The labour cost variables in the building of the "Frame SBS"[1]

Stefania Arnaldi,[2] Ciro Baldi,[3] Rosalba Filippello,[4] Livia Mastrantonio,[5] Silvia Pacini,[6] Paolo Sassaroli,[7] Francesca Tartamella[8]

Abstract

The building of the new Structural Business Statistics (SBS) Register (so called Frame) exploits company accounts and enterprise level fiscal data as main sources concerning the variables on revenues and costs. When dealing with labour cost variables an additional source is available: social security data. There are advantages and disadvantages in the use of social security data to feed the variables on wages and labour costs into the frame. In fact, while being heterodox with the main sources, their use has the advantage to introduce consistency with employment data entering the Frame via the business register. This work reports the findings obtained trying to answer questions like: which is the most suitable source to comply with SBS definitions on wages and labour costs? What are the magnitudes and characteristics of discrepancies between sources? What are the causes of these differences? The main reasons of differences have been identified through an in-depth study of the definitions of administrative variables and comparative analyses between sources, at both the macro and micro level. The solution proposed for the Frame involves an innovative correction procedure using social security data to reduce the definitional bias in company accounts due to the inclusion of costs related to external workers into the labour cost.

Keywords: labour cost, multiple administrative sources, harmonization, integration

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[1] This work is the results of the common effort of the authors. However the paragraphs can be attributed as follows: par. 1 C. Baldi, S. Pacini and F. Tartamella; par. 2 S. Pacini; par. 3 S. Arnaldi; par. 4 R. Filippello and P. Sassaroli; par. 5 S. Pacini; par 6.1 C. Baldi; par. 6.2 C. Baldi and S. Pacini; par. 7.1 L. Mastrantonio and F. Tartamella; par. 7.2 C. Baldi; par. 8 C. Baldi, S. Pacini and F. Tartamella. The views expressed in this paper are solely those of the authors and do not involve the responsibility of Istat. We express our gratitude to Fabiana Rocci and Diego Bellisai, participants in the study group that analyzed the topic, who contributed to build the body of knowledge behind this paper.

[2] Istat, e-mail: arnaldi@istat.it
[3] Istat, e-mail: baldi@istat.it
[4] Istat, e-mail: filippel@istat.it
[5] Istat, e-mail: mastrant@istat.it
[6] Istat, e-mail: pacini@istat.it
[7] Istat, e-mail: sassarol@istat.it
[8] Istat, e-mail: tartamel@istat.it

1. Introduction

In the building of the new Structural Business Statistics (SBS) Register (hereafter Frame), the treatment of the labour costs variables has represented a new challenge. In fact, regarding these variables, in addition to the company accounts and the fiscal sources, social security data could be used to compile the Frame (on the input sources of the Frame see Curatolo et al, 2015). The data of social security declarations, containing information on wages and social contributions, while having the disadvantage of being heterodox with respect to the other sources used for the revenues and other labour costs and thus of carrying the risk of introducing inconsistencies with the rest of the accounting framework, has the merit of being consistent with the data on employment that enters in the Frame via the business register. Moreover, the data of social security in Istat are the cornerstone of the business based labour market statistics, that is the statistics produced to comply with the regulations on Labour Cost Index, Structure of Earning Surveys and more recently, Labour Cost Survey. Consequently, the use of this data for the frame and the Structural Business Statistics would have carried out the extra advantage of producing horizontal consistency among statistical domains, that is the final aim of the incoming Frame Regulation Integrating Business Statistics (FRIBS).

However, since the first analysis, it has been clear that the two kind of sources have some non-negligible differences. To decide which source was more suitable for the Frame has, thus, requested a study to respond to some basic questions: why the comparison between these sources show such discrepancies? Which are the differences in the definitions of the wages between sources? Which is the most appropriate source for the SBS purposes? An in-depth analysis of the empirical and theoretical differences between the sources has been necessary and has required the involvement of many competencies: national account expertise, knowledge on social security data and on accounting theory and practices, statistical and data mining skills. The analysis has been rewarded by a far more clearer understanding of the contents of the company accounts and social security data, and, since the administrative obligations from which they stem are at the base of the enterprises informative systems, of the sources from which the enterprises draw information to fill in the statistical questionnaires. This led to a better use of all available sources to produce the Frame labour cost variables.

This paper reviews this statistical exploration and reports the main findings and the implications for the building of the frame. Since the SBS regulation is referred to the Industries and Services private sectors excluding Financial activities (NACE rev 2. Sections B to S excluding K) what follows is only referred to this population of enterprises. The structure of the document is as follows. Paragraph 2 describes the main administrative obligations of the enterprises and how they shape the accounting bookkeeping. Paragraph 3 illustrates the main empirical differences in the labour cost variables between these sources. Paragraph 4 analyzes the definitions of the different sources at a very detailed level and contrasts them with the SBS and European System of Accounts (ESA) regulation. Paragraph 5 deepen the analysis of Par. 3 to check whether some of the theoretical discrepancies may explain the differences found in the data. Paragraph 6 reports the first attempt of correcting the source to reduce the causes of bias with respect to the statistical definitions.

2. Sources and details of the labour cost variable

The input sources that feed the Frame all have information on total labour cost (TLC), with different level of detail but also different consistency with the desired content (Casciano et al, 2011; Curatolo et al, 2015).

Besides the Profit and Loss part of the company accounts (BIL) and the fiscal sources (Tax returns – UNICO, and statistical studies for the estimation of taxes due by firms in specific industries - SDS), the Frame can benefit from a supplementary source, that have only information on employee TLC, so it is not useful for the other economic variables required by the SBS Regulation, but has valuable and sound information on employees and their corresponding costs. This source is the new Employee Wage Register (whose Italian acronym is RACLI) with the individual level data linked to the employee ones. This latter register has been produced, since 2011, mainly using the new archive of social security declarations of enterprises with at least one employee. Starting from January 2010, due to an important change in administrative obligations, firms have to present, within 30 days from the reference month, a new administrative declaration, the "Uniemens" concerning both individual and firm data to the main social security institute (INPS). As a consequence, very detailed and timely administrative data for each employee, the characteristics of his jobs, and the associated firm are now available. The exploitation of this new administrative data source was accelerated thanks to the 2011 Industry and Services Census, so that the new (virtual) Census estimates on employment has been based on the new individual-level Employment Register (that is the base of the Business Register aggregated for enterprises). To this linked employer-employee job register, wages and salaries have been coherently added after procedures of check, editing and integration. The labour costs variables other than wages are at the moment not available in the individual declarations used at Istat. They are added to the RACLI register in the following manner. The amounts retained by the enterprises each year for financing the severance payment (TFR) are estimated at individual level applying the usual rate; the social contributions either paid to INPS or to other institutes (e.g. contributions to insurance schemes for occupational accidents) are are obtained, for the time being, only at firm level Using the data processed by Istat Oros Survey[9] (Baldi et al., 2008). In the near future they will be calculated at individual level starting from the Uniemens declarations. An interesting pioneering attempt to estimate the labour costs at individual level, even if with different sources available, is contained in Grand and Quaranta (2014). The new RACLI register so obtained could contribute to the Frame only for the TLC and its components, that is for a little part of the SBS target variables which are filled in using other administrative information such as profit and loss account and other fiscal data.

