

# Comparative Analysis of Labor Force Resources in Poland According to the 2011 Population Census and Labor Force Survey

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## Abstract

*This paper is aimed to analyze the size of the labor force in Poland, according to the 2011 Population Census and Labor Force Survey at the same time. These data are not consistent, an attempt is made to determine the size and causes of this inconsistency. The number of economically active and working people, as well as two relative measures: activity and employment rates were analyzed. A test of significance of differences between two parameters was used in comparisons. The absolute and relative differences between the same data from two sources were also calculated. All results were considered in total and by gender, age, level of education and place of residence divided into urban and rural areas, and by voivodships.*

## Introduction

The labor market is a special market, because the object of the transaction—work—is specific. Work belongs to people who have free will and have influence on their work. Therefore it is important to monitor situations on the labor market. The participants of this market are: enterprises, institutions and individuals, acting as employers, employees or intermediaries between employers and employees (Burda and Wyplosz 1995). However, there are supply and demand and pricing as in every market. Labor supply depends on the number of working-age population and the level of real wages. Labor demand depends on the marginal productivity of labor. From the point of view of the labor market, the population is divided into an active population (labor force) and inactive (Czarny 2006). Among the economically active population can be distinguished: working people and unemployed people (who do not have jobs, but are ready to take jobs in conditions typical in the economy).

The source of data on the labor force in Poland is the Labor Force Surveys, conducted by the Central Statistical Office from the second quarter of 1992 to the present. These surveys provide quarterly data on the population in terms of its economic activity. Furthermore, population censuses are carried out about every 10 years in Poland and around the world. The last population census took place in Poland in 2011. One of the topics it covers is the economic activity of the population.

The purpose of this paper is to analyze the size of the labor force in Poland, according to the 2011 Population Census and Labor Force Survey, as well as to examine the consistency of data on the labor force between the two data sources. If these data are not consistent, we attempt to determine the size and causes of this inconsistency.

## 1 Data

The analysis is based on data on the economic activity of the 2011 Population Census (2011 PC) and data from the Labor Force Survey conducted in the first quarter of 2011 (1stQ2011 LFS). Both the census and the survey were conducted by the Central Statistical Office in Poland. The 2011 Population Census was conducted as of March 31, 2011. Therefore for comparison we used data from the Labor Force Survey conducted as of April 3, 2011. The difference between these two moments is only three days, so it should not significantly affect the results.

In both the census and the survey, a sampling method was used (i.e., they are based on a sample randomly selected from a population of dwellings). The 2011 Population Census' sample size was 2,7 million dwellings,<sup>1</sup> that represent 20% of the population. Sample size in the Labor Force Survey (LFS) in the first quarter of 2011 was 36,9 thousand households, with 87,8 thousand people aged 15 years and older which represents about 0,28% of the population. Generalizing for the population: 32,7 million people aged 15 years and older estimated to live in Poland according to the 2011 Population Census, while 31,0 million people in the same age bracket according to the Labor Force Survey in the first quarter of 2011. The difference between these estimates is 1,7 million, which is 5,18%.

Different sampling selection schemes were used in 2011 PC and 1stQ2011 LFS: one stage and stratified sampling in the census and two-stage stratified in the survey. The LFS parameters are estimated for the country in general and in the cross-sections concerned (by selected demographic characteristics such as gender, age and educational level) and the territorial cross-sections (by place of residence divided into urban and rural, and voivodships). The large sample size in the 2011 Population Census allows for precise parameter estimates at the level of country, voivodship and even county.

The LFS is adjusted using a population structure of 48 groups (2 place of residence categories [urban, rural] \* 2 genders \* 12 age groups). Data between the two population censuses is derived from the previous census after updating with current information from the vital records and registered migration. The number and structure of the population in 2011 adjusted on the basis of the 2002 Population Census were different from those expressed in the 2011 Population Census. Therefore, the Labor Force Survey results for the years 2010, 2011 and 2012 were corrected using a population structure of 48 groups according to the 2011 Population Census. These data were considered in this paper.

The same definitions of economic activity are used in both the 2011 Population Census and Labor Force Surveys as recommended by the European Economic Commission of the United Nations and the Statistical Office of the European Union EUROSTAT. The economically active population (in other words, the labor force) includes all persons aged 15 years or more who are working or unemployed.

Data on the economically active population and the number of employed were analyzed. Two indicators describing labor force, activity rate and employment rate, were also analyzed. The activity rate is calculated as the share of the economically active persons in the population aged 15 years or more. The employment rate is calculated as the share of employed persons in the population aged 15 years or more. These four measures of labor force were analyzed in total and by gender, age, level of education, place of residence in the division of urban and rural areas and the voivodships.

