Task:

- Your task is to analyze the results of tax compliance experiment.
- Try to describe the behavior of participants (overall and session by session) during the experiment. The main variables of interest are as follows:
- RealIncome - endowment (earnings)
- ConIncome - income declare to tax authority
- Control - if 1=> subject audited by tax authority
- Catch - audit found subject "guilty."
- rpref[1] -rpref[10] - risk aversion check

Variables

	value	1	2	3	4
	meaning	baseline	flat tax rate	progressive tax rate	regressive tax rate
	value	5	6	7	8
Treatment	meaning	flat t.r. + positive news headlines	flat t.r. + negative news headlines	baseline + positive news headlines	baseline + negative news headlines
Session	value	1 or 2			
	meaning	up to 2 sessions per treatment			
Subject	value	1 to 24			
	meaning	unique identification of an experimental subject in a session			
Group	value	1 to 6			
	meaning	subject in a session were divided into smaller groups who interact together			
RealIncome	meaning	in treatments 1, 7, 8		randomly given number	
		other treatments		from a real effort tasks	
ConIncome	meaning	reported income for taxation			
Compliance	value	0		1	
	meaning	RealIncome==ConIncome		RealIncome>ConIncome	
Control	value	0		1	
	meaning	not audited		audited	
Catch	value	0		1	
	meaning	not found guilty		found guilty	
rpref[1-10]	value	1 to 2			
	meaning	risk preferences			

Description of data

Table 1 - Number of Subjects (and their characteristics) per Treatment

Treatment	1	2	3	4	5
Subjects	*44*	*44*	*40*	*32*	*48*
male	19	12	16	12	14
Czech	40	39	33	27	45
risk averse	2	6	3	2	4
risk neutral	41	35	36	30	43
risk loving	1	3	1	0	1
Treatment	**6**	**7**	**8**	**total**	
Subjects	*44*	*44*	*40*	*332*	
male	19	12	16	121	
Czech	40	39	33	298	
risk averse	2	6	3	30	
risk neutral	41	35	36	292	
risk loving	1	3	1	10	

PROFIT - ZOOMED

Legend: ▮ mean profit per session ── mean profit total
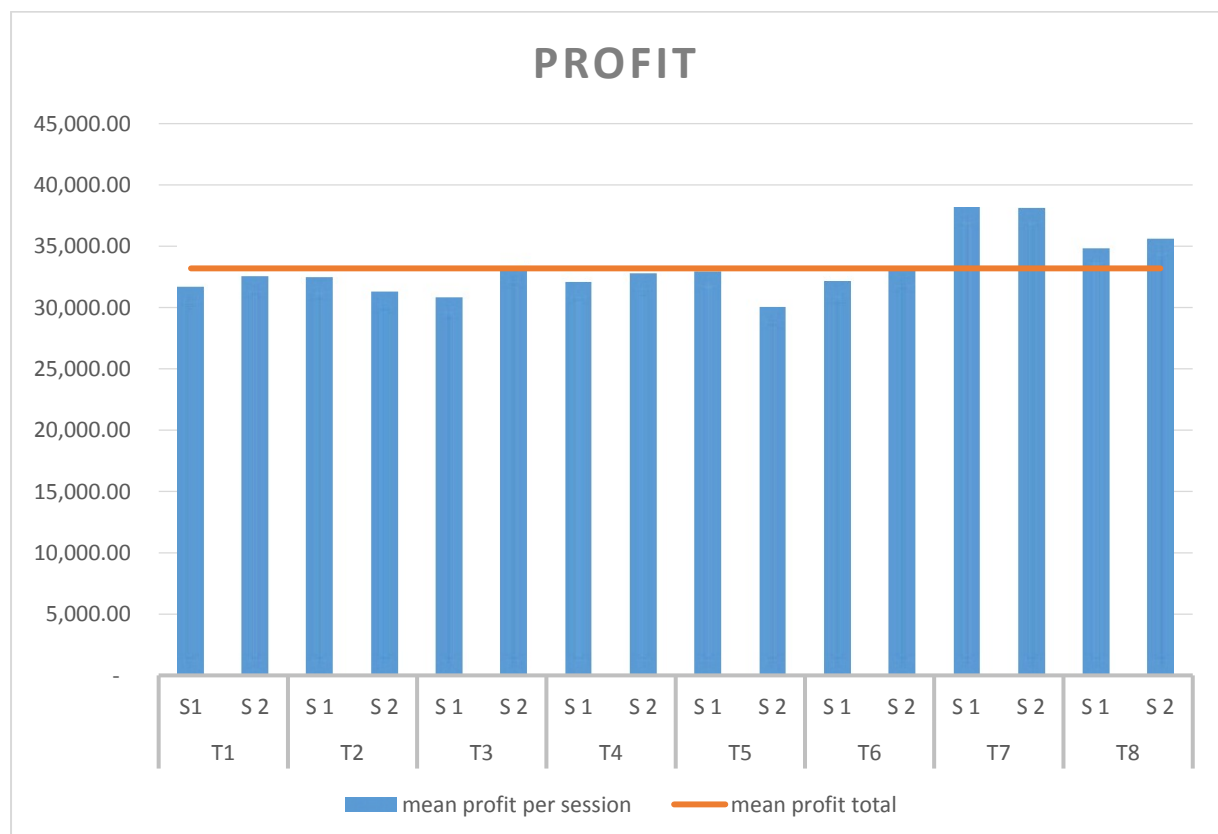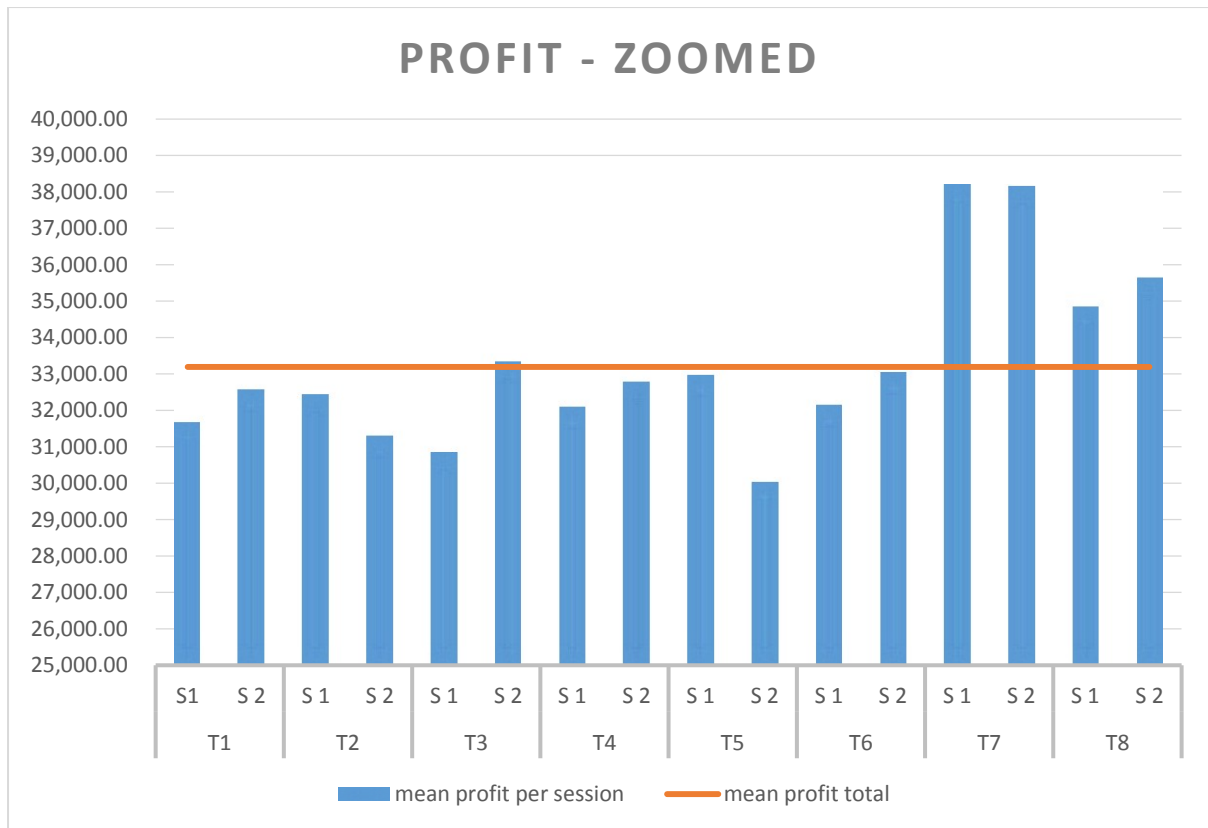
Mann-Whitney U Test

