26th Meeting of the Wiesbaden Group on Business Registers

Neuchâtel, 24 – 27 September 2018

Session N.3 - Integrated Statistical Register Systems

P. Cella, C. Viviano, ISTAT, Italy

The profile of entrepreneurs in international trade businesses

Abstract

The recent experience resulting from a European project ("BDTEC") has led to the development of an integrated database allowing the identification of different types of enterprises and the production of statistical indicators related to TEC (Trade by Enterprises Characteristics), BD/EIP (Business Demography and Entrepreneurship indicator program), SBR (Statistical Business Register) and SBS (Structural Business Statistics) topics. Moreover, the availability of a consolidated informative data structure for self-employment and entrepreneur built upon the Linked Employer–Employee Database (LEED), allows the integration of additional information useful to describe socio-demographics characteristics of people involved in decisional processes (entrepreneurs) driving internationalized firms.

The resulting set of integrated data can be used to study the features of the entrepreneurial profile together with its company performance in terms of growth, job creation and productivity. Moreover, it is possible to analyze how the ethnic composition of the labor force affects the business internationalization strategy, as well as the presence of immigrant entrepreneurs has any positive effect on the access to the import/export trade from/to the country of birth.

This paper describes some results obtained by applying a multidimensional analysis carried out in order to delineate different profiles of traders taking into consideration the combination of countries import/export combined with the country of birth of the entrepreneur and/or the composition of workers.

Three clusters can be identified: 1) Domestic companies that export, no foreigners (neither entrepreneurs nor workers); 2) Companies that export, at least one foreign entrepreneur (calculation of the composition between foreigners and Italians, composition by country, calculation of the compositions of foreign / Italian workers); 3) Companies that export, all entrepreneurs are Italians, workers at least one foreigner.

For each type of cluster both the characteristics of the entrepreneur in terms of age, sex and education, and the characteristics of the enterprise in terms of growth and performance are analyzed.

Keywords: Trade, entrepreneurs, business demography

Introduction

Demands for business statistics on specific topics is constantly growing. Different users, from policy makers to researchers, are in search of more and more detailed and comparable information at national and international level especially in a society influenced by globalization. At the same time producers of official statistical information like NSIs are under pressure to reduce the data collection costs and response burden. A register-based approach is the suggested way to partially overcome this problem and provide more information at less cost.

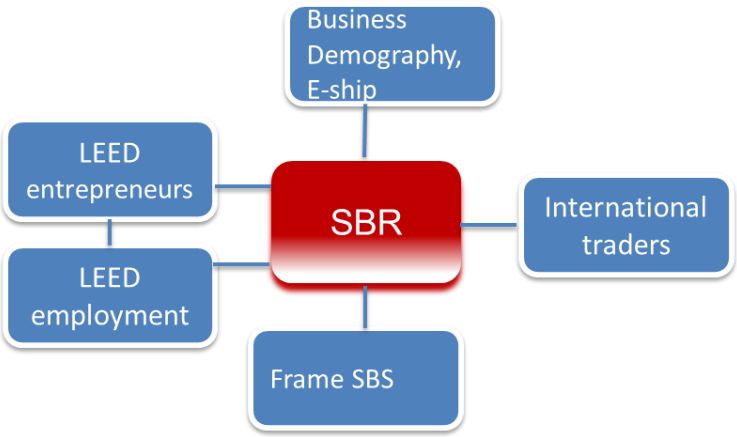
In Istat many steps forwards have been done in recent years, in order to establish a system overcoming a stovepipe organization model, fully supporting the statistical production processes both for social and economic statistics. The new Integrated System of Registers (SIR) corresponds to the development of a "multiple" approach in data collection that necessarily have to take into account heterogeneity and variability, even in time, of the sources used for the production of statistical information. This system fosters