Regarding personnel costs, one of the main characteristic of RACLI is that wages and total labour cost are coherent with employment estimations of the Employment/Business Register itself, while in the other administrative sources of the Frame the information on the number of employees is not available at all (see table 1). On the other hand all the other Frame sources have (more or less) information on TLC, but only the company account

[9] The calculation of the labour costs other than wages was done mainly through the virtual DM10 form reconstructed for each firm by the social security institute (INPS) and elaborated by the Istat Oros Survey; nevertheless in the near future it will hopefully calculated at individual level

(BIL) has the desired detail to estimate not only the complete labour cost, but also its components.

Table 1 - The total labour cost variable and its details in the different sources of the FRAME

VARIABLES	BIL	SDS	UNICO	RACLI
Total Labour Cost (TCL)	X	X	X	X
- wages and salaries	X	-	-	X
- social contributions	X	-	-	X
- severance payments (TFR)	X	-	-	X
- other costs	X	-	-	-
Employees	-	-	-	X

Besides differences in the details of the variables the sources have quite different coverage. The compilation (and dissemination) of profit and loss accounts is compulsory by law only for incorporated enterprises, while it is optional of unincorporated enterprise, so BIL covers all Incorporated enterprises and few unincorporated enterprises, thus being concentrated especially on medium large firms. SDS covers all enterprises in most market sector of economic activities with turnover below (about) 5millions thus representing especially small firms. UNICO is the fiscal statement that all unincorporated partnership, professionals and owner of individual enterprises have to fill in, therefore it covers mainly small-medium unincorporated enterprises; and RACLI covers all enterprises with at least 1 employee.

In order to define the better and correct use of each source for the statistical aim at hand, a comparison on employee costs among the different sources to understand their pros and cons has been done. Before going into the analysis is helpful to clarify where the different sources originates from, that is looking into the enterprises accounting and information systems.

3. Information systems within the company: payroll accounting and general accounting

The evaluation of labour cost is mainly the result of fiscal, social security and labour duties arising from the payroll accounting and the general accounting obligations for the enterprises.

Payroll accounting is a subfield of the general accounting bookkeeping, and along with the other subject areas, is an integral part of the company management information system. It includes all the financial records related to employee salaries, withholdings and deductions, the relationships with the social security institutions and the full documentation related to employment.

Establishing, conducting and terminating employment relationships of a "subordinate" or "pseudo-subordinate" nature requires many administrative and accounting operations, as well as obligations towards social security institutions. Some of these duties are generated only at the beginning of the employment, at its termination or whenever changes to the

employment relationship occur. Other duties are instead periodical and regularly required and repeated throughout the duration of the employment for each employee: such as payslips and payroll processing, the issuance of the “Libro unico del Lavoro” (a Single Employment Ledger containing the payroll records and schedule), tax and social security withholdings calculations and payments, and the monthly declarations of the social contributions “Uniemens”.At the end of each year, employers are required to meet the compliance for the tax and national insurance obligations.

Since the firms have the responsibility to keep record of all the events that have economic significance during the year, all obligations end up being recorded by the general accounting. General accounting entries are prepared using a chart of accounts, which is a structure containing all the items covered in the general ledger. By using special dedicated accounts, all the administrative transactions between the company and the external environment are recorded on the specific general ledger accounts with each of these accounts representing a type of expense (or income), debit (or credit), etc. The accounting journals record therefore the liquidation and payment of monthly salaries, the contributions paid by the company, withholding taxes, social security and welfare and their payment, the provision for employee severance indemnities, and any liquidation of it (TFR) in case of termination of the employment relationship. It is important to note that these records are prepared in accordance with general accounting principles, and the financial statements are prepared on the basis of the accounting entries related to a particular financial year. These principles are at the base of the differences between the concepts recorded in the payroll accounting and the one recorded in general accounting.

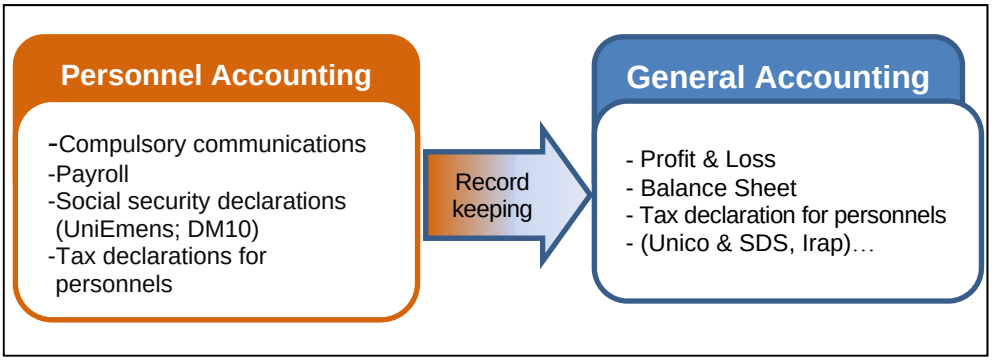
In accordance with the general accounting principles, specifically n. 12 of the Interpretative Document N.1 of the accounting standard, for each period there should be recognized "...the wages and salaries...including the portion relating to accrued and unpaid bonuses and leaves accrued but not taken before withholding taxes and social security contributions paid by the employee ... ", in addition to "...charges relating to the shares of the bonuses and holiday pay accrued and unpaid..". Therefore, in the yearly business closure, firms register the adjustment necessary to show the overall cost of employment based on the specific financial year’s accruals, and the liabilities to the employees accrued but unpaid, in accordance with the principle of accrual regardless of the date of collection or payment.

Payroll Accounting data is summarized in some specific items of the budget, especially in voice B9) personnel costs.

Those firms that adopt the system of ordinary accounting are required to prepare financial statements, and for corporations, there is an obligation to register their financial statements with the Companies Register kept by the Chamber of Commerce (C.C.I.A.A.). For individual companies, professional partnerships and collaborations, a trial balance is prepared, which involves the juxtaposition of costs and revenues, which indicates the cost of personnel. The latter however is not registered and therefore remains an internal document.

The fiscal sources UNICO SDS and IRAP (declarations for regional taxes on production activity) are then prepared based on the data from trial balance and financial statements, however, since each of these returns has different purposes, the Payroll data entered in each of them is valued differently.

Figure 1 – The different accountancy within each firm



One of the consequence of the all these different accounting duties each firms has to implement is that the use of administrative source for statistical purposes is influenced by the firms accounting system they refer to.

4. An overall picture of the differences among sources on labour cost

This section aims to highlight empirically the differences between the variables related to wages and salaries and labour costs among the available sources. In particular, the comparison of the wages and salaries is possible only between RACLI and BIL sources, while that on total labour costs can be carried out on the three sources RACLI , BIL and SDS. The results shown in the tables following are referred to the year 2010 but the analyses on the previous year data basically confirm the same evidences.

To get a first measure on the impact on aggregate data of choosing one source instead of another we use the percentage difference measure, calculated on the matched firms between the two sources as follows:

$$d1 = 100 * \frac{\sum_i v_{ai} - \sum_i v_{bi}}{\sum_i v_{bi}}$$

where $v_{.i}$ is the value of the examined variable (wages and salaries or labour cost), for firm i in the data source a or b (RACLI or BIL or SDS). The sum is over the matched firms in a given NACE section.

Table 2 shows that this difference is systematically negative in each section of economic activity for both wages and labour cost variables when the RACLI source is in the comparison. That is RACLI values are lower than those of the other two fiscal sources. At the same time, the differences between SDS and BIL, are quite small with no systematic clear sign.

