

ENTREPRENEURSHIP STATISTICS BY GENDER: A REVIEW OF EXISTING SOURCES AND OPTIONS FOR DATA DEVELOPMENT

Abstract*

It is generally acknowledged that a gender gap in entrepreneurship exists: women are less likely than men to start a business, and the enterprises owned by women are on average smaller and concentrated in a lower number of sectors than those owned by men. The size of this gap and its different dimensions are however very difficult to quantify with official statistics: this lack of international data represents one of the main challenges when considering how to boost women's entrepreneurship. The Evidence and Data for Gender Equality Initiative (EDGE) is developing and piloting methodologies to integrate a gender dimension in entrepreneurship data. This paper contributes to EDGE by reviewing the different sources of data that can be used for indicators of women's participation in entrepreneurship, gender differences in returns from entrepreneurship and gender-specific obstacles in business start-up and development. The relative advantages of population-based surveys, firm-level surveys and administrative data as possible sources of information are discussed, and relevant examples presented. The trade-offs in the identification of an empirical definition of entrepreneurs are also reviewed. The paper builds on recent work of the OECD/Eurostat Entrepreneurship Indicators Programme within the framework of the OECD Gender Initiative.

1. Introduction

It is widely agreed that entrepreneurship is a powerful source of economic growth and individual empowerment. As W. Arthur Lewis (1955, p. 182) put it: 'Economic growth is bound to slow unless there is an adequate supply of entrepreneurs looking out for new ideas, and willing to take the risk of introducing them.' Women are a largely untapped source of entrepreneurship: they are less likely than men to become entrepreneurs, and when they do, their enterprises are smaller and concentrated in a limited range of sectors (Piacentini, 2013).

A recent surge of policy interest in women's entrepreneurship has stimulated a deeper analysis of the entrepreneurship gender gap. The media have challenged the view of this gap as a natural state of things, showing evidence on the rise of women-owned businesses and portraying stories of highly successful women entrepreneurs (The Economist, 2013). Research has questioned the existence of performance gaps between women and men-owned businesses, and explored different explanations for the lower propensity of women to engage in business ventures (Fairlie and Robb, 2009; Gatewood *et al.*, 2009; Gottschalk and Niefert, 2011). This debate has however fallen short of building a solid case for targeted policies supporting women entrepreneurs, partly because of the scarcity of international data.

The development of timely and internationally comparable statistics on women in entrepreneurship is essential to answer a wide range of policy questions. First, the statistics will allow monitoring trends in the contribution of women to the creation of new businesses, beyond what is currently possible using data on self-employment. Solid numbers proving the potential of women's entrepreneurship for job creation are

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important to keep the policy momentum high. Second, the data can help understand how the characteristics of women and men entrepreneurs, such as their human capital and management experience, affect the returns from entrepreneurship and thus the relationship between entrepreneurial investments and women's economic empowerment. Third, the statistics can provide insights on policy levers of entrepreneurship and on specific policy instruments that can help women start and develop their businesses.

The Evidence and Data for Gender Equality (EDGE) Initiative is developing harmonised methodologies to support the regular production of gender-sensitive data on entrepreneurship. This note intends to contribute to EDGE by reviewing the different sources of data that can be used for indicators of women participation in entrepreneurship, gender differences in returns from entrepreneurship and gender-specific obstacles in business start-up and development. The paper builds on recent work of the OECD/Eurostat Entrepreneurship Indicators Programme within the framework of the OECD Gender Initiative¹.

The following section discusses the operational definition of entrepreneurs that can orient the data collection. Section 3 focuses on the possible use of self-employment data for gender indicators, and provides examples of dedicated survey modules on entrepreneurship in population-level data. Section 4 analyses the issues related to the production of gender indicator with firm-level surveys. Section 5 presents experimental work at the OECD on the gender disaggregation of business demography data and discusses the potential of administrative records. Section 6 concludes with some recommendation on priorities for international measurement and ways to overcome the limitations of existing data on women's entrepreneurship.

2. Defining 'entrepreneurs' and 'women-run businesses' for data collection

The first step in any data collection consists in defining the population of interest. The issue is identifying conceptually solid and empirically operational definitions of entrepreneurs and women (men)-owned enterprises. The challenge is to strike a good balance between broad definitions that inevitably include people without entrepreneurial skills and traits, and more focused definitions that can exclude individuals who have an entrepreneurial potential and are within the target group of policies for women empowerment (e.g. home-based traders with no paid employees). We discuss here the main trade-offs in the identification of an empirical definition of entrepreneurs that can be applied in standard data collection tools. The discussion also covers the related definition of women-owned, or female-run, firms.

The entrepreneur is one of the most elusive characters in economic analysis (Baumol, 1968). As summarised by Langlois (2007), different schools have seen the entrepreneur as a "discoverer", always alert to new opportunities (Kirzner, 1973); as an "evaluator", or someone who makes judgemental decisions and solves problems in economic organisations (Casson, 1993); and as an "exploiter" of new opportunities, carrying out new combinations and the creative destruction that results there from (Schumpeter, 1934). Long (1983) identifies three key themes that are recurrent among the definitional attributes of entrepreneurship: a) the willingness to bear risk and accept uncertain outcomes (Carland and Carland, 1988), b) managerial capabilities (Leibenstein, 1968), and c) capacity and willingness to innovate (Schumpeter, 1934).

¹ The OECD Gender Initiative provides evidence-based policy analysis on gender equality "in the three Es", Education, Employment and Entrepreneurship (see www.oecd.org/gender). The lack of comparable data on gender differences in entrepreneurship was identified as one of the most serious information gaps faced by policy makers who aim to unlock the economic potential of women.

Some researchers have suggested that the theoretical debate on entrepreneurship and definitions are not gender neutral but are male gendered (Kirkwood, 2004; Stevenson, 1990). There is some evidence that women are less likely than men to perceive themselves as entrepreneurs (Verheul et al. 2002). The potentially gendered nature of the term entrepreneur should be thus taken into account when formulating screening questions to identify the entrepreneurs.

The OECD/Eurostat Entrepreneurship Indicator Programme has proposed the following definition of entrepreneurs:

Entrepreneurs are those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets (Ahmad and Hoffman, 2008).

This definition emphasizes “value creation” and “innovation” as the two distinguishing features of entrepreneurial activity. It also makes a clear connection between entrepreneurship and business ownership: entrepreneurs are business owners who bear the risks and face the uncertainties associated with their activity.

The OECD definition is well-grounded in the theoretical literature and has a conceptual nature. For the purpose of data collection, it needs to be translated in clear operational rules. The open questions for this translation are:

1. the reference size of the business where entrepreneurs operate and that can be defined as ‘women-run’ or ‘men-run’;
2. whether entrepreneurs are necessarily business creators/founders;
3. inclusion or exclusion of entrepreneurial managers.

Size of the business. Entrepreneurship is not just about small and medium sized firms (SMEs). Also large firms can be entrepreneurial, in the sense of being continuously transformed through innovation. However, when firms get larger their ownership structure becomes more complex. As a consequence, it is often difficult to assign a ‘gender’ to large corporations: their ownership can be spread between several physical and juridical persons, and decision-making shared by a large number of individuals, with or without ownership shares.

For these complex organizations, gender issues are more related to imbalances in access to management roles, rather than to entrepreneurship. Even if gender issues in entrepreneurship and senior management are closely interrelated, it is important to keep a distinction between the two domains in measurement and in policy advice. The measurement problem of large corporations that are neither female nor male-run might be circumvented by limiting the population of interest to certain legal categories of firms (e.g. sole-proprietorships, partnerships and limited liability companies). One caveat is that legal categories are defined in different ways in different countries. Other operational rules can be evaluated, such as the restriction of the relevant universe to companies whose shares are controlled for the majority by physical persons.

