

DISPARITIES BETWEEN REGIONS OF THE CZECH REPUBLIC FOR NON-BUSINESS ASPECTS OF LABOUR MARKET

Tomáš Löster – Jana Langhamrová

Abstract

The attention of this article is paid only to the non-paid (salary) sphere (the subdivision MLSA). In terms of labour cost are analysed for individual regions the average gross wage, the median of gross wage, the average hourly wage, median hourly wages, average hourly wages of men and women. Furthermore, in both periods is observed proportion of workers with below average labor costs. In addition to comparisons in each region is observed among change between periods from 2008 to 2011. For example in terms of the non-business sphere was revealed that in all regions there was a decrease in the difference between the average hourly wages of men and women. The highest decrease in difference was recorded in the Central Region, where the difference was reduced to 9.76%. It was found that the lowest unemployment rate is standard in the Capital city of Prague. In all regions there was from 2008 to 2011 an increase in level of the unemployment rate, the largest increase occurred in the Olomouc region (4.5%) and the lowest increase was recorded in the Capital city of Prague (about 1.8%). Using ANOVA were identified pairs of regions, where the unemployment rate can be considered statistically significantly different. Ústí region has a consistently high level of unemployment and the lowest level has the Capital city of Prague.

Key words: Labour Market, Unemployment, Income, Analysis of Variance.

JEL Code: C40, E24

Introduction

Since 2004 is the Czech Republic one of the countries of European Union. For the purposes of Statistical Office and Eurostat is its territory divided into territorial units using standard CZ-NUTS. Classification of NUTS-3 is the division of the Czech Republic to a 14 regions. The aim of this paper is to analyse individual regions of NUTS-3 in terms of labour costs. Two selected quarters are analysed, in both cases, the fourth quarter of the year (hereafter referred

to only by number). In the first case we are talking about 2008 and in the second about 2011. 2008 was chosen because it is last year before the start of the global financial crisis. Analyses are based on the data of the Ministry of Labour and Social Affairs (MLSA) and data of regional labour rates statistics (RLRS), which represents the regular monitoring of the actual earnings level and working hours of employees in regions of the Czech Republic in the form of statistical investigation.

The issue of income distribution, inequality, poverty, unemployment and regional analysis is devoted to a number of research papers and articles, and not only in the Czech Republic, the Slovak Republic but also in other EU countries. Unemployment is a serious economic problem with many aspects of the whole economic process. This is evidenced by the number of works, such as [7], [8] and [9]. From the ranks of economists is analysed a long-term unemployment due to its implications, see [10]. Modelling and analysis of poverty and income distribution is concerned with further work, see e.g. [1], [3], [4] or [11].

1 Analysis of characteristics of labour market in non-sphere

In this article are used this basic characteristics of the labour costs in the individual regions: average gross wage (in CZK), the median of wage (in CZK), the share of employees with below-average hourly earnings, average hourly wage (in CZK), the median hourly earnings (in CZK), the average hourly wage of women (in CZK) and the average hourly wage of men (in CZK). The values of these characteristics are listed in Table 1 (for the 4th quarter of 2008) and Table 2 (for the 4th quarter of 2011).