## 2 Methods

The data on labor force come from two different sample surveys. However, they refer to the same population and the estimates based on these two samples should differ from each other only by

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1. [In the journal (in both Polish and English texts) European practice of number notation is followed—for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style). Furthermore in the International System of Units (SI units), fixed spaces rather than commas are used to mark off groups of three digits, both to the left and to the right of the decimal point.—Ed.]

sampling errors. Sampling errors occur only in sample surveys (not in the full scale census) and are formed exclusively due to the use of a random sample rather than the whole population. The measures of sampling errors are: estimator's variance (Var), standard error (SE—e.g., square root of variance) and coefficient of variation (CV—e.g., standard error divided by parameter estimator).

We ask the following research question: Did labor force parameter estimates, based on the sample in the 2011 Population Census and the sample in Labor Force Survey in the first quarter of 2011, differ from each other only in terms of sampling errors? We state the null hypothesis  $H_0: \theta_1 - \theta_2 = 0$  and alternative hypothesis  $H_a: \theta_1 - \theta_2 \neq 0$ , where  $\theta_1$  is a parameter estimated based on a sample in the 2011 Population Census, and  $\theta_2$  is the same parameter but estimated based on the sample in 1stQ2011 LFS. In order to test the differences between the two parameters for two large samples we used statistics:

$$(1) \quad u = \frac{(\hat{\theta}_1 - \hat{\theta}_2) - (\theta_1 - \theta_2)}{\sqrt{\text{Var}(\theta_1) + \text{Var}(\theta_2)}}$$

where:

$\hat{\theta}_1$ —parameter estimator for a sample in the 2011 Population Census,

$\hat{\theta}_2$ —parameter estimator for a sample in 1stQ2011 LFS,

$\text{Var}(\theta_1)$ —variance of parameter estimator for a sample in the 2011 Population Census,

$\text{Var}(\theta_2)$ —variance of parameter estimator for a sample in 1stQ2011 LFS.

The significance level 0,05 was assumed, for which critical value  $u_\alpha = 1,96$ . If the module  $u$  is less than 1,96, there is no reason to reject the null hypothesis. Due to the fact that sampling errors of estimates in the 2011 Population Census are not still known, the following procedure was conducted. First we compare empirical  $u$  with the theoretical

$$(2) \quad \frac{(\hat{\theta}_1 - \hat{\theta}_2) - (\theta_1 - \theta_2)}{\sqrt{\text{Var}(\theta_1) + \text{Var}(\theta_2)}} = 1,96.$$

Knowing estimates  $\hat{\theta}_1$  for the 2011 PC and  $\hat{\theta}_2$  for 1stQ2011 LFS as well as  $\widehat{\text{Var}(\theta_2)}$  for 1stQ2011 LFS (estimated knowing the coefficient of variation and parameter estimates), we calculated the critical estimates of standard errors of parameters estimators for the 2011 PC (that would be, if the differences between the parameters estimates for the 2011 PC and 1stQ2011 LFS were not significant):

$$(3) \quad \widehat{\text{SE}(\theta_1)} = \sqrt{\frac{\hat{\theta}_1 - \hat{\theta}_2}{1,96}}.$$

Then, we calculated the critical coefficients of variation for the 2011 PC, divided the critical standard errors by parameter estimates for the 2011 PC:

$$(4) \quad \widehat{\text{CV}(\theta_1)} = \frac{\widehat{\text{SE}(\theta_1)}}{\hat{\theta}_1}.$$

We also calculated the absolute and relative differences between the two estimates of the same parameters based on two sources of data: the 2011 Population Census and Labor Force Survey for the first quarter of 2011. Relative differences between the two estimates were calculated, divided the absolute differences between these two estimates by the arithmetic mean of these two estimates.

### 3 Results

Tables 1–4 contain estimates of the numbers of economically active and working population, as well as activity and employment rates in Poland according to the 2011 Population Census and Labor Force Survey for the first quarter of 2011. Then, the coefficients of variation of the estimates of these parameters are included: empirical CVs for 1stQ2011 LFS and critical CVs for the 2011 PC (minimal, so that the differences between the two data sources were not significant), and absolute and relative differences between the results from these two data sources. All results are reported

for the country in general, followed by gender, age, level of education, and place of residence divided into urban and rural areas and voivodships.

Lower coefficients of variation of parameter estimates are expected than for the critical coefficients due to the very large sample in the 2011 Population Census. Hence, the null hypothesis should be rejected in favor of the alternative hypothesis at a significance level of 0,05. It means that the sample selected for the 2011 Population Census gave significantly different parameter estimates than the sample of the Labor Force Survey in the first quarter of 2011.

Poland had 16,5 million economically active people (working or unemployed) according to the 2011 Population Census, and 17,2 million according to the LFS (tab. 1), about 0,7 million (4,1%) more. Poland had 14,4 million working people according to the 2011 Population Census, and 15,4 million according to the LFS (tab. 2), about 1,0 million (6,9%) more. The results for working population were similar to the economically active population.

Men were 55% of the active population and women 45% according to both data sources. 62% of active people lived in urban areas according to the 2011 PS and about the same percentage of 61% according to the LFS. Men were 55% of the working population and women 45% according to both data sources. 63% of working people lived in urban areas according to the 2011 PS and about the same percentage of 62% according to the LFS.