the increase of available information and the possibility of making use of a proper 'reading' able to interpret the connections between phenomena, i.e. issues that are at the same time economic and social, or that can be seen from two different perspectives, like work demand and supply. In such a unitary logical and functional environment consistency is ensured by SIM (Integrated System of Microdata) having the aim to support statistical production processes in the identification and estimation of the integrated set of units. The acquired administrative sources are integrated and unique identification codes are attributed to: individuals and economic units; places; relationships between individuals and units.
Having this system, the Statistical Business Register (SBR) is asked to provide a stronger role both in producing direct information (economic output), mainly on the structure and dynamics (demography) of a population of units, and in supporting integration of other administrative and statistical data sources for enriching and producing additional information.
This paper suggests the potential for analysis deriving from the integration of multiple sources by delineating profiles of entrepreneurs, type of firms and type of peoples, with reference to specific subpopulations such as the one involved in international trade and the high-growth enterprises.
A synthetic description of the different databases currently produced by different statistical domains using administrative and statistical sources is provided in section 1. Starting from those microdata a very detailed integrated structure (BDTEC) allows the identification of different types of enterprises, entrepreneurial profiles and the production of statistical indicators related to TEC (Trade by Enterprises Characteristics), BD/EIP (Business Demography and Entrepreneurship indicator program), SBR (Statistical Business Register) and SBS (Structural Business Statistics). In section 2 some results are analyzed at enterprise level, looking at the international trade statistics combined with business demography and business statistics data. Section 3 is dedicated to describe two different sets of profiles of entrepreneurs: firstly the population of traders (exporters firms) is analyzed in terms of types of firms and type of peoples engaged as owners or as employees with a focus on their country of origin; three groups are identified. Secondly it is investigated the socio-demographic characteristics of entrepreneurs performing high-growth firms in terms of their nationality, age, gender, education. A final concluding section resumes the main potentialities of such an integrated set of information in different field of analyses.

1. Multiple sources of information on enterprises and peoples

In Istat many integrated databases have already been created by the different statistical domains to support and complete their statistical production. The availability and integration of many administrative sources and their use for statistical purposes produced "satellite" registers that cover specific target populations. The coherence of the system is then assured by the SBR and its central role in linking and connecting units (Figure 1).

Figure 1 – The system of linked registers



The system of integrated information is set up by the following registers:

Frame-SBS: is the information system to generate Structural Business Statistics (SBS) data, for the production of key economic accounts statistics based on the massive, integrated use of administrative data, complemented by survey data for the estimation of the remaining economic accounts statistics. It has the function to reduce burden and costs of a statistical production process or a consistent set of processes. For each unit of the specific population of enterprises, Frame-SBS extends the information with individual data relating to the income statement by identifying the values of certain core variables. The census nature of the information included in the Frame-SBS allows the association of the main statistical variables of the income statement to each unit. The statistical result is derived by the sum. It is produced since 2012. As the SBR produces the final frame used by the SBS survey, the statistical units are perfectly aligned and identically identified; the link between SBR and Frame-SBS is done at micro-level by using the SBR identification code in a deterministic way. Among their relevant variables NACE code is used for the breakdown, while Number of enterprises, Number of Employees, Number of Persons Employed, Turnover and Purchases of goods and services as variables themselves.

International Trade Register: is a statistical register whose main purpose is to monitor the trading activities of the Italian enterprises. It contains intra and extra-EU trade micro-data. It registers information like export and import values (in euro), origin and destination of the trading transactions (trade partner country), content (products) of the trading transaction. The main variables are: export value and import value both used to classify the enterprise as exporter/non-exporter, exporter only / importer only or two-way trader/non-trader /occasional trader, and as variables themselves (export values and import values).

On a regularly base international trade statistics (COE) are integrated with the Statistical Business Register data (ASIA); such an integration allows to produce TEC statistics i.e. trade in goods statistics by enterprise characteristics. In such a manner trade flows can be associated to specific businesses structural characteristics like economic activity, legal status, size, location and the share of trade with a certain partner country as well as the amount of their trade value can be calculated. As the statistical unit for TEC is the enterprise, the linkage between the SBR and the intra- and extra-EU trade operators is not straightforward: VAT numbers used by traders who have to report for trade transactions need to be recognized first as legal units and then linked with the enterprise. Linkage results may not always provide expected outcomes due to intra-annual demographic changes or recent data not yet included in the SBR.

BD/EIP: on annual basis business demography data are produced directly from the SBR with the aim to disseminate business demography and entrepreneurship indicators. The produced database registers information like high-growth enterprises, survival information, birth and death dates.

LEED-Employment: the link between businesses with people (owners, self-employed, employees) done at microdata level allows to analyze the structure of firms on the one hand, and the profiles of entrepreneurs or workers on the other. In Italy since 2010 an exhaustive Linked Employer–Employee Database (LEED), exclusively based on data from administrative sources, has been realized in order to revise, produce and enlarge the informative statistical database on enterprises and local units produced and disseminated every year from the Italian SBR system (ASIA). In this database different typologies of workers (to be precise jobs) employed by firms are identified: employees, self-employed and contributing family workers, outworkers and temporary workers. Each worker is exactly identified by an id code that belongs to the SIM system (Integrated System of Microdata). Gender, place of birth, age, education and employment characteristics are the main available variables.

