

This is Problem Set 1 (PS1), the first of two Problem Sets that we ask you to solve during this semester. You have until March 31, 2020, 23:59 to submit your solutions to PS1. Submit your solutions (**in the .pdf format**, typed digitally¹ or written *legibly* and scanned) in the appropriate field of the section ‘Study group roster’ in the SIS². You can obtain up to 10 points for this assignment (points for each problem are indicated in parentheses). Problem Sets are **individual work**. Base your answers on what we have covered in class and the course textbook. In case you have any questions, contact Tereza Palanská at tereza.palanska@fsv.cuni.cz.

Problem 1 (6 points)

In this exercise you will work with data on inequality. First, you need to download the data. Go to the website of the [World Inequality Database](#) to select a data table to download, using the menu on the left. In that menu, in Indicators, select “Top 10% income share”. In Countries & Regions, choose any country whose name starts with the same letter as your last name (or, alternatively, your first name or your hometown). In addition, select three other countries of your choice and also “World”. In Years, select the years 1980 to 2016. In the table that appears at the bottom of the page, make sure the countries you selected have at least some available data. Once you have all these attributes selected, use the three green buttons on the bottom of the page to choose the table structure and file format and then download the dataset.

Import the dataset into your favorite statistical software (you can use any software of your choice, including MS Excel, but for your benefit, I recommend you use R, Stata or Python). Then, go to the [World Bank data page](#) and download data on GDP (current USD) of your four chosen countries and also the world for at least the years 1980 to 2016. Merge this data to your dataset on inequality. The resulting dataset should be a panel dataset with four columns: ‘Country/Region’, ‘Year’, ‘Top 10% income share’, and ‘GDP’. You should have a total of 185 observations (37 for each of the four countries and 37 for World).

- a) (2 points) Create a line chart that shows the development of the top 10% income share in your four countries. Briefly comment on what you observe (max. 30 words).
- b) (2 points) Create a horizontal bar chart that compares the top 10% income share in 2016 in your four countries and the world. Briefly comment on what you observe (max. 30 words).
- c) (2 points) In light of the current cononavirus crisis, some economists are proposing that the budget deficits that will arise due to increased government spending should be repaid primarily by wealthy people. Imagine that the governments of your four chosen countries decided that the deficit, which amounts to 5% of GDP in each of these

¹If you’re using L^AT_EX, you might find it useful to have [this document in the T_EXformat](#).

²Students from the Faculty of Mathematics and Physics will submit by e-mail to tereza.palanska@fsv.cuni.cz.

countries, will be financed by a one-time additional income tax on the top 10% of the income distribution. This tax will be a proportional tax. How high would the tax rate have to be to fully cover the deficit in each of the four countries? Show all the steps of your calculation.

Problem 2 (2 points)

Answer the following questions and tasks briefly:

- a) (0.5 point) Explain why moral hazard increases the price of health insurance. Give an example of what might help reduce moral hazard.
- b) (1 point) Consider you have no insurance and your utility function for next year is the following: $E(U) = P_0 \cdot U(\text{CZK } 400.000) + P_1 \cdot U(\text{CZK } 200.000)$. Where P_0 is your probability of being healthy and P_1 is your probability of being sick. When you're healthy, your income is CZK 400,000, corresponding to a level of utility of 100. When you're sick, your income is CZK 200,000 and your utility corresponds to 80. If the probability of being sick is 20%, would you be willing to pay CZK 40,000 for full insurance? Explain your answer and show the steps of your calculation.
- c) (0.5 point) Explain the life-cycle model related to the retirement problem in your own words.

Problem 3 (2 points)

Elections to the European Parliament take place in all EU countries, however, some aspects of the voting system may differ from country to country. Choose your home country (or, if you are not from an EU country, choose the Czech Republic) and briefly answer the following questions about how the voting system for this particular election works there.

- a) (0.5 point) What are the preferential vote rules (i.e. how many, if any, candidates can you give a preferential vote to)?
- b) (0.5 point) Can citizens of your country who live abroad vote in this election? Under which conditions?
- c) (0.5 point) Is there a threshold for party entry? If so, how large?
- d) (0.5 point) Which method for distributing mandates to candidates is used in your country in the European Parliament election? Are there any modifications to the quotients that are used? If so, which are they?