Table 2 - Comparison measures, based on d1 indicator, on wages and salaries (RACLI-BIL) and on labour cost (RACLI-BIL, RACLI-SDS, SDS-BIL), with or without extreme values (unweighted)

SECTION OF ECONOMIC ACTIVITY	Wages and salaries			Total Labour Cost								
	RACLI(a) vs BIL(b)			RACLI(a) vs BIL(b)			RACLI(a) vs SDS(b)			SDS(a) vs-BIL(b)		
	d1[1]	*d1_t5*[2]	*d1_t10*[3]	*d1*[1]	*d1_t5*[2]	*d1_t10*[3]	*d1*[1]	*d1_t5*[2]	*d1_t10*[3]	*d1*[1]	*d1_t5*[2]	*d1_t10*[3]
B - Mining and quarrying	-4.3	-3.7	-3.5	-4.5	-4.3	-4.0	-2.8	-2.9	-2.8	-0.7	-0.3	0.0
C - Manufacturing	-4.6	-4.1	-3.7	-5.2	-4.8	-4.4	-3.3	-3.5	-3.2	-0.8	-0.3	-0.1
D - Electricity, gas, steam and cond. supply	-4.7	-4.8	-3.8	-6.4	-6.8	-6.4	-9.8	-10.8	-9.8	1.2	1.2	0.0
E - Water supply, sewerage, waste, activities	-6.4	-5.9	-5.5	-8.1	-7.6	-7.1	-6.5	-6.0	-5.6	-1.3	-0.7	-0.4
F - Construction	-7.2	-6.3	-5.7	-7.3	-6.9	-6.4	-4.5	-4.3	-4.0	-0.3	0.0	0.2
G - Wholesale and retail trade	-5.2	-4.1	-3.6	-6.2	-5.2	-4.7	-3.5	-3.2	-2.8	-1.2	-0.3	0.0
H - Transportation and storage	-15.9	-12.4	-11.8	-15.3	-12.0	-11.5	-13.2	-13.1	-12.8	-4.7	0.2	0.3
I – Accomodation, food service activities	-6.4	-2.7	-2.3	-6.7	-3.0	-2.7	-0.8	-0.9	-0.8	-1.6	-0.4	-0.1
J – Information, communication	-8.0	-7.0	-6.2	-9.3	-8.3	-7.6	-7.4	-7.1	-7.0	-1.1	-0.3	0.1
K - Financial and insurance activities	-8.0	-5.9	-5.3	-9.3	-7.8	-7.2	-6.8	-6.3	-5.5	-2.0	-1.2	-0.3
L - Real estate activities	-6.7	-4.8	-4.1	-9.2	-7.0	-6.0	-4.7	-3.9	-3.6	-2.2	-1.7	-0.7
M - Professional, scientific technical activities	-8.1	-6.5	-5.8	-9.6	-8.1	-7.4	-5.3	-5.0	-4.7	-0.8	-0.1	0.3
N - Administrative support activity	-11.9	-9.5	-8.0	-12.4	-10.4	-9.0	-7.9	-6.6	-6.1	-0.5	-0.8	-0.3
P - Education	-8.2	-7.1	-6.2	-9.1	-8.0	-7.2	-4.5	-4.4	-4.0	-2.3	0.6	0.7
Q - Human health, social work activities	-6.6	-5.7	-5.1	-7.1	-6.3	-5.8	-3.3	-2.4	-2.1	0.5	-0.2	-0.1
R - Arts, entertainment and recreation	-46.3	-12.5	-9.5	-41.9	-11.9	-9.1	-7.2	-6.1	-5.1	0.0	-0.6	-0.3
S - Other service activity	-7.6	-5.9	-4.7	-8.0	-6.7	-5.6	-2.1	-1.5	-1.1	-1.6	-0.7	-0.3
B - S Total	**-7.2**	**-5.5**	**-4.9**	**-7.7**	**-6.3**	**-5.7**	**-4.3**	**-4.2**	**-3.9**	**-1.1**	**-0.3**	**0.0**

1 - d1: calculated on the original distribution with extreme values

2 - d1_t5: calculated excluding, within each Nace, the lower and upper 2.5% of the distribution of the differences

3 - d1_t10: calculated excluding, within each Nace, the lower and upper 5% of the distribution of the differences

Since the d1 indicator is sensitive to extreme values the same indicator has been computed without extreme values namely excluding, within each NACE, the lower and the upper 2.5% and 5% of the distribution of the differences (respectively d1_t5 and d1_t10

indicators). The values of these last indicators decrease appreciably (table 2). Moreover the reduction of the difference due to the exclusion of extreme values is less between RACLI and SDS and between SDS and BIL than in the comparison RACLI–BIL. These results signal that part of the problem may be due to outlying observations, especially between these last two sources. However the RACLI source continues to measure lower labour costs compared with the other sources suggesting that these differences are structural.

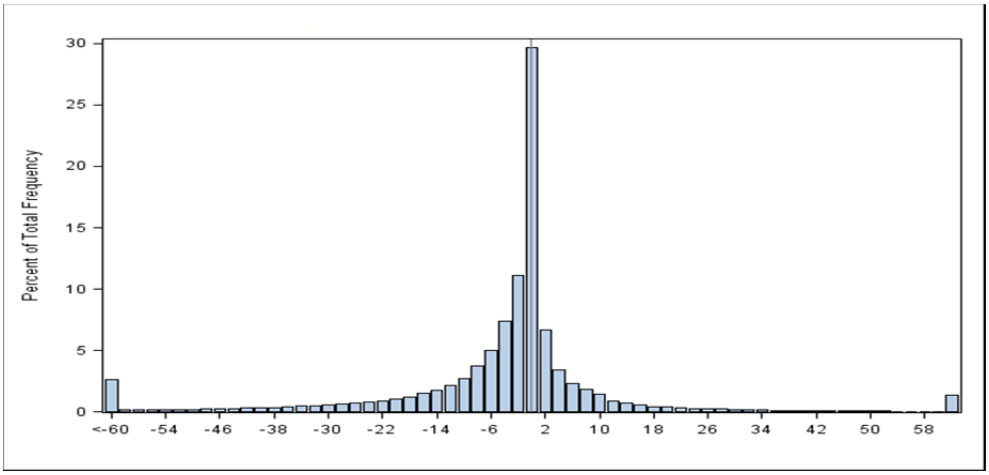
To deepen the analysis in this direction, we move to a micro level comparison, that is examining the distribution of the differences between matched firms. Since d1 is an asymmetrical measure, the following analysis is performed with the measure below:

$$d2_i = 100 * \frac{v_{ai} - v_{bi}}{(v_{ai} - v_{bi})/2}$$

where d2 is a symmetrical measure varying between -200 and +200.

Figure 2 show the distribution of d2 for the variable wages and salaries between RACLI and BIL.

Figure 2 – Distribution of d2 differences on wages and salaries between RACLI and BIL.



In order to measure a bias, not influenced by outliers possibly due to definitions differences, the main location measure we use is the median. To provide a magnitude of the similarity of the measures we use the following two indicators calculated on d2:

$$freq2=100*(F_{-2<=d2<=+2}/F)$$

$$freq5=100*(F_{-5<=d2<=+5}/F)$$

where F is the number of firms and freq2 and freq5 represent the percentage of firms, on total matched firms, having a d2 distance respectively between ∓ 2 or ∓ 5. Empirical evidence on the wages and salaries differences between RACLI and BIL is shown in the following table broken down by legal form, size classes and economic activity sections of the firms. The d2 median distance is always negative. On average 40% is the percentage of firms with a differences within 2% and this percentage rise to almost 60% for differences

within 5%. Among economic activities, the transportation sector scores the highest differences and one of the lowest percentage of firms with a difference lower than +/- 2%. In the transportation sector freq2 and freq5 are significantly lower than the average ones, implying a greater structural difference among the data compared. Regarding the firm size classes, based on the number of persons employed, the negative d2 median grows with size. Considering the legal form, mutual co-operative societies show the lowest freq5.

