

Improving Labour Statistics in Ukraine Through the Integration of Employment and Unemployment Data From Different Sources*

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I. Introduction

Information on the social and economic situation in the labour market is mainly collected from the following three broad groups of sources:

- (i) population censuses and labour force surveys;
- (ii) establishment surveys; and
- (iii) administrative records/register-based statistics.

While these multiple sources of data provide users with a wide spectrum of statistics, they may sometimes create confusion as to which of them reflect more accurately and more completely a given phenomenon. Moreover, it is not uncommon that data collected for the same economic variable from different sources may give not only different results but even show opposite trends.

Such "deregulation" of labour market statistics stems from the fact that all the sources listed above have different primary objectives, different coverage, different reference periods and frequency; they also use different definitions and classifications of closely related concepts.

It is not surprising therefore that a number of countries consider it important, and even necessary, to **compare** data collected from different sources in order to both understand why similar activities yield different statistics and to provide users with "guidelines" on how to use them.

Another group of countries go one step further and try to **reconcile/adjust** data collected from different sources in order to bridge distinctive gaps in coverage of individual sources, smooth over measurement errors and clear up differences in definitions and classifications used.

Finally, a third group of countries **integrate data** or **construct labour accounts** whereby the various types of inconsistent data are reconciled to yield a hybrid "best" estimates. In general terms, an accounting system is an interrelated set of definitions, classifications and measurement conventions which are useful for organising quantitative description, planning and analysis¹.

Proceeding from the above definition, a labour accounting system (LAS) may be defined as a system where statistics on labour supply and demand, wages and labour costs are reconciled with demographic, migration and education statistics in a cross-sectoral and longitudinal dimension and integrated into a single overall system, which can be further linked with interrelated variables of a system of national accounts. Countries where reconciliation or **balancing** is made within the Balance Sheets of Labour Resources can also be associated with the third group, although the objective of this procedure is much less ambitious than that of LAS.

This paper attempts to compare and reconcile employment and unemployment data collected from different sources in Ukraine. Also, an alternative procedure to balancing is proposed – integration of data from different sources. This work was carried out in close collaboration with the senior specialists of the State Statistics Committee of Ukraine. The author would like to express his particular gratitude to Ms. Nadiya Grygorovych, Director, Ms. Nataliya Rubliova, Chief, Labour Force Survey Unit and Ms. Olga Linnik, Senior Statistician, Statistical Reports Unit, of the Department of Labour Statistics.

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II. Main sources of employment and unemployment data in Ukraine

Employment and unemployment data are regularly collected from the following sources:

1. **Employment:**
 - (i) Compulsory statistical reports¹ of enterprises/establishments, institutions, organisations, ministries of defence and of the interior, and penitentiary establishments.
 - (ii) Compulsory statistical reports of agricultural production units.
 - (iii) Agricultural Reports on Persons Working in Farms.
 - (iv) Tax inspections' records;
 - (v) Records of the Committee on Religious Issues;
 - (vi) Labour Force Survey.
2. **Unemployment:**
 - (i) Employment offices' records².
 - (ii) Labour Force Survey.

More specifically, the above groups of sources provide the following information:

- (a) *Compulsory statistical reports* of enterprises/establishments cover all state economic units, institutions and organisations as well as large- and medium-size economic units in the private sector: information on total and gender employment by sectors/branches of the national economy. Reports are collected on a monthly, quarterly and annual basis with cumulative totals.
- (b) *Tax inspections' records* provide information on the number of self-employed and micro-businesses by age, sex, industry and occupation.
- (c) *Employment offices* of the State Employment Centre provide information on the number of registered unemployed through the network of 648 local employment offices. The State Employment Centre operates in compliance with the "Employment Law of the Population of Ukraine" adopted in July 1991. Since then, Article 2 of the Law "Unemployed" has been amended twice – in November of 1992 and November 1997. According to this Article, the status of unemployed is given to able-bodied persons of working age (women 16-54 and men 16-59 years old) who are without work, do not receive wage/salary or any other income envisaged by the current Law, registered with a local employment office, are looking for a job, and are ready and able to accept one. School-leavers under 16 can be given the status of unemployed only if they had a job from which they were released due to a change in the organisation of production and/or work or production profile, enterprise reorganisation, liquidation/closure or the cut in employmentⁱⁱ.
- (d) *Agricultural Reports on Persons Working in Peasant Farms* were introduced in 1999 and cover all administrative regions of Ukraine: information on the number of persons employed in all types of agricultural farms, irrespective of their age. Reports are collected annually.
- (e) *Labour Force Survey*, which has been conducted since October 1995 is quarterly beginning 1999 (annual before that date). The concepts and definitions of the Ukrainian Labour Force Survey (LFS) are largely based on ILO international recommendations. A survey population includes all permanent residents of 15-70 years of age, including those temporarily absent. The information collected provides a wide range of statistics on employment by age and sex, industry, occupation, educational attainment, etc.

¹ The *compulsory statistical reports* may be largely associated with a group of statistical sources called "administrative records/reports". As a rule, such reports cover all persons, irrespective of their age, engaged at the moment of reporting both in public and private enterprises/establishments, firms, institutions and organisations covered by business registers and inventory lists.

² The *employment offices' statistics* cover working age population, i.e., women 16-54 and men 16-59 years of age, registered with employment offices and given the status of "unemployed".

III. Employment estimates: methodology used

1. *Instrument*

The official employment estimate of Ukraine is constructed on the basis of the balancing method also known in the past under the name of the *Balance Sheets of Labour Resources* (BSLR), which was the unique source of integrated information on both labour supply and labour utilisation under the system of planned economy. The BSLR formed an integral part of the national *Gross Balance of Labour*, which, in turn, consisted of seven interrelated balances, and provided information on the availability and distribution of labour resources according to the type of economic activity, branch of the national economy and social group, and was available by geographic regions and territoriesⁱⁱⁱ. The BSLR reflected the distribution of labour resources in (a) the public sector of the economy (wage earners and salaried employees of governmental, co-operative and public organisations, institutions and enterprises and collective farmers participating in the economic activities of collective farms); (b) other economically active population of working age (artisans who were not members of co-operatives, etc.); (c) full-time students aged 16 and over attending educational institutions and who did not work; and (d) able-bodied population of working age engaged in individual farming plots or in household chores (i.e. those not employed in the public sector of the economy and not in full-time study)^{iv}.

It is important to mention that the balancing method currently used by the State Statistics Committee of Ukraine (SSCU) has been **significantly simplified and modified** in order to permit the integration of new sources of employment and unemployment statistics introduced after 1991. Also, it applies new concepts and definitions of labour force largely compatible with the ILO international recommendations.

A revised balancing procedure is based on two integration tables (see Tables 1 and 2 below) linked with 2 output tables. The latter are further linked with their respective supplements compiled on statistics drawn from seven input tables^v.

2. *Balancing procedure*

2.1 **Step 1:** Estimation of the population employed in all types of economic activity.

Stemming from the principal objective of the balancing procedure – estimation of the total labour resources by employment status – the **first integration table** is constructed to obtain full coverage of the population employed in all types of economic activity. This is achieved by adding data from different sources and making special estimates to adjust for under-coverage (see Table 1 below).