At the other end of the spectrum, one might wonder whether the requirements of “innovation” and “creation of value” imply by necessity a minimum size for the enterprise, *i.e.* if only those who employ at least one other person should be classified as entrepreneurs. On the one hand, the restriction to employer entrepreneurs would allow excluding a large number of “casual businesses”, owned by wage and salary workers to complement their earnings (Fairlie and Robb, 2009). The restriction also improves international

comparability for entrepreneurship statistics developed from business registers (OECD 2012a). On the other hand, it is increasingly possible to start an entrepreneurial activity (an activity characterised by risk taking, innovation and value creation) without employing other people, particularly in emerging service sectors. Moreover, a restriction to business owners with no paid employees would exclude a substantial fraction of micro-entrepreneurs, where women - and poor women in particular - are highly represented. By creating their own employment, these micro business owners do create economic value: indeed, this value is essential for the livelihoods of millions of families in developing and developed countries.

Participation in the creation of the business. Entrepreneurship is fundamentally connected with the individual initiative to create something new or to give a different shape to an existing activity. A focus on business founders is justifiable, from both an analytical and a policy perspective. The business founders or creators generally make a different type of personal investments in terms of ideas and resources than those who acquire the ownership through a purchase, inheritance or donation. Evidence shows that new firms are particularly important for economic growth and employment creation: according to data for OECD countries, firms that are five years old or less represent only around 11% of employment, but account for more than 33% of total job creation in the business sector (OECD, 2013a).

The trade-off is between a more homogeneous population of business founders where non-entrepreneurs are unlikely to be included but a significant number of entrepreneurs are excluded, and a more comprehensive population of business owners, where the measurement error runs in the other direction (i.e. inclusion of non-entrepreneurs). The choice should be oriented by the information available in the type of data used – i.e. population-level vs. firm-level data, new data collection vs. use of existing data. The intended policy use of the data also matters: statistics that are based on a population of business founders might be more informative about gender-specific constraints and gaps in the process of business creation and consolidation. If the whole population of business owners is retained in the universe for data collection, then it is important to provide disaggregations of the data by mode of acquisition and age of the firm whenever possible.

Entrepreneurial managers. Management skills are a key input to entrepreneurial success. While entrepreneurs are generally managers, not all managers are entrepreneurs. There is a risk of diluting too much the definition of entrepreneur by including ‘pure’ managers who do not own shares of the business and who are limitedly accountable for the financial performance of the enterprise. In practice, top managers and board members who are not also shareholders can be excluded from the analysis for the sake of producing easily interpretable statistics.

Summing up, the definition of entrepreneurs that will be used for EDGE has critical implications for the content and value of the collected data. Different operational rules in the definition, in particular in relation to the employment size and legal type of businesses considered, will have non-marginal effects on the measures of gender gaps. If the policy interest lies mainly in timely information on the constraints women face in establishing a new business and in surviving the critical phase of business consolidation, a specific focus on business founders and owners of young businesses might be justified.

3. Building entrepreneurship statistics from population-level data

Use of data on self-employment from labour force and general household surveys

Statistics on self-employment are commonly used to measure entrepreneurial activity and are very relevant for studying gender differences in entrepreneurship. It should be noted, however, that there are issues when measuring entrepreneurship through self-employment data. Self-employment includes a very

heterogeneous set of jobs, responding to different economic incentives, providing different economic rewards and with distinct effects on aggregate growth and development.

By definition, self-employment jobs are all those occupations where the remuneration is directly dependent upon the profits derived from the goods and services produced. There are thus at least three distinct categories of workers that can be classified as self-employed (Eurofound, 2009):

1. enterprise owners, who run their enterprise with the help of employees;
2. 'free professionals', in regulated or unregulated occupations;
3. craft workers, traders and farmers, often working with their family members and possibly a small number of paid employees.

Entrepreneurs are well represented only among category 1, the enterprise owners. The overlap between 'entrepreneurs' and 'self-employed' is thus partial. The 'grey area' between paid-employment and self-employment include large numbers of workers with autonomy in the timing and supply of their labour, such as self-employed contractors in the construction sector, commission salespersons, freelancers, workers contracted through temporary employment agencies and franchise holders... (Parker, 2004). Self-employment data should be interpreted with caution in analysis of entrepreneurship².

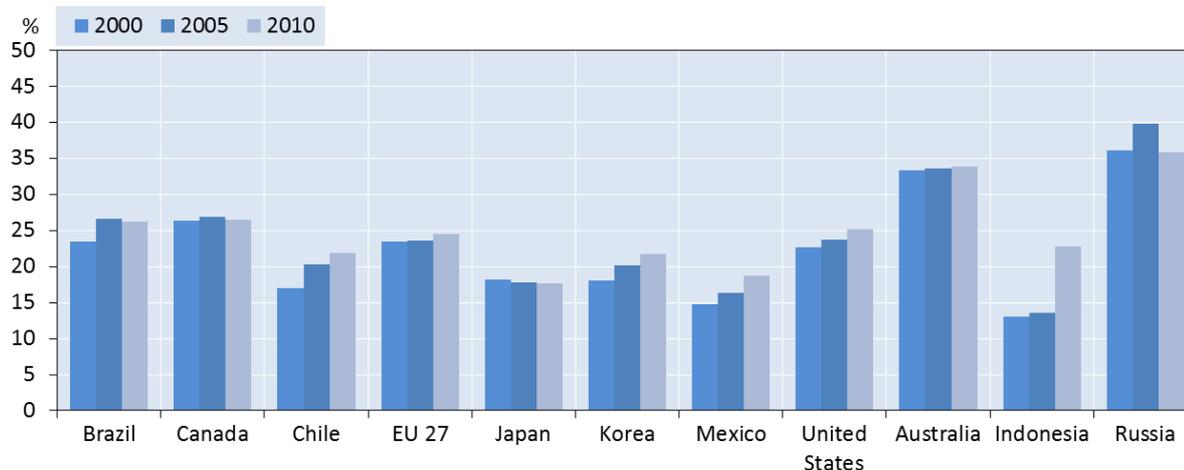
One imperfect way around this measurement problem is to look at how many men and women belong to the statistical category of the self-employed with paid employees (the 'employers'). Distinct indicators on employers and own-account workers (self-employed without employees) are included in the Minimum Set of Gender Indicators³. The data show that this distinction is relevant for gender analysis. In the OECD, there were more than three male employers for each female employer in 2011. Women, more than men, start self-employment activities they can undertake on their own, without paid employees. Differences in the gender composition of employers and own-account workers tend to be more pronounced in emerging and developing countries (Peña Parga and Mondragon-Vélez, 2009).

Data on employers from Labour Force Surveys (LFS) are valuable to compare trends in women's participation in entrepreneurial activities across countries. The share of women among employers has only marginally grown over the last decade in most OECD and G20 countries. Increases have been more evident in emerging economies such as Indonesia and Mexico (see figure 1). The relevance of distinct information on the self-employed with and without employees is confirmed by looking at trends during the economic crisis. Own-account employment levels rose between 2009 and 2011 particularly for women. When coupled with a fall in the number of female business owners with employees, it is likely that push factors (adjustment strategies to declining opportunities of wage employment), rather than pull factors have been the driving force behind these trends (OECD, 2013b).

² Other 'grey' categories of workers that are not always consistently classified across countries include unpaid family workers who work in a business run by a self-employed person; and members of worker co-operatives.

³ The Minimum Set of Gender Indicators is a selection of 52 indicators defined by the Inter-Agency Expert Group on Gender Statistics and approved by the UN Statistical Commission. A general issue with the development of distinct gender indicators for employers and own-account workers is the limited number of self-employed women and men with employees in the surveys' samples. When this small number is disaggregated according to some characteristics of the women employers (to study, for example, the distribution of women employers across detailed industry categories), there is a serious risk of obtaining figures that are below statistical reliability thresholds.