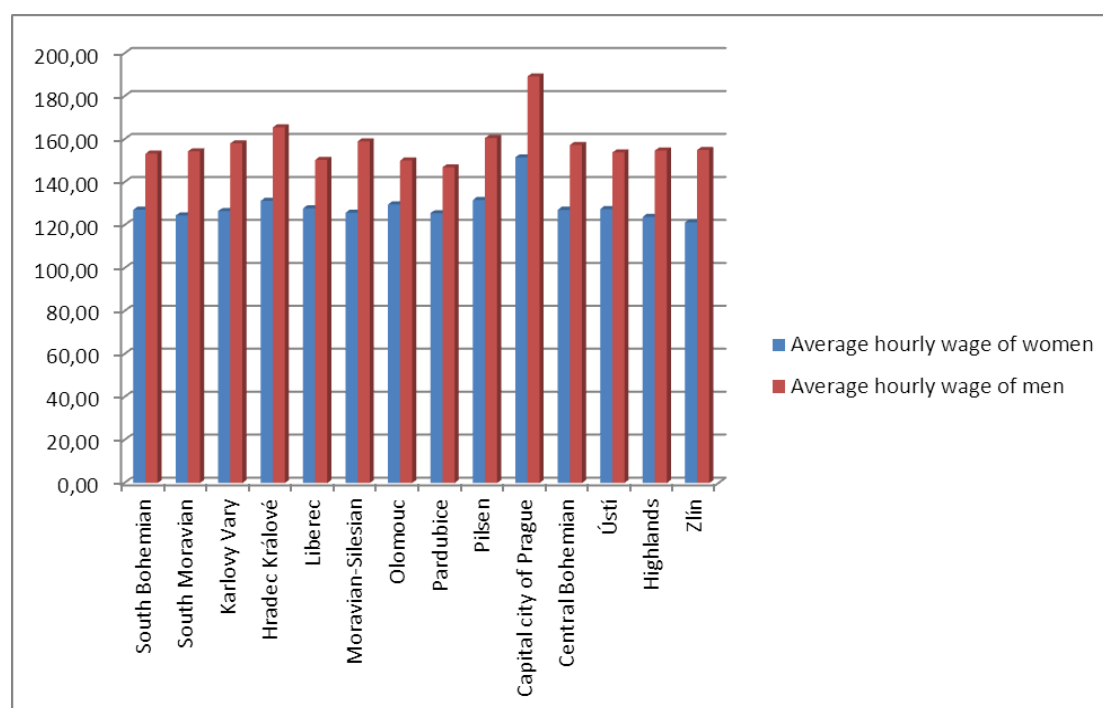
The graph in Figure 1, as well as from Table 1 shows that the average hourly earnings in the public sector in 2008 for men in all regions are higher than for women. The highest average hourly earnings were, for men and women in Prague, where it reached 189.27 CZK for males (compared with business CZK 233.77) and 151.61 CZK for women (compared with business 177.37 CZK). Regarding the share of employees with below-average hourly earnings in all regions, this value is higher than 50%, which means that more than 50% of employees have below the average earnings. (Note: "*Hourly earnings are calculated as average hourly earnings as defined in § 351 to § 362 of Act No. 262/2006 Coll. Labour Code, as amended*", see MLSA)

Tab. 1: Basic characteristics of regions in 2008

Region	Average gross wage	Median of wage	Share of employees with below-average hourly earnings	Average hourly wage	Median hourly earnings	Average hourly wage of women	Average hourly wage of men
South Bohemian	23 276	22 441	55,1	137,33	131,58	127,24	153,34
South Moravian	23 507	22 305	56,4	134,10	126,77	124,55	154,41
Karlovy Vary	23 882	23 118	54,6	138,05	132,73	126,63	158,17
Hradec Králové	24 165	23 036	57,7	143,12	134,30	131,35	165,57
Liberec	23 072	22 079	55,8	135,76	129,07	127,88	150,42
Moravian-Silesian	23 291	22 174	55,2	135,76	129,57	125,80	159,08
Olomouc	23 708	22 640	56,0	137,49	130,63	129,67	150,13
Pardubice	22 572	21 839	54,8	133,14	127,79	125,61	146,98
Pilsen	24 454	23 174	56,6	141,33	133,72	131,78	160,61
Capital city of Prague	28 706	26 335	59,4	166,09	151,63	151,61	189,27
Central Bohemian	23 525	22 853	55,6	136,79	130,10	127,20	157,36
Ústí	23 125	22 131	55,4	136,80	129,77	127,56	153,87
Highlands	23 124	22 212	55,7	133,60	127,54	123,93	154,76
Zlín	22 482	21 924	54,4	130,83	125,52	121,33	155,06