The most economically active and working people were at the age of 25–29 and 30–34 years. The least economically active and working people had general secondary or the lowest levels of education. The economically active and working people lived most often in Mazowieckie, Śląskie, and Wielkopolskie voivodships.

53,3% of the population aged 15 years and older were economically active according to the 2011 Population Census, while 55,4% according to the LFS (tab. 3). 46,4% of the population aged 15 years and older worked according to the 2011 Population Census and 49,6% according to the LFS (tab. 4).

Analyzing the activity and employment rates by gender, 61,2% of men aged 15 and older were economically active according to the 2011 Population Census and 63,7% according to the LFS. Respectively 57,3% or 53,5% of men worked. As for women, respectively 46,1% or 47,8% of women aged 15 and older were economically active, and respectively 39,9% or 42,6% worked.

Analyzing the activity and employment rates by place of residence, divided into urban and rural areas, 54,4% of the urban population aged 15 and older were economically active according to the 2011 Population Census and 55,4% according to the LFS, respectively 47,7% or 49,8% worked. As for the rural population, respectively 51,5% or 55,5% of the rural population aged 15 and older were economically active, and respectively 44,4% or 49,3% worked.

Analyzing the activity and employment rates by age, the largest percentage of the population aged 25–49 were economically active and worked. Analyzing the activity and employment rate by educational level, the highest percentage of the population with higher education was economically active (about 80%) and worked (70%) according to both considered data sources. The smallest percentage of the population with the lowest level of education was economically active (18%) and worked (13–15%).

No similarities were found in analyzing the activity and employment rates by voivodships according to the 2011 Population Census and LFS.

The size of the economically active and working population, as well as activity and employment rates were estimated lower in the 2011 Population Census than in the LFS in the first quarter of 2011. It concerned the total population, men and women, urban and rural areas, people older than 25 years, with all levels of education apart from general secondary, in most voivodships.

Analyzing the differences in the measurement of labor force according to the two data sources by educational level, the biggest were observed for people with general secondary level of education. It might be caused by emigration of people who do not have a profession, because professional classes were closed and general classes were opened in Polish vocational schools in the 1990s.

Analyzing the differences in the measurement of labor force according to the two data sources by voivodships, the biggest were observed in Łódzkie, Podkarpackie, and Świętokrzyskie.

The differences in the measurement of the labor force between the 2011 Population Census and the Labor Force Survey can be caused by non-sampling errors. They can arise in every stage of the survey: design, implementation, analysis and publishing the results of the survey. They include errors caused by incompleteness, such as lack of response, if the entities do not give any information. 13,7% of household questionnaires were not filled out in a sample survey for the 2011 Population Census. No information were obtained from 25,7% of households in the Labor Force Survey in the first quarter of 2011. Apart from this, the partial lack of response appears in social surveys, if the individuals do not answer every question. Response errors can be caused by both the respondent and the interviewer. It is difficult to avoid such errors especially in social surveys, such as the population censuses and the LFS, as indicated by a number of authors, including Kordos (1987). For example, respondents may work illegally and do not admit that they work because of various concerns. They may be registered as unemployed or draw a pension on account of an alleged disability.

Lack of response and the phenomenon of conditioning are more common in statistical surveys, which uses repeated measurements, such as panel surveys or rotation samples. Missing responses are more serious than in the cross-sectional surveys, because they increase with the aging of the sample, respondents were discouraged to answer in subsequent rounds, or part of the respondents lost contact because of a change of a place of residence. The phenomenon of conditioning refers to the situation in which repeated questioning affects responses by changing their attitudes or changes in the quality of answers (Kasprzyk et al. 1989). The LFS uses rotation samples, a subsample is tested for two consecutive quarters, two quarters after a break and then again tested by two quarters.

The differences in the measurement of the labor force between the 2011 Population Census and the Labor Force Survey can also be caused by the lack of a universal definition of the population in Polish official statistics. Population was defined as all persons permanently residing in Poland regardless of whether they are resident in the country during the census or were abroad and persons temporarily residing there for the purpose of Census 2011. The difference in the definition of the population in the 2011 Population Census and LFS concerns foreigners. They are not counted as actual population in the 2011 Population Census, which are tables of results of the census. However, foreigners are included in the examination of the Labor Force Surveys from the first quarter of 2004.

Errors involving the complete lack of contact with the respondent can be related to internal and international migration. Today people, especially young people, must be mobile. The difficulties in finding a job, especially in small towns and villages of former state farms, force people to look for work outside their place of residence, and often even in far away. The size of actual emigration remains unknown and there is lack of complete current information about this phenomenon in Poland. International migration affect several million Polish people, mostly young, their spouses and children.

The differences in the measurement of the labor force between the 2011 Population Census and the Labor Force Survey can be also caused by misleading inclusions. Part of the population can be classified incorrectly as working, inactive or unemployed. For example some retired people and university students work and they can be classified as economically inactive or working.

