that are currently produced by international and national statistics institutes. Section 3 tackles a key issue, one that is central to any discussion on business demography indicators, head-on; namely the definition of a business. Section 4 provides a definition of business births; births being the expression used to describe pure creations of businesses. Section 5 provides a definition of the corollary to births, deaths. Section 6 provides definitions of birth and death rates by considering the populations (denominator) that should be used in defining these indicators. Section 7 provides definitions of survival rates and Section 8 considers the issues of high growth firms and young high growth firms (gazelles).

[5] In practice all business registers will operate with some form of threshold that excludes very small businesses operating, usually, below some employee or turnover threshold where registration, whether on a statistical or administrative register, is not required.

[6] Identifying and surveying failed businesses is more challenging, since, by their nature, they no longer exist.

2. OVERVIEW AND COMPARISON OF CURRENT DATA SOURCES

Comparability of Current National Statistics on Business Demography

8. The main motivation for the development of this framework is the perception that current national official estimates of statistics related to business demographics, such as start-up, exit and survival rates, numbers of high growth businesses, and definitions for small and medium businesses say are not comparable internationally. The picture is murkier still when non official sources of information are also considered, such as estimates derived from private databases, such as Dun and Bradstreet, or from survey based sources such as GEM. This plethora of competing sources, using different concepts, makes it very difficult for policy makers and analysts alike to use these data. However, national statistics offices have plenty of experience in developing national statistics, for example GDP, based on harmonised concepts and comparable sources, and, so, in principle, there exists tremendous scope for improvement in the comparability of business demography statistics. This section provides some assessment of this scope by comparing current data sources used by, or available to, national statistics institutes.

9. In practice most national statistics offices derive estimates of entries and exits using statistical business registers, and so the focus of this section will be on business register based information. That is not to say that survey based methods are not worth consideration. Much can be gained using survey based information but, in order to have good quality information, large sample sizes are required, and this is especially so if information on specific types of businesses are required; which can only be identified post, or during the survey. Business register information on the other hand is largely exhaustive in its coverage, certainly for non-micro businesses, and it provides the means by which specific businesses can be systematically targeted if follow-up investigations are desired.

10. But it is clear that even amongst countries that produce business demography statistics using business registers, significant methodological differences exist. There are a number of reasons why these differences exist. These can stem from very basic differences, such as the way in which businesses are defined, to more complex differences such as the way in which entries are identified and defined; which are affected by many factors, for example, the coverage of data sources used to measure entries, and the treatment of demographic events, such as mergers and take-overs, to name but two. The bottom line however is that the methodology used by national statistics institutions is driven primarily by national considerations rather than a desire for international comparability. A quote from a recent Australian paper on establishing a conceptual framework for business demography (ABS (2004)) illustrates this well; "Whilst international comparability of the data is considered to be important, the overriding requirement is the provision of data in the Australian context". This is not stated as clearly by other national data providers, but appears to be a widely held view. Understanding the differences between national data sets is therefore a vital pre-condition to any meaningful analyses of them.

11. The main purpose of this proposed framework therefore is to provide a system of definitions that can improve the comparability of national statistics on business demographics. However, it will be some time before national statistics institutions will be in a position to produce statistics on the basis of such a framework and, as such, it is important to understand how and why current national estimates differ conceptually. This comprehension is equally invaluable in feeding in to the development of the framework itself; since it would be pointless developing a conceptual framework that could never be implemented in practice.

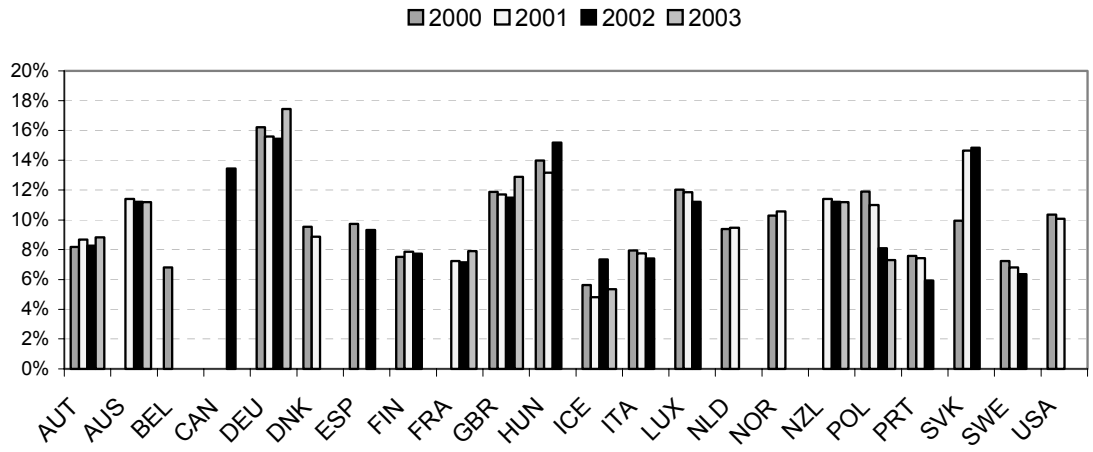
12. To provide a simple picture of the current degree of incomparability it is instructive to look at one of the most important business demography indicators commonly produced by national statistics

offices: start-up rates (see Vale 2006), since a study of start-up rates reveals much about the incomparability of other business demography indicators, such as death rates, say, and related concepts such as the statistical units used to define businesses.

Start-Up Rates

13. The chart below compares start-up rates across a number of OECD countries. It shows significant variation across countries, but at least part of this variation reflects conceptual differences and some care is needed in interpretation. For example, the increase in start-up rates for Slovakia in 2001 reflects changes to the coverage of source information, in this case business registers, which included unincorporated enterprises with no employees for the first time in the 2001 data. In some countries, for example the United States, the estimates exclude businesses without employees from the scope of start-ups and businesses, whereas the Eurostat methodology includes these businesses. That said, although the harmonised framework developed by Eurostat stipulates the rules that should be used in defining births and the population from which they are sourced (via European regulations governing business registers), practical differences in the way concepts are constructed do exist between EU economies. This is partly because different approaches are used in measuring enterprises, the statistical business unit adopted by Eurostat, but also because the development of business registers in some countries is continuing, and, as such, the coverage of activities is not currently identical across EU economies.

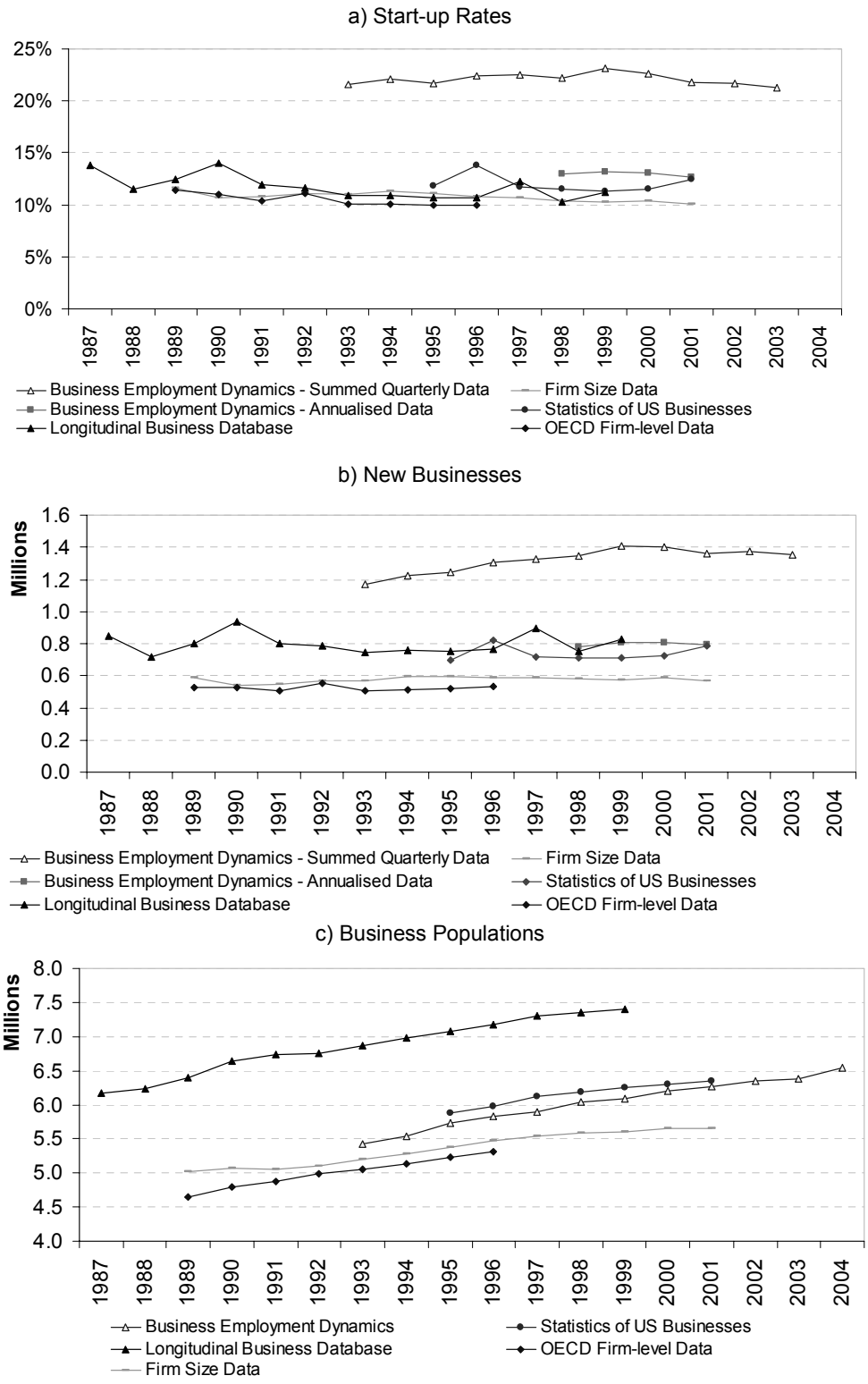
Figure 2.1 – Business Start-up Rates in Selected OECD Countries



Sources: National statistical offices and Eurostat

14. However the incomparability of national estimates of start-up rates can be established even without resorting to international comparisons. Vale, 2006, for example compares 5 start-up rates for the US, further showing that even where the rates appear to be similar, fundamental differences may still exist in the components (numerator and denominator) used in their construction; as shown in Figures 2.2 (a), (b), and (c) below.

Figure 2.2 – Comparing Start-up Rates, New Businesses and Business Populations in the US



15. There are of course explanations for these differences, the key one being that not all entries are necessarily new businesses; some new entries reflect other demographic events, such as take-overs for example, and some of the US measures shown above try to correct for those entries that are not new businesses. Periodicity is another factor. One of the series shown above, for example, shows annualised quarterly data[7]. But different treatments of demographic events are not the only causes of difference; many others exist, as described in the typology below. The key point, however, is that an international framework is needed to describe how these factors can be treated in a consistent way across all countries.

Typology of Factors Affecting Comparability

16. Nine main factors have been identified as affecting the conceptual comparability of business demography statistics.

- Units – what is the statistical unit used to measure businesses?
- Source – are the data taken from a register, a census or a survey? How reliable is the source?
- Coverage - to what extent are certain types of business included or excluded based on specific attributes (e.g. economic activity or legal form)?
- Thresholds – what explicit or implicit size thresholds apply to the source?
- Purity – to what extent can real births (and deaths) of businesses be distinguished from other demographic events, (such as mergers, take-overs, reactivations etc), that create new entries (and exits) but not births (or deaths); where births (deaths) reflect the creation (destruction) of combinations of new production factors, such as location, assets and employees, organisational structures etc.
- Timing – at what point are entries, exits, births and deaths identified?
- Periodicity – over what period are births and deaths measured, and how does this affect the measurement of very short-lived businesses?
- Type of Population – are businesses or people used in constructing the denominator for entry and exit rates?
- Temporal basis – is the population measured at a specific point in time, or does it consist of all units that were present at any time during a given period?

17. Various other factors affect business demographics such as the size of national economies, demand and supply constraints, the impact of tax, subsidy and other policies, the nature of the political system, and a wide range of other economic, political and social and cultural factors. None of these factors relate to the concepts and methodology used in constructing business demography statistics, and many of them account for the sort of variation in data that users are really interested in.

7 If start-up rates are calculated for sub-annual periods they can be averaged to produce annual totals, though these totals will be higher than those based on annual snap-shots due to better coverage of businesses that survive for less than one year. If sub-annual start-up data are only available in the form of birth rates, it is clearly more difficult to estimate the annual rate without further information about the net change in the population. Work to convert quarterly establishment start-up data from the Business Employment Dynamics series produced by the US Bureau of Labor Statistics to an annual basis has resulted in differences of over 40% between annualised start-ups and the combination of start-ups for the four separate quarters. This is a result of both the removal of short-lived businesses, and improvements to the 'purity' of the start-up estimates, removing entries that arise from other demographic events such as mergers say, by better linking establishments over time, (see Pinkston and Spletzer (2004)).

Inventory of Country Practices

18. The table that follows provides a summary of business demography indicators currently produced by national statistics institutes in a number of OECD countries. It demonstrates that considerable differences exist in the purity, coverage, temporal basis and business units used across countries. It also provides information related to the Eurostat business demography framework, which many countries contribute to. The important point to recognise here is that, although the Eurostat framework prescribes recommended ways in which business demography indicators should be developed, the estimates provided by some countries are not yet compiled on this basis.