Table 3 - Comparison measures, based on d2 indicator, on wages and salaries between RACLI and BIL matched units, by legal form, size classes and sections of economic activity.

	N. Firms	d2_Me	freq2	freq5
Section of economic activity				
B - Mining and quarrying	1,145	-0.7	43.2	64.5
C - Manufacturing	96,956	-1.1	43.1	63.3
D - Electricity, gas, steam and conditioning supply	1,239	-2.0	33.6	53.4
E - Water supply, sewerage, waste management and remediation activities	3,629	-2.3	36.3	54.5
F - Construction	70,205	-1.6	27.3	47.9
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	115,525	-0.2	45.4	62.7
H - Transportation and storage	20,982	-6.3	26.7	39.3
I - Accomodation and food service activities	31,379	0.0	48.9	65.1
J - Information and communication	22,044	-1.6	36.5	54.1
K - Financial and insurance activities	3,903	-1.2	40.4	57.8
L - Real estate activities	13,916	0.0	42.2	59.0
M - Professional, scientific and technical activities	26,629	-1.5	37.2	55.1
N - Administrative and support service activities	24,517	-1.7	34.6	51.3
P - Education	4,148	-0.3	39.6	55.5
Q - Human health and social work activities	11,242	-0.6	45.0	61.6
R - Arts, entertainment and recreation	7,341	-0.8	37.7	51.4
S - Other service activities	8,508	-0.1	39.6	59.0
Size class				
00-01	17,058	0.0	41.7	47.9
02-03	132,249	0.0	41.5	56.5
04-05	81,399	-0.5	39.8	58.1
06-09	89,958	-1.1	39.0	59.1
10-19	85,972	-1.6	38.5	59.0
20-49	44,375	-2.1	36.8	58.5
50-99	12,297	-2.2	36.2	59.2
Legal form				
LF1 - Sole proprietorship, individual entrepreneur, self employed and own account worker	1	0.0	100.0	100.0
LF2 - Partnership	493	-0.9	41.0	60.6
LF3 - Joint-stock companies	21,546	-1.6	38.3	61.7
LF4 - Limited liability companies	406,374	-0.8	39.9	57.9
LF5 - Prevalently mutual co-operative societies	21,093	-1.2	35.1	49.4
LF6 - Other co-operative societies	8,494	-1.2	39.7	56.7
LF7 - Consortium	5,244	-1.1	37.1	55.7
LF8 - Municipal companies	29	-1.3	44.8	58.6
LF9 - Other legal form	34	-8.1	23.5	35.3
Total	463,308	-0.9	39.6	57.7

The same indicators have been calculated for the labour cost variable including in the comparison the other source (Table 4). The comparisons are performed within pair of sources and include a different number of firms, since each source cover different portions of the economy.Looking at the total distribution, negative d2 median, equal to -2.7, for RACLI–BIL is higher than that for wages and salary so for this latter there is a best matching data between this two sources. On the other hand the RACLI distance from SDS on labour cost is in general lower than that from BIL.

Table 4: Comparison measures, based on d2 indicator, on Labour Cost (RACLI-BIL, SDS-BIL, RACLI-SDS) by legal form, size classes and sections of economic activity.

	RACLI - BIL			RACLI - SDS			SDS - BIL		
	N. Firms	*d2_Me*	*freq2*	*N. Firms*	*d2_Me*	*freq2*	*N. Firms*	*d2_Me*	*freq2*
				Section of economic activity					
B - Mining and quarrying	1,146	-2.4	28.8	1,526	-1.6	27.8	956	0.0	85.1
C - Manufacturing	96,954	-2.4	33.3	203,847	-1.3	34.0	73,807	0.0	79.0
D - Electricity, gas, steam and cond. supply	1,239	-3.5	26.1	41	-6.2	17.1	35	0.0	65.7
E - Water supply, sewerage, waste, activities	3,630	-5.0	21.7	1,873	-3.6	24.8	995	0.0	77.6
F - Construction	70,197	-3.9	18.3	209,516	-1.7	17.0	59,111	0.0	80.9
G - Wholesale and retail trade	115,527	-2.2	35.0	325,800	-0.7	38.6	94,155	0.0	81.9
H - Transportation and storage	20,986	-8.3	17.2	39,003	-9.8	13.2	13,881	0.0	78.6
I – Accomodation, food service activities	31,377	-0.6	42.6	165,536	0.2	40.6	26,489	0.0	88.1
J – Information, communication	22,047	-3.1	29.7	27,902	-2.7	29.5	17,916	0.0	69.6
K - Financial and insurance activities	3,902	-3.4	30.2	19,163	-1.8	34.8	3,350	0.0	71.6
L - Real estate activities	13,918	-1.7	34.6	23,700	-0.8	34.2	12,359	0.0	82.2
M - Professional, scientific technical activities	26,626	-3.4	28.9	96,166	-1.0	36.1	18,771	0.0	69.4

Table 4 continue: Comparison measures, based on d2 indicator, on Labour Cost (RACLI-BIL, SDS-BIL, RACLI-SDS) by legal form, size classes and sections of economic activity.

	RACLI - BIL			RACLI - SDS			SDS - BIL		
	N. Firms	*d2_Me*	*freq2*	*N. Firms*	*d2_Me*	*freq2*	*N. Firms*	*d2_Me*	*freq2*
				Section of economic activity					
N - Administrative support activity	24,516	-3.8	26.0	34,684	-1.7	28.7	14,966	0.0	74.9
P - Education	4,150	-2.4	31.6	2,921	-2.0	30.9	548	0.0	71.4
Q - Human health, social work activities	11,237	-2.5	35.6	52,738	-0.4	41.7	4,924	0.0	79.0
R - Arts, entertainment and recreation	7,344	-2.3	26.7	9,582	-0.3	33.5	3,344	0.0	78.0
S - Other service activity	8,507	-1.9	31.5	66,802	0.6	33.6	7,010	0.0	79.0
				Size class					
00-01	17,060	-3.3	19.4	69,403	0.8	19.0	11,321	0.0	80.0
02-03	132,251	-2.4	29.8	586,560	-0.3	32.2	103,246	0.0	80.8
04-05	81,391	-2.4	30.9	273,271	-1.0	34.4	66,774	0.0	80.3
06-09	89,961	-2.6	31.4	198,398	-1.5	36.0	74,176	0.0	79.7
10-19	85,967	-2.9	31.4	116,433	-2.1	35.0	67,754	0.0	78.1
20-49	44,377	-3.2	30.7	33,410	-2.7	32.2	26,412	0.0	76.8
50-99	12,296	-3.3	30.4	3,325	-3.2	29.5	2,934	0.0	76.4
				Legal form					
Sole proprietorship, individual entrepreneur	1	-27	00	566,478	0.1	33.8			
Partnership	493	-21	314	333,240	-1.1	35.0	388	0.0	82.2
Joint-stock companies	21,544	-33	291	8,860	-3.0	27.5	8,404	0.0	74.7
Limited liability companies	406,368	-26	307	356,077	-2.4	29.6	330,150	0.0	79.8
Prevalently mutual co-operative societies	21,101	-31	256	11,611	-2.5	25.0	10,118	0.0	79.9
Other co-operative societies	8,490	-34	289	2,217	-4.0	21.9	2,035	0.0	75.3
Consortium	5,243	-28	296	1,742	-3.1	26.8	1,490	0.0	73.6
Municipal companies	29	-161	103	95	-5.1	18.9	11	0.0	72.7
Other legal form	34	-86	265	480	-5.6	19.8	21	0.0	47.6
Total	463,303	-2.7	30.3	1,280,800	-0.8	32.8	352,617	0.0	79.6