Mann-Whitney U test is the alternative test to the independent sample t-test. It is a non-parametric test that is used to compare two population means that come from the same population, it is also used to test whether two population means are equal or not. It is used for equal sample sizes, and is used to test the median of two populations. (see e.g. http://www.statisticssolutions.com/mann-whitney-u-test/)

Test of session effect - Compare mean contribution (ConIncome) between two sessions of the same treatment

In STATA: **runksum**

by Treatment, sort : ranksum ConIncome, by(Session)

-
-> Treatment = 1

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

```
    Session |     obs   rank sum   expected
------------+-------------------------------
         1  |     120     11921      13260
         2  |     100     12389      11050
------------+-------------------------------
   combined |     220     24310      24310
```

unadjusted variance   221000.00
adjustment for ties   -288.17
              ----
adjusted variance   220711.83

Ho: ConInc~e(Session==1) = ConInc~e(Session==2)
      z = -2.850
   Prob > |z| =   0.0044   **means differ at 99% significance level – Session effect**

-
-> Treatment = 2

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

```
    Session |     obs   rank sum   expected
------------+-------------------------------
         1  |     120    12902.5     13260
         2  |     100    11407.5     11050
------------+-------------------------------
   combined |     220     24310      24310
```

unadjusted variance   221000.00
adjustment for ties   -229.51
              ----
adjusted variance   220770.49

Ho: ConInc~e(Session==1) = ConInc~e(Session==2)
      z = -0.761
   Prob > |z| =   0.4467   **means do not differ at 99% significance level – No session effect**

Chi-square test

The chi-square test is always testing what scientists call the null hypothesis, which states that there is no significant difference between the expected and observed result.

Usually refers to frequency tables. The test measures (non)existence of differences between cells.
Null hypothesis => no difference.

In our example – to test whether there is a difference between compliance rate (Compliance) among treatments.

STATA:

. tabulate Compliance Treatment, chi2 column

Compliance	1	2	3	4	5	6	7	8	Total
	122	112	105	109	134	87	117	80	866
0	55.45	50.91	52.50	68.13	55.83	39.55	58.50	40.00	52.17
	98	108	95	51	106	133	83	120	794
1	44.55	49.09	47.50	31.87	44.17	60.45	41.50	60.00	47.83
Total	220	220	200	160	240	220	200	200	1,66
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Pearson chi2(7) = 47.8479   Pr = 0.000

Differences are significant at 99% level