Table 2.1: Comparing Business Demography Statistics and their Sources

Country	Agency	Units	Source	Coverage	Threshold	Purity	Timing	Periodicity	Temporal
Australia	ABS	Legal	Register	Excludes non-market enterprises	50,000 Australian Dollars (approx. €31,000), with some exceptions, and some voluntary registrations	Excludes inactive businesses, changes in legal form, and reactivations, and identified take-overs.	Entries and Exits on the Register	Annual	Point-in-Time
Austria	Unternehmensneugründungen in Österreich 1993-2004	Enterprise.	Register	..	..	New registrations are adjusted to remove re-registrations, dormant units, and multiple registrations for the same enterprise. Adjustments are also made for registration lags.	Entries and Exits on the Register	Annual	Point-in-Time
Belgium	Statistical Office	Legal	Register	Some specific legal, medical, financial, social and personal services are exempt from value-added tax. Public sector entities are included if they are registered for VAT	No VAT registration threshold.	None	Entries and Exits on the Register	Annual	Point-in-Time
Canada	Statistical Office	Legal	Register		One or more employees		Entries and Exits on the Register	Annual	Live-During-Period
Finland	Statistical Office	Enterprise	Register	Excludes foundations, housing companies, voluntary associations, public authorities and religious communities. The data cover state-owned enterprises, but not those owned by municipalities.	VAT registered and employers only	..	Entries and exits on the LEAP database	Annual	..
France	Statistical Office	Enterprises	Register			Excludes self employed reactivations and take-overs		Annual	..
Germany	Statistical Office	Local unit	Register	Excludes certain health, public administration, insurance and agricultural activities	Covers businesses with a turnover of at least €16,620 per year.	none	Entries and Exits on the register	Annual	..
Hungary	Statistical Office	Enterprise	Register	Includes all businesses with active registration and a tax number in the register, including most government bodies. There is no registration threshold so part-time businesses are included.	..	..		Half-yearly	Point-in-Time
Japan	Statistical Office	Establishment	Census	Excludes sole-proprietor businesses in agriculture, forestry and fishing activities, or any businesses classified to domestic services, foreign governments or international agencies.	..	..	New Establishments (based on location checks between censuses).	Five-yearly, annualised	

Country	*Agency*	*Units*	*Source*	*Coverage*	*Threshold*	*Purity*	*Timing*	*Periodicity*	*Temporal*
Netherlands	Statistical Office	Enterprises	Register	Excludes NACE categories (Sections A, B, E, L, M and N, and divisions 70, 73, 91 and 92).	At least one person works in the enterprise for at least 15 hours a week.	Tracks continuity, so excludes mergers, take-overs, reactivations etc		Annual	
New Zealand	Statistical Office	legal unit	Register	The data exclude agriculture production (ANZSIC subdivision A01). They also exclude businesses of "little economic significance	Greater than $30,000 (approx €17,500) annual taxable expenses or sales and/or rolling mean employee count of greater than three		Exits and Entries on the Register	Annual	
Norway	Statistical Office	Enterprises	Register	Enterprises classified to public administration, agriculture, forestry and fishing are excluded, as are central and local government units	..	Excludes take-overs.		Annual	
Spain	Statistical Office	Enterprises	Register		..	Excludes Reactivations	..		
Sweden	Statistical Office	Legal unit	Register				..		
Switzerland	Statistical Office	Enterprises	Register	Excludes in agriculture, forestry, fishing and public administration.	..	Excludes reactivations and take-overs.	.		
Turkey	Statistical Office	Business establishments excluding companies and cooperatives.	Register	..	..	..	..		
United Kingdom	Statistical Office	Legal unit	Register	The data cover all economic activities and legal forms, though coverage is limited for certain activities that are exempt from VAT, particularly in the education and health sectors.	VAT registered and employing enterprises	..	Exits and Entries on the Register.	Annual	
United States	Census Bureau	Establishment	Census	Excludes non-market sector and some public corporations.	Businesses without employees are excluded	..	..		
..	Small Business Agency	Firm (Enterprise)	Census	See above	See above	..	..	Annual	point in time
..	Census Bureau - longitudinal database	Establishment	Census	See above	See above	Adjusted for reactivations	..	Annual	point in time
Eurostat: Belgium, Czech Republic, Denmark, Finland, Hungary, Italy, Luxembourg, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, United Kingdom		Enterprise	Register	Recommends NACE C to O, excluding L but practice varies by country	Recommends all active firms but practice varies by country	Excludes all continuing firms		Annual	

3. DEFINING BUSINESSES

Business Definitions at the National Level

19. A fundamental requirement in measuring business entries (creation) and exits (destruction) concerns the definition of a business itself. The notion varies considerably, whether the interpretation is that of statistical offices or in the more general sense of that used by the man on the street or financial markets say. Statistical offices will typically define businesses according to their activity within national boundaries, although businesses are also, and increasingly so, measured in a global, multinational sense too; which corresponds more closely with the view of the general public, at least as far as multinationals go. That is not to say however that the definitions used by national statistical offices are consistent across countries[8]. Many businesses (parents) own or control other businesses (subsidiaries) operating within the same economy. Depending on the degree of control and the nature of economic activity, some statistical offices will consolidate parents with subsidiaries, others will not.

20. The rules that govern what statistical offices do largely reflect institutional and administrative arrangements that exist in each country. Not surprisingly these differ across countries and so too, therefore, do the definitions used for businesses. It's important to put these differences into context however and, perhaps, to explain why they have arisen and continue.

21. International definitions of businesses do exist. For example the System of National Accounts, Eurostat (EC Regulation 696/93) and the International Standard Industrial Classification of all Economic Activities (ISIC) all provide definitions. Although these three systems do not entirely converge, three main types of statistical unit emerge: Enterprises, Establishments (or local kind of activity unit) and Enterprise Groups. Legal units are usually the building blocks used in defining businesses in all of these measures but legal units are not themselves comparable across countries since they reflect national administrative and legal requirements that will differ across countries.

22. All OECD countries are able to produce structural business statistics on these bases (albeit with some differences in practice), often to meet the needs of international organisations, like the OECD, and often for their own needs for example in producing R&D statistics, which can only be practically produced at the Enterprise (and Enterprise Group) level, or the national accounts, which are typically based on establishment measures. However, the focus on business demography statistics by statistical offices is relatively new and, so, the business definitions used across countries differ.

23. Historically the main use of business statistics has been in providing inputs into the calculation of gross domestic product (GDP) and to separately identify the contribution to economic activity made by different (and as homogeneous as possible) industrial sectors. Businesses, in this context, have therefore been defined as reporting units in a way that facilitates the collection of statistics to meet these needs, whilst at the same time minimising the data burden on the businesses themselves. Whether a reporting unit is a subsidiary or not is only relevant if the subsidiary is not able to provide the information required, such

[8] Work by Eurostat (Herczog et al, 1998) for example, demonstrated that the operational definitions used for enterprises differed considerably for some firm configurations, across countries, both conceptually and, more commonly, in practice.

as turnover, production, profits etc, to meet the needs of the statistical office. Typically, these reporting units are most effective when they correspond to business operating structures, which may or may not correspond to legal units, local units or establishments. It is usually possible to aggregate reporting units to give enterprise level data, though, for a few specific variables such as profits or overseas investment, the optimal reporting unit may sometimes correspond to a group of enterprises.

24. In collating business statistics as inputs into the national accounts for example, this approach works reasonably well, since in most cases it is able to provide the key economic aggregates needed at a detailed industry level whilst ensuring that businesses (reporting units) within each industry group are broadly homogeneous. This is especially true where local kind of activity units form the reporting unit and, although less so where enterprises are concerned, in all countries most enterprises correspond to local kind of activity units. In other words, the definition used for businesses in providing data for the national accounts, say, has only mattered in the sense that the more detailed the unit, the more homogeneous the industry activity measured - meaning that the business definition, in theory, only impacts on the distribution of value-added among industry groups; for total GDP the definition is of little theoretical relevance.

25. The needs of business demography statistics are however somewhat different. Because their main purpose is to provide information relating to the number of new businesses (entries), failures (exits) and growth, the definition of a business is of crucial importance since it impacts directly on entry, exit and growth rates. Indeed, as demonstrated below, the definition results in a trade-off between exit and entry figures and growth.

Selecting the Statistical Unit for Businesses

26. Consider an enterprise that initially comprises a single local kind of activity unit or establishment that then expands by creating another local kind of activity unit of the same size as the original unit but with effective operational control remaining at the enterprise level.

27. If businesses are defined as local kind of activity units this expansion results in an entry but no growth in the original business (establishment). If, on the other hand, businesses are defined as enterprises, no entries would have occurred but the original business unit would have doubled in size. Which of the approaches is better for policy purposes is not immediately obvious, since that depends on the policy focus. But a further expansion of the example can help to illustrate some consequences of each approach.

28. Consider now the outcome if the original enterprise grew by expanding its operations at the same (original) site. In this case, whether businesses are defined at the enterprise or local activity level, the result is the same; no births and 100% growth. Defining businesses as local kind of activity units or establishments therefore can result in an asymmetric treatment of growth dependent on location; which renders this approach inappropriate for policy makers interested in business demography statistics that paint a picture of the whole economy, as the results should be invariant, at least within economic borders, to where businesses choose to grow. That is not to say however that establishment based data cannot play a role in practice, since policy makers interested in investigating regional (state, county, local area) differences will not of course be able to use business demography data based solely at the national level. However even in these circumstances it is preferable to use the enterprise definition, albeit, where enterprises are defined on the basis of the economic borders of the regions; and, in practice, the smaller the region the more likely that enterprises and establishments align.

29. One could say that many enterprises are also part of larger enterprise groups in much the same way that establishments form part of enterprises and, so, enterprise based measures have the same shortcomings. But the argument can be stretched too far, resulting in a definition that links back to ultimate

owners. For example one entrepreneur, say, might own many heterogeneous enterprise groups that own in turn a number of heterogeneous enterprises. But the rationale cannot be based on ultimate ownership as the ultimate owners for most companies and certainly listed corporations are shareholders. What matters most is the level at which decisions are made, such as those that affect expansion and innovation, and where operational control resides. Policy makers are interested in understanding what makes a successful business. The factors and business characteristics that determine this are inextricably linked to operational control.

30. Measures based on enterprises come closest to these criteria, as the degree of innovation, decision making etc within a business is likely to be closely related to the organisational and management structures that exist at the enterprise level. Research and development, product design and product advertising for example will usually be developed centrally within an enterprise with establishments benefiting from spill-overs; indeed, even innovative ideas generated at the establishment level are likely to permeate throughout the enterprise as upward spill-overs.

31. Of course, not all innovation is generated, decisions made, control resides etc at the enterprise level, particularly where enterprises are foreign-owned, or, where the enterprise controls foreign subsidiaries that generate innovative ideas say. But formulating definitions on this basis would not be useful for domestic policy makers nor for international comparisons, in much the same way that local or regional policy makers would not find enterprise (only) information based at the national level particularly useful. That is not to say however that this information (foreign-ownership and multi-national) is not important, far from it. Policy makers and analysts are interested in understanding how any of the characteristics of businesses help provide competitive advantages, whether that be related to the numbers of PhDs employed or foreign ownership.

32. Ownership is a particularly important characteristic. In many countries a large source of innovation, for example, emanates from abroad. Many studies have demonstrated that foreign owned enterprises are often more profitable than similar domestically owned enterprises[9]. This often reflects higher investment made by the foreign parent company but it is also, at least partly, to do with the management and organisational structures and practices in place. Identifying who the owners are is, therefore, of interest in fully understanding the factors of innovation. However, this information can be difficult to acquire for all businesses. Many business registers, for example, the most widely used source for the derivation of business demography statistics, do not contain this information. Moreover, the country in which a company finds its headquarters is not necessarily the source of innovation. Companies place their headquarters in countries for a number of reasons; some may be related to entrepreneurship and innovation, for example, access to capital or favourable tax regimes but others may not be. The difficulty in tracing the source of innovation therefore is non-trivial. Consider for example Mittal steel, the world's largest steel maker. It has steel making facilities in 14 countries, is listed on the New York and Amsterdam exchanges, has its headquarters in Amsterdam, and is owned by an Indian living in London. In other words, although it is of interest to identify foreign ownership, some care is needed in interpretation.

33. That said it's important to put the differences between establishment and enterprise based indicators into context. The vast majority of enterprises have only one establishment; and this is especially the case for small and medium enterprises (SMEs), where there is considerable policy interest. Large new business are typically opened by a larger enterprise group, whether that be foreign or domestically owned and, so, statistics that compare levels of small business entries are likely to be comparable across countries even if the business definitions differ.

[9] See, also the OECD Handbook on Economic Globalisation Indicators and The Measurement of Scientific and Technological Activities Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition.

34. Estimates of total business entries and exits are less comparable if different business definitions are used across countries but this can be at least partly mitigated where rates are concerned. Typically, entry (and exit) rates are calculated as the ratio of entries (exits) to the total business population active in the year in question. Comparisons of entries and exits across countries based on different business definitions can be made more comparable when rates are compared as biases work in the same direction in both the numerator and the denominator – for example establishment entries will be higher than enterprise entries but so too will be the population of establishments compared to the population of enterprises.

Enterprise Exits and Entries - Large and Small Economies

35. Although the Enterprise definition for businesses is to be preferred to other concepts it is by no means perfect where international comparisons are concerned. When an enterprise with headquarters in one EU country for example sets up a new production unit in another a new enterprise is recognised. However, when an enterprise with its headquarters in one US state say sets up a new production unit in another US state this will generally be recorded as the creation of a new establishment. Seen another way, this means that estimates of the size and number of enterprises between two economic blocs, equal in every way, except that one is a nation state and the other a collection of nation states, will differ, even if exactly the same national concepts are applied. In fact, all other things being equal, comparisons will show that enterprises in the nation state, although fewer, are larger and grow more in periods of expansion (and contract more during recessions) than enterprises in an equivalently sized economic-bloc of nation states. The same cannot be said however of birth and death rates.

36. Jarmin et al, 2003 compared enterprise births in the US, on a national and state basis, and showed that churn (birth+death) rates were very similar[10]. They also showed that the average size of new establishments entering a state market for the first time was, on average, larger than the average size of a new enterprise (13.7 employees versus 12.7), reflecting the fact that expanding enterprises do so with a tried and trusted business recipe and so less risk of subsequent failure. As such, when these firms open new establishments (or expand into new markets), they can be less risk-averse and recruit more employees than may have been the case when the business was first set-up. The same study also showed that 1/3 of total enterprise growth up to 1997 experienced by surviving firms born in 1977 reflected the expansion of enterprises into neighbouring states. These biases could help to explain, at least partly, why a number of studies (e.g. Bartlesman et al 2003) have shown that US business entries were on average smaller and grew faster[11] than businesses in many EU countries; where the expansion of businesses into neighbouring markets was not picked-up up as growth but as new entries. One way of improving comparability in these cases is to separately identify foreign and domestically owned entries, although for small economies, for example Luxembourg and New Zealand, foreign owned entries may reflect a significant proportion of total entries.

37. This is not to say that business demography statistics, using enterprises as the business unit, cannot be compared, across unevenly sized economies. The point is that one cannot look at the statistics in isolation and care is needed in drawing conclusions, particularly those that are likely to impact on policy.

[10] Although a comparison of turnover rates of establishments versus enterprises revealed that turnover rates in establishments were approximately 11% lower than enterprise turnover rates.

[11] During recessions the converse might be expected, namely lower average growth in US firms. But much depends on the biases of the cohort of firms selected. Many studies implicitly select a cohort of successful firms, as only firms surviving between two periods of time are selected. Moreover, shrinking firms are also less likely to be included the greater the period between the reference years as they are most likely to go out of business and, so, be excluded from the sample.

In fact, as shown later, comparisons of domestically owned entries and exits are not impaired by variations in economic size.

Recommended Business Definition

38. In summary this framework recommends the adoption of the enterprise as the statistical unit for businesses where the definition of an enterprise follows that of the International Standard Industrial Classification of All Economic Activities (ISIC, Rev.3) described as

> "*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.*"

39. For practical purposes, this definition is equivalent to that used by Eurostat ("*the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit.*") and is the definition applied in the 1993 System of National Accounts (SNA 93).

40. That is not to say however that indicators based on other definitions of businesses units are not useful. Establishments in North America, for example, are sufficiently similar to local units in Europe to consider the possibility of a site-level start-up indicator. Ideally this would have two components, new sites due to births, and new sites created by existing enterprises. Both are of interest for studying employment dynamics and the impact of entrepreneurship at the regional and local levels. Although not stated it is implicit in the recommendations that follow that supplementary indicators based on site-level definitions for business units should be produced if possible.

4. DEFINING BIRTHS

Births versus Entries

41. In the previous section the term 'entry' was used, although not defined, to describe the arrival or creation of a new enterprise in the economy. But new enterprises can appear in a number of ways reflecting many demographic events, such as mergers and take-overs. Many of these entries are not therefore directly relevant to the study of entrepreneurship or creative destruction. That is not to say that they are not important but their economic impact differs, certainly their impact on employment will differ; mergers for example often lead to reductions in overall employment, whereas completely new creations will generate employment, even if they result in employment losses in other businesses through competitive pressures related to creative destruction.

42. Moreover, entries are not and never likely to be comparable across countries. In practice, entries are derived from registrations with administrative sources but the legal and administrative requirements that determine how and when a business registers with national administrative sources vary considerably from country to country, and are likely to continue to do so. This section attempts to differentiate between entries, which include any demographic events that lead to the creation of new enterprises even if they previously existed in different forms, and *births*; the term used in this framework to describe the creation of a combination of new production factors, such as organisation, location, employment and fixed assets, and which, in theory, at least are comparable across countries.