Finally it is important to stress that the d2 median for BIL-SDS is zero (that is, BIL values almost equal to those of SDS for total labour cost) and the percentage of firms with a difference not higher than +/- 2% is much higher compared to that of RACLI with the other sources. These findings are expected since BIL and SDS are both fruit of the general accounting, while RACLI descend from the personnel accounting. RACLI shows higher similarity with SDS and this might be partially due to the fact that SDS covers also smaller enterprises, with respect to BIL, for which lower differences have been recorded. It is likely that smaller firms have a general accounting bookkeeping less structured than larger firms and then less different from personnel accounting.

The results of these analyses together with the consideration on the different system of account within the firms (§3) lead to explore more in deep the theoretical definition of the same variable in different administrative data and in particular in data drown by the social security system (RACLI source) and those based on fiscal and general account data (BIL and SDS).

5. Main theoretical hints on differences on TLC definition: social security vs profit and loss account vs SBS Regulation

According to the definitional content of the different sources on the TLC, there are some relevant differences among the data we are taking into consideration.

Table 5 briefly summarizes these main differences among the definitions of profit and loss and fiscal sources in general (BIL/SDS/UNICO), social security data (RACLI) and the SBS Regulation which is our theoretical benchmark.

On one hand this regulation only states general contents of labour costs variable suggesting that only the remuneration of work done should be included. On the other hand,the SBS explicit reference to company accounts means that the SBS definitions are delegated to the company accounts rules and intepretations and they leave space or in some cases the official interpretations explicitly indicates, to include in labour costs also items that could be more properly intermediate costs and viceversa to not include items that should be remuneration of the work done.

Going more in depth on the actual content of each financial statement item and on the accounting practices the pros and cons of each source to measure the statistical definitions can be highlighted. The inconsistency of the input sources with the desired definitions may derive from a different definition of the underlying employment, or different content of wages and salaries or differences imputable to social contributions. Some of the items may have a negligible impact, while others can lead to biased estimates of labour costs.

As concerns employment, in company account (BIL), the definition of the personnel costs may include not only costs for employees but also for agency and project workers. The official interpretations of the company accounts, in fact states that, for the principle of prevalence of substance to form. These external workers may be "assimilated" to employees[10]. In the statistical definition, of course, agency workers and "external workers"

[10] This principle descends from fiscal rules, for which all external workers (agency workers, outworkers) costs are defined as "assimilated" to employees costs.

or "outworkers" have to be excluded from personnel costs which should be referred only to employees.

Table 5 - Difference among sources and between each source and SBS Regulation

CAUSES OF DIFFERENCE	BIL - SDS/UNICO - (Accounting and fiscal data)	RACLI (social security data)	Theory (SBS Regulation[11])
Employment			
Agency workers	Included	Not included	Not included
Outworkers	May be included, according to accounting rules	Not included	Not included
Working associates	May be included, according to accounting rules	Not included	Not included
Workers on secondment Host firm	May be included, according to accounting rules	Not included	Not included
Workers on secondment: Home firm	Included	Included	Included
Employees hired abroad	Included	Non included	Not included
Registration principle	Accrual	Cash	Accrual
Wages and salaries			
Meal voucher	Not included	Included only the part above 5,29 euro per voucher	Included
Fringe benefits	Not included	Totally included if above 258,23 Euro (otherwise excl.)	Included
Exceptional payment for leaving the enterprise	Included (in "other costs")	Excluded	Included
Stock options	Included (often in "other costs")	Excluded	Included
Travel allowances	Included	Partially included (amounts above fixed limits)	May be included
Other labour costs			
Yearly provisions/payment to funds for severance pay (TFR)	Included	Estimated	Included
Supplementary contribution	Included	Excluded	Included
Providences to employees	Included	Excluded	Included

About SDS source, the variable defined as personnel cost includes some items that cannot be statistically considered as employee costs. But this elements can be deduced from the total since they are detailed with separate sub-codes:

- expenditures that compensate self-employed services;
- expenditures for use of outworkers or agency workers;
- remuneration to associates for activity as administrators.

So for the statistical aims the TLC variable is obtained by subtracting these sub-items[12].

In UNICO, the item personnel costs include by definition expenditure for employees

[11] The definitions in the SBS Regulation refer to company accounting practice without details of specific items that have to be included/excluded. On the other hand SBS data are the input for national accounts that instead have to refer to ESA 2010 highly detailed definitions.

[12] Since the completeness and quality of these sub-items is questionable because they are not relevant for administrative purposes doubts remains on the accuracy of the final figures on TLC when the firms report these kind of items.

and "assimilated" workers and in some cases also costs for self-employed services. Moreover in this source separate details about the costs of this "assimilated personnel" is not available but for statistical purposes they should be estimated and excluded from personnel costs.

Another relevant inconsistency derived from different boundaries of employment that can lead to significant discrepancies among the examined sources is related to workers on secondment. According to the regulation their cost should be recorded in the labour costs of the organization for which they are at payroll (home organization) and in intermediate costs for the host firm. However the accounting principle establishes that they can be included in host firm labour costs in BIL so there is a potential risk of duplication of TLC aggregate values due to this kind of firms.

Focusing on inconsistencies derived from different boundaries of wages and salaries the main aspects are related to the following items.

- Meals vouchers and fringe benefits: they should be included in wages and salaries according to Regulation, while they are recorded as intermediate consumption in BIL due to the principle for which costs are classified according to their nature. In RACLI only the amount above fixed limits is included in wages and salaries.
- Exceptional payment for leaving the enterprise and stock options: they should be recorded in wages and salaries according to SBS definition while they are included in BIL labour costs but under other personnel costs. They are not at all in RACLI figures because not subjected to social contributions.
- Travel allowances: SBS definition does not mentions them specifically so it is hard to determine whether they should be accounted in intermediate costs or in labour costs[13]. They are included in wages and salaries of BIL-SDS-UNICO, while they are only partially included (amounts above fixed limits) for RACLI since only the part considered compensation for the employee is subject to social contributions.

Differences can be referred also to social contributions. About severance pay, for example, that should be included in social contribution definition, it is included in BIL-SDS-UNICO labour costs while RACLI provides only an estimate. More in general, some components of social contributions are only estimated or missing in the RACLI Register. Although these should account for tiny amounts of the social contributions this raises doubts on their use for the SBS Regulation requirements.

The comparison analysis on the TLC variable put on evidence that none of the administrative data have exactly the information requested for the statistical aim: each source has both pros and cons. In other terms, there is not a unique source with the desired content of employees wages, other labour costs and total labour cost, each source should be adjusted.

In particular the use of fiscal sources on TLC implies necessarily some corrections for the costs not pertaining employees. On the other hand, in RACLI social security based data the labour cost is referred only to employees but there are some other aspects to remember. First of all this information do not include costs for other benefits to employees (they are not collected for social security data neither estimated afterwards). Secondly, social contributions are partly directly derived from social security data, while the part due to

[13] For ESA 2010 travel allowances are intermediate costs.

other institutions (like contributions to insurance schemes for occupational accidents and diseases) is estimated.