In particular the informative data structure for self-employment (whose Italian acronym is SILO-I) is based on a structure of links between administrative legal units and individuals through a system of identification codes. The main administrative sources like the Chamber of Commerce, Tax files, Social security give insights on the role of the person inside the company (shareholder, administrator, family worker, etc.). In order to identify the entrepreneur it has been considered this complex informative data structure on self-employment. Coherently with the solution adopted to estimate self-employment, the algorithm developed to flag entrepreneurs follows a specific methodology and a set of rules that are slightly different.[1]

[1] The methodology for the identification of the entrepreneur is described in the paper "Measuring the entrepreneur: a comparative analysis using business and household ", P. Cella, C. De Gregorio, Istat, presented at the Meeting of the Group of Experts on Business Registers, Brussels, 21- 23 September 2015.

2. **The BD-TEC project and the new integrated data base**

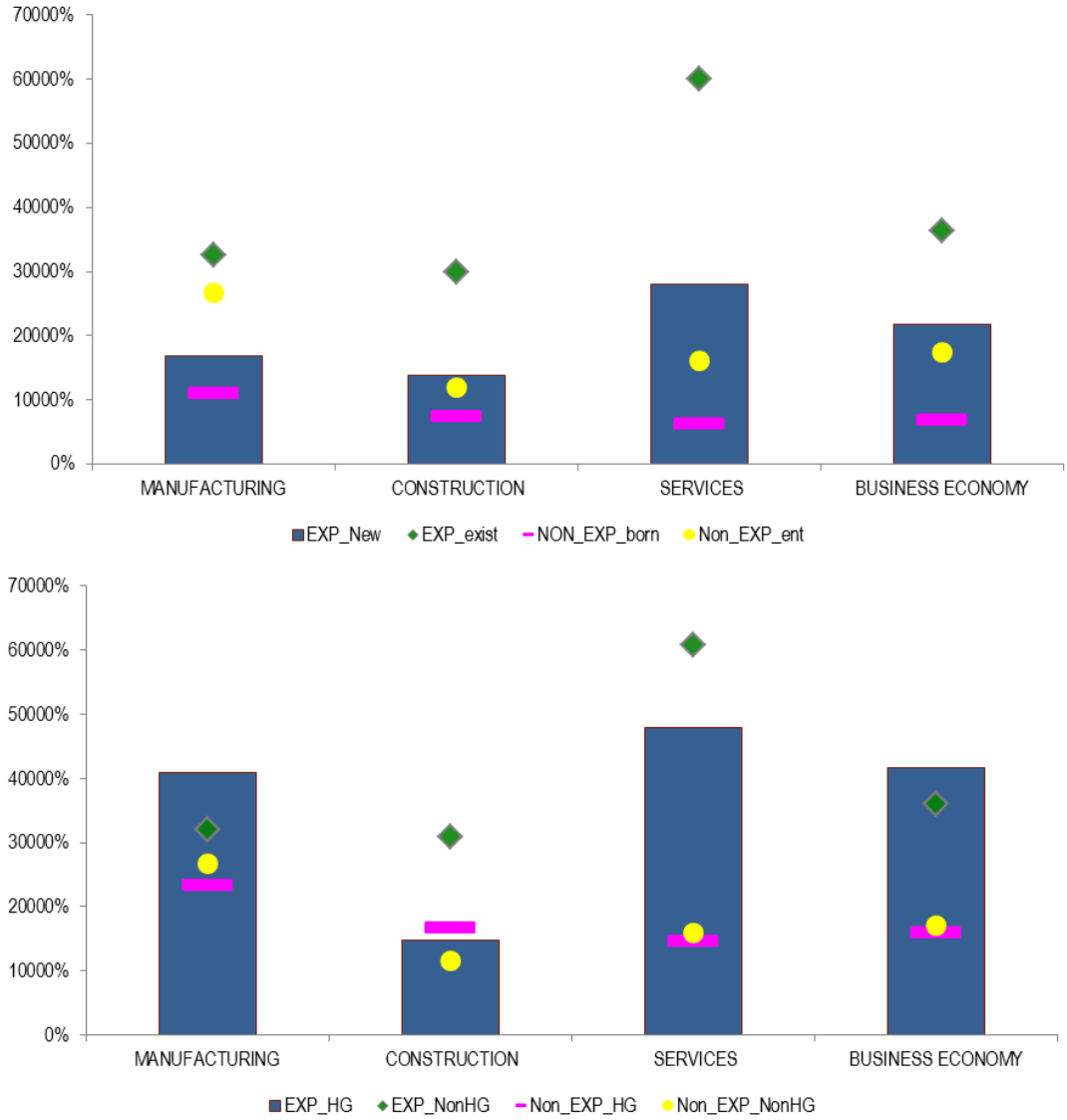
The importance of TEC data for the users is increasing putting a pressure to provide more and with a better quality statistics. Trade by enterprise characteristics (TEC) provides users with new dimensions of trade data and complements business statistics with information on the trade of the enterprises; such integrated data can be useful for the analysis and assessment of Country's economies.
Many efforts have been made at least at Country and European level in order to produce harmonized good quality TEC statistics as TEC is compiled by linking individual trader with its economic characteristics available in the business register. In recent years, Eurostat involved Countries in additional investments in this area: i) the BD-TEC project and ii) the TEC-TF project aiming to finalise a TEC Guide 2019.
The "Link Business Demography to data on trade by enterprise characteristics (TEC)" alias the BD-TEC project is an area of particular interest because it concerns the integration of information on export and imports with the business demography characteristics; for example the behaviour and economic success of new enterprises or high-growth enterprises and their involvement in international trade is a factor for the evaluation of SME and trade policy. The integrated BD-TEC data are further enriched thanks to the linkage with the SBS data in order to produce information on the economic performance, growth in terms of employees and other economic indicators.
The BD-TEC project is also promoted by the Eurostat/OECD entrepreneurship indicator program (EIP) interested to develop additional relevant indicators to the ones already collected by adding information on international trade, foreign control, and global value chains.
Finally, the integrated BD-TEC database provides the possibility to exploit many dimensions; the schema as showed in Figure 2 lists a set of components useful to build up different indicators.