43. It is often relatively easy to measure business entries, i.e. those businesses that are present in a given period but were not present in the previous period. It is more difficult however to identify births (sometimes referred to as creations *ex nihilo*). In other words, to identify entries due to re-registrations, reactivations, take-overs and other demographic events, that is, those entries that are merely continuations of enterprises that previously existed but where no, or a limited number, of production factors have changed. In order to be able to proceed, therefore, it is first important to identify all of the demographic events that lead to business entries and to create simple rules establishing which demographic events, and under which conditions, lead to births. These are set out in the following section.

44. A clarification is needed before moving on however. This framework concerns itself with the measurement of business demography data on an annual basis. Reference periods are therefore taken as calendar years. That is not to say however that the deliberations and conclusions below cannot also be applied to longer or shorter reference periods, in most cases they can. For simplicity however the framework recommendations should be taken to apply to calendar year data.

Demographic Events

45. Perhaps one of the most important and contentious considerations in defining births is 'timing', that is, when births occur. There are many ways in which an enterprise's birth date can be identified and defined; as the birth of any business reflects a number of stages (Baldwin et al, 2002). Typically it starts as the idea of an entrepreneur. This idea may then be acted upon and be evolved in a number of ways. It might be incorporated as a business which appears in official business registers immediately or it may remain unincorporated, registering on administrative (e.g. VAT, income or employment) registers once activity is of a sufficient size. Clearly, viewed in this context, the point at which a birth should be defined

is non-trivial. This issue of timing is dealt with in the following section. This section only considers types of demographic events.

Entries

46. Entries reflect the appearance of a new enterprise within the economy, whatever the demographic event, be that a merger, renaming, split-off etc. Other demographic events can create entries within sub-sectors of the economy such as relocations and reclassifications from one industrial or institutional sector to another. Entries can also appear as the result of a birth.

Changes in Controlling Legal Unit, Activity and Locations

47. The general definition of a birth reflects a new enterprise and its corresponding creation of a combination of production factors such as site, labour, organisational structures, plant and machinery etc with the restriction that no other enterprises are involved in the event. Births exclude, therefore, entries into the population due to mergers, break-ups, split-offs, or restructuring of enterprises, since these do not reflect the creation of a combination of new production factors.

48. A challenging issue for births, therefore, concerns the treatment of a business that preserves some production factors or characteristics related to production factors (such as the main economic activity) but creates some new ones as it moves from one sub-population to another. Many characteristics exist but only a few are practically measurable or interpretable in this context (see below for why labour and capital are excluded) – controlling legal unit, activity and location. How many of these need to change before a birth can be recorded is ultimately an arbitrary decision. Therefore, it is sensible to adopt, at least partially, the Eurostat continuity rules[12]; which, with one exception, record a birth if two of the three factors change. The exception adopted by Eurostat concerns the case where an unincorporated business simultaneously moves to a new location and changes its legal form to become incorporated (i.e. the controlling legal unit changes from a natural person to a legal person to limit liability). The Eurostat convention is that this does not reflect a birth.

49. However, the definition for births adopted in this framework[13] is based on enterprises with employees, as discussed below, and so differs from the Eurostat definition. As such, all unincorporated businesses with no employees that become incorporated with employees (including cases where only the owner(s) subsequently becomes an employee), are treated as births, irrespective of any other changes, although unincorporated businesses with employees that change location and legal form are not. Like Eurostat however, all enterprises that move location and change activity (and have employees in their new manifestation) are treated as births. These rules are summarised in the table below.

50. Arguably continuity of employees, including management and fixed assets should also be included with the three factors listed above, since these are clearly factors of production. But establishing the continuity of employees and fixed assets is very difficult to achieve in practice, particularly for smaller enterprises; especially because these factors can be expected to change over time for reasons not related to births (e.g. staff turnover, depreciation etc). As such, they are excluded from the two-out-of-three rule described above.

[12] See chapter 14 of the Eurostat Business Registers Recommendations Manual

[13] Although it is premature to invoke the definition for births before the reader has a chance to become familiar with the deliberations that lead to the definition recommended below it is convenient, for ease of exposition, to do so in the discussion of this demographic event.

51. Some countries have been able to link employers and employees over time and have used these links to help determine births. This method has been tested in New Zealand where an entry is not a birth if at least 70% of employees move from an old registration to a new one. Similar work in Canada is reported in Baldwin et al (2002). However these are generally exceptions rather than the rule. That all said, location and activity are likely to be closely related to employees and, so, the two-out-of-three rule is likely to proxy births that might be identified using employee-employer links.

52. The two-out-of-three rule applies to businesses that have not gone through a period of dormancy beforehand. Where dormancy does occur, births can occur for some reactivations, see Table 4.1 below.

Table 4.1 – Changes in Controlling Legal Unit, Activity and Location that lead to Births (I)

ENTERPRISE	CHANGE IN			New ENTRY is a BIRTH
	Activity	Location	Legal Form (Unincorporated versus Incorporated)	
Unincorporated with Employees	Y	Y	Y	Y
	Y	Y		Y
	Y		Y	Y
Incorporated (III)	Y	Y	Y (II)	Y (II)
	Y	Y		Y
	Y		Y (II)	Y (II)
		Y	Y (II)	Y (II)
Unincorporated without Employees	Y	Y	Y	Y
		Y	Y	Y
	Y		Y	Y
			Y	Y

(I) For simplicity it is assumed that listed demographic events aside, all other things are equal; particularly employment which is assumed to be the same before and after the demographic event(s).
(II) Except where the 'newly created' unincorporated enterprise has no employees; in which case the original incorporated enterprise is recorded as having died, see Section 5.
(III) All incorporated enterprises are assumed to have employees. In some countries, albeit in very few and exceptional circumstances, some incorporated enterprises have no employees but for simplicity this framework ignores these.

Mergers

53. Mergers involve a consolidation of the production factors of two or more enterprises into one new enterprise, such that the previous enterprises are no longer recognisable. The new enterprise is not a birth; unless the merged enterprise has employees and the original enterprises had none.

Renamings

54. Clearly, all other things equal, renamed enterprises are not births; indeed even including them in entries is best avoided.

Break-ups

55. This event involves a splitting of the production factors of an enterprise into two or more new enterprises in such a way that the previous enterprise is no longer recognisable. All other things equal the new enterprises are not considered to be births.

Split-offs

56. This event is similar to a break-up but, in this case, the original enterprise survives in a recognisable form and one or more new enterprises are created. All other things equal, the new enterprises are not considered to be births.

Changes of Ownership (one-to-one take-over)

57. This event simply involves a change in the controlling legal unit. All other things equal, this should not be considered to be a birth.

Joint Ventures

58. Joint ventures should be considered as births if they involve the creation of new factors of production, including operational control of its activities. Eurostat determines that new factors have been created if less than half of the total employment of the joint venture enterprise is transferred from the participating enterprises. This is likely to be difficult to measure with any accuracy so Eurostat recommends the rule: If employment of new (joint venture) enterprise > 2 x (total employment of participating enterprises before creation of the joint venture minus total employment of participating enterprises after creation of the joint venture), then the joint venture is a birth. This is a fairly restrictive determining rule, since it ignores other factors of production such as assets, location, activity, organisational factors etc. The preference in this framework is that joint-ventures should be treated as births if a new location is created and the activity of the joint-venture differs from the controlling Enterprise Groups. However, the difference between this preference and the Eurostat approach is likely to be negligible in practice and, so, this framework's recommendation is for countries to use the approach that is simplest to achieve in their case. European economies that have already begun to produce statistics for the Eurostat Business Demography database, are, of course, encouraged to continue with the Eurostat approach.

Re-structuring Within an Enterprise Group and Enterprise Groups

59. This event reflects a combination of break-ups, split-offs and mergers. All other things equal it does not result in any births.

Ancillary Activities

60. Creations of enterprises by an Enterprise Group, solely for the purpose of consolidating an ancillary activity of the Enterprise Group should not be treated as births. Ancillary activities typically relate to activities such as personnel management but many other activities can be viewed as ancillary. A Eurostat Task Force on Statistical Units concluded that the following activities could be considered as ancillary if the resulting goods or services are only provided within an Enterprise Group.

NACE Rev 1.1 code	*Activity*
28.62	*Manufacture of tools*
28.74	*Manufacture of fasteners, screw machine products, chain and springs*
45.50	*Renting of construction or demolition equipment with operator*
50.10	*Sale of motor vehicles*
50.20	*Maintenance and repair of motor vehicles*
50.30	*Sale of motor vehicle parts and accessories*
50.40	*Sale, maintenance and repair of motorcycles and related parts and accessories*
51	*Wholesale trade and commission trade, except of motor vehicles and motorcycles*
52.7	*Repair of personal and household goods*
60.24	*Freight transport by road*
63.1	*Cargo handling and storage*
63.2	*Other supporting transport activities*
63.4	*Activities of other transport agencies*
65.21	*Financial leasing*
70	*Real estate activities*
71.1	*Renting of automobiles*
71.21	*Renting of other land transport equipment*
71.22	*Renting of water transport equipment*
71.23	*Renting of air transport equipment*
71.31	*Renting of agricultural machinery and equipment*
71.32	*Renting of construction and civil engineering machinery and equipment*
71.33	*Renting of office machinery and equipment, including computers*
71.34	*Renting of other machinery and equipment n.e.c.*
71.4	*Renting of personal and household goods n.e.c.*
72	*Computer and related activities*
73.1	*Research and experimental development on natural sciences and engineering*
73.2	*Research and experimental development on social sciences and humanities*
74.11	*Legal activities*
74.12	*Accounting, book-keeping and auditing activities; tax consultancy*
74.13	*Market research and public opinion polling*
74.14	*Business and management consultancy activities*
74.15	*Management activities of holding companies*
74.2	*Architectural and engineering activities and related technical consultancy*
74.3	*Technical testing and analysis*
74.4	*Advertising*
74.5	*Labour recruitment and provision of personnel*
74.6	*Investigation and security activities*
74.70	*Industrial cleaning*
74.81	*Photographic activities*
74.82	*Packaging activities*
74.85	*Secretarial and translation activities*
74.86	*Call centre activities*
74.87	*Other business activities n.e.c*

The list may not be exhaustive and there may be other activities that could also be considered as ancillary.

Relocations

61. Certainly if an enterprise relocates to a different country this should be recorded as a birth, even if the production factors, (except land and buildings of course) were also transferred. Where the relocation occurs within the same economy[14] however, the same does not hold. Indeed, even if the relocated company were to acquire new production factors such as labour and capital the event should still not be considered as a birth unless the relocation coincides with a change in activity or a change in controlling legal unit (except if the legal form changes from unincorporated with employees to incorporated with employees).

Reclassifications

62. On its own a reclassification from one industrial or institutional sector into another does not result in a birth, even though the enterprise may appear for the first time in a particular sub-population. If the reclassification coincides with a change in location or controlling legal unit the reclassification should be recorded as a birth.

Reactivations

63. Reactivations are difficult to deal with conceptually. A business that is dormant for a few months (possibly due to seasonal activities) before eventually re-starting would not be considered to be a birth. However, if the period of dormancy was ten years or more, it would be harder to argue that the reactivation could be treated as a continuation of the previous activity. Ultimately the choice of the threshold after which reactivations should be treated as births needs to be defined by convention. Eurostat currently set this at two full calendar years. In other words, enterprises that exist in period t but that were previously inactive in t-1 should not be viewed as births if the same enterprise was active in period t-2 (with one exception described in more detail in the birth definition below); where the periods reflect calendar years. In these circumstances the enterprise is considered to have been dormant in period t-1. If however the firm was also inactive in period t-2 but active in period t-3 the firm should be treated as if it had exited in t-3 and so, a birth occurs in t. In the US Census Bureau longitudinal database no reactivations are recorded as births, irrespective of the period of 'dormancy'.

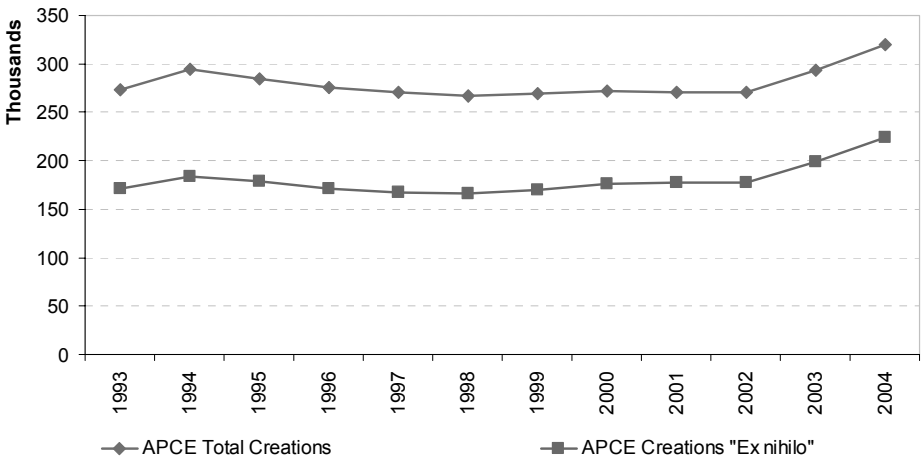
64. This framework prefers the Eurostat convention, partly because it is easier to implement (the US approach implies, at least in theory, that information on dormant enterprises is stored indefinitely and complicates the measurement of exits) but also because the convention sits more comfortably with the ethos that underpins creative destruction. Most businesses that become dormant for periods of longer than two calendar years are likely to do so because of competitive market conditions rather than by design. Some businesses may of course fall into this 'design' camp, for example those that trade according to long-run cycles, such as 'El Nino fishermen' or specialised manufacturers that respond to very sporadic demand, but these are likely to be very limited and so can be safely ignored.

Comparing Entries and Births

65. Clearly estimating births is a lot more complicated than entries. It is legitimate to question therefore whether the effort involved in moving from entries to births makes any significant empirical difference. The simple answer is yes. Figure 4.1 below uses data for France from the Agence Pour la Création d'Entreprises (APCE) to illustrate this. It shows that around one third of all entries are not births. Similar results were obtained in studies for New Zealand (Mead, 2005) and Canada (Baldwin et al, 2002) both of which showed that at least 20% of entries were not births.

[14] However if the interest was at the sub-national level, relocations from the region to another would be considered new births

Figure 4.1 Births and Entries in France



Timing

66. Thus far we have managed to identify the demographic events that lead to births and those that don't but perhaps the most important definition concerns the time at which a birth occurs. There are many ways in which an enterprise's birth date can be identified and defined. In extremis one might define it as the date at which the initial idea was formed but this is clearly an impractical definition; partly because of the difficulty in defining this date (which may be many years before any activity ever occurs) partly because many ideas never see the light of day but especially because it will be literally impossible to measure this concept in a harmonised way, if at all, within, let alone across, countries.

67. The approach typically used by statistical offices is to take the date when the enterprise first appeared on an administrative or statistical business register as a business entry, removing (to varying degrees) entries not deemed to be births. This is a pragmatic approach but it does not lend itself well to a harmonised definition across countries as it requires, first, harmonised rules for registration; which is unlikely to ever happen. Moreover it does not necessarily follow that just because a business registers for administrative purposes it will engage in market activity, as the entity may remain inactive or dormant indefinitely.

68. The concept itself needs to be defined in such a way that, in theory at least, it is replicable across countries, meaning that it should not be conditional, in theory, on legal and administrative arrangements. The only practical way to do this is to record a birth at the point that some tangible and measurable activity occurs. In practice this leaves only a few criteria that can be used, separately, or in combination, to define the creation date of a birth on the basis of:

- Turnover indicators;
- Employment indicators;
- Production indicators (including own-account production of fixed assets), even if first sales occur at a later date; and

- A certain time (years, months, etc) after a business has been economically active; whether activity is measured via turnover, employment or production.