As follows from the table, data on persons employed in enterprises/establishments, institutions and organisations, including those in public organisations, the ministries of defence and the interior and the population of prisons are taken from a set of relevant compulsory statistical reports collected by the State Statistics Committee. Data on persons employed in agricultural enterprises/establishments and agricultural farms (farmers) are collected from the compulsory statistical reports of registered agricultural production units, and agricultural reports on persons working in farms.

In addition to data obtained from the above-mentioned sources and relevant administrative records, special estimates are made to adjust for the incomplete coverage of persons engaged in individual subsidiary farming plots, agricultural farms as well as self-employed.

The estimation procedure for these categories is described below:

- (a) *Persons engaged in individual subsidiary farming plots* (ISFPs): (i) the volume of production of the registered subsidiary farming plots is estimated according to the

methodology established by the Department of Agricultural Statistics; (ii) based on (i), the annual growth rate of the output produced is further calculated; (iii) finally, the number of persons engaged in ISFP, as revealed by the LFS, is adjusted by the factor coefficient of the output growth.

- (b) *Farmers*: the number of farmers as measured by the Agricultural Reports on Persons Working in Farms is adjusted by the average family size (2.8 persons). The rationale for this adjustment is that the above report collects information on the number of registered farmers only, whereas, as a rule, all family members work in the farm either as paid or unpaid family workers.

Table 1: Estimation of the population engaged in all types of economic activity: 1999*

No.	Item	Data source	Population	Of whom	
				Women	Men
	I. Employed in all branches of the economy	G L1, L2, L3, L4	18,789.6	9,404.0	9,385.6
1	of whom: Employed in enterprises/establishments, institutions and organisations, including those in social organisations, ministries of defence and the interior and the population of prisons	Compulsory reports of enterprises and establishments, institutions and organisations, power ministries and penitentiaries	14,031.1	-	-
2	Employed in agricultural enterprises	Statistical reports of agricultural production units	2,512.8	-	-
3	Engaged in individual subsidiary farming plots	LFS, estimates	2,178.2	-	-
4	Employed in agricultural farms (farmers)	Agricultural reports on persons working in agricultural farms	67.5	-	-
	II. Engaged in other types of economic activity	L5 + L6	3,034.1	1,483.7	1,550.4
5	of whom: Self-employed	LFS, tax inspection, estimate	3,008.5	-	-
6	Clergy	Committee on Religious Issues	25.6	-	-
	III. Employed in all types of economic activity	G I, II	21,823.7	10,887.7	10,936.0

* Annual average.

- (c) *Self-employed*: this category comprises two major types of persons: (i) those employed in the informal sector, and (ii) those employed in small enterprises (up to 5 people employed). While data on the former are taken directly from the LFS, the number of the latter is a combination of data received from the compulsory statistical reports and estimates calculated according to the following procedure. It is believed that the reports cover about 50% of the registered small enterprises. To adjust for this under-coverage, the State Statistics Committee computes a balance of the registered enterprises as of the end of the year ($X_{t12} - X_{t1}$) and multiplies the resulting figure by the average number of employees included in company records per reporting enterprise. It is worth noting that

the above adjustment factor varies depending on the industry to which the enterprise belongs. The largest number of under-reported self-employed are found to be in commerce where the adjustment factor is 1.5. Another estimate is made on the basis of information on the number of licenses issued during the reference year, received from tax inspections. This is a cumulative total, next adjusted by the average number of persons employed per informal sector employer as captured by the LFS. Based on the above approach, both juridical and physical persons are covered by the estimation procedure.

2.2 Step 2: Estimation and distribution of labour resources by employed, unemployed and not economically active.

The second step of the balancing procedure is the estimation of the total labour resources broken down by employed, unemployed and not economically active. To achieve this, Table 1 (Output) is constructed.

According to the national definition, *labour resources* comprise all persons of working age engaged in economic activity as well as those able to work (able-bodied population) but not working due to specific reasons. The working age limits (women 16-54 and men 16-59 years of age) provide an indication of the potential labour resources or labour reserve. Also included are retired persons receiving a pension but who continue to work and persons below 16 years of age

Table 1 (Output): Estimation of the employed population: 1999 (annual average)
(Thousands)

No.	Item	Total	Urban	Rural
01	Total labour resources	29,989.0	22,162.2	7,826.8
	of whom:			
02	Able-bodied population of working age	27,361.1	20,879.6	6,481.5
03	Persons above the pension age and below 16 years of age engaged in economic activity	2,627.9	1,282.6	1,345.3
	of whom:			
04	Persons above the pension age among whom:	2,625.8	1,281.5	1,344.3
05	Engaged in individual subsidiary farming plots	1,208.8	167.2	1,041.6
06	Population below 16 years of age	2.1	1.1	1.0
	DISTRIBUTION OF LABOUR RESOURCES			
07	Employed in all types of economic activity (09+10) among whom:	21,823.7	15,743.0	6,080.7
08	Person of working age (07-03) of whom:	19,195.8	14,460.4	4,735.4
09	Employed in all branches of the economy	18,789.6	13,299.5	5,490.1
10	Engaged in other types of economic activity ³	3,034.1	2,443.5	590.6
11	Unemployed registered with employment offices, of working age	1,089.4	849.6	239.8
12	Full-time students in working age	2,286.4	2,049.4	237.0
13	Not economically active able-bodied population of working age of whom:	4,789.5	3,520.2	1,269.3
14	Women on pre-natal, maternity and child-care leave	733.5	573.1	160.4
15	<i>For reference: ILO unemployed</i>	2,698.8	2,302.9	395.9

engaged in economic activity – active labour. Excluded are persons of working age who are physically disabled and those retired prior to the official retirement age on special terms.

³ Self-employed and clergy.

Table 1 (Output) provides more detailed information on persons employed in all types of economic activity by urban and rural areas. More importantly, it completes Table 1 above with estimates on persons unemployed, full-time students and not economically active. The latter three categories are harmonised to cover the working age population only. As has been mentioned earlier, this output table is further linked with seven input tables, which contain seven different layers of statistics with a higher level of detail. These supplementary tables are used like telescopic lenses to obtain a higher resolution picture of different events⁴.

2.3 Step 3: Estimation of the population employed in all types of economic activity.

Table 2 shows the **second integration table** where the **balancing** of labour resources is made. This table integrates data on the following categories of labour resources of Ukraine:

- Employed in all types of economic activity, irrespective of age.
- Unemployed of working age registered with employment offices.
- Full-time students of working age.
- Not economically active able-bodied population of working age.

Table 2 (Balancing): Estimation of the employed population: 1999 (annual average)
(Thousands)

No.	Item	Data source	Population
01	Total labour resources	Line 2 + Line 3	29,989.0
02	of whom: Able-bodied population of working age	Population Statistics Department, SSCU* & Ministry of Social Security	27,361.1
03	Persons above the pension age and below 16 years of age engaged in the economic activity	Statistical reports of enterprises/establishments and LFS	2,627.9
DISTRIBUTION OF LABOUR RESOURCES			
04	Employed in all types of economic activity	See Table 1 (Output)	21,823.7
05	Unemployed of working age registered with employment offices	State Employment Service statistics	1,089.4
06	Full-time students of working age	Educational establishment statistics (all levels)	2,286.4
07	Not economically active able-bodied population of working age	Balancing line: L1 - L4 - L5- L6	4,789.5

* State Statistics Committee of Ukraine.