SOURCE: MLSA CZ

Fig. 1: Average hourly wage of men and women (in CZK) in 2008



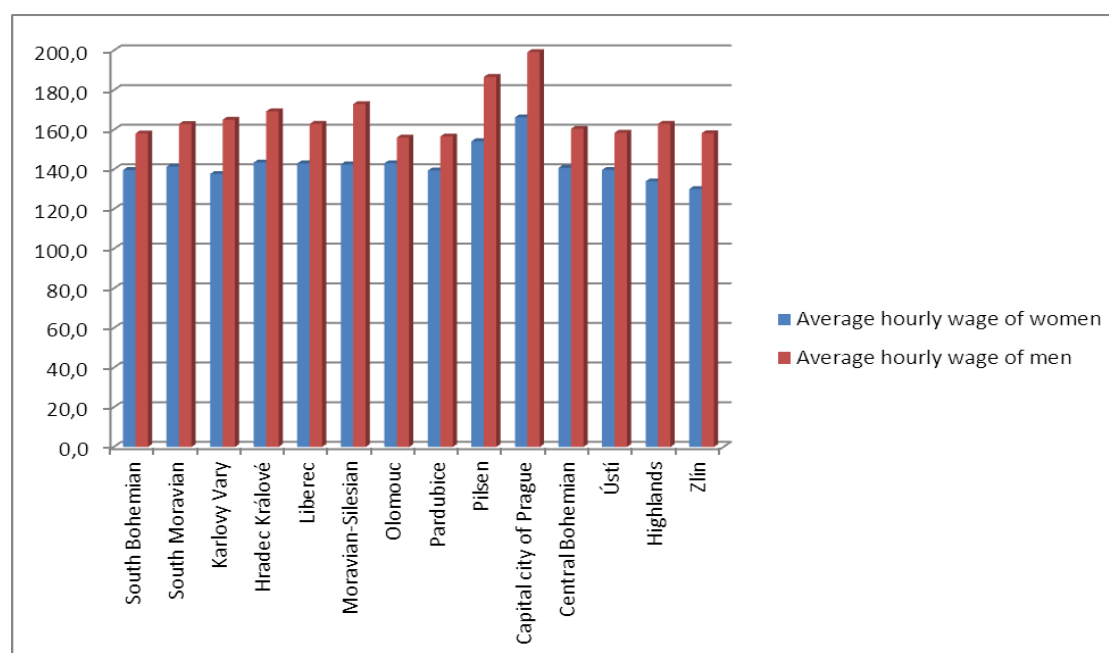
SOURCE: OWN CALCULATION

Tab. 2: Basic characteristics of regions in 2011

Region	Average gross wage	Median of wage	Share of employees with below-average hourly earnings	Average hourly wage	Median hourly earnings	Average hourly wage of women	Average hourly wage of men
South Bohemian	23 609	22 999	66,2	146,36	140,97	139,70	158,14
South Moravian	24 791	23 474	63,1	148,25	139,22	141,41	162,97
Karlovy Vary	23 948	23 218	64,1	147,48	141,06	137,74	165,06
Hradec Králové	24 783	23 448	63,4	151,89	143,63	143,52	169,30
Liberec	23 525	22 658	68,2	149,67	141,29	143,05	163,00
Moravian-Silesian	24 432	23 191	64,7	151,38	143,63	142,52	172,97
Olomouc	24 785	23 447	63,2	148,06	139,59	143,12	156,13
Pardubice	23 227	22 616	68,0	145,36	138,28	139,49	156,63
Pilsen	25 406	23 781	61,3	164,81	150,50	154,23	186,68
Capital city of Prague	29 619	27 134	44,3	178,79	164,46	166,29	199,21
Central Bohemian	23 853	23 208	64,9	147,00	141,17	140,85	160,50
Ústí	23 530	22 740	66,1	145,89	138,47	139,75	158,50
Highlands	24 101	23 038	66,4	142,95	134,75	134,01	163,03
Zlín	22 906	22 452	70,1	137,75	133,98	130,12	158,22

SOURCE: MLSA CZ

Fig. 2: Average hourly wage of men and women (in CZK) in 2011



SOURCE: OWN CALCULATION

The graph in Figure 2 as well as in Table 2 is the apparent average hourly earnings in the fourth quarter of 2011. It is obvious that Capital city of Prague has again the highest average hourly earnings, both in men (199.2 CZK) and women (166.3 CZK).

Tab. 3: Changes of average hourly wage between 2008 and 2011 (in CZK).