Timing Criteria

69. Each of these criteria is considered in turn below.

Turnover

70. This lends itself well to a definition for birth-dates as it is measurable and demonstrates that the birth has gone beyond the raw idea stage to income generation. It does not necessarily imply that any production of goods and services occurs however because receipts can be received in advance of any production occurring; not that this represents a reason to eliminate it as an option.

71. Where the concept may provide problems is in the fact that, in theory at least, it includes births with sales as little as 1 cent. The risk therefore is that the measure could lead to estimates of births that were swamped by economically insignificant births, including many that have little long term growth or survival prospects; although the impact of this could be mitigated by weighting births by turnover. A variant therefore is to retain the concept but with a size threshold; determined by a level of turnover that measures only economically significant business entries as births. There are two major problems with this variant. The first is that an economically significant threshold is a subjective measure that will, moreover, differ across countries depending on the size of their economies and their per capita income. The second is that, even assuming that a unique threshold for all countries and industries could be determined at some point in time in a common currency, it would change in national currencies in line with exchange rate movements and over time would need to change in line with some to-be-determined measure of inflation (that would need to reflect inflationary pressures in all countries and the product prices of all industries). These are insurmountable conceptual and practical (measurement) problems that mean that if turnover is to be used as (one of) the criterion for births it needs to be based on any turnover over zero.

72. It should be recognised, however, that the use of such a threshold (any turnover greater than zero) will mean that the time spent by a business in its development period will be considered as gestation. Businesses that start-up and fold before any revenue is realised will therefore not be included. This is not of course perfect since some of these businesses would have invested heavily in people and capital before folding but to draw the line elsewhere would be possibly a case of throwing out the baby with the bathwater since many other businesses would also come into scope, unless, for example, thresholds governing employment and investment were used in isolation, which can cause further complications.

Employment

73. Employment based measures present more formidable challenges than turnover based statistics as employment statistics include all forms of employment whether the workers are paid employees or not. But statistics in this latter component of employment are difficult to collect. Many small, typically unincorporated, businesses, for example, will employ unpaid family workers who may each participate to the enterprise in different ways; some will work full-time some part-time.

74. Clearly there are similarities between employment and turnover based measures in so far that thresholds will exclude some entries but that is not to say that the conclusions are necessarily the same. Employment based measures are not affected by exchange rate movements or inflation but they are extremely sensitive to practical measurement issues. Does a new enterprise with a sole-proprietor working one day a week or one day a year, for example, constitute a birth, even if it is not economically significant, and do the drivers behind the creation, which can be very varied, matter.

75. Another possible factor that could be used to define enterprise births therefore relates to the motivating factors of entrepreneurs. New businesses can be created for many different reasons, reflecting varying degrees of innovation and different types of (Schumpeterian) entrepreneurial change. For example they may be formed through 'push' or 'pull' factors. 'Push' entrepreneurs reflect those, dissatisfied with their current positions, who, for reasons unrelated to their entrepreneurial characteristics, are pushed into starting a new business. 'Pull' entrepreneurs on the other hand are those who are have a desire to grasp the new opportunities and higher rewards (financial or otherwise) presented by a business opportunity.

76. The numbers of 'push' entrepreneurs in any particular economy may have little to do with the pervasiveness of an entrepreneurship-culture within that economy. For example, other things equal, economies with little or no social safety nets might have higher numbers of 'push' entrepreneurs than those with generous social security systems but it would be over-simplistic to ascribe this to a difference in intrinsic entrepreneurship levels in the populations at large. Moreover, although it is clear that policy measures designed to increase entrepreneurship in either country will have some similarities, for example ensuring that barriers to entry are not prohibitive, important differences will also exist between 'push' and 'pull' creations, meaning that considerable caution is needed in comparing the numbers of births across countries; particularly those at different stages of economic development. Many, usually informal, businesses in developing economies for example, provide employment to their owners only, and, because they tend to be subsistence-motivated, have very limited growth potential.

77. 'Pull' entrepreneurs have a different motivator. Their businesses are usually innovative, exploiting opportunities presented by new technologies, business processes, expertise, knowledge, and, so, are more likely than 'push' businesses to grow and to improve productivity, profitability and competition within an economy.

78. Both sets of entrepreneurs are important but in different ways and governments need to ensure that their policies adequately reflect both. However, separately estimating the levels of the two sets of entrepreneurs (without the use of dedicated surveys) is not likely to be practicable in any country, which is partly why demography statistics published by NSOs rarely, if ever, split businesses this way. However the lack of a breakdown is arguably not that important when considering business demography birth, death and survivability statistics. Policy makers are, in the main, interested in identifying the factors that lead to successful businesses, one of these factors will almost certainly be motivation but there will be many others – access to capital, tax policy, start-up costs, foreign/domestic ownership etc. Identifying the contribution of these factors to successful and failing firms is clearly of import and this can be done using more focused surveys targeting successful or failed firms

79. A further consideration with employment based measures, is that, used on their own, they are not necessarily correlated with turnover based notions of economic activity. A sole-proprietor for example will typically invest considerable time in developing a business plan, searching for premises, marketing, research etc before any market activity occurs. Indeed the business may never move to the sales or production stage. Clearly, therefore, employment based measures that embrace employment in its most general sense need to be coupled with some measurable characteristics of activity such as turnover or production.

80. But this still leaves open the question of how much employment is needed to record a birth. The Eurostat definition for Business Demography is to include all business entries, satisfying the criterion for births, that appear on the statistical register regardless of employment size; although this is qualified with a requirement that business registers should include all businesses with a labour input of at least one person half-time and smaller businesses if possible.

81. It will never be possible for any business register or statistical source to capture all businesses or business activities such as car-boot sales and bartering for example, which are, at least theoretically, in scope, or to differentiate between push and pull creations. So, the definition for births must rely on some notion of economic significance. The Eurostat suggested and optional threshold described in its Business Register regulations implies that this significance can be established, in practice, when half a full-time equivalent is employed (although it should be noted that the Business Demography recommendations manual makes no explicit reference). This is not always easy to measure.

82. Additionally, comparisons of births based on employment measures are likely to be affected by the levels of informality or underground production that occurs within each economy, as 'informal' enterprises are typically small with no or very few employees. All other things equal therefore, countries with high levels of informality are more likely to have lower levels of births than countries with low levels of informality; although if a concerted effort was made to bring informal businesses into the formal economy the opposite is likely to be the case.

83. An alternative approach therefore is to restrict the definition of employment to employees only, such that only entries that have employees can be considered as being in scope for births. This has some attractions over total employment based measures as, typically, employees are easier to measure and, secondly it provides a more meaningful measure of economic significance; certainly a measure based on employees is likely to limit the numbers of 'push' enterprises as these are less likely to have employees than 'pull' enterprises. Cross country comparisons based on the employee approach will still be affected by the differing levels of informality across economies but, because informal enterprises are disproportionately those with no employees, the impact is likely to be smaller than for employment based measures. One important aspect to realise in this approach is that births are not exclusively drawn from entries, as an enterprise active in period t-1 but with no employees will be recorded as a birth in t if employees are taken on in period t.

84. The key interest for policy-makers after-all, in the context of business demography statistics, is in the understanding of which businesses are likely to grow and create employment. Many sole-proprietor enterprises will never get to the 'employing' stage and, so, birth statistics that include all of these businesses may be difficult to interpret. That is not to say that these businesses are not important, merely that including them in birth statistics may not provide a clear picture of future growth prospects and innovation.

85. Moreover, business entries are particularly sensitive to changes in the status of individuals which, in turn, are often driven by legal and tax considerations. Business entries also include therefore "pseudo-enterprises", sometimes also referred to as "false self-employed", where a person acts as an employee of an enterprise, in that they effectively work for that enterprise every day over a long period of time but for legal or tax purposes are technically self-employed. Changes in tax legislation therefore that make it beneficial for employees to switch from employee to self-employed status are likely to see business entries increase without any direct change in overall employment (see also Vale and Powell (2002) and Brandt (2004)). That said, employee based measures can also be affected by differences in the propensity to incorporate across countries and over time – since sole-proprietors that become incorporated also become employees.

86. By extension it is worth considering whether the threshold to establish economic significance could be extended above the one-employee level to higher levels. Although it is worth noting that using high thresholds can create biases across countries even after birth levels have been normalised to create birth-rates, using the total population of enterprises, human population or GDP say. Small economies for example, with small (human) populations, will inevitably have less potential to create large new enterprises than economies with much larger populations. That said, two, three, four, five employee thresholds, say,

are worth considering although, as shown in the section on Deaths, these alternatives create problems in defining deaths and births in a consistent and meaningful way.

Production

87. Although turnover and production are largely coincidental they are not the same and for some business entries there may be a considerable lag between the two. For example, production (e.g. production of factories and development of software systems) commonly occurs some time before turnover. However this type of production is mainly related to capital acquisition rather than the production of goods and services for sale; which are closely linked to turnover and of more direct interest to identifying successful firms. As such, turnover is arguably a better indicator to use than production, particularly because own-account production does not necessarily imply that any market activity ever occurs. Moreover, identifying when own-account production occurs, particularly in very small enterprises, is likely to be too difficult to implement and measure in a consistent way for all enterprises and is relatively subjective. Budding entrepreneurs and inventors, for example, might spend some time developing ideas and inventions within their garages well before, if ever, a marketable product or productive asset emerges.

Years of Economic Activity

88. An alternative definition, based more closely on a measure of economic significance, is to define births as those business entries that have remained active for a certain period of time. Such an approach could lead to the removal of very short-lived enterprises, for example those that survive for less than one-year. This approach is not considered further here however, as it is more closely linked to indicators of survival which are discussed later and is also discussed in the context of point-in-time versus live-during-period estimates below.

Data Sources – Censuses, Surveys, Statistical and Administrative Business Registers and Thresholds

89. Thus far considerations have focussed on the theoretical aspects of births and birth dates but the key aim of this framework is to propose a set of indicators that can be produced by all OECD statistical offices and, so, practical considerations of data availability cannot be ignored.

90. In practice, the level of births within an economy can only be measured using statistical or administrative business registers. This information varies across countries, although within Europe they have moved much closer together as a result of regulations concerning Business Registers.

91. That all said, it is important for producers and users of enterprise demography statistics to recognise their potential limitations in the context of international comparability - the main one being that the appearance of a business on administrative or business registers does not necessarily coincide with the date at which the business first became active. In some countries for example, businesses may be required to register, or voluntarily register, before any turnover is recorded or production occurs. Indeed it does not necessarily follow that all of these businesses will ever be involved in production; instead they may remain permanently inactive. In yet other countries the administrative registers capture businesses after they have already been active for a while; usually because businesses need to exceed some threshold (commonly turnover or employment based) before registration. In practice this may mean that many small and micro enterprises will be excluded

92. The existence of thresholds in business registers is perhaps the most important factor that can cause differences in business demography statistics, as illustrated in Section 2. Although they attempt to be as exhaustive as possible, business registers will, in practice, use one threshold or another that excludes some businesses. Commonly, as described above, the thresholds are based on monetary values, using turnover as the indicator for example, or they are based on employment levels. However the thresholds

may be based on other criteria reflecting the institutional make-up of businesses, for example they may exclude some industrial sectors, like agriculture, or all unincorporated firms say. Finally the registers, in all countries, will exclude firms operating exclusively in the 'black' or underground economy[15]. Although the economic importance of missing firms is generally not significant, when set against total economic activity, their importance in the context of entrepreneurship, and in particular with regards to Small and Medium Enterprise (SME) policy, is greater, and such shortcomings in business register information need to be recognised in the context of business demography statistics.

93. Survey based approaches to the measurement of births are also possible but these will typically be of lower quality than information derived from registers, which, in theory, cover all businesses above a certain threshold; although it may be easier to derive estimates of births from surveys since respondents will be able to describe precisely how their businesses were created: takeovers, births etc. Moreover, survey based approaches may also capture the creation of informal enterprises. Survey data have been used by some countries, most notably in the DOSME[16] project for countries of Central and Eastern Europe. This approach can be useful when registers are not sufficiently developed and has the advantage of being able to collect more information on entrepreneurship than is available from other sources but it also suffers from the usual constraints of survey errors and sample size limitations when detailed data breakdowns are required.

94. In theory, census data can be at least as good, and sometimes better than register based information, if they have less scope restrictions, but the cost of running a census of businesses every year makes this approach unrealistic for most countries. Data from less frequent censuses may still be of interest but, as discussed in the section on periodicity below, they raise major comparability issues.

95. This framework does not specify a unique data source for calculating estimates of births. The Eurostat Business Demography database is based on information within business registers but many countries outside the EU do not currently have adequate statistical or administrative business registers, indeed, even within the EU the comprehensiveness of these registers varies across countries and time.

96. This framework does however express a preference for register based approaches on the grounds that all OECD countries have them and so information on births can be derived without any increase in administrative burdens for businesses and because, despite the incomparability of business registers in practice, it is possible to derive business demography statistics based on registers that are less affected by these differences; as shown below. Moreover, in calculating birth-rates, using births as a percent of the total population of enterprises, the conceptual consistency between the denominator and numerator populations can only realistically be maintained using the same source information. Survey based approaches may also be used to measure the total population of enterprises but they are complicated by issues of multiple-counting of enterprises and require survey respondents to differentiate between statistical business units. If business registers do exist, but a survey based approach is still used to estimate births, there is a risk that inconsistencies between the numerator and denominator arise, for example at the industrial sector level or because the numerator includes births of informal enterprises not included in the business register population.

97. If business registers are used as the basis for measurement it follows that the higher the (common) activity (turnover and employment) thresholds for births the more comparable the indicators across countries are likely to be, as, typically, differences in coverage of business registers occur at the

[15] Additionally, it is important to recognise that registers with information on firm employment and turnover may also be affected by underground production.

[16] Demography Of Small and Medium-sized Enterprises – see: http://forum.europa.eu.int/irc/dsis/dosme/info/data/en/index.htm

very small enterprise level. However, improved ease of comparability has to be balanced against the loss of information relating to small enterprises; an area of considerable policy interest. This is particularly so for small countries where biases may be inadvertently introduced. However, as shown below, it is possible to use a definition for births using thresholds that maintain the economic relevance of the concept whilst, at the same time, improving the potential for international comparability.

Point-In-Time versus Live-During-Period - Births

98. An issue that is of particular relevance in the context of business register approaches is when the population of businesses is measured. There are two approaches. The first, point-in-time, takes a snapshot of businesses in consecutive periods, preferably, at the end or beginning of calendar years for which estimates are required (assuming that the time-period of attention is annual births) and, so, is analogous to a 'stocks' approach. The second approach, live-during-period, measures the population of enterprises during the course of the calendar year, and, so, can be seen as a 'flows' approach. This latter approach lends itself well to the estimation of short-lived births, that is, those that enter and exit the population of enterprises during a calendar year. The former approach may not however fully capture these births, depending on the supplementary information available in each country. Moreover, it may introduce biases across countries and industries. Many of the businesses that are active for less than a year will be excluded altogether, but those that, by chance, are active on the day the snap-shot is taken will be included. Therefore, if a reference date such as 31 December/1 January is used, short-lived businesses with activities related to the Christmas period are likely to be included but businesses with different seasonal patterns of activity such as tourism or agriculture-related activities could be under-represented; which may be particularly relevant in the context of Northern versus Southern hemisphere comparisons.