So we had two main alternative possibilities about the use of the different data source in the Frame: the integration of Personnel Costs from the register based on social security data or the use of these latter data to correct the fiscal source on the same variables. The choice was basically between using the same sources with the same priority as those supplying the other economic variables, hence disposing of a coherent accounting framework or using RACLI for labour costs, with the advantage of having the same sources that is the base of the estimate of employment, thus keeping the maximum consistency with the labour input. To enhance the coherence among all economic flows and balancing items it has been preferred to gather all information from the same sources. So the final decision was to use the same source for all SBS variables including personnel costs but using social security information to apply some corrections according to the statistical definitions.

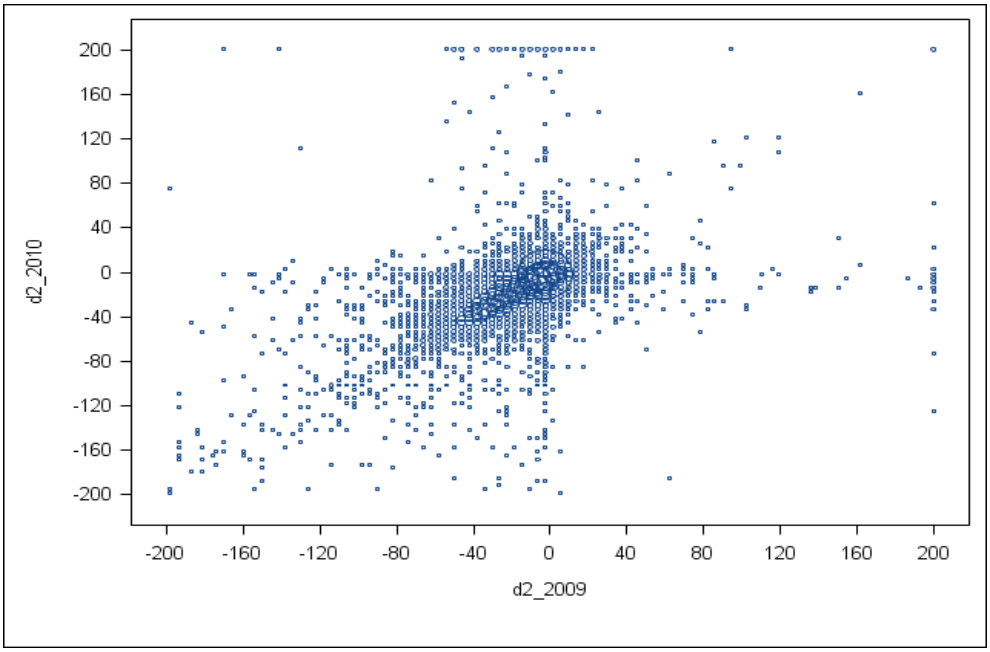
6. Empirical hints on differences among sources

6.1 The causes of the differences

The analysis of paragraph 4 has provided a descriptive overview of the basic measures of the differences between company accounts and social security data. The differences are quite widespread among economic sectors, size classes and legal forms even if in some cells, notably in transport sector (section H), their size is more marked. In this paragraph the analysis is deepened trying to understand which are the main drivers of these discrepancies.

A first question to which is necessary to respond is whether the differences are persistent over time. As stated above the size of the differences are rouglhly the same between 2009 and 2010. To investigate further, figure 3 plots the differences on wages and salaries between BIL and RACLI for each enterprise observed in 2009 against those observed for 2010 in section H. The data are binned in classes of differences to avoid overplotting and the size of the bubble indicates the number of enterprise in that bin. Since the data are concentrated on the diagonal of the graph it is possible to conclude that enterprises with the larger difference in one year are also those with the larger differences in the subsequent year. This hints at the facts that the differences are explained by structural characteristics of the units and are not due to contingencies.

Figure 3. D2 distances on wages and salaries BIL-RACLI: 2009 versus 2010.



Once proved the persistency over time of the difference between the sources on the same variable, to derive some insights on the causes of the differences a look in the labour cost structure may be of help even if it is fully available only for BIL. One such insight come from the analysis of the severance payment (TFR) that is the amount of wages retained by the enterprises (or versed to an external Fund) each year to be provided to the workers at the termination of the labour contract. For most enterprises its size is about 7.4% of all non-occasional elements of the total wages plus a part due the appreciation of the fund already accumulated. Typically the distribution of the TFR should concentrate on the range of 6-9% of the total wages and salaries as table 6 confirms (63.9% of firms in all sections). The percentage of firms in the entire economy for which this ratio is below what expected is 25.1% (14.4% between 1 and 6 and 9.7% below 1). It interesting to stress that in section H, this shares rise to 40.5% (29.3% between 1 and 6 and 11.2 below 1).

Table 6 – Firms by classes of the percentage ratio of TFR on wages in the BIL source

FIRMS	% Ratio of TFR on wages					
	missing	<1	1-6	6-9	>9	all
	All sections					
number	2,667	44,761	66,822	296,343	53,072	463,665
%	0.6	9.7	14.4	63.9	11.4	100
	section H: Transportation and storage					
number	137	2,360	6,152	10,940	1,409	20,998
%	0.7	11.2	29.3	52.1	6.7	100

Tables 7 suggests that this feature is associated with the differences in wages between the two sources, RACLI and BIL. In section H, while the d2 median of the difference is only -2.2% for firms that have a ratio of the TFR over wages in the normal range 6-9%, it jumps to -25.3% for the firm with a TFR in the range 1-6%.

Table 7 – Distribution of the difference RACLI-BIL in wages and salaries of transportation and storage section by classes of the percentage ratio of TFR on wages

% Ratio of TFR on wages	D2 RACLI-BIL wages				
	N	Mean	Q1	Median	Q3
<1	2,359	-20.9	-32.3	-10.3	0
1-6	6,147	-26.9	-35.7	-25.3	-12.7
6-9	10,924	-5.7	-10.2	-2.2	0
>9	1,409	3.7	-4	0	5.3
All	20,839	-13.1	-22.5	-6.5	0

This evidence suggests that the firms that show larger negative differences between the two sources may have part of their total wages not subject to the TFR provision. This may occur in either of two situations. The first is when part of the wages indicated in the profit and loss account are paid to workers that are not employees (as mentioned in paragraph 5 and measured in paragraph 6.2) and for whom the legislation does not envisage the TFR provision. The second is when company accounts wages include some components that are not subject to the TFR. The base for TFR computation is composed by all the non-occasional elements of wages. According to the Italian legislation, however not all amount paid to the employees are considered wage from the point of view of tax and social security contributions. The general principle is that only elements that are income for the worker are considered taxable and subject to social contributions. One element that is only partially subject are travel allowance (which weight in transport sector is relevant) since part of it is a refund of expenses. In the accounting practice travel allowances are totally included in wages and salaries while they are only partially included for Racli (see table 5), since for the social security contribution the amount of transfer allowance above fixed limits has to be considered a refund for the employee so no contributions has to be paid on it. At the same time, the exceeded part is considered remuneration so it has to be subjected to the payment of the contribution rate.

6.2 The outworkers

Table 8 confirms that profit and loss account may include in the voice “Personnel cost” also workers not properly employees, like staff workers and project workers. It compares the distribution of the d2 difference of wages between RACLI and BIL separately for firms which have only employees and firms with at least one outworker. This information is drawn from the newly available Business register that provide, for each enterprise, the number and types of employees and of outworkers attached to it and in some cases their costs.