Region	Average hourly wage of women	Average hourly wage of men
South Bohemian	12,46	4,80
South Moravian	16,86	8,56
Karlovy Vary	11,11	6,90
Hradec Králové	12,17	3,74
Liberec	15,17	12,58
Moravian-Silesian	16,72	13,89
Olomouc	13,45	6,00
Pardubice	13,87	9,64
Pilsen	22,45	26,06
Capital city of Prague	14,68	9,94
Central Bohemian	13,65	3,14
Ústí	12,19	4,63
Highlands	10,08	8,27
Zlín	8,79	3,17

SOURCE: OWN CALCULATION

Table 3 shows the average hourly rate differences between men and women (in CZK) between the 4th quarter of 2008 and 4 quarter of 2011. It is clear that in all regions there was an increase in average hourly earnings in all the regions and for both sexes. The largest increase in average hourly earnings was occurred in the Pilsen region and that of CZK 22.45 for women and 26.06 for men CZK. Comparing the increases in average hourly earnings has two interesting facts. First, the already mentioned fact that in all regions compared to the business sector has been an increase in average hourly earnings and that the increase in average hourly earnings (excluding the Capital city of Prague) is higher in women than in men.

It is also interesting comparison of indicators, such as the difference of the average hourly earnings of men and women (in CZK), the difference of average hourly earnings and

median of gross earnings, as a difference of the average gross earnings and median of gross earnings. The values of these parameters are shown in Table 4 (for 2008) and Table 5 (for 2011). From the tables it is apparent that the average hourly earnings in all regions in both years are higher than the median hourly wage. This means that more than 50% of people in the public sector have less than the average hourly earnings.

Tab. 4: Comparison of indicators (in CZK) in 2008

Region	Difference of average wage of men and women	Difference of hourly average and median	Difference of average hourly wage and median
South Bohemian	26,10	5,75	835
South Moravian	29,86	7,33	1202
Karlovy Vary	31,54	5,33	764
Hradec Králové	34,21	8,82	1129
Liberec	22,55	6,69	993
Moravian-Silesian	33,28	6,19	1116
Olomouc	20,46	6,86	1068
Pardubice	21,37	5,35	733
Pilsen	28,84	7,61	1280
Capital city of Prague	37,66	14,46	2371
Central Bohemian	30,16	6,69	671
Ústí	26,31	7,03	994
Highlands	30,83	6,06	913
Zlín	33,73	5,31	558

SOURCE: OWN CALCULATION

Tab. 5: Comparison of characteristics (in CZK) in 2011

Region	Difference between average hourly wage of men and women	Difference between hourly average and median	Difference between average gross wage and median
South Bohemian	18,44	5,39	611
South Moravian	21,56	9,04	1318
Karlovy Vary	27,33	6,43	730
Hradec Králové	25,78	8,26	1335
Liberec	19,95	8,38	867
Moravian-Silesian	30,45	7,75	1241
Olomouc	13,01	8,47	1338
Pardubice	17,14	7,08	611
Pilsen	32,45	14,31	1625
Capital city of Prague	32,92	14,33	2485
Central Bohemian	19,65	5,83	645
Ústí	18,75	7,43	791
Highlands	29,02	8,20	1063
Zlín	28,11	3,77	454

SOURCE: OWN CALCULATION

Apart from analysing the distribution of earnings inequality is interesting to see to what this change in inequality occurred between 4 quarter of 2008 and 4 quarter of 2011. These data are shown in Table 6. It is evident that (unlike businesses sector, etc.) occurred in all regions to reduce the difference in the average hourly earnings of men and women. The most significant change occurred in the Olomouc region, where the difference between the average hourly earnings of men and women decreased by 36.40% in the Central Bohemian Region, where the difference decreased by 34.84%, it has led to improvement in equality between the sexes in terms of earnings. It is evident from Table 6 that occurred in most regions to increase the difference between the average hourly earnings and median of hourly earnings, which often noticeably deepened uneven distribution of earnings in the non-business sector. For example, the Pilsner Region, the difference between the hourly mean and median hourly earnings increased by 88.02%. Graphically, the changes of differences in the average hourly earnings of men and women in the various regions in the non-business sector (and for comparison in the business sphere) are trapped in Figure 3. As mentioned above, the differences between the