99. The required supplementary information to correct for any differences between point-in-time and live-during-period approaches may not be available in all countries and so it will not always be possible to record these short-lived births; which can be significant: Eurostat "live during period" enterprise survival data covering 48 observations for 18 countries over 4 years show that on average just over 87% of births in a given year are also active in the following year; indicating that the number of short-lived births that are born and die within the same calendar year is not insignificant. Removing these short-lived births from any definition of births would, of course, remove this issue of incomparability but, at the same time, as mentioned above, it could introduce others, namely those related to seasonal activities that occur within the snap-shots. It seems preferable therefore for countries to record these short-lived births separately. This issue is discussed in more detail in Vale (2006) and in the section on birth rates below.

Periodicity

100. This issue concerns whether the source data are sub-annual, annual, or less frequent. The majority of the sources identified in Section 2 concern annual data, though quarterly and monthly data sets are available for some countries. Indeed, in a few cases, data availability is linked to economic censuses at intervals of five years.

101. For data with a periodicity of greater than one year it is difficult to construct estimates of births that can be compared to annual data, as the proportion of short-lived births that will be missed increases considerably. In Japan, annualised average rates are calculated for the years between censuses (Takahashi (2000)), but these mask the natural year on year variability usually observed in business entry and birth data.

102. If sub-annual data include counts of births they can simply be added to produce annual totals, though these totals will be higher than those based on annual snap-shots and for which no supplementary information is available; due to better coverage of businesses that survive for less than one year.

103. Work to convert quarterly establishment start-up data from the Business Employment Dynamics series produced by the US Bureau of Labor Statistics to an annual basis has resulted in differences of over 40% between annualised 'births' and the sum of 'births' for the four separate quarters. This is a result of both the removal of short-lived businesses, and improvements to the purity of the birth estimates by better linkage of establishments over time, and is documented in Pinkston and Spletzer (2004).

Birth Definition

104. In concluding from the above, it follows that a definition for births should be based on a combination of turnover and employment measures, where the turnover component reflects any turnover above zero. The employment based component can be based on total employment or employee indicators; the latter being, arguably, the more relevant in the context of business dynamics, entrepreneurship, innovation and growth and certainly more relevant in the context of employment creation. Moreover, employee based measures are clearly easier to record than employment based measures, which are complicated by the subjectivity of determining when employment actually occurs. Combining employment based measures with turnover can remove this subjectivity but the issues of measurement and economic significance remain. Perhaps the most important of these is measurement. Not all countries are able to compile statistics on this basis, as shown in Section 2. In fact no country will ever be able to record all small unincorporated enterprises unless every market enterprise, no matter how large, is required to register; which would constitute a disproportionately costly administrative burden. Moreover, and as described above, employment based measures are very sensitive to changes in tax legislation, particularly in the context of employees moving to 'false' self-employed. It is theoretically possible to remove these new enterprises from the population of entries and, so, from births but this is not likely to be simple to do in practice.

105. Ultimately an employment threshold is needed; one that can only be determined by convention, taking into account a range of factors: interpretability, ease of calculation, data availability, and comparability. The recommendation made in this framework is to record the birth of an enterprise as when it takes on board its first employee and records some turnover; subject to the removal of any 'false' births from the population of entries that are created as a result of other demographic events, such as take-overs, described above.

106. That is not to say that this measure will not be affected by institutional factors that may treat entries, with little real economic difference, differently. Sole-proprietors, for example, that become incorporated will be treated as a birth if an employee threshold of one is used, and in this context it is important to note that the propensity of incorporating businesses differs across countries, and often, over time. One way to ameliorate this is to also record births of enterprises using higher employee thresholds, such as two, three etc, up to ten say, as complementary indicators, since, the higher the threshold, the lower the probability of a birth occurring as the result of an unincorporated enterprise with no employees becoming incorporated with employees. Indeed, at the two employee threshold, only unincorporated partnerships that become incorporated with employees are likely to distort birth levels, and these are likely to be negligible when compared to total births.

107. As such this framework also recommends that complementary birth statistics are also calculated on the basis of a two-employee threshold, following the same additional rules that apply for births, using the one-employee definition; these births are referred to in this framework as *economic births*. The comparability of this measure is certainly less likely to be adversely affected by policy measures, such as income tax and corporation tax differentials which provide incentives and disincentives for self employed unincorporated enterprises to incorporate, and, moreover, it can be produced by most OECD countries.

108. These measures differ from the Eurostat definition, which takes employment rather than employees as a threshold and which is a broader definition for births. The difference in this convention is mainly driven by the fact that statistical business registers in OECD countries are more varied than in Eurostat countries, where regulations that have improved convergence exist, but also partly reflects an attempt to produce economically meaningful indicators that can be easily constructed and which are less affected by the differing levels of exhaustiveness in national business registers, at least where very small enterprises are concerned.

109. In summary therefore the point at which a birth of an enterprise occurs is when employees and turnover are both greater than zero for the first time[17] and no other enterprises are involved in the event. This does mean therefore that births in year t are not always sourced from entries in year t; for example, enterprises that existed and were active in calendar year t-1, with no employees, that became enterprises with employees in t would be births in calendar t.

110. The recommendation of this framework therefore is that births should be recorded on a calendar year basis, recording any births that occur on and within 1 January and 31 December. For some OECD countries, particularly those that compile business register data using snap-shots and financial years, this may not be so easy. For strict comparisons on a calendar year basis, such data sets would need to be apportioned between years, though in practice this may not be necessary if births rates are fairly stable over time.

111. The type of data source used to estimate births is important and business registers are preferable to survey or census based measures. However, because some countries use live-during-period approaches to updating their registers, countries are encouraged to separately identify short-lived enterprises (those that are born and die within the same calendar year); partly to improve the comparability with countries that use point-in-time approaches to register updating and partly because these enterprises are of different economic significance and policy relevance to enterprises that survive for longer periods. That said this framework advocates a general preference for live-during-period based estimates of births.

112. Another issue that affects comparability in an unintentional way is the statistical unit used to define businesses, and described in Section 3; which demonstrated that a large economy will have lower enterprise births than an equally sized group of countries even if the numbers of new establishments are the same; as a result of the creation of new enterprises in each country by foreign owned multinationals. As such, and because the distinction is of policy interest in its own right, this framework recommends that estimates of births should separately identify whether enterprise births are foreign or domestically owned.

113. Births can be defined as follows:

> *A birth amounts to the creation of a combination of production factors with the restriction that no other enterprises are involved in the event. Only enterprises with employees and turnover can be considered in scope for births. A birth of an enterprise occurs when employees and turnover are both greater than zero for the first time. Births do not include entries into the population due to mergers, break-ups, split-offs, or restructuring of enterprises. Births do not include entries into a sub-population resulting only from a change of activity, controlling legal unit or location but do include entries if two of these three factors change, excluding entries that arise from an unincorporated business with employees simultaneously moving to a new location and changing its legal form to become incorporated with employees (and therefore limit liability). Births in calendar year t do not include*

[17] In practice, many countries impute employees from turnover, or vice-versa, if one of these variables is missing (as recommended by Eurostat), thus, in practice, the only cases where a value will be zero are those where positive confirmation of this has been received from a survey or administrative source.

enterprises active in calendar year t, following inactivity in t-1 and that had both employees and turnover in t-2, which are viewed as reactivations, but do include enterprises reactivated after periods of inactivity spanning two or more calendar years. Births in period t also include enterprises that were active in t-1 but that had no employees. Births in calendar year t include enterprises active in calendar year t following inactivity in t-1 and active in t-2 but with no employees.

A secondary, measure but of equal importance, referred to here as 'economic births' relates to a two-employee threshold and is also recommended by this framework

Economic Births occur when the second employee is recruited or turnover first occurs, whichever of the two occurs latest[18]*. Economic births do not include entries into the population due to mergers, break-ups, split-offs, or restructuring of enterprises. Economic births do not include entries into a sub-population resulting only from a change of activity, controlling legal unit or location but do include entries if two of these three factors change, excluding entries that arise from an unincorporated business with employees simultaneously moving to a new location and changing its legal form to become incorporated with employees (and therefore limit liability). Economic births in calendar year t do not include enterprises active in calendar year t, following inactivity in t-1 and that had both employees and turnover in t-2, which are viewed as reactivations, but do include enterprises reactivated after periods of inactivity spanning two or more calendar years. Economic births in period t also include enterprises that were active in t-1 but that had one or less employees. Economic births in calendar year t do include enterprises active in calendar year t following inactivity in t-1 and active in t-2 but with no employees.*

Ideally births (and economic births) should be split by activity (2 3 and 4 digit ISIC level if possible), legal form (limited liability companies, sole proprietors, partnerships, public corporations and non-profit institutions serving households), employment size, turnover and ownership (foreign and domestic), *and should separately identify those births that are born and die within the same calendar year.* However, in recognition that this level of breakdown may be difficult to achieve in practice, particularly when one considers the disclosure issues it raises, births (and economic births) at the 2-digit level, broken down by employment size, ownership and/or turnover, provide an acceptable information set. Additionally, with this option, births (and economic births) can be shown broken down by employee size-bands, preferably, 1, 2-4, 5-10, 10-20, and 20+ (although, of course, the 1 employee size band is redundant for economic births).

114. Table 4.2, below summarises the definition for births ignoring for simplicity more complex demographic events such as mergers and takeovers.

Table 4.2 – Defining Births by Turnover and Employees

Enterprise had Employees and/or Turnover in						
T-2		T-1		T		Birth
Employees	Turnover	Employees	Turnover	Employees	Turnover	
N	N	N	N	Y	Y	**Y**
N	Y	N	Y	Y	Y	**Y**
N	N	N	Y	Y	Y	**Y**
Y	Y	N	N	Y	Y	**N**
Y	Y	N	Y	Y	Y	**N**
Y	N	Y	N	Y	Y	**Y**
N	Y	N	N	Y	Y	**Y**

115. It is important to note that those countries that use employee and/or turnover thresholds in their business registers above the one-employee and greater-than- zero-turnover thresholds recommended in this

[18] In other words when the number of employees is greater than 1 and turnover is greater than zero for the first time.

framework will have lower levels of births than in equivalently sized countries that have business registers with no thresholds. Moreover, where these thresholds are driven by legal and/or fiscal requirements further distortions may arise. For example, countries that use VAT registers as the primary source for their statistical business register may record fewer businesses than might be expected just above this threshold; as businesses operating marginally above the threshold might be inclined to declare revenue to the authorities just below to avoid any increased burdens that might come with being VAT registered. National Statistical Offices are encouraged therefore to develop their business registers to ensure that all enterprises with one or more employee and any turnover are recorded.

116. A couple of cautionary notes merit mention here. The first concerns comparisons of Eurostat defined birth rates, based partly on employment, and those recommended in this framework, based partly on employees. The Eurostat statistics provide information showing separately the births of zero-employee enterprises. Removing these births from the Eurostat total figures will not result in statistics that are comparable with the definition for births given in this framework, as the net result will not include within births any enterprise that moves from a zero-employee size class to a one or more employee size class; which are included as births in this framework. The same is true where estimates of economic births are concerned, since Eurostat figures for births excluding one-employee and zero employee births, will not include any births that occur when enterprises of this size move into the two-employee category.

117. The second cautionary note concerns changes to the coverage of business registers. In some countries business registers cover only a sub-set of the entire population of market enterprises. Any increase in the coverage of the register should not, by default, be included as births even it is not possible to differentiate between those enterprises in the newly covered sub-population that were active at time t and earlier and those that were born in time t.

Box 1: Recognising Confidentiality Constraints

A recurring theme of this framework, as can be seen in the following sections, is the desire for indicators that are as detailed as possible; where 'detailed' refers to the need to have indicators that reflect the smallest possible cohort of businesses with the same characteristics (size, industry, legal form etc) as possible. A natural consequence of this is that the smaller the cohort the more likely that the data cannot be provided because of disclosure risks. This is especially relevant for indicators on gazelles say, discussed in section 8; since, by their nature, gazelles are likely to already represent a relatively small sub-set of businesses, particularly in small countries.

The framework acknowledges this possibility. A panacea is for countries to also compile statistics at a higher level of aggregation; so, for example, providing information on births, deaths, gazelles etc by size; births, deaths, gazelles etc by industry; births, death, gazelles etc by legal form; births, deaths, gazelles by size and 2-digit industry groupings etc. It is too early to be too prescriptive about this. Clearly the preference is for statistics to be as detailed as possible but it is only by implementing a program of data production and delivery that it will be possible to best judge the optimal aggregate sizes and characteristic combinations.

5. DEFINING DEATHS

Deaths and Exits

118. Like Births, defining deaths and when they occur is also non-trivial. Businesses may, for example, remain registered on business registers, an important source of information for business demography statistics, even though they no longer exist. Equally, like births, the process of firm death can also be arbitrary. Many businesses, for example, experience a process of decline or dying before they are finally wound-up. And some businesses enter receivership before being wound-up, continuing some administrative functions even if normal activity is permanently ceased. Moreover there is a difference between business closures and business failures. The former reflects a withdrawal from the market that may have been anticipated at the outset of the businesses creation. Differentiating between these businesses and the point at which businesses begin their decline is also of policy interest.

119. These difficulties notwithstanding however, the corollary to the definition for births is that the death of an enterprise should reflect, in a general sense, the destruction of a combination of production factors. By extension this excludes exits that occur through other demographic events such as mergers, take-overs, break-ups, name changes, or restructuring of a set of enterprises. Equally, where the focus is on a particular sector, deaths do not include enterprises that are reclassified out of the sector of interest if no other demographic event is coincident with the reclassification, namely a change in the legal form of the enterprise or location.

120. Recalling the measures recommended for estimating births, it follows that businesses with more than one employee in calendar year t that have less than one employee in calendar years t+1 and t+2 can be considered to have died in calendar year t.

121. This is not a perfect definition since the business could have remained active in calendar years t+1 and t+2, albeit with no employees, and, so, differs from the more general description of business exits; which are normally considered to be those that cease to be active, in other words, go out of business altogether. Businesses that experience a decline in employment size below a set employee threshold do not necessarily cease activity. These declines may, for example, reflect cyclical troughs in activity or periods of restructuring and downsizing that result in increased probability of survival or profitability over the longer term.

122. However, using a more general definition for deaths based on activity criteria alone would result in an inconsistency with the definition used for births that could lead to interpretative difficulties. For example, if all new creations of enterprises in an economy are below the one employee threshold recommended for births, and none grow to be an employing firm, it is possible, at least in theory, that measures of births and deaths in this economy would show, incongruously, persistently high levels of deaths but never any births. As such, it is important to distinguish between deaths and the more common definition for business exits and to refer to deaths as the statistical corollary of the definition used for births.

123. Although imperfect, because the definition for deaths does not measure all business exits in the sense that the enterprises have ceased to be active, the definition does reflect the exit of firms that cease to be businesses with employees, and, so, is readily interpretable in an economically meaningful way. Like

births however the definition is affected by the propensity of businesses to incorporate, since the higher the population of businesses with one employee or more, the higher the likelihood of more deaths. Additionally, using the definition proposed for deaths in this framework, the levels of deaths can also be affected by the propensity of incorporated businesses to become unincorporated; as incorporated businesses with one employee that become unincorporated with no employees would result in a death.

124. It is possible to use other definitions for deaths but these would be inconsistent with the definition for births and, in any case, many of these alternative definitions also present challenges for comparability across countries and over time. For example, one might consider legal failures, based on bankruptcy say, as a measure. But bankruptcy laws differ across countries. In some countries, for example, enterprises can declare themselves as bankrupt but are able to continue trading with receivers in operational control. Often this results in the winding-up of the enterprise as it goes into liquidation[19] but sometimes the enterprise is able to continue operating, albeit with more restrictive operations and under new management. This means that some enterprises on business registers, say, may be active but also bankrupt, making it very difficult to use a concept of deaths based on bankruptcy, particularly as some nominally bankrupt companies may recover.

125. Other possibilities exist for a definition of deaths, the most obvious being when businesses cease trading altogether. But, as demonstrated above, this concept presents practical difficulties when compared to the definition of births.

