

Seminar Corporate Governance: Topics on Data Analysis with STATA

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22 November 2017

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Part I

Introductory

1 Why we are here and how we get there?

Slide 2 **Who am I?**

- Yuhao (Hanan) Zhu.
- Final-year PhD Students at Erasmus School of Economics.
- Corporate Governance, Asset pricing, and Behavioral Finance.

Slide 3 **Why this topic?**

- Not knowing where to collect desired data.
- Lacking sufficient knowledge about STATA.
- Improperly resenting the results.

Slide 4 **How to approach?**

- Popular databases and what you can find from them.
- Basic knowledge of STATA commands, essential issues, and ability to read help documents.
- Design of the tables of results.

Slide 5 **What to expect?**

- Better data quality for your thesis.
- Correct results for your analysis.
- Clear way of showing your results.

Slide 6 **Above all**

You can improve your thesis grade by at least 1.0 if you do can reach these three criterion.

2 What to learn today?

Slide 7 **Databases**

- Popular databases.
- EDSC.
- WRDS.

Slide 8 **STATA**

- Layout.
- Idea behind STATA commands (functions). Link them to other computer languages.
- Basic commands for panel regressions.
- Essential issues and common mistakes.
- How to read STATA help document?

Slide 9 **Tables**

- How to get beautiful tables from STATA.
- How to get them into Excel?
- What items to show in your thesis?
- Title and captions.

Slide 10 **Note**

- Important sections and points are preceded by an asterisk *.
- There are two kinds of questions: questions and good questions. So feel free to ask.
- I will also ask questions during the lecture.

Part II

Databases

3 Fantastic databases and how to find them

Slide 11 * **Erasmus Data Service Center**

- When you do not know which databases meet your need, go to the website of EDSC.
- https://www.eur.nl/ub/en/edsc/databases/financial_databases/

Slide 12 **EDSC - Financial databases**

Financial databases

The Data team provides access and supports a number of financial databases. If you already know the name of the database you want to use, you can use the alphabetical list to get access.

You can also get a list of databases by subject (like stock prices, IPOs, CEO's) by entering keywords in the search box on this page. The titles, content descriptions and keywords of all UL-databases will be searched. Please note: you can't search in the databases.

There are **36** hits.

A - B - C - D - E - F - G - H - I - J - K - L - M - N - O - P - Q - R - S - T - U - V - W - X - Y - Z

Title

 **Audit Analytics (via WRDS)**

Provides detailed audit information on over 1,200 accounting firms and 15,000 publicly registered companies. [Read more](#)

 **Bloomberg Finance**


Bloomberg is the standard for financial data. [Read more](#)

 **BoardEx**

BoardEx contains data from publicly listed companies about their board members. [Read more](#)

 **Capital IQ People Intelligence (via WRDS)**

People Intelligence covers over 2.4 million people including private and public company executives, board members, and investment professionals, globally. [Read more](#)

 **Compustat Global (via WRDS)**

CompuStat Global consists of annual and quarterly report data of listed companies, with an

Slide 13 **Hand-collected data sets**

- Sometimes, hand collected data sets are also important.
- Not all data you need for your thesis is available through data sets.
- You can collect them by hand or by spiders.

4 * WRDS

Slide 14 **WRDS**

- Wharton Research Data Services.
- <https://wrds-web.wharton.upenn.edu/wrds/>
- You can get permission to WRDS through EDSC.

Slide 15 **Databases**

- Compustat: Fundamentals of the firm.
- Execucomp: Executive compensation.
- CRSP; Stock prices.
- Event Study: A nice tool to do event study.

Part III

STATA

5 Why STATA?

Slide 16 **Too many choices**

- Excel (VBA): We know them when we are very young.
- SPSS: The first statistical software you met in your bachelor.
- EViews
- R
- Matlab
- Python

Slide 17 **Advantages of STATA**

- Ready-to-use packages and commands that are written and revised by previous researchers.
- Reusable codes and programs.
- Professional in handling panel data sets.
- In-design statistics.

Slide 18 **Alternatives**

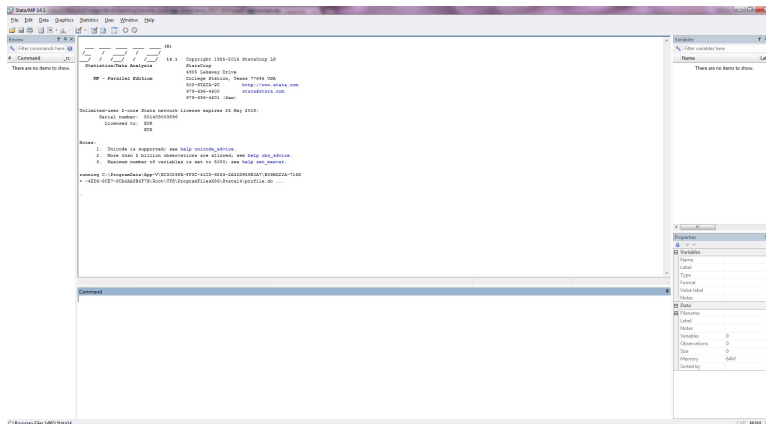
- Excel (VBA and Python add-ins): Pre-process of the raw data sets. Some data sets are not clean enough for STATA.
- EViews: Professional in handling time-series analysis.
- R: Data visualization.
- Matlab: Simulations.
- Python: Spiders.