## 4 Conclusions

Slightly more than half of the population aged 15 years and older is economically active in Poland. One of two persons aged 15 years and older worked in 2011, on average. Men more often than women, urban residents more than rural, those of the mobile working age, with tertiary educational level were active and worked more often. The activity and employment rates were too low, especially among people with general secondary and the lowest levels of education, as well as among people older than 50 years. Actions are recommended in order to activate these people within the labor market.

**Tab. 1.** Comparison of the size of the economically active population according to the 2011 Population Census and the Labor Force Survey in the 1st Quarter 2011

Sections	Specification	Estimates of the number (thousands)		CV (%)		Differences between 2011 PC and 1stQ2011 LFS	
		2011 PC	1stQ2011 LFS	1stQ2011 LFS Emp.	2011 PC Crit.	absolute (thousand)	relative (%)
Gender	men . . . . .	9076	9468	0,3	2,2	-391,8	-4,2
	women . . . . .	7445	7738	0,4	2,0	-292,8	-3,9
Resid.	urban . . . . .	10352	10543	0,4	0,8	-191,5	-1,8
	rural . . . . .	6170	6663	0,5	4,0	-493,1	-7,7
Age	15-17 . . . . .	27	24	12,7	6,2	3,3	12,9
	18-19 . . . . .	161	121	5,4	12,6	39,5	28,1
	20-24 . . . . .	1583	1442	1,3	4,5	140,9	9,3
	25-29 . . . . .	2426	2475	0,6	1,0	-48,6	-2,0
	30-34 . . . . .	2379	2448	0,5	1,5	-69,4	-2,9
	35-39 . . . . .	2187	2264	0,5	1,8	-77,3	-3,5
	40-44 . . . . .	1873	1963	0,5	2,5	-90,3	-4,7
	45-49 . . . . .	1848	1989	0,6	3,9	-140,9	-7,3
	50-54 . . . . .	1996	2138	0,7	3,6	-141,9	-6,9
	55-59 . . . . .	1388	1475	1,1	3,2	-87,4	-6,1
	60-64 . . . . .	469	499	2,9	3,3	-30,3	-6,3
65+ . . . . .	186	235	4,7	13,5	-49,2	-23,4	
Education	tertiary . . . . .	4448	4542	1,2	1,1	-93,8	-2,1
	post-sec./voc.sec. <sup>a</sup> . . . . .	4286	4855	n.a.	n.a.	-569,4	-12,5
	general secondary . . . . .	2004	1544	1,8	11,7	460,3	25,9
	basic vocational . . . . .	4412	4799	1,0	4,5	-387,2	-8,4
	lower . . . . .	1368	1334	2,2	1,3	33,5	2,5
Voivodship	dolnośląskie . . . . .	1267	1221	3,1	1,9	45,9	3,7
	kujawsko-pomorskie . . . . .	900	851	3,2	2,8	49,4	5,6
	lubelskie . . . . .	928	1076	2,7	8,1	-148,1	-14,8
	lubuskie . . . . .	446	475	3,8	3,4	-29,4	-6,4
	łódzkie . . . . .	1097	1403	2,5	14,2	-305,6	-24,4
	małopolskie . . . . .	1401	1386	2,6	0,5	14,6	1,1
	mazowieckie . . . . .	2376	2562	2,3	4,0	-186,2	-7,5
	opolskie . . . . .	405	398	3,5	0,8	6,5	1,6
	podkarpackie . . . . .	830	915	2,8	5,2	-85,0	-9,7
	podlaskie . . . . .	501	507	3,5	0,7	-6,5	-1,3
	pomorskie . . . . .	989	838	3,3	7,8	150,6	16,5
	śląskie . . . . .	1983	2062	2,2	2,0	-78,8	-3,9
	świętokrzyskie . . . . .	507	692	3,6	18,6	-184,9	-30,8
	warmińsko-mazurskie . . . . .	593	584	3,2	0,8	9,0	1,5
	wielkopolskie . . . . .	1571	1498	2,5	2,4	73,0	4,8
zachodniopomorskie . . . . .	729	607	3,7	8,5	121,7	18,2	
Total		16521	17206	0,3	2,1	-684,6	-4,1

Source: Own calculations based on data from Central Statistical Office, Poland

<sup>a</sup> post-secondary or vocational secondary

**Tab. 2.** Comparison of the size of the working population according to the 2011 Population Census and the Labor Force Survey in the 1st Quarter 2011