Demographic Events

Exits

126. Exits reflect the failure and closure of enterprises within the economy, whatever the demographic event be that a merger, renaming, split-offs etc. Other demographic events can create exits within sub-sectors of the economy such as relocations, and reclassifications from one industrial or institutional sector to another. Exits also occur because of deaths.

Changes in Controlling Legal Unit, Activity and Locations

127. Using the definition for births as a reference point, it follows that under certain circumstances deaths can occur in conjunction with changes in the controlling legal unit, activity or location. Indeed, all births resulting from a change in two or more of the controlling legal unit, activity and location also result

[19] The question whether units in liquidation should be treated as active or not was discussed in the Eurostat Business Demography Working Group meeting of April 2004. More precisely, the question had arisen whether a dying enterprise should be considered active even if its remaining activities are related only to its liquidation e.g. selling production factors or managing administrative procedures. Several Member States reported on their practice in a written consultation by e-mail during the summer of 2004. The clear tendency was to consider these units active as long as they have either turnover or employment regardless of the type of the activity. This position is in line with the principle in the Eurostat Business Demography methodology that a change of activity alone during the lifetime of an enterprise is ignored. A few member states reported that a further distinction was needed. If there is information available on a court decision on bankruptcy, the business should no longer be considered as active, whilst a unit awaiting the decision on bankruptcy is still regarded as active. This is not proposed in this framework, which, in any case, adopts a different definition of deaths to that used by Eurostat. The Eurostat definition, consistent with its definition on births, records a death only when all employment and turnover has ceased for more than two calendar years; which differs from the definition used in this framework that records a death when the enterprise ceases to have employees or turnover for more than two calendar years.

in a death; unless the original enterprise that exited had no employees to start with.. These circumstances are summarised below. When an enterprise experiences a change in one or more of the controlling legal unit, activity and location, such that an exit and entry occurs in the business population the exit is viewed as a death in the following circumstances shown in the table below:

Table 5.1 – Changes in Controlling Legal Unit, Activity and Location that lead to Deaths(I)

ENTERPRISE	CHANGE IN			EXIT is a DEATH
	Activity	Location	Legal Form (Unincorporated versus Incorporated)	
Unincorporated with Employees	Y	Y	Y	Y
	Y	Y		Y
	Y		Y	Y
Incorporated (III)	Y	Y	Y	Y
	Y	Y		Y
	Y		Y	Y
		Y	Y	Y
			Y	Y (III)

(I) For simplicity it is assumed that listed demographic events aside, all other things are equal; particularly employment which is assumed to be the same before and after the demographic event(s).
(II) Except where the 'newly created' unincorporated enterprise has no employees; in which case the original incorporated enterprise is recorded as having died, see Section 5.
(III) Only if the newly created unincorporated enterprise has no employees.

Mergers

128. Mergers involve a consolidation of the production factors of two or more enterprises into one new enterprise, such that the previous enterprises are no longer recognisable. The new enterprise is not a birth and the enterprises that existed before the merger are not viewed as deaths; unless the merger coincides with a change in employment such that no employees exist in the merged entity but existed in the original enterprises.

Renamings

129. Clearly the renaming of an enterprise does not, on its own, result in a death of the original enterprise.

Break-ups

130. This event involves a splitting of the production factors of an enterprise into two or more new enterprises, in such a way that the previous enterprise is no longer recognisable. The new enterprises are not considered to be births and the enterprise that existed before the break-up is not considered to have died.

Changes of Ownership (one-to-one take-over)

131. This event simply involves a change in the controlling legal unit. All other things equal, no death occurs unless the enterprise moves from incorporated to unincorporated with no employees.

Joint Ventures

132. Cessations of joint ventures should be considered as deaths only if they were originally introduced as births.

Re-structuring Within an Enterprise Group and Enterprise Groups

133. This event reflects a combination of break-ups, split-offs and mergers. All other things equal it does not result in any deaths.

Deaths: Failures and Closures

134. Another issue of interest in the context of deaths is the difference between deaths that have occurred because of a failure and those that occur through closure, where closures reflect a withdrawal from the market anticipated at the outset of the businesses creation (Brian Headd, 2003). Differentiating between these two types of exits is clearly of policy interest, since the former reflects the failure of some business model whereas the latter often reflects a successful business model. However, the information on whether enterprises become inactive through failure or closure is not readily available. Moreover the distinction between deaths because of failures or closure is not always clear. For example a consultant of an enterprise, of which he or she is the sole employee and owner, might choose to become an employee of another enterprise if the remuneration offered was greater, resulting in the death of his/her business, but it is not clear whether this represents a failure or a closure. As stated above, the reasons for deaths are clearly of importance to policy makers, but, like many other statistics relating to factors of success and failure, these reasons can generally only be established via dedicated surveys that target known deaths.

Death Definition

135. Deaths can be defined as follows: *A death amounts to the economic destruction of a combination of production factors with the restriction that no other enterprises are involved in the event.*

An enterprise death in calendar year t occurs when an enterprise with one or more employees and some turnover in calendar year t records zero employees or zero turnover in calendar years t+1 and t+2. Deaths do not include exits from the population due to mergers, take-overs, break-ups, or restructuring of enterprises. Deaths do not include exits from a sub-population resulting only from a change of activity, controlling legal unit or location but do include exits if two of these three factors change, excluding exits that arise from an unincorporated business with employees simultaneously moving to a new location and changing its legal form to become incorporated with employees (and therefore limit liability).

Ideally deaths should be split by activity (2 3 and 4 digit ISIC level if possible), legal form (limited liability companies, sole proprietors, partnerships, public corporations and non-profit institutions serving households), employment size, turnover and ownership (foreign and domestic), *and should separately identify those deaths that are born and die within the same calendar year*. However, in recognition, that this level of breakdown may be difficult to achieve in practice, particularly when one considers the disclosure issues it raises, deaths at the 2-digit level, broken down by employment size, ownership and/or turnover, provide an acceptable information set; additionally, with this option, deaths can be shown broken down by employment size-bands, preferably, 1, 2-4, 5-10, 10-20, and 20+.

136. In theory, estimates of total deaths in an economy should include all market enterprises that satisfy the definition set out above. In practice however business demography statistics are largely based on the information available in business registers, which may only cover a sub-set of the entire population of market enterprises. If changes are made to the coverage of the business register it is necessary to ensure that deaths are correctly measured. Decreases in the numbers of enterprises resulting from reductions in the

coverage of registers (for example by increasing say the employment or turnover thresholds in the business register) should not, by default, be included as deaths. On occasions it may not be possible to identify those enterprises no longer on the register that actually died. Where this occurs these enterprises should not be arbitrarily included as deaths.

137. The definition for deaths used above is the corollary of births given earlier. In the same way one might consider whether a definition of economic deaths would be useful as a complement to economic births. This has not been included in this framework because it is not clear that the notion of an economic death has quite the same analytical use as an economic birth; although there is no reason in principle or practice why this indicator could not be developed.

Practical Issues

138. The definition of deaths means that a death cannot be established until two full calendar years after it occurred. This affects timeliness. It means that estimates of deaths in calendar year t will not be available until calendar year t+3. One way of providing provisional estimates of deaths in calendar year t, early in calendar year t+2, is to make projections regarding the number of enterprises inactive in calendar year t+1 that are likely to remain inactive in calendar year t+2, based on historical average ratios.

Point-In-Time versus Live-During-Period - Deaths

139. Like Births, point-in-time estimates of Deaths, are likely to provide lower estimates than live-during period estimates.

6. BIRTH AND DEATH RATES

Populations

140. Thus far the framework has focused on providing the conceptual underpinning of definitions for births and deaths. However, total estimates of births and deaths, although of interest, cannot be compared across economies unless they are normalised in some way for the differences in sizes of each economy. This process of normalisation produces estimates of birth and death rates that can be used to compare the levels of creative destruction and entrepreneurship across economies. A number of different denominators can be used to achieve this. Typically, statistical offices use the population of enterprises active in the reference year of interest but other measures can also be used – for example the working-age population or even GDP. Each measure has some advantages and disadvantages over the others and each is considered in turn below.

Populations of Enterprises

141. Although the definitions for births and deaths proposed in this framework are based on a one-employee threshold it does not necessarily follow that the population of enterprises must also reflect the same threshold; that is, active enterprises with one employee or more.

142. However, not doing so can lead to very severe restrictions on international comparability of birth and death rates. The coverage of the known population of all enterprises, with and without employees, will differ, in practice, across countries; depending on the legal requirements of enterprises to register. In many countries only businesses above a certain size threshold are required to register, and these thresholds vary across countries. Typically this means that the coverage of very small, micro, enterprises varies significantly across countries, and, as such, invalidates the use of the entire measurable and observable population of enterprises as a denominator.

143. This is not however the case if coverage of the population of enterprises is defined in a consistent way with the coverage of births and deaths. In other words, if the population of enterprises is to be used as a denominator it must include only the population of active enterprises with one or more employee.

144. Consistency in the enterprises covered by births, deaths and the enterprise population is typically the practice used by all countries that produce birth and death rates, irrespective of the definitions used for births and deaths since these countries will usually record births and deaths on the same basis as the observable population of enterprises.

145. Despite its widespread use however, the measure is not without some disadvantages. Economies in transition for example, particularly those moving from centrally planned to market economies, will generally have fewer market enterprises than in equivalently sized market economies. Under these circumstances these economies will display higher birth and death rates than in a similarly sized market economy even if the levels of births and deaths are the same in both.

146. Moreover the population of enterprises will be affected by the varying levels of enterprise consolidation that occurs across countries. As described earlier demographic events such as mergers and break-ups, for example, do not impact on births but they do impact on the population of enterprises. As

such the business population in any country will fall, all other things equal, as a result of industry consolidation via mergers and acquisitions for example, but birth rates will rise even if the level of births over time is unchanged. Of course this example over-exaggerates the potential impact of such events. In most OECD economies the number of enterprises is at least in the hundreds of thousands and, so, typically, demographic events that change the size of the denominator (the enterprise population) will have a minimal impact on the overall birth and death rates.

147. However, care is needed when interpreting rates across countries with very different levels of industry consolidation or de-regulation. Consider for example two identical economies, except one has a number of near-monopoly or state controlled sectors and the other a more competitive market. Even if the levels of births were the same in both countries, counter-intuitively perhaps (as one might expect higher rates in more competitive economies) the rates would be higher in the monopoly market. The example is of course imperfect since one might also expect births to be lower in the near-monopoly market but the point is to illustrate an arithmetical fact that can hamper the interpretability of rates. One might consider attempting to alleviate this particular problem by focusing only on specific sectors (and so showing birth and death rates in specific industrial sub-sectors using only the population of enterprises in the same sub-sectors). However, this is not advisable since the smaller the sub-population the greater the potential impact of demographic events and importance of the starting position; an issue of particular relevance where new (hi-tech) industries are concerned.

148. This latter point illustrates what is in part a philosophical conundrum. Although the population of enterprises provides a population from which deaths are sourced it is not so obvious that the same holds for births; since these are sourced, at least for domestically owned births, from the population of budding entrepreneurs; in other words the working-age human population.

Human (Working-Age) Population

149. The working-age population is arguably a better denominator than the population of enterprises since it is not affected by any of the disadvantages described above. However, there are a number of practical difficulties that complicate the use of this measure.

150. The first concerns the working-age definition which will differ across countries, as will the age at which individuals are legally permitted to create new enterprises.

151. The second relates to the size of the informal, or underground, economy. Countries with a large number of underground enterprises will have lower birth rates than countries with smaller informal economies even if the total births of formal and informal enterprises are the same. This problem is likely to be lessened however if business populations are used.

152. For some specific purposes other sub-sets of the human population may be used, an example of this is the use of the population of unemployed persons for analyses designed to illustrate the extent to which unemployment encourages entrepreneurship. Great care is needed to accurately interpret data using such sub-populations, as, in practice, only a proportion of new businesses are actually started by people who were previously unemployed

GDP

153. GDP is the least desirable of the three indicators described here that can be used as a denominator and is not recommended. GDP at current prices should definitely not be used as the basis of the denominator as GDP estimates need to be converted into a common currency which means that, all other things equal, birth rates in countries will change if exchange rates change. Moreover, in periods of very high inflation year-on-year birth rates will show systematic declines even if the levels of births are

unchanged. GDP in constant prices provides a better measure although birth rates will be affected by differences in purchasing power parities across countries and the choice of the reference period in which estimates are converted to a common currency.

Recommended Population Measure

154. In concluding, the choice for the population definition boils down to one of 'the population of enterprises' or 'the working-age population'. This framework recommends the former, although, in recognition of some of the possible interpretative difficulties embodied in this measure, when used to calculate birth rates, and, in recognition of the diagnostic possibilities offered by the latter measure, it also recommends that a complementary indicator for birth and death rates be based using the working-age population as a numerator.

Point-In-Time versus Live-During-Period - Populations

155. If the denominator is based on the human population, point in time estimates are generally used, i.e. the number of people on a specific date. Where it is based on a business population, two main approaches exist. The traditional approach, followed in most of the data sets used by NSOs, is to use point in time business population data. This is consistent with human demography and allows a "stocks and flows" approach to business demography.

156. An alternative approach is to use the population of businesses that were considered to be in scope at any point during a given reference period. This approach is favoured by Eurostat in their business demography data collections, partly because it ties in with the approach used to collect financial variables (e.g. turnover for a given period), and partly because it was thought at the time to be easier for countries that did not have accurate birth dates for units in their business registers. This is still Eurostat's view although anecdotal evidence suggests a review could be worthwhile.

157. It is clear that a live during period population will be larger than one on a point in time basis. The extent of the difference will depend on various factors, but mainly on the length of the period, and the degree of churn (i.e. joiners and leavers) in the business population. As a result, data compiled using a point in time population will not be directly comparable with those based on a live during period approach.

158. There is a danger with the point in time approach that short-lived businesses that start and close in the period between two reference points may not be included in the business population, or indeed births. This risk is theoretically removed using the live during period approach but, in practice, is only really solved for either approach by having accurate information on birth and death dates or very frequent (daily) observations of the whole population.

159. However it is important to note that live-during-period estimates do present other complications that need to be corrected for. Like exits and entries, live-during-period measures are affected by other demographic events. For example mergers may result in the appearance of a new enterprise registration and, so, live-during-period population estimates will record a larger population of enterprises than point-in-time estimates. The following example provides an illustration of this. At the beginning of a given year, country A's telecoms sector is dominated by a former state monopoly. Shortly after the start of the year, however, it is taken over by a foreign telecoms business, with all activity transferred to a new subsidiary of the foreign business. Later in the year the subsidiary merges with a utility company, and forms another new enterprise. Thus the original enterprise would be counted three times by the live during-period approach. In theory however it is possible to overcome these difficulties by adjusting the population of enterprises for mergers, take-overs etc in the same way (and using the same information set) that exits and entries are

transformed into births and deaths, although it would still be necessary to know the beginning of period point-in-time estimate.

160. It is however possible to estimate a live during period population by adding the total number of business entries during a period (and that survive into the next period) to the point in time estimate for the start of that period; if it is assumed that the numbers of short-lived births (those that are born and die within the same period) are negligible. Similarly a point in time population can also be estimated from live during period data. (Vale (2006) shows that for most OECD member countries, birth rates based on live during period business populations are between 1% and 2% lower than those based on point in time populations).