⁴ *For information:* The structure of employment by industry (see Table 1 (Output), L09) is given in Table 2 (Output), not shown here, where the population employed is broken down according to the Ukrainian Industrial Classification of All Economic Activities. This classification is convertible to ISIC (Rev. 3) on the basis of the conversion table constructed by the State Statistics Committee for this purpose. Table 2 (Output) is linked with the corresponding supplementary table: Estimation of Employment by Industry, Property Forms and Sex.

IV. Labour Force Survey employment statistics

The official employment estimate received from the above balancing procedure is different from the LFS employment statistics. Thus in 1999, the two sources showed that there were respectively 21,823.7 thou. and 20,048.2 thou. persons employed in Ukraine. The difference stems from a number of reasons, which are explained in Chapter VI below. Also in this chapter an attempt is made to reconcile the data for the discrepancies revealed.

V. Unemployment data

1. As stated earlier in Chapter II, unemployment statistics are collected from monthly records of employment offices and the quarterly Labour Force Surveys. Consequently, the following two sets of unemployment data are available in Ukraine:
 - (a) *Official* (registered) unemployment and *official unemployment rate*, calculated as a ratio of registered unemployed and the able-bodied population of working age.
 - (b) *ILO* (LFS) unemployment and the *ILO unemployment rate*, calculated as a ratio of the LFS unemployed and labour force (LFS employed + LFS unemployed).

Both are widely quoted and utilised but due to the striking difference between them (see Table 1 (Output), L11 and L15 above), their interpretation causes certain difficulty for national and international users and sometimes leads to their sheer misunderstanding. It is therefore important to provide users with a kind of guide explaining why the data differ. An approach to such a guide is shown in Chapter VII where a comparison between the two measures of unemployment in Ukraine is made.

VI. Reconciliation of employment data from different sources

1. Sources

As very neatly observed by Henk Van Tuinen, Yan Willem Altena and Hanneke C.M. Imbens^{vi}, an experienced statistician knows that every source, and by implication every type of statistics, has its own peculiarities. All sources generate non-sampling errors, samples generate sampling errors; registers are “polluted”; registers, administrations and respondents have their own concepts; interviewers generate biases and written questions are badly understood (and often extremely difficult to read); data cleaning generates biases but it is an indispensable activity because of the shortcomings mentioned. Table 3 demonstrates to what extent information compiled from different sources vary.

Table 3: Various employment figures

(Thousands)				
Years	Official estimates	Statistical reports	Labour Force Survey	Register-based data
1996	23,231.8	18,925.5	24,114.0	2,363.5
1997	22,597.6	17,735.4	23,755.5	2,762.5
1998	22,348.7	17,248.8	22,998.4	2,933.7
1999	21,823.7	16,543.9	20,048.2	3,034.1
Annual change				
1997	- 634.8	-1,190.1	- 358.5	- 399.0
1998	- 248.9	- 486.6	- 757.1	- 171.2
1999	- 525.0	- 704.9	- 2,950.2*	100.4

* Move from annual to quarterly surveys, change in the definition of persons engaged in individual subsidiary farming plots and the corresponding questionnaire changes (see section 1.3 below).

1.1 Official estimates

The content and the estimation procedure of the official employment estimates have already been presented in detail in Section 2. *Persons employed in all types of economic activity* (see Table 1 and Table 1 (Output)) comprise persons of working age engaged in the following types of economic activity: public sector (government institutions, organisations and enterprises, social and religious organisations and business companies, international organisations) and persons employed in the private sector (all types of companies, sole proprietor enterprises, agricultural farms, individual subsidiary farming plots as well as self-employed persons) working full- or part-time. Also included are retired persons receiving a pension but who continued to work and persons below the working age who were engaged in the above economic activities as well as the institutional population^{vii}, excluded are persons on administrative leave and women on child-care leave.

1.2 Statistical reports

Employment data based on statistical reports are collected from (a) compulsory quarterly and annual statistical reports of enterprises and establishments, institutions, and organisations, power ministries and penitentiaries; (b) quarterly and annual reports of agricultural production units; and (c) annual agricultural reports on persons working in farms. These reports cover all economic units, institutions and organisations listed in business registers as well as relevant governmental records. *Persons employed in all branches of the economy* (see Table 1 and Table 1 (Output)) comprise persons of working age employed in the public, collective and private enterprises, institutions and organisations, joint-ventures as well as agricultural production units, international organisations and peasant farms⁵. Also included are retired persons receiving a pension but who continued to work and persons below the working age who were engaged in the above economic activities and reported as such^{viii}.

1.3 Labour Force Survey

The Labour Force Survey, which has been conducted at first annually and then quarterly as from 1999. *Employed persons* comprise all persons aged 15-70 years who, during the reference week, did any work at all as paid employees, in their own business, profession, or on their own farm who worked at least one hour during the reference week; as well as persons who worked at least thirty hours on individual subsidiary farming plots and sold or exchanged the output produced; and unpaid family workers. Also included are persons who had jobs or businesses from which they were temporarily absent due to specific reasons, full- or part-time students working full- or part-time, retired persons who performed some work during the reference week, as well as members of armed forces living in households^{ix}. Excluded are the institutional population, conscripts and career military living in barracks.

The important decrease in the LFS employment in 1999 as compared to 1998, shown in Table 3, was due to the following reasons: (i) move from annual to quarterly LFS; (ii) change in the definition of persons engaged in individual subsidiary farming plots; (iii) questionnaire changes linked to (i) and (ii) above. More specifically, the following definition for category (ii) was introduced: all persons aged 15-70 years who worked at least 30 hours per week on individual subsidiary farming plots and who sold and/or exchanged, at least partially, the output produced. The introduction of the latter criterion represents the major change in the definition used during the previous survey rounds when persons interviewed were tested for the duration of working time only. This has led to the dramatic employment decrease in 1999 as persons who did not satisfy the above two criteria were classified as not economically active (2.5 million).

⁵ Included in the total number but not covered by statistical reports are persons engaged in individual subsidiary farming plots.

1.4 Register-based data

Strikingly low employment figures shown in the last column of Table 3: “Register-based data” come from the records of tax inspections. While tax inspections have much higher records of physical persons liable for taxation by kind of businesses and activities, they do not produce an integrated summary table yielding the total number of persons registered as employed at the national level. Due to this situation, up to now, the State Statistics Committee has only managed to obtain from tax inspections information on the total number of *licences* issued during the reference year to physical persons who wished to start their own business. These data are used for the computation of estimates of self-employed persons (see Table 1 on p. 4, L5).

2. Reconciliation

Reconciliation can be defined as a complement of a comparison with an attempt to quantify reasons for differences with a view to diminishing or even fully adjusting the discrepancies resulting from different sources. This often involves analysis at the level of sub-aggregate components and sometimes at the level of individual analytical units. Simply speaking, reconciliation is adjustment of data sources in order to avoid conflicting data^x.

It has already been mentioned in Chapter III, that the official employment estimates are obtained as a result of data integration from different sources (see Table 1, p. 4) and therefore considered to be more reliable and complete than any other employment data collected from an individual source of labour statistics. The closest employment data, both in numbers and coverage, are collected from the quarterly Labour Force Survey.