Figure 2 – The variables available in BD-TEC database

NACE	size class	Variable	Type of trader
Total: B_N_S95_X_K C G45_G46 B-S95_X_C_G45_G46_K	Total SME micro small& medium LARGE	number of enterprises number of employees number of persons employed export values import values Turnover Purchases of goods and services	Total Trader (TRD) Exporter only (EXP_ONLY) Importer only (IMP_ONLY) Two-way trader (TWT) Non & occasional trader(NOT) Non trader (NON)* Occasional (OCC)* UNK
Age	**Growth**	**Partner location**	**Group status**
Total Young: 0-5 years old (YNG) Others (OTHER) UNK	Total HGE NON_HGE UNK	Total INT_EU28 EXT_EU28 USA_CAN CHINA ROW NA_UNK	TOTAL IND DEP DEP_DOM DEP_INT DEP_FC DEP_FA

An interesting integrated output, for example, is obtained as result of linking business demography (BD) statistics to International trade in goods statistics by enterprise characteristics (TEC) and SBS economic indicators: it allows to measure the economic performance, in terms of labor productivity, by enterprise type i.e. new and high-growth traders enterprises, exporter or non-exporter, by economic sectors breakdowns (Figure 3).

Figure 3 – Labor productivity of enterprises by type of enterprises and sector (*thousands of euro, year 2015*)



EXP_Born= new exporter enterprises; EXP_ent=exporter enterprises; NON_EXP_born=new NON exporter enterprises; EXP_HG= exporter high-growth enterprises; EXP_NonHG=exporter NON high-growth enterprises; Non_EXP_HG= NON exporter high-growth enterprises; Non_EXP_NonHG=NON exporter NON high-growth enterprises.

Productivity is always higher for exporting companies, both for new and existing enterprises. In Manufacturing, the existing companies are more performing regardless of being an exporter or not; while in Services exporting enterprises have a higher productivity with respect to the non-exporting companies. Productivity is even higher for the high-growth enterprises: the best performance is showed by the total business economy in general and it is reflected in the Manufacturing, while in the Construction and Services sectors the performance is more related to being exporter or not, rather than being high-growth or not.