161. However live-during-period based estimates present other complications that are not so easy to overcome. Policy makers and analysts are equally interested in estimates of birth and death rates that provide some measure of employment creation as a percentage of total employment (see below). But the nature of employment makes this very difficult to do as enterprise employment levels will vary during the reference period. Moreover, further complications arise when an enterprise purchases an establishment belonging to another enterprise; giving rise to the possibility that live-during-period employment estimates for the total economy are less than the sum of live-during-period estimates of industrial sectors. For estimates of births and deaths weighted by employment it is clear that point-in-time estimates provide the only practical basis for measurement and, for consistency (and not only because they are simpler to calculate), it follows that birth and death rates should also be calculated on this basis.

Birth, Economic Birth and Death Rate Definition

162. Birth and death rates are based on a denominator and a numerator. The numerators for birth and death rates follow the definitions for births and deaths respectively, given earlier in this framework. The denominator for both birth and death rates is the population of enterprises with one employee or more and active (turnover greater than zero) at a reference point-in-time in the reference period.

163. A supplementary indicator for both birth and death rates is also recommended using the working-age population as a denominator.

164. In line with the recommendation given for birth rates it follows that a similar definition is needed for economic birth rates, where economic births are as defined earlier in the report. By extension, for economic birth rates, the population of enterprises used as a denominator should include only those enterprises with two or more employees and are active at a reference point-in-time during the reference period.

165. Ideally birth, death and economic birth rates should be split by activity (2 3 and 4 digit ISIC level if possible), legal form (limited liability companies, sole proprietors, partnerships, public corporations, non-profit institutions serving households), employment size, turnover and ownership (foreign and domestic), *and should separately identify those births and deaths that are born and die within the same calendar year.* However, in recognition, that this level of breakdown may be difficult to achieve in practice, particularly when one considers the disclosure issues it raises, birth, death and economic birth rates at the 2-digit level, broken down by employment size, ownership and/or turnover, provide an acceptable information set; additionally, with this option, birth, death and economic birth rates can be shown broken down by employee size-bands, preferably, 1, 2-4, 5-10, 10-20, and 20+ (although, of course, the 1 employee size band is redundant for economic births).

Weighted Births and Deaths

166. Although nominal birth and death rates are of considerable interest, they do not paint a complete picture of the economic contribution of births and deaths. Analysts and policy makers, for example, are

particularly interested in their contribution to employment. Turnover is also often of interest, but less so, and, moreover, more difficult to estimate in practice and, so, is not mentioned further here. This interest, is two-fold, the first concerns the direct employment gained or lost when a birth or death occurs as a percentage of total employment, and the second concerns the longer term employment growth prospects of births, which is discussed in Section 8. This section focuses on the former area of interest.

Percentage (Direct) Contribution of Births to Employment

167. The direct contribution births make to employment, as a percentage of total employment, can be shown by simply taking the total number of employee jobs created in each birth and dividing this total by the total number of employees in the economy.

168. The reference to 'direct' in the paragraph above is deliberate and is included to highlight the fact that the indicator measures only employment creation related to the birth of an enterprise at its birth. It does not therefore measure any employment that may subsequently occur in years to come.

169. In theory it would be better to record these jobs on a full time equivalent basis but it is recognised that this is usually difficult to achieve in practice, since it would require specific treatment for seasonal activities where information is seldom available. As such it is preferable to record merely the head-count figures and not full-time equivalents.

Percentage (Direct) Contribution of Births to Employment -Definition

170. Birth Rates should be supplemented by indicators showing the number of employee jobs created by enterprises when they are born as a percentage of total employees in the relevant reference period, where the total population of employees should be calculated using a point-in-time approach.

Percentage (Direct) Contribution of Deaths to Employment

171. The death of an enterprise is generally thought to follow a period of decline, which often lasts more than one calendar year[20]. Arguably, therefore, indicators showing the (negative) contribution made by deaths to employment should be able to fully account for the process of dying, in other words, attribute jobs lost during the enterprise's demise to the time of death. Empirically, however, this is easier said than done; as it would require the identification of the point in time in which each enterprise began its decline and subsequent death. If this were based say, on the point at which employment was at a maximum, the negative contribution of deaths would also include any job losses that were driven by productivity and/or technological advances say; meaning that the estimates would be biased upwards.

172. An alternative approach would be to define the point at which an enterprise began to die as the point at which both turnover and employment began to decline. However even this approach is imperfect. Some enterprises for example may consciously decide to reduce turnover and employment in response to market conditions, for example, reductions in the pool of skilled and affordable workers or the desire to protect the brand by reducing supply. Additionally employment and turnover falls could coincide with productivity increases and falls in the prices of raw inputs.

[20] That said, initial research in two EU Member States has shown that employment for the period in which death occurs is not significantly different to that of previous periods.

173. Equally, not adjusting for the process of decline that many dying enterprises undergo introduces potential biases in statistics that show the relative proportion of deaths by size class, with upward biases for smaller businesses. The approach adopted by Eurostat to overcome this potential bias is to define the size class of the enterprise by the average employment over the period during which the enterprise was active. However this is not a perfect panacea, especially if the period between birth and death is long,

174. Ultimately some convention is needed. One pragmatic approach is to take the maximum employee levels, averaged over the year and on a full time equivalent (FTE) basis, in the two calendar years before an enterprise's death to calculate the negative contribution made to employee levels. However evidence from two European countries suggests that, in practice, employment for the period in which death occurs is not significantly different to that of previous periods.

175. Moreover, attempting to create indicators for employee weighted deaths that reflect the whole process of dying introduces an asymmetry between employee weighted births and deaths; since the indicator for employee weighted births measures only the direct and immediate relative contribution of births to employment. Taking employment losses at the point of death is, therefore, arguably the most pragmatic approach; certainly it is by far the simplest and provides estimates of jobs lost through deaths, as a percentage of total employees, which are immediately interpretable and consistent with the concept used for births.

Percentage (Direct) Contribution of Deaths to Employment - Definition

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

7. SURVIVAL RATES

Survival Rates

177. Indicators of birth and death rates can provide an important insight into creative destruction and form invaluable inputs into the analyses of productivity growth at the enterprise level. But this is not the whole story. Of particular interest in the context of business demography analysis and entrepreneurship policy development is the survivability of newly formed enterprises. Two countries for example might have very similar birth and death rates, consistent over time but if one has births that all die within the first year and the other has births that all die after twenty years, say, the levels of creative destruction, innovation and growth potential in the latter economy are almost certainly higher. Focusing on birth and death rates alone therefore can be misleading. Policy makers need to know that their policies are not only encouraging the creation of new enterprises but the creation of successful enterprises that increase the long-term productive capacity and wealth of the economy.

178. Survival rates show the probability of an enterprise still being in business 'x' years after the enterprise birth. How these rates are calculated depends a great deal on the treatment of other demographic changes which do not result in an enterprise death such as reactivations, mergers, break-ups etc but, put simply, an enterprise has survived if it has not died[21].

179. Survival rates can be shown at many different levels, for example they can describe the survivability of all births in the economy over a number of years, or they can describe specific sub-sectors, for example a particular cohort of enterprise births in a particular reference year with the same activity and legal form and size class say.

180. A key question for policy makers concerns the characteristics of enterprise births that have relatively high and low probabilities of survival over time, and how these businesses evolve. Enterprise creation and destruction are part of a process of experimentation, where new firms first make their initial investments unsure of their potential success. Because of this initial uncertainty firms do not start out positioning themselves at a unique optimal size but they may decide to grow once they have learned more about their chances to be profitable. Traditional models of firm learning under uncertainty suggest that while many enterprise births may not survive for long those that do should grow very fast to reach the average incumbent size. As they approach the minimum efficient scale, gain experience and accumulate assets, survivors increase their chances of staying in the market over time. As the enterprise matures (and grows) and the environment becomes less uncertain, the conditional probability of surviving should be expected to decrease. This evolution is important and, as such, estimates of survival rates for any given cohort of enterprises, with defined characteristics, such as legal form, need to continue to track this cohort even if the characteristics of any of the enterprises changes over time.

[21] This definition of survival differs from that used by Eurostat which defines survival to exclude cases where enterprises merge, break-up or are taken over by an existing enterprise. In these cases Eurostat view the enterprise as not having survived based on the view that a non-survival is not necessarily a death. The view of this framework is that this sits uncomfortably with the definition used for deaths both in this framework and in the Eurostat definition. In theory the Eurostat definition for survivals provides for the possibility of declining survival rates even if no deaths occur. That said, in practice, the difference in treatment of these demographic events is not, on its own, expected to significantly distort comparisons between the two frameworks.

181. In this way, and ignoring events such as mergers, break-ups etc, for simplicity, the probability that births at time *t* with legal form *i,* industrial sector, *j,* and size class, *k*[22] at time *t* are still active in calendar year *t*+τ, referred to as the *year-t τ survival rate* for enterprises born at time *t,* can be defined as:

$$(1) \qquad {}^{\tau}s_t^{i,j,k} = {}^{\tau}S_t^{i,j,k} \Big/ B_t^{i,j,k}$$

Where ${}^{\tau}S_t^{i,j,k}$ is equal to the number of enterprise births in calendar year t that survive into t+ τ and $B_t^{i,j,k}$ is equal to the number of births in calendar year *t.* Note that the definition includes the possibility that enterprises can die in the same calendar year of their birth. In other words the *year-t τ survival rate* reflects the probability of births being active in at least *τ* consecutive calendar years, but not necessarily *τ* *12 months. It is important to note that, although the characteristics of an enterprise, such as size class, sector, or legal form say, may change over time, survival rates group all births on the basis of their characteristics prevailing at the time of birth.

182. Indicators of survival rates of births born in year *t* are of interest if there is some intrinsic relationship between the year of an enterprise's birth and its subsequent probability of survival, facilitating, for example, investigations into the evolution of survival rates for different birth-year cohorts over time; which might be related to changes in economic conditions, such as consumption patterns, competitiveness, competition policy or other policy measures. An alternative measure is to show the probability of all births in a particular cohort, with different birth years, surviving a certain number of years, τ, after their birth. These rates are referred to here as the *average τ-year survival rate*, ${}^{\tau}s^{i,j,k}$, where

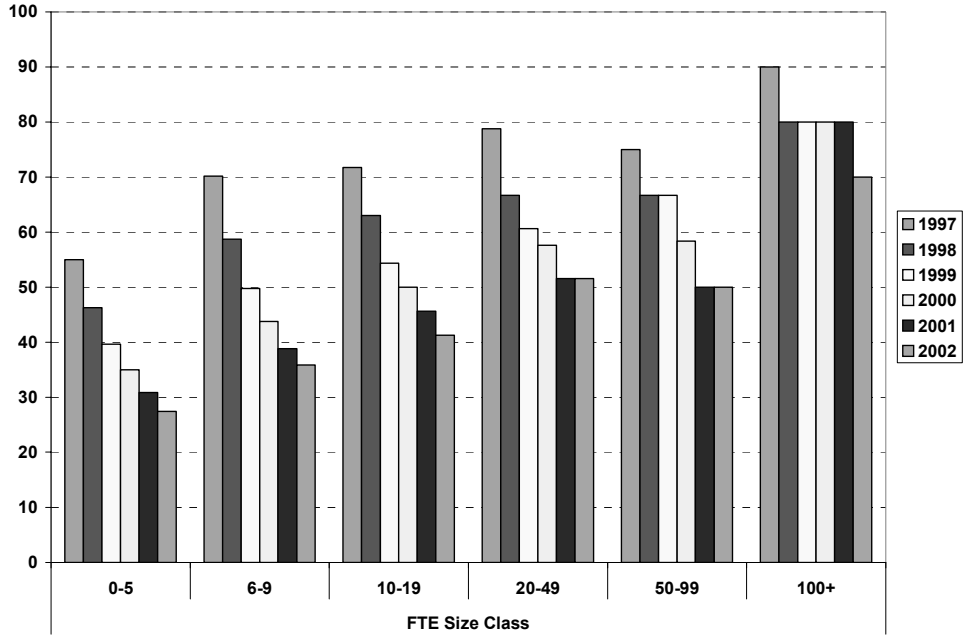
$$(2) \qquad {}^{\tau}s^{i,j,k} = \sum_{t=t1}^{t=t2-\tau} {}^{\tau}S_t^{i,j,k} \Bigg/ \sum_{t=t1}^{t=t2-\tau} B_t^{i,j,k}$$

Where t1 and t2 represent the start and end years over which average rates are calculated and *τ* is less than or equal to (t2-t1), and, as before, the 'cohort' reflects enterprises with the same characteristics *i ,j* and *k,* irrespective of their birth year.

183. A key issue for both *average τ-year survival rate*s and *year-t τ survival rates* concerns the maximum value of *τ* for which they should be calculated and after which their analytical value is negligible. For example it is theoretically possible to calculate the probability of an enterprise survival 100 years after its birth but this is unlikely to be of much use for policy purposes even if were possible to estimate these probabilities in practice. Ultimately the period of time for which survival rates should be calculated has to be selected by convention. Clearly the larger the value of *τ* the less relevant the survival measure and the harder it is to measure. Anecdotal evidence, see Figure 7.1 below for example, suggests, as would be expected, that it is in the initial years of a birth where a great degree of uncertainty abounds; related to the, often innovative and untested, business plans of births. This initial period typically lasts about 5 years after which the uncertainty is gradually lessened, as enterprises business move closer to the average incumbent size, and the conditional probability of survival is likely to increase (the hazard rate, see below, is likely to decrease). The recommendation of this manual therefore is that *average τ-year survival rate*s and *year-t τ survival rates* should be calculated for *τ*=0 to 5.

[22] Note that other enterprise characteristics can be shown, for example ownership.

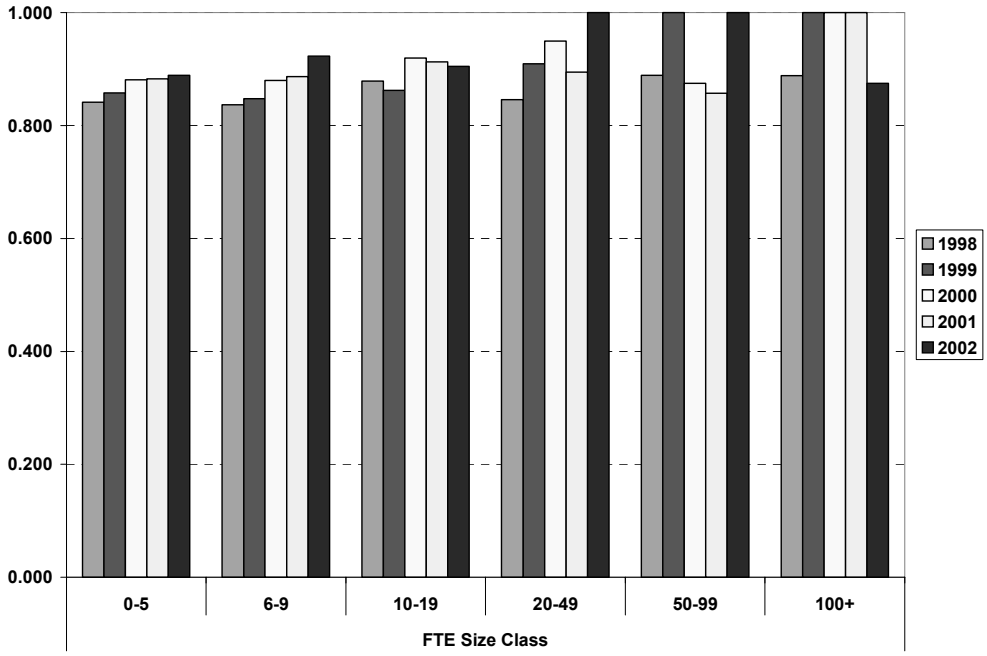
Figure 7.1: Survival Rates of 1995 Enterprise Births by Full Time Equivalent Size Class in New Zealand[23]



Source: New Zealand, Ministry of Economic Development

184. The chart above, for New Zealand, shows that even for small enterprises, the year-on-year difference in survival rates levels off after three years.