Proceeding from the above definition of reconciliation, an attempt is made in this Section to reconcile the Labour Force Survey employment data and the official employment estimates of Ukraine. The ultimate objective of this reconciliation is to reduce the difference between the two figures as much as possible by harmonising their coverage through a series of additions and subtractions of conflicting data underlying the different categories of the labour force. Two reconciliation approaches are proposed and describe below.

The **first reconciliation approach** is based on the assumption that the reconciled final totals are adjusted for the differences in coverage, whereby the mutually missing categories are added to the original data.

As can be noted from Table 4, the difference between the LFS employment data and the official employment estimates is 1,775.5 thou. persons or 8.9%.

Part of this difference is attributed to persons on administrative leave and women on child-care leave excluded from the official estimates but included in the LFS data. The first step of adjustment-1 is therefore to harmonise for this divergence by adding 314.700 and 409.500 to the official estimates respectively.

Contrary to the official estimates, the institutional population is excluded from the LFS employment. Hence the next step is to balance for this difference by increasing the LFS data by 174.600.

The LFS employment is quasi-civilian as it covers career military living in surveyed households only, whereas the official estimates include both career military and conscripts. To adjust for this difference, 250.000 are added to LFS data.

The last step of reconciliation concerns the self-employed, unpaid family workers and persons engaged in individual subsidiary farming plots who, while being included in both figures, differ in respective absolute numbers. The official estimates for these categories are

higher by 2,036.000 than the LFS data. To adjust for this disparity, this number is added to the LFS results.

The above exercise gives a non-accountable difference of 42.1 thou. or 0.2%.

Table 4: Reconciliation of employment data (I): Ukraine, 1999

(Thousands)

Quarterly Household Labour Force Survey	1999	Official employment estimates	1999
1. Employed (including working pensioners, career military, women on child-care leave and persons engaged in individual farming plots)	20,048.2	1. Employed as reported by registered economic units, institutions and organisations (including working pensioners and persons below 16 years of age, institutional population without inmates of religious institutions and excluding career military, self-employed, persons engaged in individual subsidiary farming plots, unpaid family workers, persons on administrative leave, women on child-care leave)	16,543.9
<i>Of which:</i>		<i>Of which:</i>	
• Career military	Quasi-civilian	• Career military & conscripts	250.0
• Institutional population	Excluded	• Institutional population without inmates of religious institutions	149.0
• Self-employed	1,540.7	2. Self-employed and unpaid family workers: LFS , tax records, estimates	3,008.5
• Unpaid family workers	190.0	<i>Of which:</i>	
		• Not according to LFS	1,277.8
• Persons on administrative leave	314.7	3. Farmers: agricultural report on persons working in agricultural farms plus estimates	67.5
• Employed institutional population	Excluded	4. Persons on administrative leave	Excluded
• Persons engaged in individual subsidiary farming plots (PEIFP)	1,420.0	5. Institutional population: inmates of religious institutions	25.6
• Women on child-care leave	409.5	6. Persons engaged in individual subsidiary farming plots: LFS plus estimates	2,178.2
		<i>Of which:</i>	
		• Not according to LFS	758.2
		7. Women on child-care leave	Excluded
A. Total LFS employment:	20,048.2	B. Official employment estimates (1+2+3+5+6):	21,823.7
		Difference:	1,775.5
(a) <i>Plus:</i> institutional population	174.6	(a) <i>Plus:</i> persons on administrative leave	314.7
(b) <i>Plus:</i> career military & conscripts	250.0	(b) <i>Plus:</i> women on child-care leave	409.5
(c) <i>Plus:</i> self-employed, unpaid family workers and PEIFP not according to LFS	2,036.0		
C. Total adjusted LFS employment:	22,508.8	D. Total adjusted official employment estimates:	22,550.9
		Non-accountable difference after reconciliation: Estimates/LFS (D/C)	42.1 or 0.2%

In spite of rather good matching of the above reconciliation procedure, in our view, it would be difficult to admit that the adjusted totals have resulted in more accurate employment figures than officially published. In fact, based on the balancing method described in Chapter III, the Ukrainian employment already seems to be questionably high (see explanation in Chapter VIII), whereas the reconciled estimates are even higher (+727.2 thou. persons).

The **second reconciliation approach** makes another type of reconciliation (see Table 5), whereby the LFS employment data and the official employment estimates are adjusted for the

differences revealed in a way that the categories included in one source but excluded from the other are subtracted from and respectively added to the relevant source. The objective of this exercise is to interchange and harmonise the coverage and definitions of the LFS data and the official employment estimates as much as possible in order to better confront the two employment figures. The adjusted numbers are thereafter compared with the corresponding original data: C with B and D with A.

As has already been mentioned above, the difference between the LFS employment and the official employment estimates is 1,775.5 thou. persons or 8.9%.

Table 5: Reconciliation of employment data (II): Ukraine, 1999

(Thousands)

Quarterly Household Labour Force Survey	1999	Official employment estimates	1999
1. Employed (including working pensioners, career military, women on child-care leave and persons engaged in individual farming plots)	20,048.2	1. Employed as reported by registered economic units, institutions and organisations (including working pensioners and persons below 16 years of age, institutional population without inmates of religious institutions and excluding career military, self-employed, persons engaged in individual subsidiary farming plots, unpaid family workers, persons on administrative leave, women on child-care leave)	16,543.9
<i>Of which:</i>		<i>Of which:</i>	
• Career military	Quasi-civilian	• Career military & conscripts	250.0
• Institutional population	Excluded	• Institutional population without inmates of religious institutions	149.0
• Self-employed	1,540.7	2. Self-employed and unpaid family workers: LFS , tax records, estimates	3,008.5
• Unpaid family workers	190.0	<i>Of which:</i>	
		• Not according to LFS	1,277.8
• Persons on administrative leave	314.7	3. Farmers: agricultural report on persons working in agricultural farms plus estimates	67.5
• Employed institutional population	Excluded	4. Persons on administrative leave	Excluded
• Persons engaged in individual subsidiary farming plots (PEIFP)	1,420.0	5. Institutional population: inmates of religious institutions	25.6
• Women on child-care leave	409.5	6. Persons engaged in individual subsidiary farming plots: LFS plus estimates	2,178.2
		<i>Of which:</i>	
		• Not according to LFS	758.2
		7. Women on child-care leave	Excluded
A. Total LFS employment:	20,048.2	B. Official employment estimates (1+2+3+5+6):	21,823.7
		Difference:	1,775.5
(a) Less: persons on administrative leave	314.7	(a) Plus: persons on administrative leave	314.7
(b) Less: women on child-care leave	409.5	(b) Plus: women on child-care leave	409.5
(c) Plus: institutional population	174.6	(c) Less: institutional population	174.6
(d) Plus: career military & conscripts	250.0	(b) Less: career military & conscripts	250.0
(e) Plus: self-employed, unpaid family workers and PEIFP not according to LFS	2,036.0	(c) Less: self-employed, unpaid family workers and PEIFP not according to LFS (2+6)	2,036.0
C. Total adjusted LFS employment:	21,784.6	D. Total adjusted official employment estimates:	20,087.2
Non-accountable difference after reconciliation: LFS/Estimates (C - B)	37.3 or 0.2%	Non-accountable difference after reconciliation: LFS/Estimates (D - A)	39.0 or 0.2%

As follows from Table 5, part of the difference is attributed to persons on administrative leave and women on child-care leave excluded from the official estimates but included in the LFS data. The first step of adjustment-2 is therefore to harmonise for this divergence by subtracting 314.700 and 409.500 from the LFS and adding them to the official estimates.

