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Cross Cutting Topics – Part 3 “Maintaining Representative Turnover and SPPI: Re-stratification, Resampling, Rebasing, and Updating Weights”

Italian Turnover in Services Sector

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1. Introduction

The Short-Term Statistics Regulations (Council Regulation (EC) No. 1165/98 and (EC) No. 1158/2005 of the European Parliament and of the Council) require short-term statistics on turnover (variable 120) under the provisions of Annexes A (industry), C (retail trade) and D (other services activities). Turnover is an important short-term indicator for distribution and all services and its objective is to show the development of the market for goods and services. According to the Methodology of Short-term business statistics- Interpretation and guidelines (Eurostat, 2006) “turnover comprises the totals invoiced by the observation unit during the reference period, and this corresponds to market sales of goods or services supplied to third parties. Turnover also includes all other charges (transport, packaging, etc.) passed on to the customer, even if these charges are listed separately in the invoice. Subsidies received from public authorities or the institution of European Union are also included. Turnover excludes VAT and other similar deductible taxes directly linked to turnover as well as all duties and taxes on the goods or services invoiced by the unit. Reduction in prices, rebates and discounts as well as the value of returned packing must be deducted”.

In more recent years special effort has been put on service indicators given the increased share of service sectors in the economy of European countries. Eurostat produced a report on the methodological characteristics of the index of turnover for the service sectors between European Countries (Eurostat, 2009). According to this report, eleven of these use administrative data. Among these eleven, six use administrative data in conjunction with statistical surveys. For example, in Germany administrative data are used for smaller enterprises, whereas in the case of Norway the administrative source is the main source, with surveys conducted for activities that are exempt from the administrative requirements (VAT) (see Table 2 in Eurostat, 2009).

The STS-Regulation requires turnover to be transmitted to Eurostat either as an index or as absolute figures. The turnover index is a simple value index (price multiplied by quantity/volume) and is a direct index in that it compares the current period with the fixed period in the base year (Eurostat, 2006). In order to compile turnover indices at higher levels of NACE, the indices at the lowest level have to be aggregated by using weights based on the turnover share of each activity in the base. According to the Eurostat report thirteen countries compile a Laspeyres or a fixed base index while four countries do not produce an index but a time series of the value of turnover.

2. The turnover index for services sector in Italy.

In the calculation of the turnover indicator, it could be decided whether it is possible or preferable to use administrative data or conduct a statistical survey instead. As turnover is recorded in accounts by all units, information concerning turnover does not need to be collected through a statistical survey and administrative sources can be used. The main administrative source for turnover is the VAT declarations made by enterprises regarding their purchases and sales.

In Italy, the main administrative source for VAT is represented by a Government Agency (called 'Agenzia delle Entrate'). The enterprises are required to report to the Agenzia

delle Entrate on either a quarterly or monthly basis, depending on enterprise size, only the VAT difference between the credit and debt position. There is no evidence on the total turnover. For such reasons a survey has been used in Italy collecting on a quarterly basis information on turnover and employees from the enterprises that represent the observation unit for this indicator. Moreover, the indicators are released on a quarterly basis as indices with fixed base.

2.1 The base year

The actual indices on turnover for the service sectors have been released with reference to the base year 2010=100 for the first time in June 2013. As recommended in “Methodology of Short-term business statistics- Interpretation and guidelines”, Structural Business Statistics (SBS) data are the best source for the calculation of the weights in order to provide the maximum of consistency between different indicators.

Table 1 - The weights in 2010 for quarterly turnover indicators of services

Nace (Rev. 2)	Economic Activities	Weights 2010
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles	10.200
G46	Wholesale trade, except of motor vehicles and motorcycles	46.046
H49	Land transport and transport via pipelines	5.827
H50	Water transport	1.085
H51	Air transport	0.726
H52	Warehousing and support activities for transportation	4.272
H53	Postal and courier activities	0.625
I 55	Accommodation	1.732
I 56	Food and beverage service activities	4.267
J	Information and communication	10.153
	Total published before June 2014	84.933
M69	Legal and accounting activities**	3.064
M70.2	Management consultancy activities**	1.361
M71	Architectural and engineering activities; technical testing and analysis**	2.227
M73	Advertising and market research**	1.257
M74	Other professional, scientific and technical activities**	1.280
N78	Employment activities**	0.555
N79	Travel agency, tour operator reservation service and related activities**	1.123
N80	Security and investigation activities**	0.318
N81.2	Cleaning activities**	1.224
N82	Office administrative, office support and other business support activities**	2.658
	Total released in June 2014	15.067
	Total	100.000

In Table 1 the weights for the year 2010 are reported. According to this weights structure the result is a high share in the service sector for the wholesale trade (46%) followed by Information and Communication (10.1%). This structure will be kept until 2018 when the base year will be changed to 2015=100 even if certain experiments will be carried out in Istat to evaluate the possibility to release in the future short-term indicators in chain-linked form.