The evidence is striking: while the median difference of firms with only employees waver around zero, that of firms with outworkers is systematically negative. This is even more clear when looking at the first quantile of the distribution. What is probably occurring is that, for many firms, the wages in the accounts data include the compensation for

outworkers while, by definition, the social security source, used in this comparison does not. The table, however, shows also that in Transportation, the sector with the highest negative difference, passing from one type of enterprises to the other, the distribution does not shift much to the left, leaving the parameters of the distribution roughly unchanged.

Table 8 – Distribution of the differences on wages between RACLI and BIL separated for firms with/without at least one outworker.

Nace sections	without outworker				with at least one outworker			
	N. firms	Q1	Median	Q3	N. firms	Q1	Median	Q3
Total (B-S)	316,529	-5.0	-0.1	0.8	146,938	-10.9	-2.5	0.1
Industry (B-E)	60,998	-3.9	-0.3	0.6	42,067	-7.8	-2.1	0.0
Industry (B-F)	117,843	-5.0	-0.4	1.3	55,403	-9.5	-2.5	0.0
Services (G-S)	198,686	-5.0	0.0	0.6	91,535	-12.1	-2.5	0.1
B - Mining and quarrying	802	-4.2	-0.3	0.5	344	-6.8	-1.3	0.4
C - Manufacturing	57,545	-3.8	-0.2	0.6	39,499	-7.7	-2.1	0.0
D - Electricity, gas, steam and air conditioning supply	593	-6.2	-1.1	0.2	650	-10.0	-2.5	0.1
E - Water supply; waste managment	2,058	-7.7	-1.1	0.1	1,574	-11.3	-3.3	0.0
F - Construction	56,845	-6.4	-0.7	2.9	13,336	-15.3	-4.8	0.0
G - Wholesale and retail trade	82,533	-3.9	0.0	0.4	33,037	-9.2	-1.9	0.2
H - Transporting and storage	14,970	-21.9	-5.6	0.0	6,012	-21.6	-6.2	-0.2
I - Accommodation and food service activities	24,770	-2.4	0.0	1.4	6,614	-7.6	-1.0	0.6
J - Information and communication	13,014	-5.7	-0.3	0.5	9,044	-13.9	-3.2	0.0
K - Financial and insurance activities	2,502	-6.4	-0.3	0.1	1,393	-11.7	-2.7	0.0
L - Real estate activities	10,490	-4.0	0.0	1.1	3,435	-10.6	-1.3	0.7
M - Professional, scientific and technical activities	15,137	-5.9	-0.4	0.3	11,496	-13.9	-3.1	0.0
N - Administrative and support service activities	15,850	-6.9	-0.2	0.8	8,669	-16.6	-3.9	0.0
P - Education	1,935	-2.0	0.0	1.7	2,221	-17.4	-2.4	0.7
Q - Human health and social work activities	6,666	-3.3	0.0	0.5	4,584	-13.0	-2.5	0.0
R - Arts, entertainment and recreation	4,968	-5.3	0.0	1.6	2,381	-18.4	-3.8	0.4
S - Other services activities	5,851	-3.9	0.0	1.8	2,649	-13.3	-2.6	0.3

The analysis confirms that most of the differences between social security and company account/fiscal data are due to two effects: differences in underlying employment and items included or not in wages and salaries. The first element can be measured and must be corrected to estimate the desired SBS target variable. About the second one, it is instead uncertain if the inclusion of some items (i.e. travel allowances) should be corrected since the SBS is vague on the specific contents[14] and moreover they cannot be directly measured though the sources available.

[14] The general principle underlying the classification of costs suggest that labour costs should include only the remuneration of work done while other expenses for the production process should be classified in intermediate consumption. On the other hand the SBS explicit reference to company account items leaves space for interpretation since Italian practice allow to include in labour costs also items that could be more properly intermediate costs.

7. The correction: theory and practice

7.1 The theoretical frame

The need to edit the value of employees costs derived from the company accounts and the fiscal sources flows from the requisite of consistency within the whole theoretical accounting framework. It has to be kept in mind, in fact, that the final objective of the Frame is the representation of the whole accounting framework, not only the estimate of the labour cost. This implies that consistency have to be achieved not only with respect to theoretical definition and classification, but also between the estimate of all economic flows and balances and the underlying labour input. This is the condition to be able to determine the correct per capita value (in terms of costs and productivity) and to represent correctly also the distributive flows directed to the remuneration of the different types of labour input underlying production.

All types of labour input, in fact, contribute to production: employees and self-employed but also all kind of "external" employment (i.e. agency worker, outworkers etc). What change is how their cost (or their remuneration) is classified. The cost of "external" employment should be included in intermediate consumption, so that the value added (=production-intermediate consumption) is netted only of labour cost of external workers. The cost of employees is instead recorded in personnel costs and deducted from the value added to obtain the gross operating surplus. So this balancing item is computed when all internal and external employees are remunerated. However the gross operating surplus has yet to remunerate another labour input. Self-employed, in fact, contribute to the production with both labour and capital and have to be remunerated for both. In other terms, self-employed, who also owe the enterprises (or part of it) withdraw part of the enterprise profit to compensate both their labour and capital (also for the risk) input, thus receiving what is called a "mixed income" as part of the gross operating surplus, in the simplified accounting framework here represented.

It is therefore clear that economic flows have to be represented and classified in different cost items, according to the classification of the underlying labour input. Therefore the cost for external worker have to be included in intermediate consumption and not in personnel costs to correctly represent value added, while income flows remunerating self-employed do not have to be included neither in intermediate consumption, nor in personnel costs, since their remuneration have to be included in gross operating surplus[15].

This is the theoretical accounting framework, but when we deal with accounting and fiscal registers we have to consider, as shown in figure 4, that:

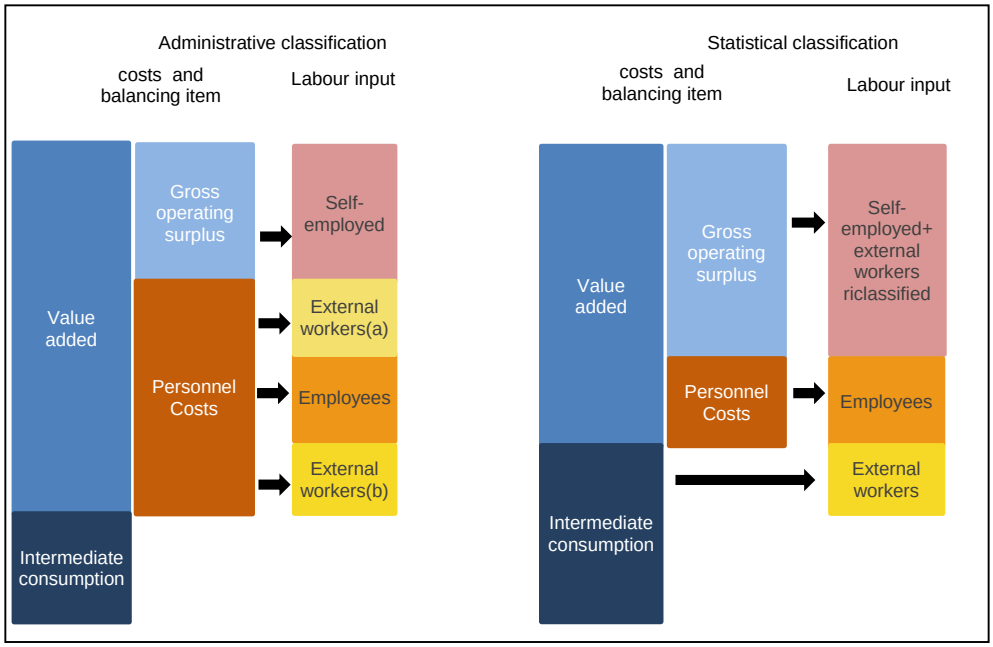
- In fiscal definition external workers receive a compensation that can be assimilated to employee costs (i.e. have the same characteristics in term of tax-deductibility): for this reason in fiscal forms and accounting practices, costs related to external workers (b in figure 4) can be recorded in the personnel costs.
- Fiscal practice may also induce many enterprises to classify the remuneration of self-employed as cost of external workers (a in figure 4).