The next step is to counter-balance for the difference in coverage of the institutional population and the armed forces by decreasing the number of the official employment estimates by 176.000 and 250.000 respectively and increasing the LFS data as appropriate.

The ultimate step of reconciliation concerns the self-employed, unpaid family workers and persons engaged in individual subsidiary farming plots who, while being included in both figures, differ in respective absolute numbers. The official estimates for these categories are higher by 2,036.000 than the LFS data. To balance off the disparity, this number is added to the LFS results and subtracted from the official estimates.

The adjustment-2 exercise gives a non-accountable difference between the adjusted LFS employment and official estimates of 37.3 thou. or 0.2%, and between the adjusted official estimates and the LFS employment of 39.9 thou. or 0.2% the same as above. This ratio is similar to adjustment-1.

Again, as in the case of adjustment-1, while there appears to be a close match between the data from the two sources, it is difficult to say without further study whether the adjusted totals can be considered more reliable than the published official employment estimates.

In the above reconciliation procedures the adjustments were limited to total employment for both sexes. As follows from Table 1, the balancing method does not provide information for individual employment categories by sex. The only detailed breakdown available is by urban and rural areas (Table 1 (Output)). This handicap has been confirmed to the author by the State Statistics Committee of Ukraine. Because of this shortcoming it is currently impossible to test how close the employment data reconciled by sex will be to the employment data reconciled for both sexes.

However, the reconciliation exercises described in this Chapter can be used as the basis for a process of integration of employment data from different sources which in the author's view should replace the balancing method currently used in Ukraine. An approach to such integration is presented in Chapter VIII.

VII. Comparison and reconciliation of unemployment data

1. *Methods of measuring unemployment in Ukraine*

As has already been shown in Chapter II (p. 2) and Chapter V (p. 7) unemployment is measured in Ukraine through the quarterly Labour Force Survey and statistics of people registered as unemployed with employment offices for administrative purpose^{xi}.

These two sources are equally quoted and their respective unemployment rates are regularly published. However, the unemployment figures yielded by each source substantially differ, and users are often confused as to which source is the more reliable. Thus in 2000, the LFS unemployment rate was 11.7%, while the registered unemployment rate was 4.2%. This difference stems from the fact that the two sources are based on different concepts and definitions, and serve different purposes.

A Labour Force Survey is the main instrument of data collection on employment and unemployment in countries with market economies; it permits the collection of consistent and comprehensive information both for employees and the self-employed population. Moreover,

with the exception of population censuses, an LFS is the most reliable method yet devised for covering the whole population, in which each person can be assigned a definite status of being employed, unemployed or not in the labour force. A household survey counts each person as an individual only once and thus avoids overlap, irrespective of the number of jobs he/she may be holding and enterprises he/she may be working for. Furthermore, the concepts and definitions of the LFS are based on the ILO international recommendations, which can be used as a yardstick for international comparisons on this topic. In sum, after the Population Census, an LFS has the most complete population coverage and is believed to reflect the real situation in the labour market regarding labour supply, irrespective of whether or not a person has a job, is registered with an employment office and/or fits the working age limits.

A weakness of Labour Force Surveys is that a relatively large sampling error may occur. Another drawback is that accurate data on formal variables and small areas are difficult to obtain.

The *LFS unemployed* comprises all persons above a specified age who during the reference period were without work, currently available for work and seeking work^{xii}.

The major advantages of administrative records are that they are normally available at regular intervals, cover all, or major parts of the country, are total rather than sample counts. As a result, they supply continuous information about the levels of new and continued individual or grouped entities unaffected by sampling variability. They are also free of reporting errors because each registration must be supported, at least *de jure*, by legal documentation certified as correct by the individuals or employers. Statistical data become available without practically any cost. As for the weaknesses of administrative records, the following should be kept in mind: (a) incomplete coverage of the population; (b) the concepts needed for administrative purposes differ from those needed for statistical purposes; (c) registered data may be "polluted" with outdated information.

In Ukraine, the *registered unemployed* comprises able-bodied persons of working age (women 16-54 and men 16-59 years old) who are without work, do not receive wage/salary or any other income envisaged by the current Law, registered with a local employment office, are looking for a job, and are ready and able to accept one. School-leavers under 16 can be given the status of unemployed only if they had a job from which they were released due to a change in the organisation of production and/or work or production profile, enterprise reorganisation, liquidation/closure or a cut in employment.

While most countries with market economy consider the LFS unemployment to be the main source of unemployment statistics at the national and regional levels, the registered unemployment data, in the absence of monthly LFS, remain as the main monthly indicator of unemployment, in particular for small areas.

Ideally, the best would be to construct a combined/integrated unemployment figure, which would have full population coverage and be available for both larger and smaller areas. This procedure is followed by a number of countries with a developed registration system matched with the corresponding LFS questionnaire links^{xiii}.

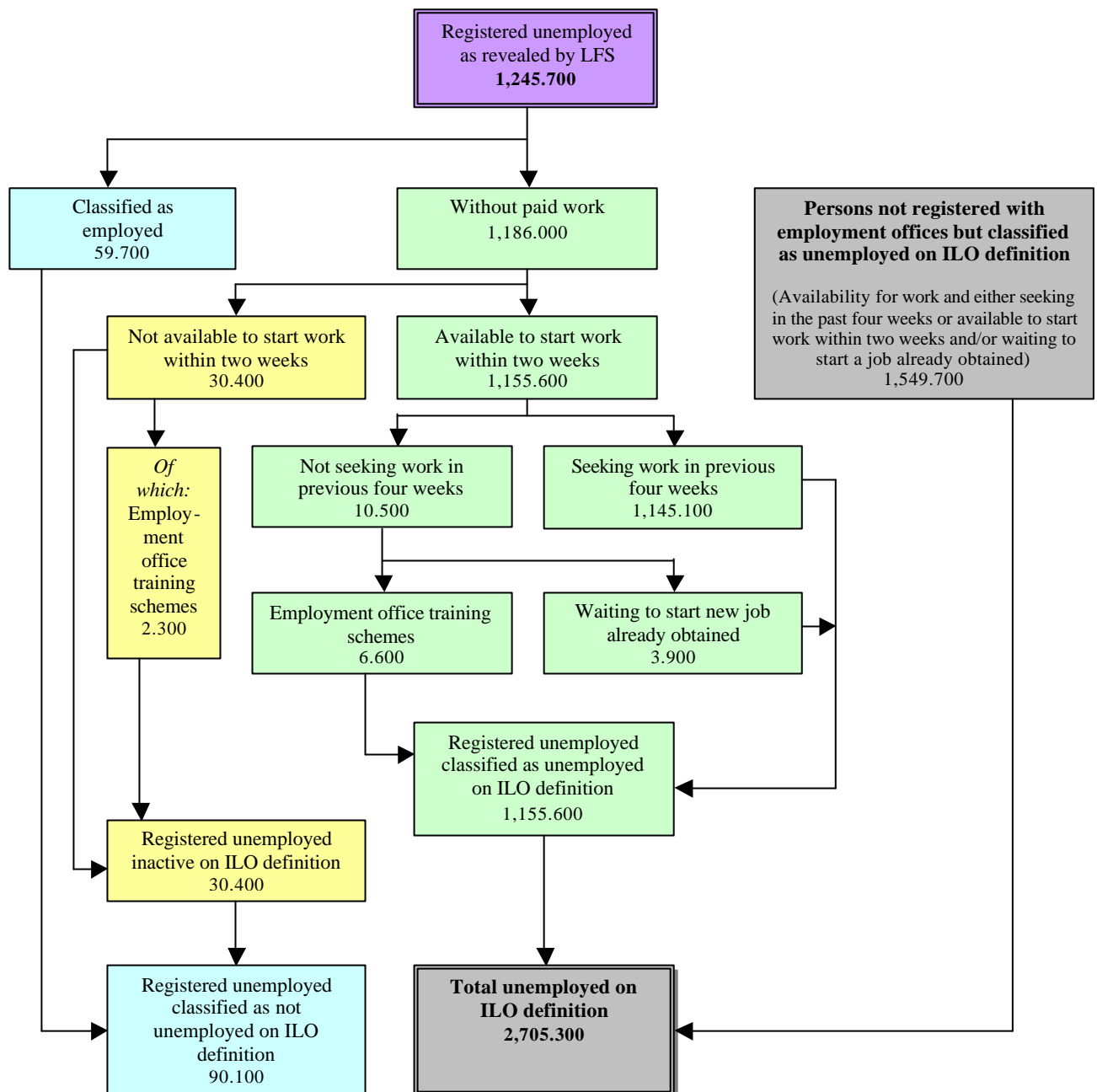
Yet, in this paper we would like to confine our study to comparing and reconciling the number of LFS and registered unemployed as revealed by the quarterly Labour Force Survey in 2000 (see Figure 1). The objective of this exercise is an attempt to look at and suggest reasons why the LFS and registered unemployment statistics differ so importantly in Ukraine. Persons registered as unemployed with employment offices, as shown by the LFS, were identified through Question 65 "What was the main reason for which you did not look for work?" and Question 69 "Did you register as unemployed at the State employment office during the survey reference week?".