Sections	Specification	Estimates of the number (thousands)		CV (%)		Differences between 2011 PC and 1stQ2011 LFS	
		2011 PC	1stQ2011 LFS	1stQ2011 LFS Emp.	2011 PC Crit.	absolute (thousand)	relative (%)
Gender	men . . . . .	7938	8509	0,4	3,6	-570,6	-6,9
	women . . . . .	6437	6888	0,5	3,5	-450,7	-6,8
Resid.	urban . . . . .	9066	9478	0,4	2,3	-412,1	-4,4
	rural . . . . .	5310	5919	0,6	5,8	-609,1	-10,9
Age	15-17 . . . . .	24	23	12,9	1,9	0,9	3,8
	18-19 . . . . .	90	72	7,0	10,3	18,3	22,6
	20-24 . . . . .	1142	1068	1,6	3,3	74,2	6,7
	25-29 . . . . .	2071	2177	0,8	2,6	-106,0	-5,0
	30-34 . . . . .	2129	2239	0,7	2,6	-110,3	-5,1
	35-39 . . . . .	1969	2101	0,7	3,4	-131,7	-6,5
	40-44 . . . . .	1686	1829	0,6	4,3	-143,1	-8,1
	45-49 . . . . .	1653	1831	0,7	5,5	-178,5	-10,3
	50-54 . . . . .	1767	1957	0,8	5,5	-189,6	-10,2
	55-59 . . . . .	1233	1363	1,3	5,4	-130,4	-10,1
	60-64 . . . . .	430	466	3,0	4,2	-35,7	-8,0
65+ . . . . .	182	232	4,7	14,1	-50,3	-24,3	
Education	tertiary . . . . .	4170	4317	1,3	1,8	-146,8	-3,5
	post-sec./voc.sec. <sup>a</sup> . . .	3793	4420	n.a.	n.a.	-627,0	-15,3
	general secondary . . .	1687	1325	2,0	11,0	362,0	24,0
	basic vocational . . . . .	3724	4231	1,1	7,0	-507,2	-12,8
	lower . . . . .	1000	1065	2,4	3,3	-65,5	-6,4
Voivodship	dolnośląskie . . . . .	1099	1078	3,2	1,0	20,8	1,9
	kujawsko-pomorskie . .	765	757	3,4	0,5	7,6	1,0
	lubelskie . . . . .	799	947	2,8	9,4	-147,7	-16,9
	lubuskie . . . . .	383	428	3,9	6,0	-44,7	-11,0
	łódzkie . . . . .	953	1265	2,6	16,7	-311,9	-28,1
	małopolskie . . . . .	1231	1245	2,7	0,6	-14,2	-1,2
	mazowieckie . . . . .	2125	2366	2,4	5,8	-241,1	-10,7
	opolskie . . . . .	352	358	3,6	0,9	-6,1	-1,7
	podkarpackie . . . . .	681	808	2,9	9,5	-126,8	-17,0
	podlaskie . . . . .	437	455	3,7	2,2	-18,4	-4,1
	pomorskie . . . . .	864	764	3,5	5,9	99,8	12,3
	śląskie . . . . .	1752	1892	2,2	4,1	-140,5	-7,7
	świętokrzyskie . . . . .	420	588	3,8	20,5	-168,5	-33,5
	warmińsko-mazurskie	494	525	3,5	3,3	-31,5	-6,2
	wielkopolskie . . . . .	1406	1353	2,7	1,9	52,8	3,8
zachodniopomorskie . .	617	530	3,7	7,2	87,3	15,2	
Total		14376	15398	0,3	3,6	-1022,2	-6,9

Source: Own calculations based on data from Central Statistical Office, Poland

<sup>a</sup> post-secondary or vocational secondary

**Tab. 3.** Comparison of activity rates according to the 2011 Population Census and the Labor Force Survey in the 1st Quarter 2011