3. **Linking entrepreneurs characteristics and enterprise group status**

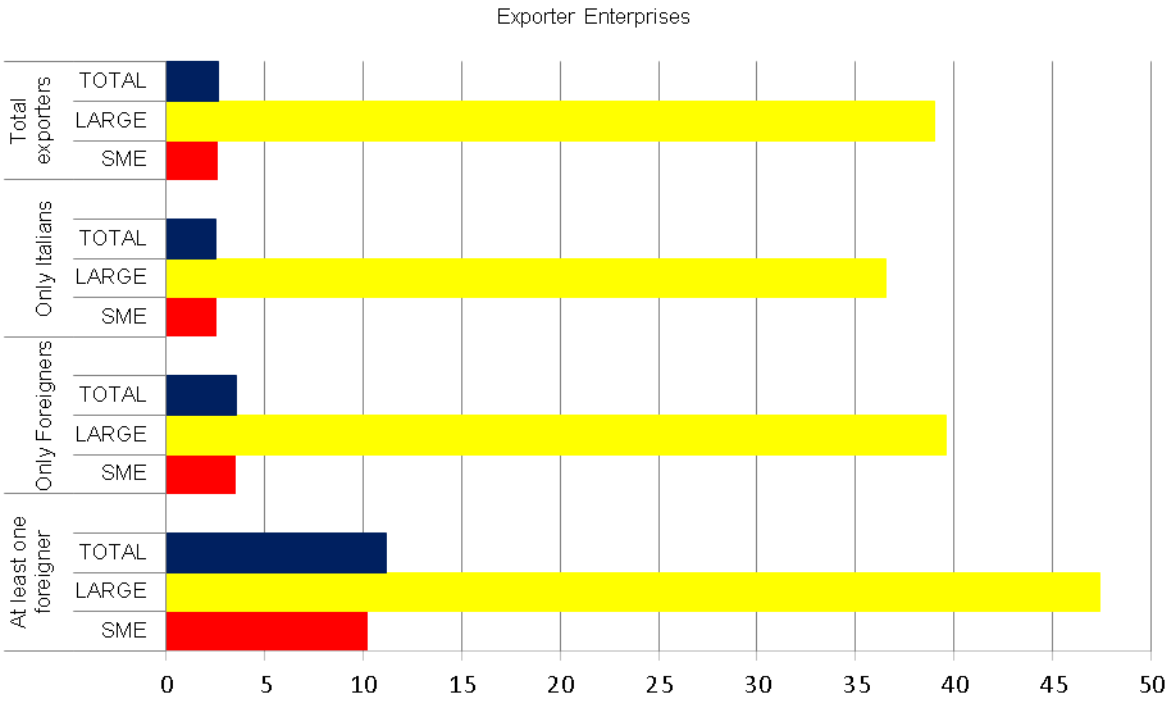
In order to investigate for new profiles of entrepreneurs, the BD-TEC database was linked with the LEED-employment register, a microdata structure that integrates the demand side (the entrepreneur) with the supply side (the employment). To deepen the role of entrepreneurs together with their employees, information on demographic characteristics (age and gender), labour market outcomes (type of occupation, sectors of activity), educational attainment and the country of origin is combined with enterprise characteristics. The

following analysis focuses on two themes relevant for the entrepreneurship study: a) the behaviour of native/ foreign-owned businesses engaged in trading activities; b) the profile of entrepreneurs involved in high-growth firms.
In order to describe how native/ foreign entrepreneurs behave in respect to trading activities, entrepreneurs are profiled on the basis of their country of origin, the country of origin of their workers, the type of trader (enterprises involved only in exports). In addition other factors are taken into account like the type of ownership that is whether the enterprise is part of an enterprise group (domestically or foreign controlled) rather than being independent, and the partner country, useful to trace whether there exists a link between the country of origin of the entrepreneur and the market where he/she exports. Within the group of entrepreneurs of high-growth enterprises a multivariate approach (Cluster analysis) is used to identify homogenies profiles of entrepreneurs in terms of their demographic characteristics.

3.1 A taxonomy for exporter native/foreign-owned firms

Migrant-owned businesses is an important policy question; the migrant entrepreneurship phenomenon is then explored as it represents a factor that affect positively the economic growth. Foreign people managing exporting firms may have an advantage and take opportunities in foreign markets, especially those represented by their country of origin.
In order to compare data, harmonization of the variable country of origin available in the different sources has been done.
On average for reference year 2015, 2.7% of the total population of active enterprises in the Italian business economy was involved in international trading like only exporter[2]. The incidence of traders is affected by the firms' size: although large enterprises (250 persons or more) represent only 0.8% of the total Italian business economy, 39% of them export while among SMEs only 2.7% are exporting enterprises. There exists a correlation between the trading activity and the country of birth of the entrepreneur. The percentage of exporter enterprises increases according to the country of birth of entrepreneur (Figure 4) in the sense that when the enterprise is managed by at least one foreign entrepreneur, the percentage of larger exporter enterprises reaches the highest percentage (47.4%).