Figure 1. Share of employers (self-employed with employees) who are women, 2000-2010



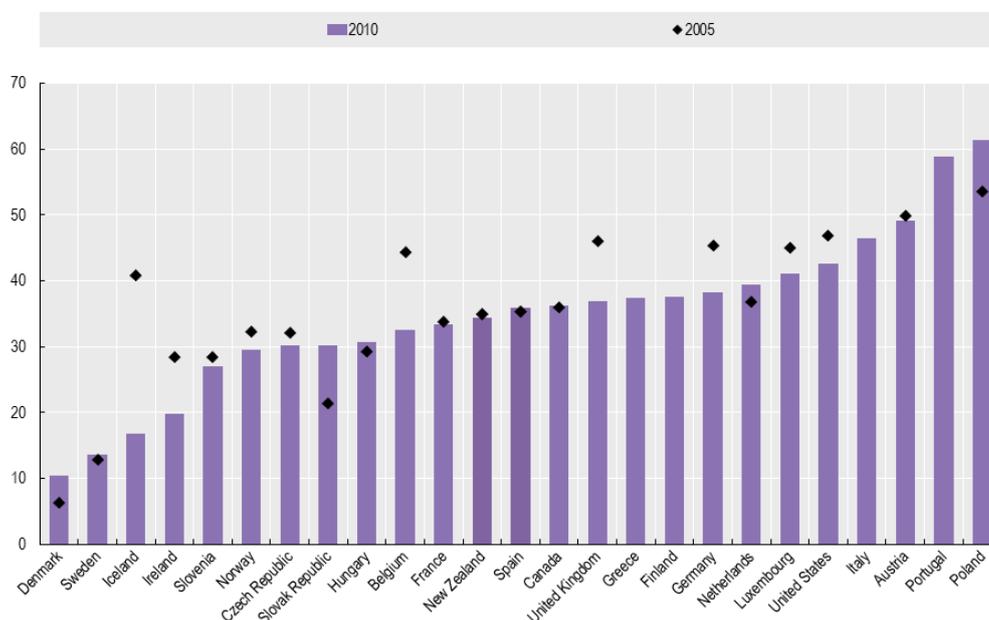
Source: National Statistical Offices and OECD tabulations on household surveys microdata.

Labour force surveys include fairly standardized questions on characteristics of the working population. These data can thus be used to develop descriptive evidence on gender differences in age, tenure in business ownership, education, place of birth and hours worked. Information on characteristics of the firms owned by the self-employed is generally limited to the size and industry of the business unit. Covering the whole population in working age, LFSs enable relevant cross-country comparisons of the self-employed and those working for a salary.

Indicators on size and sector of businesses owned by the self-employed and on characteristics of self-employed women and men have been tested by the OECD (OECD, 2012b). The data show that self-employed women tend to have started their business more recently and have thus possibly less experience in the management of an enterprise. Self-employed women have on average higher educational attainments than men, and the education attainments of both women and men are significantly higher among employers than among own-account workers. Women, in all countries, are less likely to hold self-employment jobs in manufacturing and construction industries, and are over-represented in the smallest size class of businesses.

Measures of gender gaps in earnings from self-employment can also be developed from available data for a large set of countries. This information can generally be obtained from the same data sources used for income distribution statistics, i.e. general household survey or surveys of earnings. As shown in figure 2, the gaps in mean earnings from self-employment are substantial everywhere (35% on average) and wider than those observed in wage employment (15% on average). The differences between earnings of self-employed women and men get considerably lower when the gap is calculated on earnings per-hour worked, given that women tend to work significantly less time on their businesses.

Figure 2. Gender Gap in Self-employment earnings, 2010/11



Note: The *gender gap in self-employment earnings* is defined as the difference between male and female average self-employment incomes divided by the male average self-employment income. Both positive (benefits) and negative (losses) earnings are included in the computation of the averages. The data refer to unincorporated self-employed only.

Source: Entrepreneurship at a Glance 2013, OECD (2013b)

There are still methodological hurdles that hamper the comparability of self-employment earning data across countries and time periods. In fact, the self-employed often have accounting practices which make it difficult for them to provide accurate responses to survey questions on earnings⁴. Moreover, their financial and accounting framework does not relate well to the one statisticians use in constructing national accounts or household income analysis (Eurostat, 2011). The data on earning gaps that have been collected at the OECD only refer to the unincorporated self-employed. An issue for the extension of the county coverage is that some national surveys only report data on earnings, censoring at zero all the losses. This practice might bias the comparisons by gender, given possible differences in the asset base and investment behaviour of women and men-owned firms.

Cross-country analysis of self-employment data should take into account some comparability problems. The main one relates to the classification of “self-employed” owners of incorporated businesses. Some countries, for example Japan, New Zealand, Norway and the United States, include only the self-employed owners of unincorporated businesses in their official reports, following the 2008 SNA. Supplementary

⁴ The European Union Statistics on Income and Living Conditions (EU-SILC) includes one question on “Cash benefits or losses from self-employment”. Self-employment income is defined as the income received, during the income reference period, by individuals, for themselves or in respect of their family members, as a result of their current or former involvement in self-employment jobs. The definition includes a) net operating profit or loss accruing to working owners of, or partners in, an unincorporated enterprise, less interest on business loans; b) royalties earned on writing, inventions, and so on c) rentals from business buildings, vehicles, equipment, etc. after deduction of related costs. The definition only refers to unincorporated businesses, and so excludes director’s fees earned by owners of incorporated enterprises and dividends paid by incorporated enterprises.

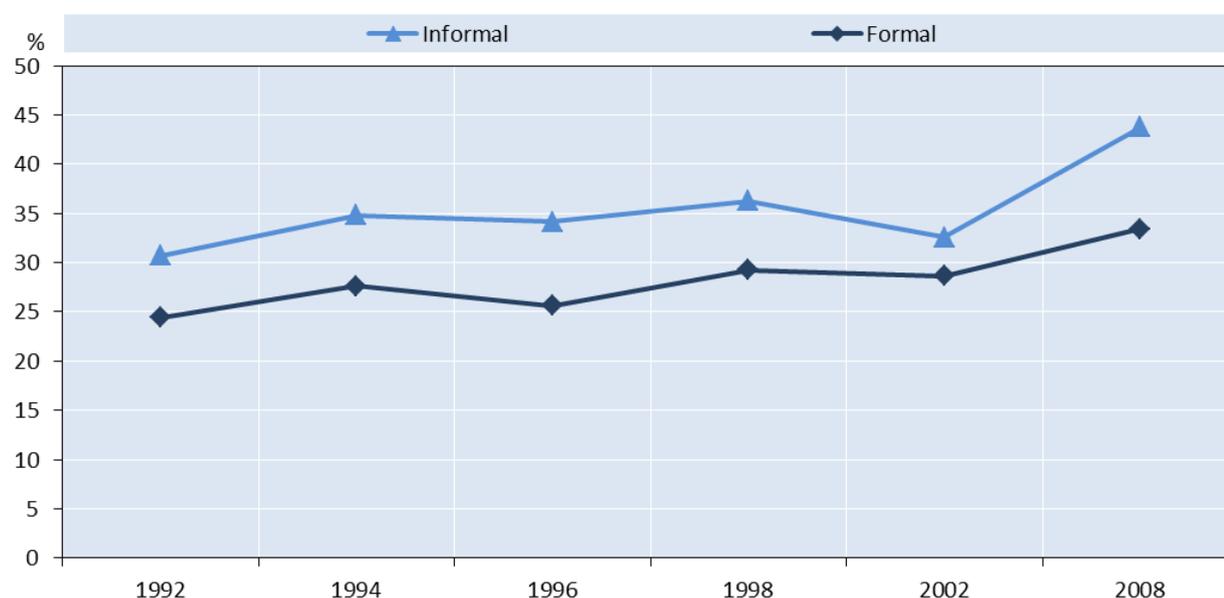
sources on data are generally available to correct for this issue by adding estimates on women and men who incorporated their businesses (see OECD, 2012a).

The integration of a limited set of questions on the modes of acquisition of the business and on activities undertaken for the business would greatly improve the usefulness of self-employment data for comparative analysis of entrepreneurship. However, there are competing demands to include new questions in labour force surveys, in several domains such as unpaid work, quality of jobs, household income etc... . Any change in the core questionnaire requires long approval and testing processes in many countries. A stand-alone module on self-employed and entrepreneurship that can be added to labour force surveys at regular intervals (e.g., every five years) seems a more viable option than changes in the core questionnaire, at least in the short term.