Sections	Specification	Estimates of the number (thousands)		CV (%)		Differences between 2011 PC and 1stQ2011 LFS	
		2011 PC	1stQ2011 LFS	1stQ2011 LFS Emp.	2011 PC Crit.	absolute (p.p.)	relative (%)
Gender	men . . . . .	61,2	63,7	0,3	2,0	-2,5	-4,0
	women . . . . .	46,1	47,8	0,3	2,1	-1,7	-3,6
Resid.	urban . . . . .	54,4	55,4	0,4	1,8	-1,0	-1,8
	rural . . . . .	51,5	55,5	0,4	0,8	-4,0	-7,5
Age	15-17 . . . . .	2,1	1,8	0,5	3,9	0,3	15,4
	18-19 . . . . .	16,3	12,4	12,7	7,3	3,9	27,2
	20-24 . . . . .	59,6	55,1	5,4	12,2	4,5	7,9
	25-29 . . . . .	82,1	84,3	1,3	3,9	-2,2	-2,6
	30-34 . . . . .	83,7	86,3	0,6	1,4	-2,6	-3,1
	35-39 . . . . .	84,3	87,5	0,5	1,6	-3,2	-3,7
	40-44 . . . . .	83,5	87,3	0,5	1,9	-3,8	-4,5
	45-49 . . . . .	79,4	84,7	0,5	2,3	-5,3	-6,5
	50-54 . . . . .	71,2	75,4	0,6	3,4	-4,2	-5,7
	55-59 . . . . .	49,4	52,3	0,7	3,0	-2,9	-5,7
	60-64 . . . . .	20,1	21,5	1,1	3,0	-1,4	-6,7
65+ . . . . .	3,6	4,6	2,9	3,6	-1,0	-24,4	
Education	tertiary . . . . .	78,2	80,1	4,7	14,2	-1,9	-2,4
	post-sec./voc.sec. <sup>a</sup> . . . . .	64,7	67,4	0,5	51,0	-2,7	-4,0
	general secondary . . . . .	50,8	47,6	n.a.	n.a.	3,2	6,5
	basic vocational . . . . .	60,8	62,7	1,3	3,2	-1,9	-3,1
	lower . . . . .	18,4	18,5	0,6	1,6	-0,1	-0,5
Voivodship	dolnośląskie . . . . .	53,8	54,0	1,8	0,3	-0,2	-0,4
	kujawsko-pomorskie . . . . .	53,4	53,8	1,5	0,2	-0,4	-0,8
	lubelskie . . . . .	53,0	55,5	1,7	0,4	-2,5	-4,6
	lubuskie . . . . .	54,7	53,7	1,4	2,4	1,0	1,9
	łódzkie . . . . .	51,8	57,1	1,8	0,9	-5,3	-9,7
	małopolskie . . . . .	53,0	54,3	1,3	5,2	-1,3	-2,4
	mazowieckie . . . . .	55,1	58,4	1,3	1,3	-3,3	-5,8
	opolskie . . . . .	51,4	53,5	1,2	3,1	-2,1	-4,0
	podkarpackie . . . . .	50,4	55,8	1,4	2,1	-5,4	-10,2
	podlaskie . . . . .	53,5	53,9	1,3	5,5	-0,4	-0,7
	pomorskie . . . . .	55,2	54,7	1,5	0,4	0,5	0,9
	śląskie . . . . .	52,4	52,9	1,6	0,5	-0,5	-1,0
	świętokrzyskie . . . . .	48,5	56,6	1,2	0,5	-8,1	-15,4
	warmińsko-mazurskie . . . . .	52,4	52,0	1,3	8,5	0,4	0,8
	wielkopolskie . . . . .	56,1	57,2	1,6	0,4	-1,1	-1,9
zachodniopomorskie . . . . .	52,8	50,5	1,2	1,0	2,3	4,5	
Total		53,3	55,4	1,9	2,2	-2,1	-3,9

Source: Own calculations based on data from Central Statistical Office, Poland

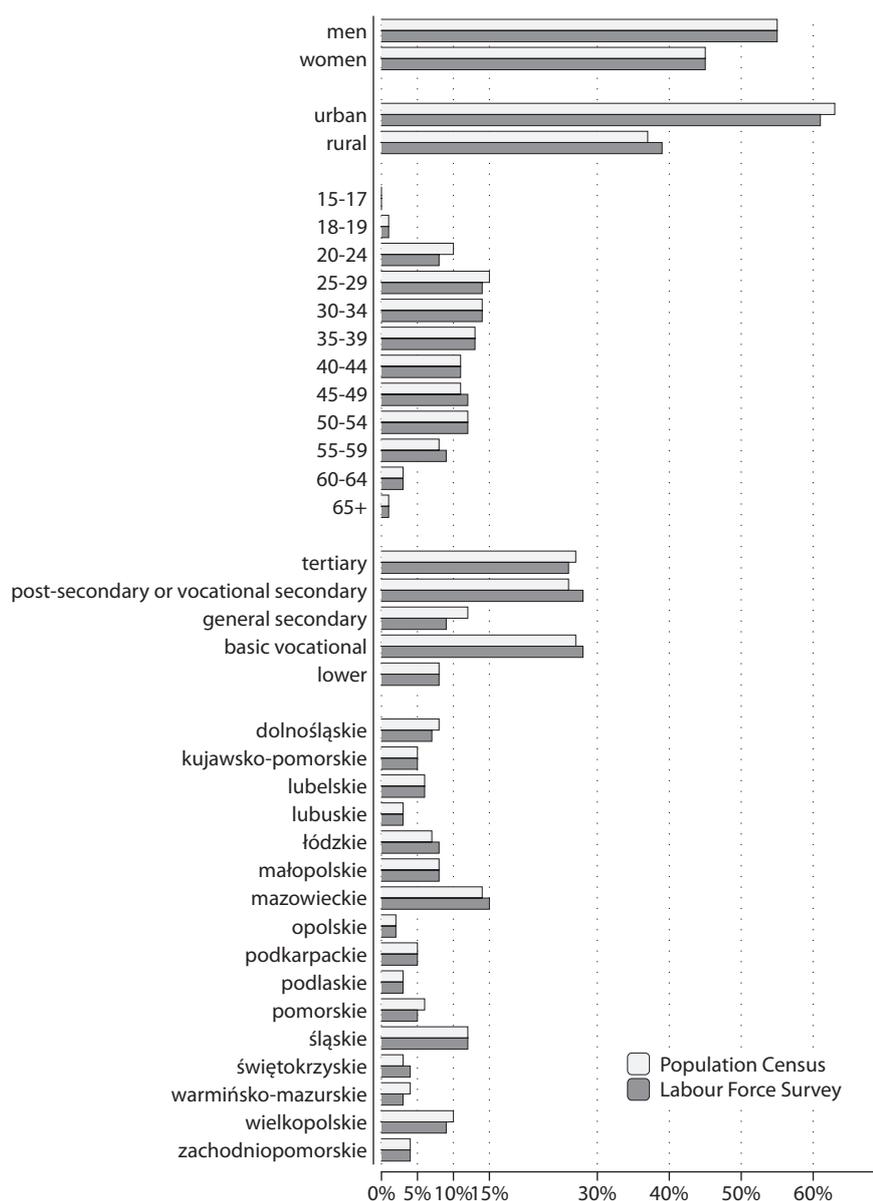
<sup>a</sup> post-secondary or vocational secondary