Figure 4 – Number of exporter enterprises by Country of birth of entrepreneur and size class (*percentage, year 2015*)



[2] Exporters: enterprises that have export value >= 5000 euro AND export intensity (exports / turnover) >= 5% (irrespective of whether they are also importers)

Starting from the country of birth of the entrepreneur combined with the one of employees it is possible to define the following taxonomy of companies (Table 1):

Table 1 – Number of exporter and non- exporter enterprises by Country of birth of entrepreneur and Country of birth of employees (*percentage, year 2015*)**)**

Country of birth of entrepreneur	Number of enterprises		Country of Birth of employees									
	%		No employees		Only Italians		Only Foreigners		At least one foreigner		TOTAL	
	Exporter	NO Exporter	Exporter	NO Exporter	Exporter	NO Exporter	Exporter	NO Exporter	Exporter	NO Exporter	Exporter	NO Exporter
Only Italians	87.8	92.4	21.0	65.3	35.6	23.6	1.3	1.7	42.1	9.4	100.0	100.0
Only Foreigners	2.9	0.6	34.8	61.5	13.2	8.3	27.7	21.4	24.3	8.8	100.0	100.0
At least one foreigner	9.3	7.0	10.5	38.6	20.9	27.5	1.1	4.1	67.5	29.8	100.0	100.0
TOTAL	100.0	100.0	22.0	64.8	33.1	22.6	3.8	3.1	41.1	9.5	100.0	100.0

1) **Companies managed by Italian entrepreneurs only** (87.8% of exporter companies and 92.4% of Non-exporter companies);

2) **Companies managed by foreign entrepreneurs only** (2.9% of exporter companies and 0.6% of Non-exporter companies);

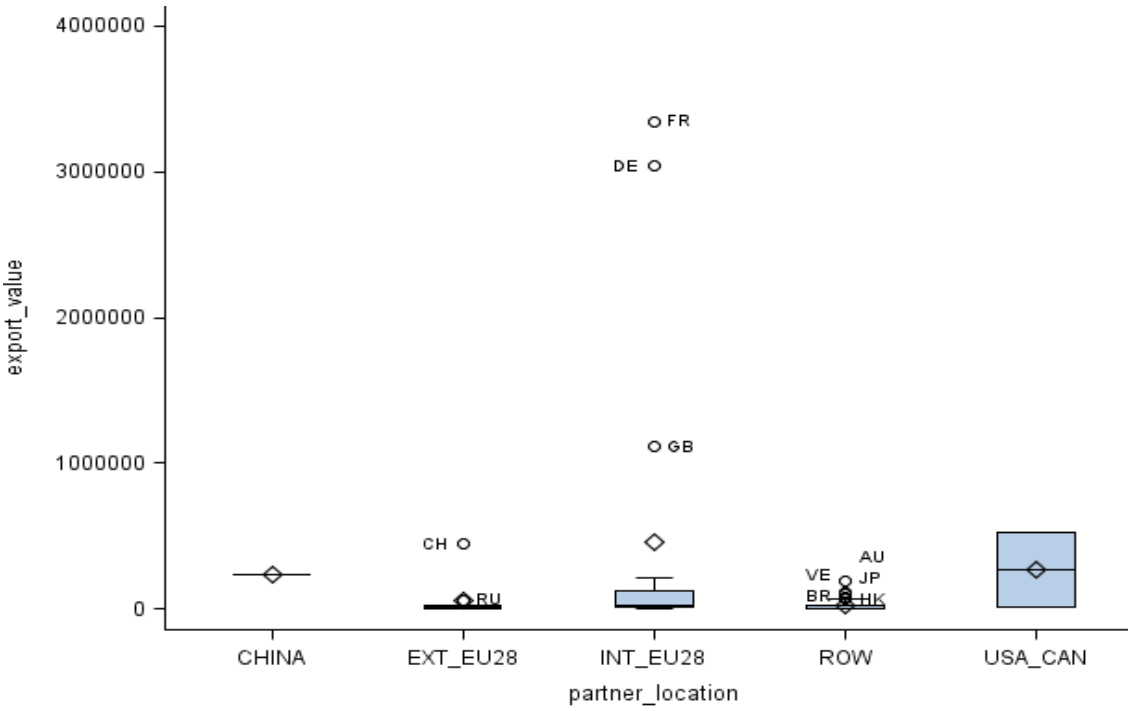
3) **Companies managed by both Italian and foreign entrepreneurs** (9.3% of exporter companies and 7% of Non-exporter companies).

Among these 3 clusters some combinations show interesting results deserving further studies. For example among **Companies managed by Italian entrepreneurs only** 42.1% of exporters and 9.4% of Non-exporters have at least one foreign employee. This phenomenon is greater for **Companies managed by both Italian and foreign entrepreneurs** where the percentage of companies with at least one foreign employee is 67.5% of exporters and 29.8% of Non-exporters. For **Companies managed by foreign entrepreneurs only** it seems they tend to hire mostly only foreign employees (27.7% of exporters and 21.4% of Non-exporters), while the difference among trading and not trading is less accentuate.