2. Comparison

Wim P. Leunis and Jan Willem Altena^{xiv} specify that *comparison* is limited to the juxtaposition of results from various sources ad hoc or on a regular basis in order to highlight differences and similarities (irrespective of the action undertaken as a result of this comparison). It will typically involve a graphic or tabular presentation of the alternative series, perhaps accompanied by a commentary, which may include a qualitative explanation of any overall differences in level or trend. Comparison of data may take place at the level of the aggregates or at the level of the individual data (micro-level).

However, as has already been mentioned, here we shall not compare data coming from different sources but rather two groups of unemployed derived from the same source but identified on the basis of the two different conceptual definitions given above.

Figure 1 : Comparison of the two LFS components on registered unemployed and the ILO measure of unemployment: 2000 (annual average)



As follows from Figure 1, in 2000 there were 2,705.300 people unemployed in Ukraine on the ILO definition – that is, people without paid jobs who said they were available to start work and had sought work at some time during the four weeks period prior to interview. This measure was 1,459.600 higher than the number of registered unemployed, which averaged 1,245.700 persons. Despite the difference in the levels shown by the two measures, which is not surprising given the differences in definition and coverage, both the ILO and registered unemployment measures show broadly similar trends since 1995.

Figure I illustrates the components that make up the difference between the two measures of unemployment. Thus it shows that the majority of people in the registered unemployment in the year 2000 (some 1, 15 million) were also classified as unemployed on the ILO definition, and vice versa.

It further shows that in 2000 there were an estimated 90.100 registered unemployed not classified as unemployed on the international measure. These consisted of some 30.400 people claiming unemployment-related benefits but not unemployed according to the ILO definition because they were not available to start work; and another 59.700 people receiving benefits who had some work during the survey reference week and were therefore classified as in employment.

Conversely, there were 1,549.700 people who were unemployed according to the ILO definition but who were not in the count of those registered unemployed receiving unemployment-related benefits.

This may just be a coincidence, which could further be re-examined for other years, but the reconciled number of registered unemployed satisfying both definitions (1,155.600) is almost identical to the number of people counted in 2000 as registered unemployed by the State Employment Centre - 1,155.200.^{xv} It is possible that the divergence may be more important if we compare and reconcile the LFS measure and administrative unemployed by sex.

Obviously, the above comparison and reconciliation procedure could be applied to registered unemployment statistics collected by the State Employment Centre and confronted with LFS unemployment data. Also, this approach may be suggested for the calculation of small area unemployment estimates. However, in both cases more sophisticated procedure would be required involving, *inter alia*, the following steps: (i) conduct of a small-scale survey of unemployed people registered with employment offices testing their liability to be classified as LFS unemployed (micro-matching), (ii) harmonisation for the differences revealed, and (iii) further adjustment by distributing the differences to the regions on a pro-rata basis (small area estimates)^{xvi}.

VIII. Data Balancing and Integration: What future for Ukraine?

1. *Balancing: advantage and weak points*

Analysing the balancing method used in Ukraine, we have identified a number of advantages and weak points, which are summarised below.

The main advantage is twofold:

- Employment and unemployment data from all major sources are put together to generate information on the total labour resources comprising employed, unemployed and not economically active. This information cannot be obtained from any individual source of labour statistics currently available in Ukraine.
- A detailed structure of labour resources is available for users broken down by urban and rural areas and, for major aggregates, by sex.

On the other hand, the balancing method, in our opinion, has a number of weak points:

- Differences in definitions, classifications and levels of detail are not harmonised. Thus, while compulsory statistical reports provide information on all people employed without age limits, the LFS employment is confined to persons of 15-70 years of age. Another discord is while labour resources comprise all the able-bodied population classified as employed according to both LFS and compulsory reports' definitions (which are different), the unemployment used for the balancing procedure is limited to registered unemployed, i.e. persons of working age only.
- Only estimates for major aggregates are available by sex.
- Method used to estimate the total number of persons engaged in individual subsidiary farming plots is not convincing and seems to bias towards the upper edge.
- Method used to produce estimates of self-employed is so synthetic that data received look more like "guesstimates" than estimates.
- Historical time series are not consistent even though no official break has been announced. The fact is that both the content and coverage of time series have changed significantly since 1991, i.e. after gradual introduction of market economy elements to the Ukrainian economy. Thus employment estimates currently comprise a number of new categories which could not exist under the former economic and political system, such as self-employed, unpaid family workers, persons on unpaid administrative leave, etc. Conversely, while persons were engaged in individual subsidiary farming plots, they were not included among the employed population as in their absolute majority this was their leisure rather than economic activity. To sum up, it is impossible to compare employment estimates of 1990 and 2000 as their absolute numbers tell two different stories.

2. *Data integration*

Statistical integration may be defined as the confrontation and combination of data from different sources, both at an individual and at an aggregate level^{xvii}. The main goal of integration is to provide insights, which cannot be gained from the individual sources themselves. The main benefits of integration are provided to the users of statistical information. Using integrated data they are not confronted with contradictory statistics or with fragmented information. But integration also provides a service to the respondents. By combining sources the response burden of separate sources can be alleviated because not every source need provide exhaustive information. Experience with statistical integration shows that it generates a lot of knowledge on the quality of data, and thus yields information needed to improve them. In brief, integrated information:

- is more comprehensive;
- provides a better overview and more consistent picture;
- is more accurate.