2.2 The sampling design

As already said for the Italian turnover index in the services sector turnover information is collected for a sample of enterprises. The sampling design is usually carried out at the

change of base year through an accurate analysis of the structural characteristics of economic sectors subject to investigation. To evaluate the composition of each division by a number of companies and employees, the information contained in the register of the active enterprises (ASIA) for the year 2010 and annual statistical surveys on economic performance of industrial and services companies have been used. For the actual indices in the last change of base year, it was decided to consider as estimation domains for mostly the economic activities, the groups of economic activity (3 digits of NACE Rev 2.1 classification). Only for some sectors the 4 digits were used. For accommodation and food and beverages activities was also taken into consideration the geographical distribution (Northwest, Northeast, Middle, South and Islands).

The stratification variables used instead are the economic activity together with classes of employees. In particular, the enterprises with more than 100 employees (according to ASIA database) are a self-representative stratum and 3 classes of employees (2-4, 5-19, 20-99) are considered.

2.3 The annual update

On the occasion of the indices release for the first quarter, every year the sample units are updated to create the list of enterprises for the sending of the questionnaire using the stratification in the previous section.

Personal information for enterprises, necessary for postal distribution, are created using the information contained in the ASIA register for the most recent year. In this way cessation of activities (for bankruptcy or liquidation, merger, lease or transfer of all or of business interested in detection) or list errors (incorrect shipping address) are taken into account. For these enterprises, a further control on the activity state is developed using administrative sources.

Taking into account the hypothesis about domains of estimation and stratifications, optimal allocation of the sample is created using both information on the enterprises in the ASIA database and structural business statistics referred to the most recent year.

The algorithm Bethel is used at a 3% level of error, implemented in MAUSS-R (Di Giuseppe *et al.*, 2010), which is a software that allows the determination of the optimal sample allocation, in multivariate cases and for several domains of interest, for surveys with a stratified sample design and implemented in R to determine the sample size and to allocate the total amount of units in the different strata of population with the possibility of changing the desired precision for each estimate of interest.

Table 2 reports the number of units for each division for the sample extracted in April, 2014 using the ASIA register for 2012.

The highest number of units is extracted for the wholesale trade (5.826 units); a result that is consistent with the ones obtained using SBS data for the calculation of the weights.

Table 2 – Sample size for economic activities

Nace Rev 2.1	Economic activities	Number of Units
G 45	Wholesale and retail trade and repair of motor vehicles and motorcycles	1.676
G 46	Wholesale trade, except of motor vehicles and motorcycles	5.826
H 49	Land transport and transport via pipelines	1.177
H 50	Water transport	109
H 51	Air transport	86
H 52	Warehousing and support activities for transportation	1.383
H 53	Postal and courier activities	58
I 55	Accommodation	1.126
I 56	Food and beverage service activities	1.197
J *	Information and communication	1.309
M 69	Legal and accounting activities*	526
M 70.2	Management consultancy activities	439
M 71	Architectural and engineering activities; techn.	456
M 73	Advertising and market research	270
M 74	Other professional, scientific and technical activities	690
N 78	Employment activities	99
N 79	Travel agency, tour operator reservation service and related activities	413
N 80	Security and investigation activities	144
N 81.2	Cleaning activities	311
N 82	Office administrative, office support and other business support activities	844
Total		18.139

3. Estimation methodology

The estimators framework for economic variables is quite well established in the structural business statistics domain. Regarding short-term statistics, the situation is heterogeneous depending on the indicator and on the timeliness needed to be fulfilled. At the European level and as indicated in the Short-Term Methodologies Handbook from Eurostat (Eurostat, 2006) the choice of methodology to be implemented is left to the National Institute of Statistics.

The estimates carried out by national statistical institutes for many surveys are derived computing weights calibrated on totals for auxiliary variables correlated with the variable of interest. In ISTAT in the Short-Term Statistics domain, where there is quite an established tradition for cut-off sample design, the main problem is to find an auxiliary variable so that the correlation with the variable of interest is high along all the time span. Actually, calibration on control totals is used to minimize errors. A decrease in errors is linked to the association of population control totals pattern of non-ignorable

nonresponse and, moreover, with the variable of interest. Regarding service sector turnover, the number of employees and the turnover from business registers are used as auxiliary variables to correct for non-response. ReGenesees software, an R package for design-based and model-assisted analysis of complex sample surveys, is also used. Together with this estimator, an estimator based purely on enterprises observed on both occasions (the reference quarter and the same quarter of the previous year) is used for those sectors characterized by a concentration of big enterprises. The index number calculated for the economic activities in the first column of Table 1 are then aggregated with the weights in the third column.

References

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