Figure 7.2: One-Year Conditional Probability of Survival of 1995 Enterprise Births in New Zealand



[23] Evidence suggests that these survival statistics are under-estimates. The statistics are calculated on the basis that if a business ceases to exist under exactly the same legal status or structure then it is assumed to have collapsed, presumably due to financial difficulties. These "deaths" can signify other events, such as those described in section 5.

185. Figure 7.2 above, showing the conditional probability of enterprises born in 1995 surviving at least one extra year[24], illustrates this point better and shows that 5 years after birth the conditional probability of survival stabilises; and, so, one can conclude that they have the same conditional probability of survival as older enterprises.

186. A related issue concerns the period of time over which *average τ-year survival rates* should be calculated. Clearly t1 and t2 should not be too far apart otherwise the average will combine probabilities of survival over what might be incomparable periods; a gap of, say, 50 years between t1 and t2 say might be interesting for historians, for example, but would be of limited use for policy makers interested in the impact of current policies and market conditions on survival rates. That said, the average period should ideally embody one complete economic cycle, to avoid the introduction of potential biases related to points in the economic cycle.

Survival Rate(s) Definition

187. This framework recommends that two measures of survival are developed by NSOs.

- 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.*

- The second is *average τ-year survival rates* which shows all births in period t1 to t2- *τ* that have not died *τ* years after their birth, as a per cent of all enterprise births in years t1 to t2- *τ.* This corresponds approximately to the un-weighted average *year-t τ survival rate* over periods t1 to t2- *τ.* The periods t1 and t2 should correspond to one economic cycle

- Rates should be calculated for *τ* = 0 to 5. Ideally both measures should be split by activity (2 3 and 4 digit ISIC level if possible), legal form (limited liability companies, sole proprietors, partnerships, and public corporations), employment size, turnover and ownership (foreign and domestic). However, in recognition, that this level of breakdown may be difficult to achieve in practice survival rates at the 2-digit level, broken down by employment size, ownership and/or turnover, provide an acceptable information set; additionally, with this option, survival rates can be shown broken down by employment size-bands, preferably, 1, 2-4, 5-10, 10-20, and 20+.

Survival Rates – measurement issues

188. Survival rates in countries that only record enterprises above the thresholds recommended in this framework for births are likely to show an upward bias as their births are more likely to have already survived their formative and turbulent start-up years, when the likelihood of failure is higher.

[24] This conditional probability corresponds to 1-the hazard rate.

$h_{t,\tau}^{i,j,k}$, the hazard rate, = $1-{}^{\tau+1}S_t^{i,j,k} \;/\; {}^{\tau}S_t^{i,j,k} = 1 - {}^{\tau+1}s_t^{i,j,k} \big/ {}^{\tau}s_t^{i,j,k}$

8. HIGH GROWTH ENTERPRISES AND GAZELLES

Defining Growth by Enterprise Characteristics

189. One of the key interests in business demography statistics relates to the growth potential of births as well as the growth potential of existing enterprises. Indeed, an important catalyst for the development of business demography statistics was the innovative database developed by David Birch in 1979.

190. Birch suggested that conventional methods used at the time for determining the contribution of different sized enterprises to employment growth produced misleading results. Prior to Birch's work much of the analyses on firm growth assumed little if any inter-class movement of firms (and in so doing implicitly reduced the ability to identify creative destruction). Many of these analyses produced estimates of the contribution large enterprises made to growth in calendar year *t* by generally assuming that the same enterprises were large in years *t* and *t-1*. Because these enterprises were defined as large on the basis of their size in calendar year *t* however, Birch contended that these analyses produced biased results of employment growth: high estimates for large enterprises and low for small enterprises.

191. Birch instead defined enterprises by their size class in the base year of his study (the year from which growth rates were determined). On this basis, he argued that small enterprises were considerably larger employment creators than had previously been thought, and that they contributed the majority of employment growth (82%) in the US during the 1970s.

192. However Birch's approach is not without contention, since it is one of two main views that dominate the study of the allocations of businesses to size classes when studying growth.

193. The main alternative to Birch's approach defines an enterprise's size on the basis of its average size in line with the underlying theory that the pattern of employment in enterprises fluctuates randomly, depending on variations in demand and other transitory factors, around a trend, and so that in equilibrium each enterprise has some typical size. Birch's approach (see also Kirzner, 1997) reflects a more turbulent system, where the business environment sees continuous changes in tastes and technologies say, and where enterprises continuously adapt to exploit opportunities; adjusting employment in the process. This view assumes that there is no equilibrium path towards which businesses converge.

194. This framework does not provide a view on which of the two economic theories are the most plausible, both have their merits, and can be useful as long as their derivation is clear.

High Growth Enterprises

195. For obvious reasons, one of the most important indicators used in studying entrepreneurship is an indicator of high growth enterprises. At the same time however there is very little unanimity on how this indicator should be defined in an international context. Typically national statistical institutions, analysts and policy makers will adopt an approach based on convention. For example, the International Consortium on Dynamic Benchmarking of Entrepreneurship, led by FORA, a research and analysis division under the Danish Ministry for Economic and Business Affairs, defines high growth enterprises as all enterprises, less than five years old, with more than 15 employees at the start of the observation period and that had either 60% more employees and/or turnover at the end of the observation period.

196. Part of the rationale behind the 15 employee threshold is to avoid introducing biases that overstress the importance of small enterprises. To illustrate, if the number of employees is taken as the determinant for growth, an increase of one employee in an enterprise that starts with one employee will reflect 100% growth, whereas an enterprise with 100 employees that takes on an extra 50 has lower growth. To focus on the former enterprise as being of greater policy and analytical interest than the latter is likely to be misguided. On the other hand, focusing merely on the absolute size of employment gains biases towards large firms.

197. Birch (1987) and Schreyer (2000), attempted to reduce the size of these biases by weighting growth by absolute employment gains. High growth enterprises were then defined as the 10% of enterprises who scored highest on this measure. Although useful in interpreting business dynamics within economies, for example the measure provides information on the most successful enterprises and their characteristics, such as size and sector, it is much harder to interpret these measures across countries, and so this approach is not considered further here.

198. Ultimately, for simple cross-country comparisons of high growth enterprises, a Danish approach is necessary; where the definition is established by convention. However some qualifications are necessary. Clearly the study of turnover growth is important but there are a number of factors which complicate cross-country and inter-temporal comparisons when turnover thresholds are used. Inflation is the first; which introduces potential biases between high and low inflation countries, between high and low inflation periods, and between high and low inflation products and, so, industries; especially commodity industries. The second reflects the relationship between turnover and income (profits, value-added) across industrial sectors. A retail enterprise for example that shifts its sales from low value products to the same quantity of higher value products will not necessarily increase profits nor employment, particularly if the shift is dictated by changes in consumer tastes. As such this framework will not adopt a measure that is based, even in part, on turnover.

199. Other qualifications are necessary however. Even though the Danish approach introduces a size threshold of 15 to avoid introducing biases that overstress the importance of small enterprises, biases still exist. Very large enterprises for example will be much less likely to increase their size by 60% but ignoring large enterprises with significant growth, albeit below 60%, would be arguably negligent of policy makers, since their ultimate objective is to increase well-being, whether that be via encouraging increased employment in large or small firms; both of which can be entrepreneurial and innovative; although, because the Danish measure focuses on young firms the threshold is not likely to create a significant distortion since very few new enterprises start, or grow very quickly to become, very large. At the same time the use of a threshold also complicates cross-country comparisons, very small countries for example are more likely to have proportionally fewer enterprises with more than 15 employees than much larger countries for example.

200. Clearly supplementary indicators for high growth firms with less than 10 employees and high growth firms with hundreds of employees could help to address these issues, where the growth threshold for smaller firms is higher than 60% and for large firms lower than 60%, but the framework avoids making firm recommendations in this area as these supplementary indicators are best developed on a country by country basis.

High Growth Definition

201. The approach advocated in this framework is to provide information on employment growth broken down by size class and employee growth bands. All enterprises with more than one employee are considered in scope, irrespective of their age. Many studies focus only on young firms but these often assume that older firms are not entrepreneurial or are of little interest in its study. This framework takes a

different view; namely it does not exclude the possibility that older firms can be innovative and entrepreneurial.

202. The recommended size-class bands are 10-19, 20-49, 50-249 and 250-499, and 500+, and the recommended growth bands are 0-(less than) 10, 10-(less than)20, 20- (less than)30, 30- (less than) 40, 40-(less than) 50 and 50+ average annualised growth over the observation period, where the observation period should be no more than, and preferably, three years; this is partly because the longer the observation period the greater the difficulty in ensuring that businesses are not affected by other demographic events. In this way high growth enterprises, broken down by size classes, can be defined by users in line with the growth bands. It is possible to consider smaller size bands but it is not clear what benefit these would provide. Enterprises with less than 10 employees are not included as to do so would create an indicator of high growth enterprises that would potentially be swamped by small enterprises. An enterprise with 1 employee, for example, that increases employment by one every year would show 300% growth over three years. That is not to say that these enterprises are not of interest but clearly some threshold is needed.

203. Ideally, for each size class, the breakdown by size band should show the percentage of enterprises in each growth band, as a percentage of all enterprises with 10 or more employees and the total working age human population. Further breakdowns of enterprises by characteristics, such as legal form and industry are also recommended. The breakdown by industry is particularly important because in many sectors, for example pharmaceuticals, potential growth of small enterprises is restricted by development and R&D costs say.

204. The definition for growth should define enterprises on the basis of their size class at the beginning of the observation period and growth must exclude any changes due to other demographic events such as mergers, take-overs and break-ups. In recognition that this level of breakdown may present disclosure problems, a high growth definition, given below, should be attempted as a minimum.

All enterprises with average annualised growth in employees greater than 20% 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 broken down by as detailed a size class band as possible, legal form and ISIC industry, and 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..

205. 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 annum on average over a two year period.

206. The charts below, using simulated data illustrates the type of information that can be provided using this definition, and the importance of the size class breakdown. Figure 8.1 shows that no large enterprises, with more than 500 employees, grow by more than 10%, but at the same time, as shown in Figure 8.2, the growing firms in this cohort contribute over 25% of total employment growth.

Figure 8.1 – Distribution of Enterprises by Size Class and Growth Band

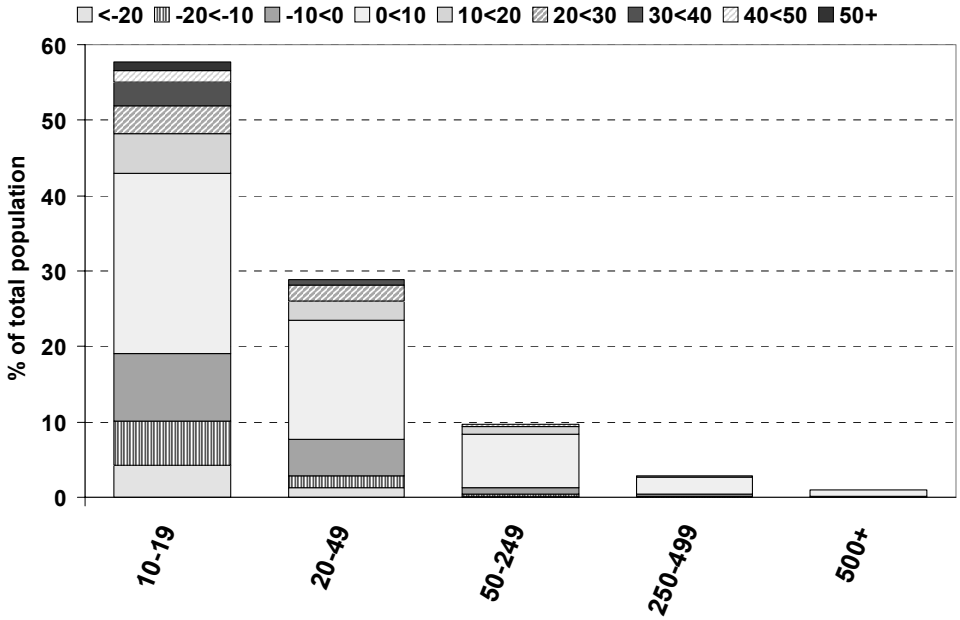
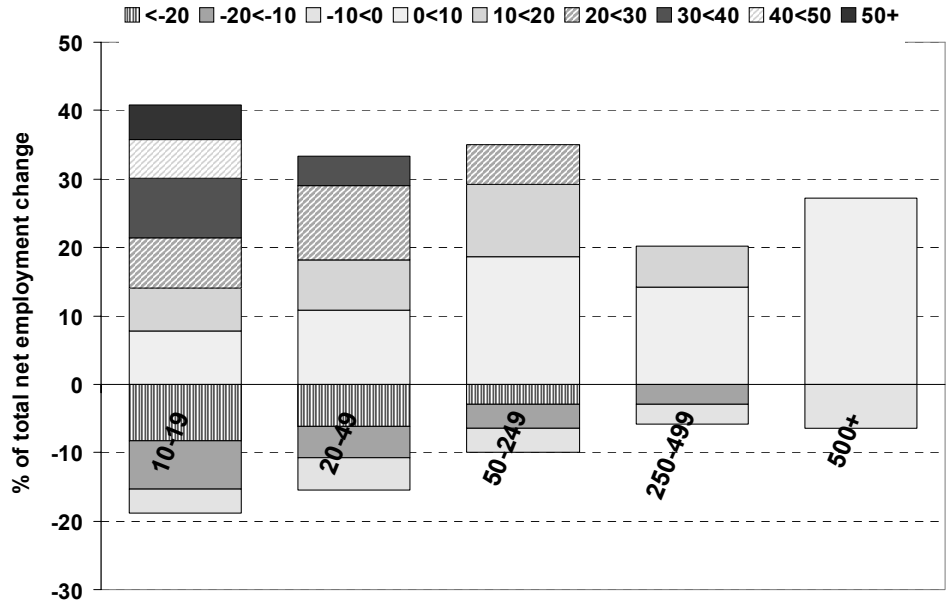


Figure 8.2 – Distribution of Employment Change by Enterprise Size Class and Growth Band



Gazelles

207. In practice, high growth businesses will be typically young; this is partly a function of the learning and expansion process that young businesses typically undergo – grow, to reach some optimal size or die – but it also partly reflects the correlation (bias) between size (small) and growth (high) potential. Young high growth businesses are typically referred to as gazelles in the literature.

208. This framework defines 'gazelles' as high growth businesses of less than 5 years old. Information on gazelles should include estimates of employment growth broken down by size class and employee growth bands. The recommended size-class bands are 10-19, 20-49, 50-249 and 250-499, and 500+, and the recommended growth bands are 0-10, 10-20, 20-30, 30-40, 40-50 and 50+ average annualised growth over the observation period, where the observation period should be no more than, and preferably, three years (in practice very few gazelles will appear in the higher size class bands, as young firms are typically small. Ideally, for each size class, the breakdown by size band should show the percentage of enterprises in each growth band, as a percentage of all enterprises with 10 or more employees and as a percentage of the working age human population. Further breakdowns of enterprises by characteristics, such as legal form and industry are also recommended.

209. The definition for growth should follow the principles outlined above, namely that enterprises are defined on the basis of their size class at the beginning of the observation period and growth must exclude any changes due to other demographic events such as mergers, take-overs and break-ups. In recognition that this level of breakdown may present disclosure problems, a high growth definition, given below, should be attempted as a minimum.

All enterprises less than 5 years old with average annualised growth in employees greater than 20% 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 broken down by as detailed a size class band as possible, legal form and ISIC industry, and 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.

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