Surveys on owners of micro and small businesses

Surveys of micro-businesses are a second typology of household-level data that yields relevant information on gender differences in entrepreneurship. These surveys have been used in emerging and developing countries to produce estimates of the size and economic performance of micro-businesses, particularly the unregistered ones that are off the radar of other statistical investigations. The gender relevance of these data is clear. Across countries at different level of development and with different social institutions, women represent an important share of the owners of informal micro-enterprises. In Mexico, the share of female owners has been consistently higher for non-registered than for registered enterprises (figure 3).

Figure 3. Percentage of small and micro-enterprises owned by women, Mexico



Note: Only micro-enterprises with five employees or less (15 employees or less in manufacturing) are included. Source: OECD estimates based on six waves of INEGI Encuesta Nacional de Micronegocios (ENAMIN). The data are representative of Mexican urban areas. ENAMIN 2008 data were adjusted according to estimates from the population census.

Two noteworthy examples of nationally representative, large-scale data collection on micro-businesses and their owners are: 1) the *Encuesta Nacional de Micronegocios* (ENAMIN) conducted at regular intervals by the *Instituto Nacional de Estadística y Geografía* of Mexico (INEGI) and the *The Economía Informal Urbana* (ECINF), conducted in 1998 and 2003 by the *Instituto Brasileiro de Geografia e Estatística* (IBGE).

In this type of surveys, the sampling strategy uses an existing individual-level data collection as sampling frame (Mexico's quarterly labour survey for ENAMIN and the demographic census for ECINF). Preliminary interviews screen households for the presence of at least one business owner employing a maximum number of people, for possible inclusion in the survey. Specially defined, multi-stage designs are then applied to include units which are hard to detect in standard household surveys, such as very low-income families⁵. These surveys are often called 'mixed surveys', as they collect information on both the entrepreneur and his/her business, and build on an existing sampling infrastructure for data collection.

The surveys provide extensive detail on the characteristics of the micro-enterprises such as sector, revenues, profits, types and amount of financing for start-up and investments, number and characteristics of paid and unpaid employees, capital stock, whether the activity is run inside or outside the home...The valuation of business assets is possible in both surveys. ENAMIN, in particular, contains a detailed business capital module, which separates assets into tools, machinery, furniture and fixtures, business vehicles, premises, and other sources of capital. Within each category, the owner is asked whether items were acquired new or used, whether they are owned, rented or borrowed, and their replacement cost (McKenzie and Woodruff, 2006). The two surveys also include fairly detailed information on the micro-entrepreneur, including the main reasons for working in the business, the number of partners, the employment history, the time spent on the business.

The experience of micro-business surveys is particularly relevant for the definition of monetary metrics comparing the returns of entrepreneurship for men and women. Under-reporting and noisy measures of asset values and revenues are a frequent outcome when surveying micro-firms without formal accounting systems. Both the ENAMIN and the ECINF survey contain detailed questions on business revenues and expenses. ENAMIN also includes a self-reported measure of earnings given by the entrepreneurs' answer to the question "how much do you obtain as earnings after deducting expenses?". McKenzie and Woodruff (2006) show that the correlation between self-reported earnings and profit measures derived from questions on sales and expenses is approximately 0.8 in ENAMIN. Other studies on similar data have found lower levels of correlation, around 0.2/0.3. According to experimental analysis in de Mel et al. (2009), the simple question on earnings provides a more accurate measure of firm profits than detailed questions on revenues and expenses. Self-reported earnings do however provide downward biased estimates of true profit levels, and it is not clear whether under-reporting is more relevant for women or for men.

Mixed surveys are a cost-effective option for collecting information on both entrepreneurs and their business within an established survey frame (see also ADB, 2011 for an overview of mixed surveys on informal employment). This approach has been extensively tested for surveying micro and informal businesses. Both the questionnaires and the sampling design have been adapted to the need of producing representative and meaningful data for this particular population. The possibility of extending this approach to collect information on a wider population of business owners needs to be further investigated.

Surveys of entrepreneurial attitudes and activities

A third and last typology of population-data that is relevant for EDGE is represented by surveys on entrepreneurship coordinated by research consortia or private research companies. These surveys are generally based on randomized telephone interviews, and collect detailed information on entrepreneurial

⁵ In the Brazilian survey, the sampling was done in two stages: in each state the primary sampling units (census tracts) were stratified geographically in three strata (capital, other census tracts in the capital metropolitan area and remaining census tracts). In a second step, the primary sampling units were stratified according to levels of income within the geographical stratum. Census tracts were then randomly selected with a probability proportional to the number of households in the sector. From each selected census tract a total of 16 households was then randomly selected for interviews.

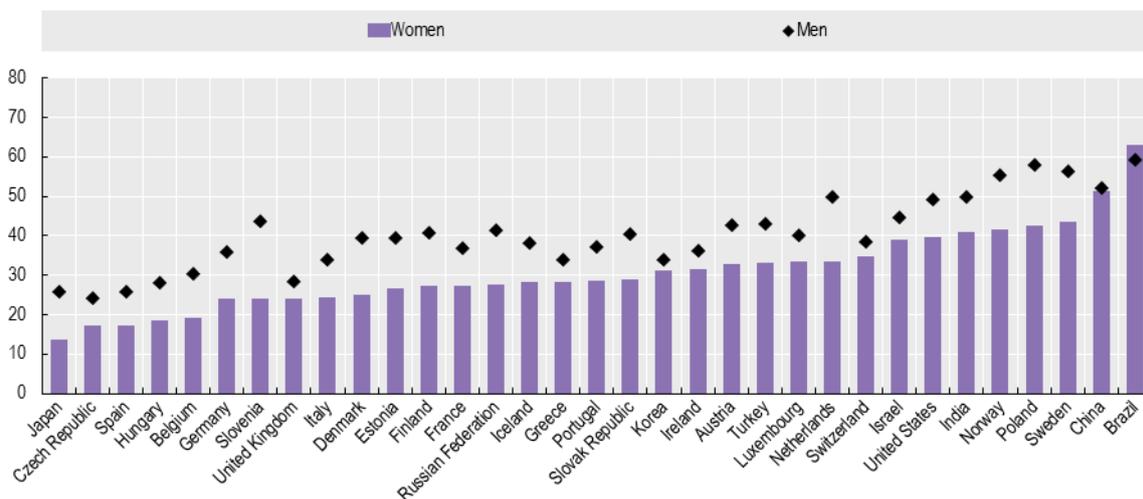
attitudes of the general population, as well as on activities and aspirations of entrepreneurs. The two best known examples are the Global Entrepreneurship Monitor (GEM) and the Flash Eurobarometer Survey on Entrepreneurship.

The Global Entrepreneurship Monitor (GEM) is one of the most cited sources of entrepreneurship data. The GEM consortium regularly produces reports on gender differences in entrepreneurship (GEM 2013). The survey currently covers around 70 developing, emerging and developed economies. The target sample is 2,000 adult individuals, even if some GEM national teams engage in larger data collections. Information collected via the survey is complemented with expert assessments on entrepreneurial framework conditions.

The Eurobarometer is regularly conducted by private contractors on behalf of the European Commission’s Enterprise Directorate-General. The last round of the survey in 2012 covered 40 countries: the EU27, Brazil, China, Croatia, Iceland, India, Israel, Japan, Korea, Norway, the Russian Federation, Switzerland, Turkey and the United States. The size of the target sample was of 1000 individuals in each country.

Both surveys are a relevant source of contextual information on determinants of gender differences in entrepreneurship, providing information on hard-to-measure topics such as subjective perceptions on the feasibility of entrepreneurship and risk tolerance, cultural attitudes towards entrepreneurship and availability of formal and informal support institutions. For example, the Eurobarometer data for 2012 show clearly that women see business ownership as a less feasible career option than men (figure 4), either because they have a higher perception of the risks associated with entrepreneurship, feel they lack the financing capacity or are concerned about difficulties in reconciling family and work commitments as entrepreneurs. The GEM data documented that for women, more than for men, the choice to start a business is often linked to necessity (Minniti, 2009, Brush et al. 2011)

Figure 4. Feasibility of self-employment by gender, 2012



Note: Feasibility of self-employment indicates the percentage of individuals aged 15 or more declaring that, regardless of preferences, it would be feasible for them to become self-employed within the next five years.