Integration typically entails reconciling data from various sources into one or more of the following groups: (i) household surveys; (ii) establishment surveys; and (iii) administrative records/registers^{xviii}. Usually, there are differences between the data from these sources due to three categories of causes:

- (a) Differences in definitions, classifications and level of detail.
- (b) Differences in population covered.
- (c) Measurement errors.

In the process of data reconciliation from different sources, the following four stages are distinguished:

- (i) *Harmonisation* whereby the differences in definitions, etc. are removed. Source data are adjusted in such a way that for each variable data according to one single definition becomes available. The same can be said about differences in classification and level of detail.
- (ii) *Completion* whereby full coverage is reached by using data from various sources. Sometimes estimation procedures are needed.
- (iii) *Minimisation of measurement errors* whereby the source data are adjusted in such a way that measurement errors are eliminated as far as possible. This stage can be characterised as “an organised hunt for errors”, by confronting countries from different sources.
- (iv) *Balancing* whereby the discrepancies which still remain after the first three stages are eliminated by a balancing method. Sometimes balancing is done “manually”, sometimes mathematical procedures are used (a Lagrange minimisation procedure). Usually, an element of judgement is needed in making the balancing decisions: which data sources must be adjusted mostly depends on judgements on the relative accuracy of the various sources. When relations between various variables exist, judgements are needed on which variables are measured most accurately.

3. An approach to integration of Ukrainian labour statistics

In this section, the author proposes a framework for the integration of Ukrainian labour statistics. Taking into consideration that a comprehensive integration procedure requires the meticulous work of a group of specialists and an on-line access to the relevant databases, the approach proposed is simplified and limited to overall guidelines.

(i) *Harmonisation*. It is proposed to reconcile data from various sources into the Labour Force Survey conceptual framework. The following rationale has strongly biased the author’s decision in favour of LFS when comparing data available from other sources in Ukraine: LFS has the largest coverage, comprises employed, underemployed, unemployed and not economically active, data are available by sex, age, industry, occupation, as well as by geographical and administrative division. Hence LFS population already gives a better picture of labour resources than any other individual source (see Figure 2).

(ii) *Completion*. As has already been documented in Tables 4 and 5, the LFS employment data do not cover the institutional population and armed forces. Also, the State Statistics Committee of Ukraine believes that the LFS results underestimate self-employed, unpaid family workers and persons engaged in individual subsidiary farming plots.

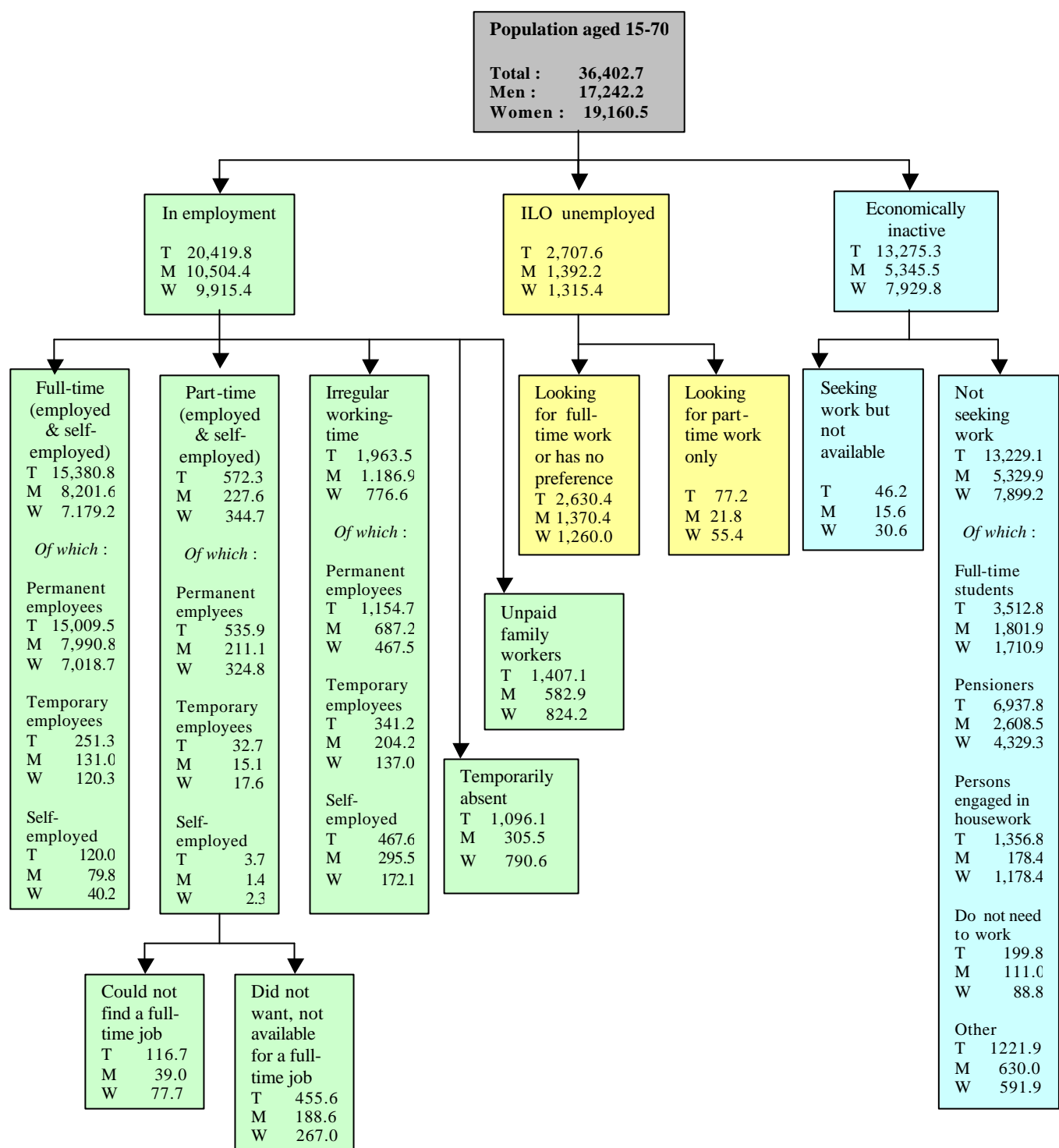
Using the responses from the 1999 quarterly LFS, it is estimated that among persons classified as unemployed according to the LFS definitions 1,651.1 thou. did not register with an employment office. According to the national legislation most of these persons were counted as employed and therefore included in the official employment estimates (e.g. self-employed, unpaid family workers, persons engaged in individual subsidiary farming plots). At the same time, the comparison of the LFS and administrative unemployed (Figure 1) showed that the LFS estimates of registered unemployed are practically identical with the employment offices’ statistics.

The question therefore arises how many persons not registered with employment offices but classified as unemployed according to the LFS definition can be “reclassified” into employed and included among self-employed, unpaid family workers and persons engaged in individual subsidiary farming plots covered by official employment estimates. This query can be thoroughly verified at the next stage of integration.