The not exporter enterprises managed both by only foreigners and by at least one foreign-born entrepreneur are 269,768 representing the 7.6% of the overall not exporter enterprises population, while the exporter enterprises managed both by only foreigners and by at least one foreign-born entrepreneur are 12,010 equal to 12.2% of the total exporters. With reference to the latter case, it is interesting to analyze the relative composition of the employees in terms of their country of origin: the 21.5% have a labor force constituted exclusively of foreign workers while the 34.5% both Italian and foreign.

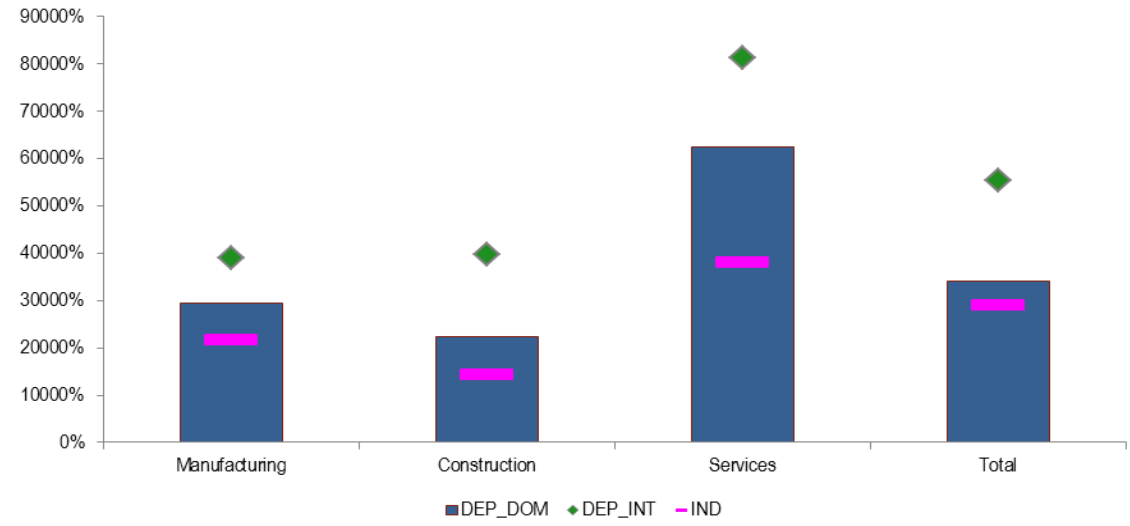
With regard to the companies' employment choices in relation to the country of birth of their employment, for the exporting companies there is a very high correlation between the country of birth of the entrepreneur and the internal composition of the countries of birth of related labor force. For example, in the case of only exporting companies managed both by only foreigners and by at least one foreign-born entrepreneur and who have hired at least one foreign employee (6,709 enterprises), in the 62.8% of these type of companies, the country of birth of the foreign entrepreneur coincides with the country of birth of at least one foreign employee and for the 32.4% coincides with at least one export country.
Focusing the attention on this latter population of firms in which the country of origin of entrepreneur coincides with the country of origin of at least one employee and one export country in Figure 4 we analyze the distribution of export value by partner location.
Among the 28 Countries of the European Union (INT_EU28), France (FR), Germany (DE) and the United Kingdom (GB) are the export countries in which the greatest shares of export value are recorded. The European countries not belonging to the European Union (EXT_EU28) with higher export value are Switzerland (CH) and Russia (RU). Among the rest of world (ROW), Venezuela (VE), Japan (JP), Brazil (BR) and Hong Kong (HK) are the countries with the highest exports. Finally, remarkable quotas of export values are realized in the three big markets of China, USA and Canada.

Figure 4 –Distribution of Export value by Partner location (*thousands of euro, year 2015***)** (Boxplot)



The 27.2% of the population of exporting companies managed by at least a foreign-born entrepreneur belongs to enterprise groups, 19.3% are multinational groups while 7.9% are domestically controlled. The type of ownership affects the performance of enterprises that export, in fact multinational groups show an higher productivity in respect to the other types (Figure 6). This is especially evident in the Services sector where the difference between the productivity of companies belonging to multinational groups and that of companies belonging to domestic groups is about 188 thousands euro and reaches 434 thousands euros compared to independent companies.

Figure 6- Productivity level of exporter enterprises managed by at least one foreign entrepreneur and with at least one foreign employee employment by group status and economic sector (*thousands of euro, year 2015*)



3.2 The profiles of entrepreneurs of High-growth enterprises

On the basis of multivariate analysis (Cluster analysis) it was possible to identify, within the group of entrepreneurs of high-growth enterprises, some profiles that differ significantly from each other with respect to some demographic characteristics but are relatively homogeneous within them. This type of analysis was carried out only for entrepreneurs of high-growth enterprises, because, as previously said, high-growth is a relevant condition in affecting the entrepreneurial performance.