Source: Entrepreneurship at a Glance 2013, OECD (2013b), based on Flash Eurobarometer on Entrepreneurship data

These data have been mainly produced for supporting policy and academic analysis of entrepreneurship. Assessing the statistical reliability of these data for international data compilations is outside the scope of

this paper⁶. It is more useful to emphasize here the relevance of the GEM and Eurobarometer's questionnaires as possible models for a new survey module on entrepreneurship. Particularly in the GEM case, extensive testing and revision have resulted in a very clear formulation and highly efficient sequencing of the questions. The questionnaire also proved to be a robust instrument to collect consistent information in very different contexts and cultures.

4. Using survey data at the level of the firm

Firm-level data are more suited than population surveys to the analysis of differences in the performance of firms owned and controlled by women and men. Many different firm-level surveys document firm heterogeneity in productivity, access and use of credit, innovation, export and participation in value chains. However, very few of these surveys collect information on the owners.

Differently from labour force surveys, there is no common international framework that orients the design of business surveys. Comparability of existing data is made difficult by *i*) the fact they refer to different populations of enterprises (often focusing on SMEs but with different size thresholds for inclusion in the sample), *ii*) the fact they tend to focus on particular categories of enterprises (start-ups/recently created enterprises, firms in high-technology industries).

The extension of official firm-level data for the production of gender-sensitive indicators is thus challenging. Outside the boundary of official statistics, the Enterprise Surveys of the World Bank represent the most promising framework for the collection of firm-level data on characteristics and performance of women and men-owned businesses at the global level.

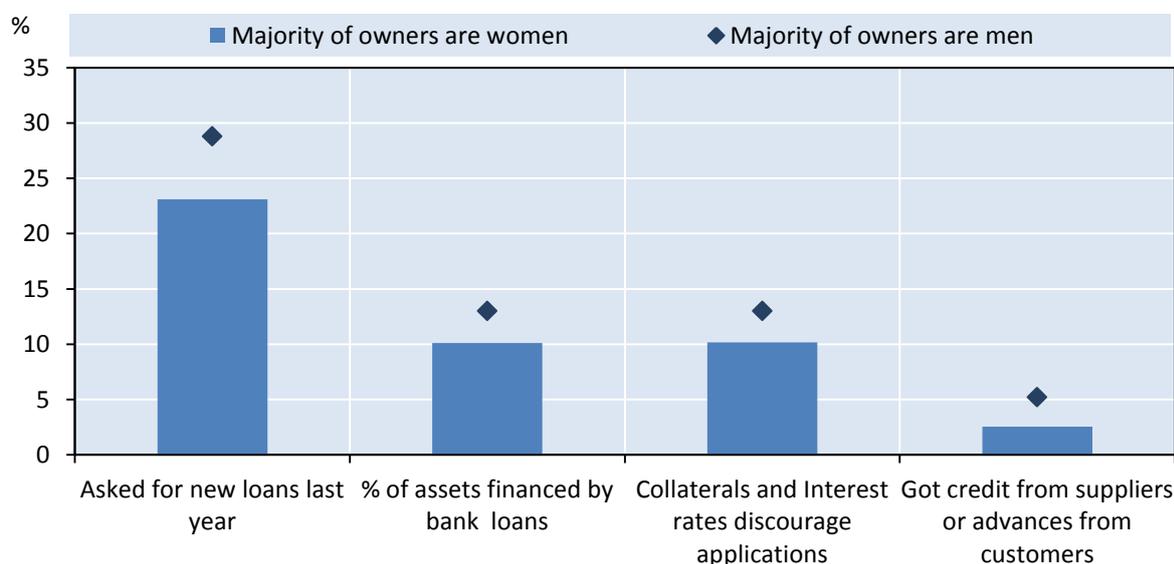
A first attractive feature of the Enterprise Surveys is their coverage. The programme started to collect firm-level information since 2002, and now covers over 130,000 companies in 135 economies. Moreover, the Surveys allow comparing firms across several performance measures. The questionnaire includes detailed modules on access to finance, workforce composition and costs, bribery and vulnerability to crime, relations with government, innovation investments, and other areas. An important caveat is that the sample is restricted to firms with five or more employees, and so excludes the size class of firms where female ownership and management is more prevalent. The World Bank is however managing surveys collecting information on micro and informal firms in several countries. Moreover, the sample is based on samples of firms in key industrial centres in a country, so it is not possible to compare enterprises in urban and rural areas.

One important issue related to the use of the Enterprise Surveys data is the classification of enterprises by gender. In the core questionnaire used for the majority of the countries in the current sample, the Enterprise Surveys identify firms 'with female participation in ownership', from the question: 'are any of the owners female?'. 'Female participation in ownership' does not necessarily imply that women have control over management decisions. Firms with some female ownership include in fact family-owned firms, where women might have only marginal decision-making power. Aterido and Hallward Driemeier (2011) convincingly show that the criterion used to classify enterprises is very important for analysis of gender differences. Using Enterprise Survey data for six Sub-Saharan countries with an additional gender module, they find that 'female participation in ownership' is not associated with productivity gaps, but whether the decision-makers are female is.

⁶ The main issues are related to the small size and representativeness of the national samples, questioning the suitability of using these data for monitoring country-level changes in entrepreneurial activity. See Ardagna and Lusardi (2010) for an analysis of reliability of the GEM data, also in comparison with the Eurobarometer data.

Different survey questions have been experimented in the World Bank’s surveys to complement the information on female participation in ownership with more direct information on the gender distribution of decision-making power. The first option simply asks the primary respondent about the total number of owners, and whether the majority of these owners are female. This option might still yield biased results, in those cases where women represent the majority of part-owners but decision-making is concentrated in one single owner (a male). Figure 5 shows gender differences in use of external credit, for a subset of surveys where it is possible to define women and men-owned firms according to the gender of the majority of owners. A second option includes questions about the gender of the ‘largest owner’ (identified as the person most active in the operation of the firm) and on whether this largest owner is also the main decision maker. Women(men)-owned firms can then be identified as those firms where the largest owner with decision-making authority is a female (a male)⁷. The Enterprise surveys’ questionnaires have been recently modified to include a question on the percentage of female ownership: this innovation is likely to increase the usefulness of the future rounds of Enterprise Surveys for gender analysis.

Figure 5. Difference in credit use by gender of the majority of the owners, Sub-Saharan Africa (18 countries, 2009-2011)



Note: OECD calculations based on World Bank Enterprise Surveys and World Bank Indicator Surveys; pooled data for registered firms in African countries. The selection of countries is restricted to those 18 sub-Saharan countries whose Enterprise surveys include detailed information on the gender of multiple owners. Enterprises are defined as women (men)-owned if the majority of the owners are female (male). See OECD (2012b).

A few OECD countries have regular survey programs that allow firm-level analysis of gender differences in ownership. A key model is the Survey of Business Owners in the United States (SBO). The SBO has been conducted every five years since 1982 by the US Census Bureau (the last available data refer to 2007 and a new survey is scheduled for 2014). Its universe comprises all the operating firms with receipt of USD

⁷ The first type of classification of women and men-owned enterprises (share of owners who are female) is possible using a set of Enterprise Surveys (the Indicators Survey) that have been recently run in different Sub-Saharan countries (see figure 5). The second option (gender of primary owner and decision maker) has been experimented for the questionnaire of the ‘Informal Surveys’, an extension of the standard surveys collecting data on non-registered businesses and their owners.

1000 or more that filed tax forms as individual proprietorship, partnership or any type of corporation⁸. The survey thus covers both firms with paid and firms without paid employees. In 2007, the SBO sample comprised 2.3 million businesses, of which approximately 62 % provided complete answers to the questionnaire.