**Tab. 4.** Comparison of employment rates according to the 2011 Population Census and the Labor Force Survey in the 1st Quarter 2011

Sections	Specification	Estimates of the number (thousands)		CV (%)		Differences between 2011 PC and 1stQ2011 LFS	
		2011 PC	1stQ2011 LFS	1stQ2011 LFS Emp.	2011 PC Crit.	absolute (p.p.)	relative (%)
Gender	men . . . . .	53,5	57,3	0,4	3,6	-3,8	-6,9
	women . . . . .	39,9	42,6	0,5	3,4	-2,7	-6,6
Resid.	urban . . . . .	47,7	49,8	0,4	2,2	-2,1	-4,3
	rural . . . . .	44,4	49,3	0,6	5,6	-4,9	-10,5
Age	15-17 . . . . .	1,8	1,8	12,9	0,0	0,0	0,0
	18-19 . . . . .	9,2	7,4	7,0	10,0	1,8	21,7
	20-24 . . . . .	43,0	40,8	1,6	2,6	2,2	5,3
	25-29 . . . . .	70,1	74,1	0,8	2,9	-4,0	-5,6
	30-34 . . . . .	74,9	78,9	0,7	2,7	-4,0	-5,2
	35-39 . . . . .	75,9	81,2	0,7	3,6	-5,3	-6,8
	40-44 . . . . .	75,2	81,4	0,6	4,2	-6,2	-7,9
	45-49 . . . . .	71,0	77,9	0,7	5,0	-6,9	-9,3
	50-54 . . . . .	63,1	69,0	0,8	4,8	-5,9	-8,9
	55-59 . . . . .	43,9	48,3	1,3	5,1	-4,4	-9,5
	60-64 . . . . .	18,5	20,0	3,0	4,1	-1,5	-7,8
65+ . . . . .	3,5	4,5	4,7	14,6	-1,0	-25,0	
Education	tertiary . . . . .	73,3	76,2	0,5	51,0	-2,9	-3,9
	post-sec./voc.sec. <sup>a</sup> . . .	57,2	61,3	n.a.	n.a.	-4,1	-7,0
	general secondary . . .	42,8	40,8	1,5	22,1	2,0	4,8
	basic vocational . . . . .	51,3	55,3	0,7	10,4	-4,0	-7,5
	lower . . . . .	13,4	14,8	2,1	159,5	-1,4	-9,9
Voivodship	dolnośląskie . . . . .	46,7	47,6	1,7	1,0	-0,9	-1,9
	kujawsko-pomorskie . .	45,4	47,9	2,0	2,8	-2,5	-5,4
	lubelskie . . . . .	45,6	48,9	1,6	3,7	-3,3	-7,0
	lubuskie . . . . .	47,0	48,4	2,0	1,5	-1,4	-2,9
	łódzkie . . . . .	45,0	51,5	1,4	7,4	-6,5	-13,5
	małopolskie . . . . .	46,6	48,7	1,5	2,3	-2,1	-4,4
	mazowieckie . . . . .	49,3	53,9	1,4	4,8	-4,6	-8,9
	opolskie . . . . .	44,7	48,1	1,6	3,9	-3,4	-7,3
	podkarpackie . . . . .	41,4	49,2	1,6	9,6	-7,8	-17,2
	podlaskie . . . . .	46,7	48,4	1,8	1,9	-1,7	-3,6
	pomorskie . . . . .	48,2	49,9	1,8	1,8	-1,7	-3,5
	śląskie . . . . .	46,3	48,6	1,2	2,5	-2,3	-4,9
	świętokrzyskie . . . . .	40,1	48,1	1,7	10,2	-8,0	-18,1
	warmińsko-mazurskie	43,6	46,7	1,8	3,6	-3,1	-6,9
	wielkopolskie . . . . .	50,2	51,7	1,4	1,5	-1,5	-2,9
zachodniopomorskie . .	44,7	44,1	2,1	0,7	0,6	1,4	
Total		46,4	49,6	0,3	3,5	-3,2	-6,7