This impose a re-classification of costs to be coherent both with our accounting

[15] From a National accounts point of view this flow is distributed in the secondary distribution of income account.

framework and with the correct representation of labour input as shown in the right hand side of figure 4.

Figure 4 - Classification of labout input costs: from administrative sources to statistical classification



Only costs related to proper employees have to remain in personnel costs. This imply that:

- costs related to external worker(b) have to be subtracted from labour costs and be classified as intermediate consumption
- costs related to external worker(a) have to be subtracted from labour costs determining a higher gross operating surplus that will remunerate these external workers reclassified as self–employed.

7.2 The correction method

The analysis sketched in paragraph 6 has demonstrated that the labour cost of some firms in accounting and fiscal data includes the costs of external workers and thus it can lead to overestimate the variable requested in the SBS Regulation. This definition/measurement error has to be corrected in order to avoid any bias in the final estimate of the labour cost statistical variable. A correction method has to tackle different points:

- identify which units must be corrected and which must not;
- calculate the size of correction;
- reallocate this correction between intermediate consumption and gross operating surplus.

As discussed previously, the new Employment Register provides a lot of information on the number of external workers, their wage compensation and social contributions for each type of external worker (see table 9).

Table 9 – Details available on external workers in the new Employment Register.

	n. of persons employed	wage compensation	social contributions
External workers reclassified as self-employed	X	X	X
Collaborators	X	X	X
Manager	X	X	X
Vouchers	X	X	X
Associates	X	X	X
Others	X	X	X
Temporary workers	X	*	*

**estimated by the RACLI register*

The only category of personnel assimilated to employees for which no information on costs are present are the temporary workers. For them, however, an estimate of wage and social contribution costs can be estimated by RACLI register. More in deep they have been imputed with the medium cost of blue and withe collars of the firms where temporary workers are employed.

Enterprises that have external workers and whose labour costs measured by the profit and loss are above those measured by RACLI are likely to be in the list of units to be corrected. This condition, however, if it is necessary is not sufficient, since the difference between the two sources may be due to other idiosyncratic definitional differences and not to the allocation of cost of non employees into the personnel costs. As we saw in paragraph 5 there are many of these differences in the two type of accounting. It has been decided that for the purpose of SBS statistics the other definitional differences do not need to be corrected , since the regulation definition, those that the frame aim to measure, are such that the company accounts definition can fit into them. In symbols:

$$w_i^{CA} = w_i^R + n_i + d_i + e_i$$

The equation states that the difference between the wages in company account of enterprise i, w_i^{CA}, and the wages in the social security based register, w_i^R, is equal to a difference, n_i, due to the inclusion of the wages of external workers and a difference, d_i, due to other systematic definitional differences and e_i, an i.i.d. error with zero mean due to random factors.

$$n_i \geq 0$$

It will be equal zero for firms that do not employ external workers or for firms that do not add their wages to those of the employees in the company accounts.

The method aims to obtain an estimate of n_i since it is the only element that should be eliminated by the correction method, to get to a corrected version of the wages of company accounts, $\widetilde{w}_i^{CA}$ equal to:

$$\widetilde{w}_i^{CA} = w_i^R + d_i + e_i$$

This correction is done in two steps: the first step obtain an estimate of d_i , $\widetilde{d_i}$, and, second, obtain an estimate of n_i , $\widetilde{n_i}$ given $\widetilde{d_i}$.

The estimate $\widetilde{d_i}$ is obtained by taking the median of the differences between wages in company accounts and wages in Racli for enterprises that have only employees aggregates in cells according to economic activity, size, legal form. Since by definition in such firms $n_i=0$ the average of differences is an estimate of the systematic definitional discrepancy between the two sources. The choice of taking the median instead of the mean is due to the presence of outliers.

The estimate $\widetilde{n_i}$ can thus be obtained using the information contained in the employment register and synthetized in table 9. What is not straightforward is choosing the costs of which types of workers have to be deducted from the company account figure. In fact different enterprises may have included costs of different kind workers along with those of true employees. Since, in principle, once taken into account the definitional difference, the wages in company accounts should be equal to the one in social security data plus a random error, the choice has been to estimate $\widetilde{n_i}$ as the sum of costs of those categories of workers that minimizes, for each firm, the difference between the wages of company accounts and the wages of RACLI plus the definitional difference. In symbols:

$$\widetilde{n_i} = \min(\text{abs}(\widetilde{w}_i^{CA} - (w_i^R + \widetilde{d_i})))$$

$$\text{Since } \widetilde{w}_i^{CA} = w_i^{CA} - \widetilde{n_i} = w_i^{CA} - \sum_{j\epsilon S_i} w_{ji}^E$$

Where w_{ji}^E is the wage of the *j-th* category of external worker (temporary woker, project worker..) employed at firm *i*. The sum $\sum_{j\epsilon S_i} w_{ji}^E$ thus represent the sum of wage of external workers over the set of categories S_i employed at firm *i*

$$\widetilde{n_i} = min_{S_i}(\text{abs}((w_i^{CA} + \widetilde{n_i}) - (w_i^R + \widetilde{d_i})))$$

Thus the minimum is over all possible sets S_i of categories of workers employed at firm *i*.

8. Final Remarks

The availability of multiple administrative sources on the same variables and the comparison among them let to better understand details and characteristics of the data, their administrative definition/aim, the way they are measured and differences among them. The reconciliation of administrative data and statistical purposes requires a deep knowledge of the sources to correct them or to measure the residual discrepancies. The comparison analysis on the TLC variable pointed out that none of the administrative data sources have exactly the information requested for the statistical aim. Each source has both pros and cons on different aspects due to the administrative purpose they are produced for. For the Frame and the satisfaction of the SBS Regulation, the choice for TLC variables was basically between two possibilities. The first was the use of the same sources (accounting and fiscal data) with the same priority as those supplying the other economic variables, hence disposing of a coherent accounting framework. The alternative was the use of social security data for labour costs with the advantage of having the same sources that is the base of the estimate of employment, thus keeping the maximum consistency with the labour input. Because of coherence among information drown from the same sources and the explicit reference of the SBS Regulation to balance items, the accounting/fiscal personnel cost variables have been included in the Frame but after correcting for wrong inclusions with the support of social security information. So far the evolution on the administrative

data available and used for statistical purposes let us to estimate and correct personnel cost data of Frame sources when not properly employee costs were included. Other aspects should be deepened and possibly corrected like worker on secondment and the remuneration in kinds, and some other may be enhanced like the correction method. Moreover, since the statistical definition of the same variable may be partially different in different regulations, as SBS and ESA, they must be taken into consideration to extend the use of administrative data to satisfy other regulations.

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