This repeated, cross-sectional survey is a unique tool for monitoring the contribution of women-owned businesses to employment and value creation. Using SBO data for the decade 1997-2007, Coleman and Robb (2012) show that the number of women-owned firms in the United States increased at a faster pace (44%) than the overall number of firms (30%). However, women-owned firms increased their revenues by 46% over the period, compared to an average of 68%: this provides clear evidence that the firms created by women tend to be smaller than the firms created by men.

Women, men and mixed owned enterprises in the SBO are identified through a simple and solid methodology. The questionnaire asks for the percentage of ownership, position title in the firm, gender and other characteristics for up to four persons owning the largest percentages of the business. A firm is then classified as women-owned if one or more women own more than 50% of the business. Information on personal characteristics of the owners is not collected if the business belongs to a group and another company or organization own more than 50% of the stock and equity.

Unique features of the SBO's questionnaire are also worth mentioning. The questionnaire includes information on business inheritance, business ownership among family members, and owner's experience in working for a family business. This allows studying the role of family-factors behind the entrepreneurial decisions (possibly differentiating "exploiters" of existing activities from "creators" of a new business). The questions on the characteristics of the main four owners are also important for identifying whether it is gender, or rather other individual characteristics correlated with gender (e.g. type of education, experience in management), that matter in explaining the gender gaps.

The SINE survey ("New Enterprises Information System") in France is another relevant model of official survey on enterprises that can be disaggregated by gender. The French Statistical Institute (INSEE) surveys a sample of entrepreneurs from businesses in the French business register at the date of the creation of the firm, and three and five years after the creation. Different panels of young firms (created in 1994, 1998, 2002, 2006 and 2010) in SINE populate an on-going system monitoring changes in the characteristics of entrepreneurs and in the 'business environment' they operate in. Entrepreneurs are defined as the founders and main managers of the firm. This system and its coverage can be adjusted over time to respond to new policy demand. For example, the new legal regime of the 'auto-entrepreneur' has stimulated new creations by reducing red-tape and invoicing costs for very small businesses. The last cohort of SINE in 2010 has been extended to obtain specific information on the fast-growing population of auto-entrepreneurs, surveying 40 thousands of them.

The SINE's questionnaire combines objective information on the enterprise's activity, employees' structure and changes, main customers, internationalisation and innovation outputs with a more subjective screening of the entrepreneur's conditions at start, perceived difficulties and development prospects. The survey also provides policy-relevant information on the use of training and advice services at the start-up and in the development phase. A key strength and uniqueness of the SINE surveys is their longitudinal design. Using SINE data referring to enterprises born in 2006, it is possible to observe that the survival rates of newly created women and men enterprises are highly dependent on the experience in the business activity of the founder before the start-up (OECD 2012a). The data can also be used to analyse

⁸ The sampling strategy takes into account estimated probabilities that businesses are minority or women-owned. These estimates are based on the combination of different secondary data sources and techniques (e.g. analysis of word strings in the company name indicating possible minority ownership).

heterogeneities within the group of women entrepreneurs. SINE data from the 2006 cohort suggest, for example, that enterprises founded by immigrant women have significantly lower survival rates than enterprises founded by native-born women.

The ‘Eurostat Factor of Business Success (FOBS)’ survey shows that the SINE model can be adapted to international data collections. FOBS was implemented in 2006 as a stand-alone survey by 16 European countries under the coordination of Eurostat. As SINE, it focuses on young enterprises. The population surveyed was enterprises born in 2002, that had survived to 2005, and that were still managed by their founders at the time of the survey. The survey shows that, across European countries, enterprises founded by men tend to be relatively more involved in export activities, with the exception of enterprises founded in Italy, Portugal and Sweden. The gender gap in innovation activity of young firms is particularly evident for process innovation, defined as the introduction of a significant change in production and delivery methods. Differences between enterprises run by men and by women are less marked when looking at innovation in organisational methods and marketing practices, two forms of innovation that are less capital intensive (OECD, 2012a).

Differently from the SBO, the SINE and FOBS questionnaires are not explicitly designed to produce tabulations of women and men-owned firms. Information is collected for one single respondent, and not on the complete founding or management team. This issue is generally less problematic in surveys of young firms, as young firms tend to have less complex ownership and management structures. Other surveys of young firms collect information on more than one owner or founding partner. The Kauffman Firm Survey (KFS), for example, include information on up to ten owners’ personal characteristics and equity shares⁹. Men and women-owned firms can be then identified on the basis of the gender of the owner with the larger equity share (Coleman and Robb, 2009) or, as in the SBO, looking at which gender holds the majority of the shares.

Summary information for three model surveys presented in this paragraph is presented in table 1.

Table 1. Definitions, coverage and questionnaires of firm-level surveys with information on owners

Survey	Definition of men and women-owned enterprises	Population	Characteristics of the owners	Firm characteristics	Longitudinal design
World Bank Enterprise Surveys	Based on female participation in ownership, from survey question: ‘are any of the owners female?’.	Firms with five or more employees. Survey conducted by private contractors, with stratified random sampling on a sample frame derived from an official register or from private sources. The stratification is by firm size, business sector, and geographic region	No specific module on owner’s characteristics beside gender.	Detailed information on industry, employment and turnover. Set of thematic survey modules on: a) access to infrastructure and services, b) Sales and supplies (including imports and exports), c) number of competitors and	No, with exceptions for some countries.

⁹ The Kauffman Firm Survey (KFS) is a longitudinal survey of new businesses in the United States. It collects information on 4,928 firms that started in 2004 and surveys them annually. The longitudinal design of the survey allows looking at whether there is any change in the ownership structure by gender over time. A similar, longitudinal surveys of new firms with information on owners is the KfW/ZEW start-up survey in Germany. Both surveys oversample enterprises in high-technology sectors.

		Sample size between 150 and 2000 firms according to country size.		innovation activities, d) hours of operation and use of production capacity e) land ownership and access, f) exposure to crime, g) access and use of finance, h) access and use of business services.	
Survey of Business Owners (United States)	Data collected on the ownership shares of up to four persons. Gender of ownership defined according to the gender of person or persons who own 51 percent or more of interest or stock.	All the operating firms (consisting of one or more establishments) with receipt of USD 1000 or more that filed tax forms. The universe is stratified by state, industry, frame, and whether the company had paid employees.	Questions on gender, age, ethnicity, race, modalities of acquisition of the business, business functions, previous employment, hours worked business ownership among family members (not in all rounds).	Information on start-up date, sales, profits, employment, industry, source of capital used for start-up and capital improvements, exports and operations outside the US, use of e-commerce.	No, but data can be linked to administrative records
Information System on New Enterprises (SINE, France)	Possible on the basis of the gender of the respondent, who is the person 'responsible' for the enterprise at the time of the interview.	The samples are selected from the business start-ups recorded in the French SIRENE register, stratified on the basis of region, business sector and employment. Five generations of start-ups have been surveyed in 1994, 1998, 2002, 2006, 2010. sample of approximately 30,000 to 50,000 business start-ups.	Questions on gender, nationality, civil status and presence of children, education, previous start-up experience and work in the same sector of the founded enterprise, motivations for start-up and development expectations.	Management structure (sole-management, couple or partnership), source and amount of capital used for start-up, industry, region, number of paid and unpaid employees.	Yes, follow-up surveys three and five years after the creation

5. Using business registers and economic censuses for gender indicators

Business registers and economic censuses are the primary source of structural information on the population of businesses. They have so far rarely used for gender indicators, as their focus population are firms or establishments, not the individuals who own or manage them. The incorporation of basic ownership information in business registers would generate a sustainable information base to monitor the level and economic value of women's participation in entrepreneurship. Once the information to link business units with physical persons is developed, the production of statistics is less costly than a representative firm survey. Such incorporation of information on owners in business register is however very difficult in many countries¹⁰.

¹⁰ Countries using economic censuses instead of registers can generally monitor changes over five years in the number, size, industry, employment and financial variables for establishments owned by men and by

Practical issues limit the current use of business registers for international data on gender and entrepreneurship. First, business registers do not exist or are still in a development phase in many countries. Second, the development of ownership information requires a linking with administrative data on individuals such as tax registers: this linkage can be impossible if the registers (and their underlying data) do not share any common identifier with the data on individuals. Third, also when the linkage between administrative data on individuals and on businesses is possible, the linking procedure often requires extensive data processing work. There is thus a sunk cost in the construction of this information, and statistical offices might lack the resources for investing in a linked data infrastructure.

