

Probability and Statistics

Group Project Description

I. Research Question

This is a group project. In the project, you are asked a simple question: *Does audit firm size have significant impact on audit prices in China?* You are expected to complete the project collaboratively.

II. Required Materials

You are formed into small groups and for each group, a **written report** is required, accompanying with the **log file** generated in Stata (since the log file contains all the codes, there is no need to provide the code file separately). In addition, each group is required to prepare a **presentation video** about your project and submit the video along with other materials in a zipped package. Please send all the required materials to fangfang.hou@xmu.edu.cn before **August 31, 2023 (DEADLINE)**.

In the presentation video, each group member should show their face and describe in detail their role in the team's work, and you should: (1) clearly identify the research question and the background information, (2) develop the hypotheses and the research design, (3) describe the practical process of statistical analyses, and (4) discuss the results and their implications.

Note: you should try to report the statistics in a formal way in your written report (e.g. following the listed references in the last section of this document) rather than directly inserting snapshots.

III. Instructions on Data

I have already uploaded the raw and cleaned datasets together with the “data_prep.do” files for your use. The raw data is obtained from CSMAR online data platform – Financial Statements and Audit Opinions sections. Please read the “data_prep.do” carefully to see how we clean the raw data and calculate needed ratios/dummies.

The cleaned dataset “Audit_Combas_data.dta” contains the total audit fees and other financial variables of Chinese listed firms, which you can use for further tests. The observation is at the firm-year level, i.e., each observation records the yearly statistics for a particular firm at the end of a particular fiscal year. Each firm is

uniquely identified by “Stkcd”, and the fiscal year end date is identified by “Accper”.

IV. Step-by-step Instructions

Specifically, you are asked to do the following things:

- 1) Generate summary statistics table following the prior literature. e.g. Table 3 Panel A in Chen et al. (2011). Provide your explanation on the statistics of interest. (Graphical presentation is not mandated, but you are welcome to use the graphical techniques we have learned in this part, e.g. Boxplot, Scatter plot, Histograms etc.)
- 2) Conduct two-tailed t-test to see whether the mean audit fee of big 8 audited firms is significantly different from that of non-big 8 audited firms. Provide your explanation on the statistics of interest.
- 3) Perform an ANOVA analysis to see if there are significant differences in the average audit fees for audited firms of different sizes (Hint: you can use tertiles, quartiles, or quintiles of total assets of audited firms as the proxy). Please provide an explanation of the statistical data you are interested. Provide your explanation on the statistics of interest.
- 4) Conduct Linear Regression to test the null hypothesis: H_0 : *Audit firm size has no significant effect on audit prices in China*. Following Francis (1984), you may use **big8** in the data to proxy for the audit firm size. Generate robust standard errors adjusted for heteroscedasticity and cluster at the firm level. Provide your explanation on the statistics of interest.
- 5) Conduct Multiple Linear Regression to test the null hypothesis: H_0 : *Audit firm size has no significant effect on audit prices in China* by adding more control variables that are documented to be correlated to firms' audit fee, e.g., audited firm size (*Total Assets*), *Audit Opinion*, *Current Assets Ratio*, *Equity-to-Debt ratio* (See Francis, 1984; Liu & Subramaniam, 2013; Chen et al. 2013), etc. Generate robust standard errors adjusted for heteroscedasticity and cluster at the firm level. Provide your explanation on the statistics of interest.

V. Reference

Chen, H., Chen, J. Z., Lobo, G. J., & Wang, Y. (2011). Effects of audit quality on earnings management and cost of equity capital: Evidence from China.

Contemporary Accounting Research, 28(3), 892-925.

Francis, J. R. (1984). The effect of audit firm size on audit prices: A study of the Australian market. *Journal of Accounting and Economics*, 6(2), 133-151.

Liu, L., & Subramaniam, N. (2013). Government ownership, audit firm size and audit pricing: Evidence from China. *Journal of Accounting and Public Policy*, 32(2), 161-175.

Chen, J., Cumming, D., Hou, W., & Lee, E. (2013). Executive integrity, audit opinion, and fraud in Chinese listed firms. *Emerging Markets Review*, 15, 72-91.