For the entrepreneurs of high-growth enterprises four profiles have been identified; they can be summarized as follows:

- the first profile (18.7% of entrepreneurs), is related to entrepreneurs that are mostly adult (90.5%), with at least a diploma of secondary education (94%) and with a greater presence of foreigners (86.8% are Italian, 5.4 percentage points less than the average of 92.2%);

- the second profile (39.4%) is characterize by entrepreneurs predominantly male (96.5), but, unlike the first cluster, they are older (93.3% are senior) with an above-average education (29.7% have at least a first degree);

- the third profile (25%) is mainly characterized by higher education (42.1% are graduates) and compared to previous ones, there is a higher component of women (although the majority are still men 68.7%);

- finally, the fourth profile (16.9%) concerns mostly female entrepreneurs (only 31.8% is male), younger (51.1% is under 35) mostly with diploma of secondary education (89.8%)

Table 2 – Results of Cluster analysis on entrepreneurs of high-growth enterprises

CLUSTER	%	Gender (Male)	Young	Adults	Senior	Italian	Limited education	Diploma	Advanced Education
1	18.7	82.6	4.0	90.5	5.5	86.8	4.1	94.0	1.9
2	39.4	96.5	1.7	5.0	93.3	92.5	29.6	40.7	29.7
3	25.0	68.7	4.4	81.6	14.0	95.5	37.9	20.0	42.1
4	16.9	31.8	51.1	20.0	28.9	91.7	1.7	89.8	8.5
TOTAL	**100.0**	**82.5**	**5.5**	**39.1**	**55.4**	**92.2**	**29.1**	**44.7**	**26.2**

LEGEND:

Young	15-34 years
Adults	35-49 years
Senior	50 years and +
Limited education	No formal education and primary school certificate
Diploma	diploma of lower and upper secondary education
Advanced Education	At least a first degree (University degree, master's degree)

4. Concluding remarks

The purpose of the paper was to show the potentiality and variety of analyses that can be performed using integrated administrative and statistical data on businesses and on individuals, and how the SBR carries out a central role in the linkage process of multiple sources. The use of the new integrated statistical infrastructure entrepreneurship is correlated with enterprise characteristics since each entrepreneur is linked at the micro-

level with his/her business characteristics and business performance. Among possible analyses the paper describes two examples in delineating entrepreneurial profiles and related statistical indicators, on one side with respect to the exporting enterprises population, on the other side in order to deepen the demographic characteristics of entrepreneurs managing high growth firms. Future work and research will be oriented to explore the longitudinal dimension of businesses. Business demography and entrepreneurship statistics indeed, provide information about the creation, survival and dissolution of businesses and about the characteristics and activities of entrepreneurs. Over the previous decades, interest in these types of statistics has increased as they are sources of information about innovation, competitiveness, economic growth and job creation.

References

AA.VV. *Methodological solutions for the integrated use of statistical sources to estimate employment* (in Italian). Final report of Istat Working group on the development of new methods for employment estimates for National accounts benchmark. Istat working paper (to be published). Rome, ISTAT 2015

EUROSTAT. "*Annex 1:Technical Specifications Of The Action And Award Criteria"* Grant application on Link Business Demography To Data On Trade By Enterprise Characteristics (TEC). Luxembourg, 2017

M. Consalvi, G. Garofalo, C. Viviano *"The new role of the Business Register within the Integrated System of Registers"***,** 25th Meeting of the Wiesbaden Group on Business Registers International Roundtable on Business Survey Frames, Tokyo, 8 – 11 November 2016

M. Piacentini "*Entrepreneurship statistics by gender: a review of existing sources and options for data development"*. Paris, OECD 2013

OECD *The partial renaissance of self-employment*. In: OECD employment outlook, ch.5. OECD: Paris, pp. 155-199. Paris, OECD 2000

OECD *Entrepreneurship at a Glance 2015*, Paris, OECD 2015

P. Cella, C. De Gregorio "*Measuring the entrepreneur: a comparative analysis using business and household data***",** Meeting of the Group of Experts on Business Registers, Brussels, 21- 23 September 2015

P. Cella, I. Corvino, D. Frigeri, A. Stocchiero, M. Narilli "*Il ruolo degli imprenditori immigrati per l'interscambio commerciale dell'Italia*" in Rapporto ICE 2014-2015

UNECE "*Guidelines on the use of statistical business registers for business demography and entrepreneurship statistics"* New York and Geneva, 2018