Countries in Northern Europe have well consolidated systems of linked registers and use these administrative data for both social and business statistics. Exercises in linking business and individual registers have also been undertaken in Austria, Italy, New Zealand, Portugal, Spain and the United States. The Italian Statistical Institute (ISTAT) recently moved to a Business Census exclusively based on data from administrative sources. In this new virtual census, all persons registered by an administrative source (social security, tax data) are linked to the business register unit in which they work as employees and/or of which they hold an ownership share. This system can be now used by ISTAT to produce comprehensive statistics on women entrepreneurs and on women in business. The structure also provides instruments to analyse the relationship between business performance and workforce compositions, monitor workers flow statistics within and among enterprises, understand the evolution of jobs (transition from employees, employers, outworkers, etc.), study the demographic characteristics of self-employed persons, etc. (Garofalo et. al. 2012)

On the methodological side, the substantive issue is again the definition of women and men-owned firms. The identification is straightforward when there is only one registered owner of the enterprise¹¹. When there is more than one owner, the gender classification of the enterprises requires additional information on the distribution of ownership between the different individuals participating in the business. If no direct information on distribution of shares is available and the individual data come from tax registers, a possible alternative is to infer the distribution of ownership from declared business revenues. Pilot tests on linked tax and business register data in the United States shows that such procedure is feasible. When detailed data on the individuals' jobs are available, more sophisticated methodologies can be applied to rank female and male shareholders according to their role in the enterprises and decision-making power (see box 1 on the Swedish experience).

Box 1. The Identification of women business leaders in the Swedish linked register

Statistics Sweden recently developed the 'Entrepreneurship Database' to produce new evidence on entrepreneurs and business leaders from a gender perspective. An algorithm based on a hierarchical decision-making procedure was used to identify the 'operational leader' of each business unit in the register. The operational leader is defined as *the person who runs the enterprise on a day-to-day basis*. A points function has been constructed based

women. There are only limited examples of gender disaggregated data from economic censuses. The availability of information on owners in the censuses is no guarantee that this information is actually processed and made available.

¹¹ There might be gender-sensitive measurement issues also in this simple case, as businesses with one registered owner are in reality often owned and managed by couples, and there might be tax-related incentives influencing which of the two partners register the business.

on the functions/positions of the individuals in the enterprises: for example, an individual receives 1 000 000 points if he is the president/managing director according to the Companies Registration Office, 400 points if he/she is a board member, 0 point if he/she is an employee. The person with the highest points in each company is the company's operational leader.

The Database shows that more than a quarter of enterprises (27.4 percent) in the Swedish business sector were run by women (i.e. a woman was the operational business leader) in 2010. Since 2004, the number of women running enterprises has risen by 6.6 percent. In the health and care industry, 59 out of 100 enterprises were run by women while the corresponding number for construction-related enterprises was just 3 out of 100. Enterprises run by women generally had fewer employees and a larger percentage of female employees. A higher proportion of women business leaders had a post-secondary education compared to men. The turnover rate among operational business leaders was relatively low. The probability of a man succeeding a man was almost 71 percent higher than a woman succeeding a woman.

Source: Andersson and Andersson (2013)

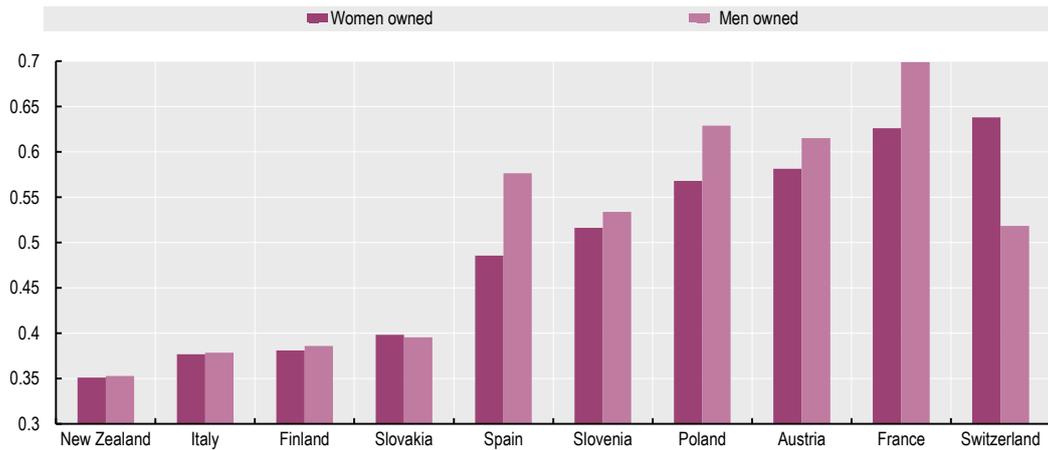
The OECD recently piloted a collection of data on women and men-owned enterprises from business registers and economic censuses. The project is part of a broader activity on entrepreneurship data development – the OECD/Eurostat Entrepreneurship Indicators Programme (EIP). Given the complexity of defining women and men-owned enterprises for companies with complex legal forms, the pilot data collection is restricted to sole-proprietor enterprises. The data linkage is generally easier for sole-proprietorship, since the business is not legally separate from the sole proprietor. Statistics disaggregated by gender of the sole-proprietor, business size and sector have been collected for the following indicators: 1) number; 2) number of persons employed; 3) turnover; 4) birth rates; 5) death rates; 6) three-year survival rates; and 7) employment growth in surviving enterprises. The indicators 1 to 3 have been produced for sole-proprietorships from economic censuses in Mexico and Japan, while the indicators 4 to 7 require the longitudinal structure of business registers. Consistently with the other EIP data collections, the indicators are calculated for employer enterprises, i.e. sole-proprietor enterprises with at least one employee.

The indicators obtained from this data collection are based on the methodologies and definitions of the OECD/Eurostat manual on business demography statistics. This international harmonization increases comparability of the estimates of demographic events¹². For the countries included in the data collection, the birth rate of female-owned sole-proprietorships is higher than that of male-owned ones; in other words, the number of female-owned enterprises with one proprietor is growing at a faster pace than the number of male-owned ones (OECD, 2012a). A key strength of business register data is the possibility of building 'dynamic' indicators, comparing the performance of women and men-owned enterprises over time. For example, figure 6 shows gender disaggregated data on the survival rate three years after birth and on employment growth over the first three years of activity. In most countries, there is not a marked gap between women and men-owned enterprises according to these two indicators of performance.

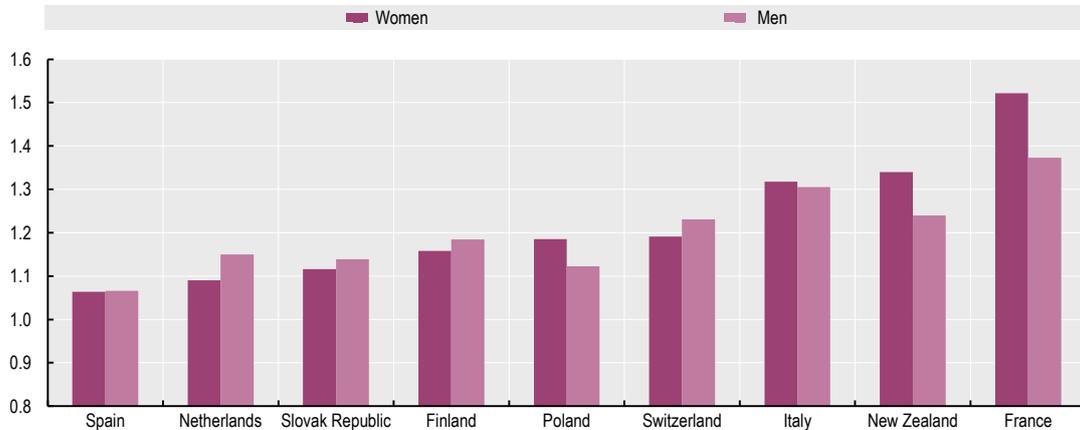
¹² The international comparability of these indicators crucially depends on the consistency of the definition of "sole-proprietorship" across countries. In some countries sole-proprietorship is a general term covering all the businesses owned by one individual, while in other countries (e.g. in the United States) sole-proprietorship is a specific legal status associated to enterprises with unlimited personal liability and subjected to a particular tax regime. If there are specific incentives to register one's enterprise as a sole-proprietorship, and these incentives vary across countries, then international comparability might be hampered.