Source: Own calculations based on data from Central Statistical Office, Poland

<sup>a</sup> post-secondary or vocational secondary



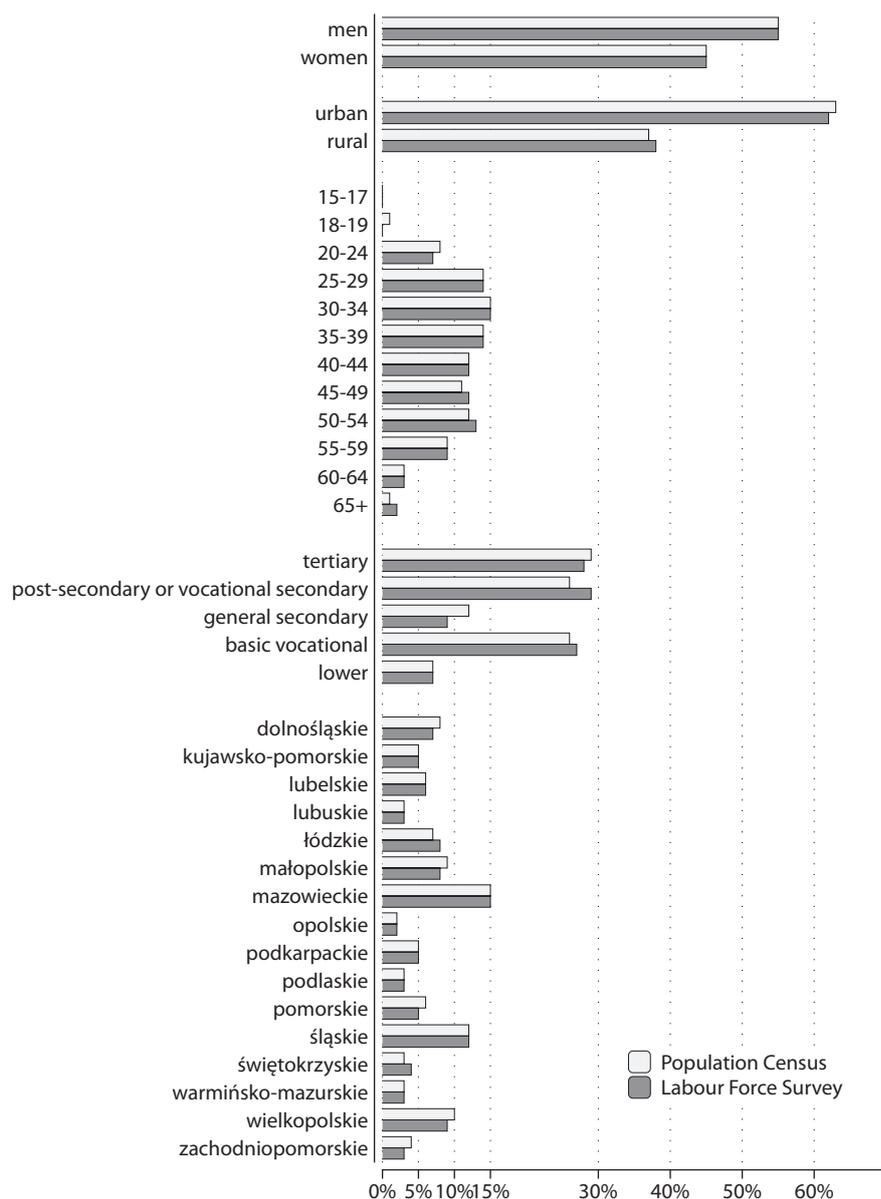
**Fig. 1.** Economically active population by gender, place of residence, age, educational level and voivodship (percentage of total economically active population)

Source: Own calculations based on data from Central Statistical Office, Poland

There were significant differences in the measurement of the labor force between the 2011 Population Census and the Labor Force Survey in the 1st Quarter 2011. They could be caused by: total and partial non-response, response errors, the phenomenon of conditioning in repeated surveys, the lack of a universal definition of the population in Polish official statistics, internal, domestic and foreign migration, or illegal employment on the labor market in Poland. The differences in the measurement of labor force between the two considered data sources were not caused by the different sample sizes, different sampling selection schemes or the timing of the surveys.

Gender and place of residence (divided into urban and rural areas) did not differ significantly in the measurement of the labor force between the 2011 Population Census and the Labor Force Survey in the first quarter of 2011. Age, educational level and voivodships significantly differed in the measurement of the labor force between the 2011 Population Census and the Labor Force Survey in the first quarter of 2011.

Greater efforts should be made to correctly identify the size of the labor force at the local, regional and national levels, as well as to allocate this resource more successfully and efficiently.



**Fig. 2.** Working population by gender, place of residence, age, educational level and voivodship (percentage of total working population)

Source: own calculations based on data from Central Statistical Office, Poland

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