(iii) *Minimisation of measurement errors.* The methods used by the State Statistics Committee to measure the estimated number of self-employed, farmers and persons engaged in individual subsidiary farming plots (PEIFP) seem to be rather arbitrary. It is therefore proposed to revisit the current approximation procedure especially applied for the estimation of PEIFP and unpaid family workers. Thus, the dramatic decrease of PEIFP revealed by the LFS-99 (about 2,5 million persons) has been balanced off by smoothing up the unemployed LFS population so that a large part of it is reclassified into employed PEIFP as well as unpaid family workers.

The author has a feeling that the above manoeuvre was instigated by the necessity to arrive at the historically “consistent” employment time series rather than reflect the real situation on the labour market.

Figure 2 : Labour market position of people aged 15-70: 2000 (thousands)



(iv) *Balancing*. This is the final stage of the statistical integration process. As has already been mentioned above, an element of judgement is needed in making the balancing decisions on which data sources must be adjusted the most. This generally depends on judgements on the relative accuracy of the various sources. In the author's opinion, the LFS definitions should be kept in mind when the Ukrainian employment and unemployment data are finally balanced.

4. Integration table

Table 6 may serve as a basis for the integration of employment and unemployment statistics in Ukraine.

Table 6: Integration of labour statistics: Ukraine, 1999

(Thousands)

Quarterly Household Labour Force Survey	1999	Official employment estimates	1999
1. Employed	20,048.2	1. Employed as reported by registered economic units, institutions and organisations	16,543.9
<i>Of which employed in:</i>		<i>Of which employed in:</i>	
• Enterprises	Matching with	• Enterprises	
• Institutions	“Compulsory reports”	• Institutions	
• Organisations		• Organisations	
• Self-employed	1,540.7	2. Self-employed and unpaid family workers	3,008.5
• Unpaid family workers	190.0	3. Career military and conscripts	250.0
• Persons on administrative leave	314.7	4. Farmers (Compulsory reports)	67.5
• Women on child-care leave	409.5	5. Institutional population	174.6
• Persons engaged in individual subsidiary farming plots	1,420.0	6. Persons engaged in individual subsidiary farming plots	2,178.3
Total LFS employment:	20,048.2	Total employed (1+2+3*4-+5+6):	21,823.7
(a) <i>Plus:</i> institutional population	174.6	<i>Less:</i> Persons engaged in individual subsidiary farming plots not classified according to the LFS definition	758.2
(b) <i>Plus:</i> career military & conscripts	250.0		
(c) Farmers	67.5		
(d) <i>Plus:</i> self-employed, unpaid family workers and PEIFP not according to LFS	2,036.0		
(e) <i>Less:</i> LFS unemployed (not registered) counted as employed in (d) above	1,651.1		
Total adjusted LFS employment:	20,925.2	Total employment estimate (without age limits):	21,065.5
2. Unemployed (15-70 years of age)	2,698.8	7. Unemployed (working age population)	1,089.4
Total adjusted labour force:	23,624.0	Labour resources (without not economically active of working age):	22,154.9
3. Not economically active (15-70 years of age):	13,728.7	8. Not economically active (working age population):	4,789.5
Total adjusted “labour resources”:	37,352.7	Total labour resources (working age population)	29,230.8

As in the case of the balancing procedure, Table 6 must have directly links with a number of tables where micro-linking or at least detailed confrontation of data from different sources are

made. At the stage of *harmonisation* these data should be matched and adjusted for differences in definitions, point in time vs. average numbers and, where possible, reference period/dates. This procedure is only earmarked in Table 6 where employed in enterprises, institutions and organisation are confronted and should further be matched with data from relevant compulsory statistical reports. It should be kept in mind that usually enterprise statistics give more accurate employment statistics than an LFS. The reason being fairly small sampling errors, close relation between questionnaire concepts and the concepts of the company's administration, as well as the fact that characteristics of statistical units surveyed are uniquely determined. However, it is important to remember that small enterprises are inadequately covered by enterprise statistical reports, whereas LFS information may have a better coverage.

At the *completion* stage, it is proposed to achieve full employment coverage by including the following categories to the LFS data: institutional population, armed forces, farmers and estimates of self-employed, unpaid family workers and persons engaged in individual farming plots (PEIFP) classified as employed not according to the LFS definition.

When opting for the mechanism of the *minimisation of measurement errors*, it is proposed, *inter alia*, to analyse the LFS unemployment vs. registered unemployment. In the author's view, labour resources should be on harmonised concepts and definitions. Consequently, if employment comprises all persons engaged in economic activity irrespective of their age, then unemployment should not be confined to the working population only, as is currently the case. With this in mind, it is suggested to subtract from the sub-total of adjusted LFS employment the number persons not registered with employment offices but classified as LFS unemployed (1,651.1 thou. people). This proposal should be carefully studied by the Ukrainian specialists in terms of its validity by a micro-matching exercise.

At the final stage, *balancing*, it is suggested to adjust the official employment estimates for the over-coverage of PEIFP by subtracting 758.200 from the total of 21,823.7 people. The rationale behind this decision being the weakness of the estimation method currently used in Ukraine. This is an important move as it may help the acceptance of a lower national employment figure produced at the end of the integration procedure.

Based on the integration framework proposed above, the author arrived at the estimated employment figure of 20,925.200 people. Compared with the official employment estimate, the difference amounts to some 898.500 people or 4.3%. If we confront this figure with the adjusted official employment estimate as suggested above, the divergence will shrink to 140.300 people or 0.7%. Which, in fact, is almost a perfect match! Indeed, given the difficult economic situation, continued criticism of mass media and various users as well cautiousness of major international financial institutions the current employment estimate seems to be more like a wish than crude reality.

It goes without saying that the above steps should also be applied to the not economically active population, which will finally permit the production of a global estimate of labour resources in Ukraine.

IX. Conclusions and recommendations

The State Statistics Committee of Ukraine has a full array of modern employment and unemployment sources to produce timely, reliable and comprehensive labour statistics. The data are regularly published and disseminated to different users through press-releases, in paper editions and electronically.

The State Statistics Committee utilises the balancing method to produce an annual employment estimate, which involves basic integration of employment data from different

sources. However, when closely studied this method shows a number of weak points which, in the author's opinion, tarnish the image of Ukrainian statistics. While compared with statistical integration, the balancing applied in Ukraine only partly meets the requirements of a proper integration procedure. The whole exercise, as it stands now, even if it has elements of different stages of integration, can largely be associated with the last stage of integration where an element of judgement or "guess" is tolerated to a certain degree. Last but not least, the historical time series of employment estimates are not only inconsistent but misleading.

Although LFS unemployment has incontestably better coverage and level of detail, the government officials and other users continue to make reference more often than not to the registered unemployment, which in the case of Ukraine is less than half the LFS measure.

The comparison and reconciliation of Ukrainian employment and unemployment data showed a high degree of discrepancy resolution, which may be fortunate coincidence or a real proof of quality statistics produced in Ukraine. To check this maxim, one needs to make a series of reconciliation exercises extending them to totals and by sex.

The reconciliation method lays a sound ground for a proper statistical integration and is therefore an indispensable tool of the comprehensive integration procedure.

Proceeding from the above, the author would like to make the following recommendations on how to improve labour statistics in Ukraine:

1. Reconcile employment data regularly.
2. Reconcile unemployment data regularly and issue in a relevant publication on LFS results.
3. Stop data balancing and change to comprehensive data integration. Although the process may appear to be difficult, the experience with balancing will facilitate substantially and speed up this transition. The changing of millennium may be a good opportunity for this!

* * *

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