Figure 1. OECD business demography indicators by gender of sole-proprietor, 2009

Panel A) Three-year survival rates



Panel B) Three-year employment growth rates



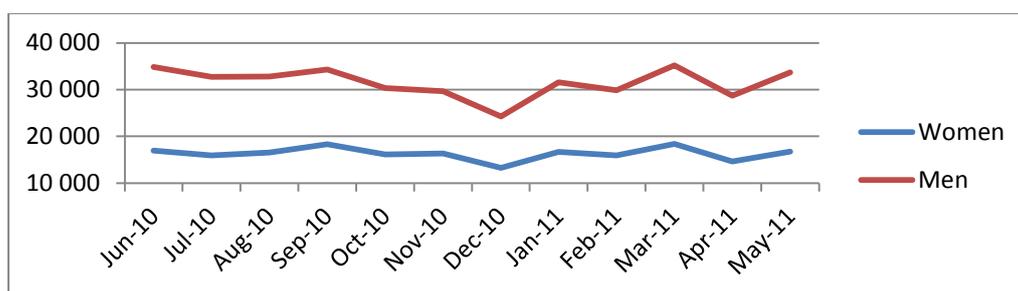
Note: The *three-year survival rate* for a reference year t is calculated as the number of women (men) enterprises having survived up to t as a percentage of all women (men) enterprises that reported at least one employee for the first time in year $t-3$. The *three-year employment growth rate* corresponds to the number of persons employed in surviving women (men)-owned enterprises in the reference year t divided by the number of persons employed in the year of birth $t-3$ of those same women (men) enterprises that have survived to t .

Source: Entrepreneurship at Glance 2012, OECD(2012a), based on tabulations provided by National Statistical Offices.

The development of linked administrative registers is desirable also in countries with less advanced statistical systems, but will not happen in the short term. For the purposes of producing gender indicators with large country coverage, it is important to assess the possible use of administrative data from other sources than business registers. This might require considering indicators that are simpler than those included in standard business demography, but for which data are more readily available. For example,

several statistical offices and other agencies publish data on business registrations, and these records are in some cases disaggregated by gender. Registrations only approximate genuine enterprise creations: the timing of the registration often does not coincide with the start of production activities, and businesses can be cancelled and re-registered without changes in the factors of production. Notwithstanding these issues, international data on business registrations by gender would represent a relevant step-forward for monitoring women's entrepreneurship. Figure 7 shows monthly data on registrations by gender in Germany: men register around twice the number of businesses than women, and the decline in registrations around the end of 2010 has been higher for men than for women. Bankruptcy filings might be also possibly disaggregated by gender (Dobbie and Song, 2013).

Figure 7. Monthly data on new business registrations by gender, Germany



Source: Statistisches Bundesamt-Gewerbeanzeigen.

Chambers of commerce often hold data repositories with extensive coverage of registered businesses. These data have been used to produce indicators of gender differences in business ownership. For example, the Italian Chamber of Commerce has regularly released data on the number, industry distribution and employment of businesses owned by women. These data show that in 2012, women controlled about a quarter of all companies – more than 1.4 million¹³. Finally, commercial data providers have assembled large inventories of firm-level data with detailed information on management and ownership for many countries¹⁴. The use of these commercial data for international statistics is problematic; however, these data show the increasing availability of micro-data repositories that are still under-exploited for gender analysis.

6. Conclusions

Gender-sensitive statistics on entrepreneurship are still under-developed. Given the relevance of entrepreneurship as a driver of development and of women empowerment, it is worth exploring ways to better use existing data or to sustainably produce new data on women's contribution to business creation, gender-specific obstacles in the start and management of enterprises, and gender-gaps in performance or returns from entrepreneurship.

¹³ Data are tabulated by degree of female participation in ownership and management: for partnerships, the firm is 'prevaingly' or 'strongly' female-run if women are respectively more than 50% or more than 60% of the partners. Corporations are prevaingly (strongly) controlled by women if women holds more than 50% (66%) of the share. In other legal forms, the number of women in the board of directors is considered.

¹⁴ OECD analysis on the ORBIS database shows that women-owned businesses enterprises owned by women are 5 to 30% less productive (have lower value-added per employee) than enterprises owned by men (OECD 2012a). This productivity gap is mostly explained by the fact that women-owned companies have less capital, fewer employees, and are underrepresented in high-turnover sectors with respect to companies owned by men.

The definitions used and the identification of the type of data sources for the EDGE data collection should be consistent with the current policy demands and targets. For example, the exclusion of business owners without employees can help the statistical identification of entrepreneurs, by reducing the likelihood of counting in the non-entrepreneurial self-employed workers. However, the majority of programs for women's entrepreneurship target small businesses, and have an explicit interest in those women who start with little resources and are not able to employ anyone during the first years of activity.

Policy-makers recently started to diversify their support schemes for women entrepreneurs, giving more weight to policy measures stimulating the performance and growth potential of women-run enterprises (e.g. research and innovation grants with gender participation targets). This shift reflects the recognition that the policy agenda for women's entrepreneurship is not just about increasing the number of women-owned firms, but also about levelling gender gaps in investments, access to high-value-added industries, innovation and growth (Hallward Driemeier, 2013; Piacentini, 2013). Other metrics besides static measures of women's participation in entrepreneurship are thus needed to quantify gender gaps in a way that is relevant and meaningful for policy.

The limitations of existing data and of available resources make a strong case for the selection of a parsimonious set of indicators and the use of cost-efficient data collection methods. Research and policy experience suggest some possible priority areas for indicator development. Gender differences in access and use of finance is one key issue affecting both women's likelihood of starting a venture and the growth of women-owned businesses. Gender differences in financing strategies are not easy to measure: a rich literature has documented the complexity of disentangling demand-side and supply-side factors behind the lower use of external credit by women (Coleman and Robb 2009 and 2012; Hallward Driemeier, 2013). Other emerging areas for measurement include: a) gender differences in internationalization and participation in global value chains; b) gender gaps in innovation investments and outcomes (for both tangible and intangible forms of innovation), c) the quality of human capital and management experience of start-up founders, d) availability and type of social network support, e) gender differences in use and evaluation of public support services, f) the impact of women's entrepreneurship on social mobility and poverty reduction.

This note has discussed the relative advantages of population-based and firm-level data collections. Given that household surveys are regularly undertaken in most countries, the inclusion of a supplementary module in population-based surveys seems a viable option. The additional questions can be asked to the subset of primary respondents who currently own or have recently owned a business, with limited increases in the surveys' costs and respondent burden.

Firm-level data collections with questions on owners and managers are attractive since most business surveys include detailed information on accounts, employment structure, customers, financing and innovation. However, developing firm-level indicators with global coverage is more challenging within the EDGE timeframe, given the limited harmonization of on-going surveys of firms (with the exception of the World Bank's Enterprise Surveys). Pilots of survey questions on distribution of ownership and decision-making power might help build capacity for a more systematic inclusion of owner's characteristics in firm-level data collections. Information sharing and international collaborations on data-linking methods might also lead to greater use of business registers for the collection of data on entrepreneurs.

The data gap on women and entrepreneurship might also be addressed through a hybrid strategy, combining different data sources. For example, administrative data on the number and sector of businesses registered by women and men can provide a first level of information on gender differences in start-up rates. Dedicated modules in household and firm-level surveys might then be used, at regular intervals, to produce finer information on functional differences of enterprises owned by women and by men, as well as on human capital, demographic characteristics, motivations and goals of entrepreneurs.

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