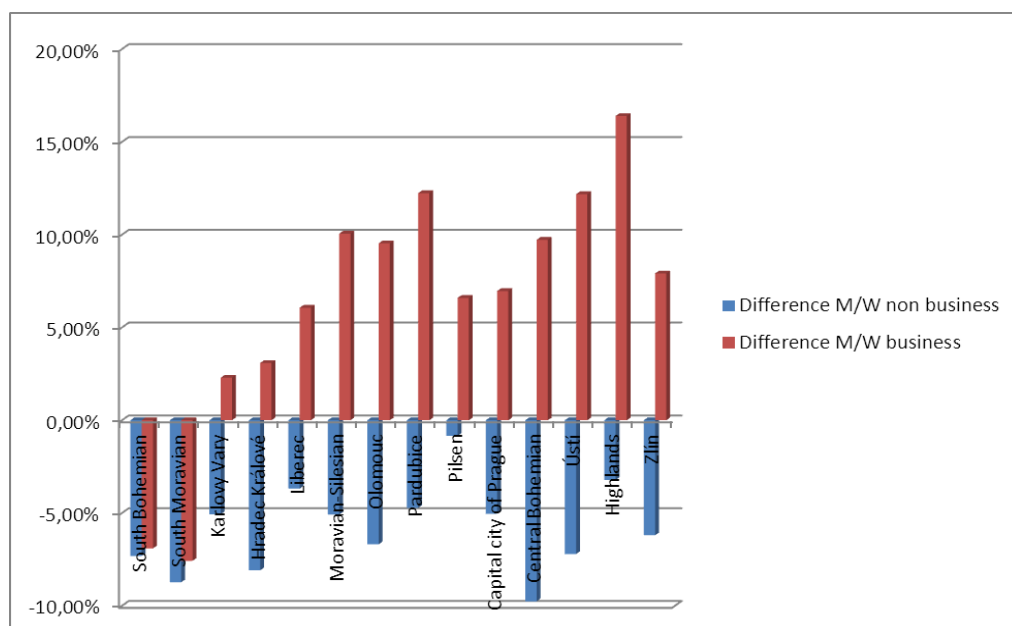
average hourly earnings of men and women decreased in all regions of the non-business sector, unlike the business sector, where in addition to South Bohemian and South Moravian region caused to deepening of inequality.

Tab. 6: Changes of characteristics (in %) between 2008 and 2011

Region	Difference between average hourly costs of men and women	Difference between hourly average and median	Rozdíl PHM-MM
South Bohemian	-29,37	-6,14	-26,86
South Moravian	-27,81	23,32	9,58
Karlovy Vary	-13,35	20,56	-4,40
Hradec Králové	-24,65	-6,28	18,24
Liberec	-11,50	25,23	-12,68
Moravian-Silesian	-8,49	25,23	11,18
Olomouc	-36,40	23,48	25,27
Pardubice	-19,80	32,52	-16,68
Pilsen	12,53	88,02	26,92
Capital city of Prague	-12,58	-0,92	4,78
Central Bohemian	-34,84	-12,86	-4,01
Ústí	-28,73	5,59	-20,48
Highlands	-5,86	35,23	16,45
Zlín	-16,67	-29,08	-18,51

SOURCE: OWN CALCULATION

Fig. 3: Comparison of changes of characteristics in business and non-business sectors



SOURCE: OWN CALCULATION

2 Analysis of regional unemployment

To obtain a more comprehensive view about the labour markets is appropriate to analyse the unemployment rate in each region. As stated above, the issue of unemployment is dedicated to many economists and analysts. For example, in [5] also addresses the impact of unemployment on public budgets and it is also advisable to analyse unemployment by region.

Values of regional unemployment rates for the 4th quarter of 2008 and 2011 are reported in Table 7. It is clear that in both phases is generally highest unemployment rate in the Ústí region that in the two periods has reached a level more than 10%. Between the two years occurred in all regions of the increase in the unemployment rate, the highest increase was in the Olomouc Region (4.5%) and the lowest was in the Capital city of Prague (about 1.8%).

Tab. 7: Unemployment rates (in %)

Region	Unemployment rate in 2008	Unemployment rate in 2011	Difference between 2008 and 2011
South Bohemian	4,80	7,50	2,70
South Moravian	6,80	9,80	3,00

Karlovy Vary	7,60	9,80	2,20
Hradec Králové	4,80	7,50	2,70
Liberec	7,00	9,50	2,50
Moravian-Silesian	8,50	11,20	2,70
Olomouc	6,90	11,40	4,50
Pardubice	6,00	8,40	2,40
Pilsen	5,00	7,00	2,00
Capital city of Prague	2,10	3,90	1,80
Central Bohemian	4,50	7,10	2,60
Ústí	10,30	12,90	2,60
Highlands	6,30	9,40	3,10
Zlín	6,10	9,40	3,30

SOURCE: MLSA CZ, OWN CALCULATION

In terms of a more detailed analysis of unemployment in regions, it is interesting to examine whether the unemployment rate is significantly affected territory (region). This verification will be given to the nature of the data used analysis of variance (ANOVA), the output is shown in Figure 4.

Fig. 4: Output of analysis of variance of Statgraphics Plus for 2008

ANOVA Table for mira_nezam08 by kraj

Analysis of Variance					
Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,0229502	13	0,0017654	5,24	0,0000
Within groups	0,021239	63	0,000337127		
Total (Corr.)	0,0441892	76			

SOURCE: OWN CALCULATION

The above output shows that the unemployment rate in 2008 is at 5% significance level significantly affected by region (p-value in the last column of this output is less than the 5% significance level, so we tested the hypothesis of conformity mean values of individual measurements unemployment in regions reject).

Note: Condition of using ANOVA about the same group variance is at the 5% significance level is met, tested the hypothesis of Bartlett test of conformity of group variances is not rejected (Bartlett's test: 1,32284 P-Value = 0,182651).

Fig. 5: Output from analysis of variance of Statgraphics Plus in 2011

ANOVA Table for mira_nezam11 by kraj

Analysis of Variance					
Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
Between groups	0,0310656	13	0,00238966	4,81	0,0000
Within groups	0,0313202	63	0,000497146		
Total (Corr.)	0,0623858	76			

SOURCE: OWN CALCULATION

A similar conclusion can be made for the rate of unemployment in 2011 and on 5% significance level it is possible to say that the unemployment rate is statistically significantly affected region.

Note: Condition of using ANOVA about the same group variance is in 2011 at the 5% significance level is met, tested the hypothesis Bartlett test of conformity of group variances is not rejected (Bartlett's test: 1,16748 P-Value = 0,706246).

Among the regions, which are statistically significantly different from most others in terms of unemployment include the Ústí region, as well as the Capital city of Prague. Based on the method of multiple comparisons revealed that Prague has over other regions differing significantly lower the unemployment rate, the Ústí region compared to other regions differing significantly higher unemployment rate.

Conclusion

Amount of earnings, as well as the unemployment rate in each region affects the entire economic process and the life of the population and therefore the analysis of these indicators are very important to get a comprehensive view about the individual labour markets. When we analysing each region, for example we found that the average hourly earnings in the non-business sector in 2008 for men in all regions is higher than for women. The highest average hourly earnings were, for men and women in Prague, where it reached 189.27 CZK (compared with business 233.77 CZK) for males and 151, 61 CZK (compared with business 177.37 CZK) for women. Regarding the share of employees with below-average hourly earnings in all regions, this value is higher than 50%, which means that more than 50% of employees are below the average earnings. Further analysis showed that in all regions there

was an increase in average hourly earnings in all regions and for both sexes. The largest increase in average hourly earnings occurred in Pilsner region and that 22.45 CZK for women and 26.06 CZK for men. It is interesting when we compare the increases in average hourly earnings, unlike the business sector increased average hourly earnings in all regions, and that the increase in average hourly earnings (excluding the Capital city of Prague) is higher in women than in men. Interesting is also the analysis of development of differences between the average hourly earnings of men and women. The most significant change was occurred in the Olomouc region, where the difference between the average hourly earnings for men and women decreased by 36.40% and in the Central Bohemian region, where it decreased by 34.84%, which from gender view has led to improvements in gender equality in terms of earnings. As was mentioned above, the differences between the average hourly earnings of men and women decreased in all regions of the non-business sector, unlike the business sector, where in addition to South Bohemian and South Moravian region caused to deepening inequality. It showed with using ANOVA that on the 5% significance level can be considered as the unemployment rate dependent on region. Ústi region has a consistently high level of unemployment and the Capital city of Prague the lowest of all regions.

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Contact

Ing. Tomáš Löster, Ph.D., Bc. Jana Langhamrová

University of Economics in Prague,

Department of Statistics and probability,

W. Churchill Sg. 4,

130 67 Prague 3

Tomas.Loster@vse.cz, xlanj18@vse.cz