Slide 19 **Job synergy**

- Catch online data with Python.
- Pre-process and clean the data sets using Excel.
- Data visualization using R.
- Panel analysis using STATA.

6 STATA basics, commands, and do-files

Slide 20 Layout



Slide 21 Windows

- * Input window: you give command to STATA.
- * Output window: STATA gives you results.
- Review window: commands you typed before. You can reuse them by clicking.
- Variables window: List of variables within the data set.
- Property window: Property of a certain variable, e.g., name, label, and data type.

Slide 22 Give commands

- There are always two ways to give command:
- Click buttons in the menu bars or ribbons (like what you do in SPSS).
- Type your command and press "Enter" (like what you do in CMD or Terminal).

Slide 23 Preferred way

- Typing command is preferred to clicking. Why?
- Clicking is annoying.
- Commands can be re-used later.
- We have "do-file".

Slide 24 Commands

- Commands are the most essential advantage of STATA.
- Clicking menu bars is first translated to commands, and then executed by STATA.
- Commands are well-defined functions!
- When you give commands, think that you are programming!

Slide 25 **Idea behind commands**

- Typed-in commands are conceptually equivalent to functions used in other computer languages.
- $Y = \text{Function}(X_1, X_2, X_3, \dots | \theta)$.
- X_1, X_2, X_3 and so on are the input arguments (independent variables).
- θ is the parameters (optional variables).
- Y is the output (dependent variable).
- *Function* is well-defined sequential calculations and actions. Define once, and can be re-used many times.

Slide 26 **Structure of the STATA commands**

- `command [arg1 arg2 ...] [if expression] [, options]`
- Command name.
- main argument.
- optional arguments.
- sample constraints.
- options.
- "Commands" are "Functions" without parenthesis.

Slide 27 **An example: OLS estimate**

- What if we calculate the OLS estimate by hand?
- Independent variable(s): Matrix X .
- Dependent variable: Y .
- OLS estimate $b = (X'X)^{-1} X'Y$.
- This formula can be defined as a function: `regress`

Slide 28 **An example: STATA**

- We type the command: `regress Y X`
- STATA analyzes your command:
- The function is `regress`. The OLS estimate should be used.
- The first argument is Y . It is the dependent variable.
- The second argument is X . It is the independent variable.
- STATA conducts calculation in the background: $b = (X'X)^{-1} X'Y$.
- b is printed in the output region.

Slide 29 **An extended example: STATA**

- We type the command: `regress Y X if year == 2000, vce(robust)`
- The function is `regress`. The OLS estimate should be used.
- The first argument is `Y`. It is the dependent variable.
- The second argument is `X`. It is the independent variable.
- STATA sees `if`. So the sample is constrained to observations with year equal to 2000.
- STATA sees `,`. So `vce(robust)` is option: using robust standard error.

Slide 30 * **The most important things to learn about STATA commands**

- The purpose of the command (function).
- The main arguments (variable) of the function.
- Which observations (sub-sample) are used?
- The options.

Slide 31 **Example**

- `summarize age income if gender == 1, detail`
- The purpose of the function is to summarize the variables.
- The variables we want to summarize are `age` and `income`.
- Which observations are used: `males`.
- We want to show more detailed summary: `, detail`

Slide 32 **What is do-file?**

- A sequence of commands just like a program.
- Automatically run from the beginning to the end. Or run the selected parts.
- Easy to re-use the codes.
- Ready to show to others with comments.
- Loops.

Slide 33 **Always use do-files**

- Always use do-files when you use STATA.
- `Ctrl + D` on PC, or `Shift + Cmd + D` on Mac to run selected commands.

7 * Basic commands with Demo

Slide 34 Basic functions

- We will go through basic commands (functions) for panel analysis by:
- The idea behind commands.
- The structure of a command.
- A real example.

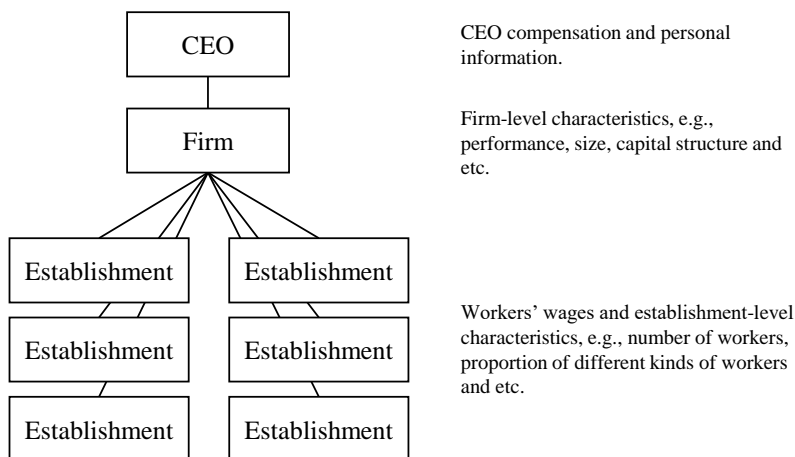
Slide 35 Learning by doing

- Now we introduce the most basic commands in STATA. They are frequently utilized when doing corporate finance studies. Get familiar with them for your thesis.
- Example: a German panel data set.
- Working paper: *The real costs of CEO compensation: the effect of behindness aversion of employees.*
- Purpose: Relationship between CEO compensation and workers' pay.

Slide 36 Real example

- Data set 1: Firm-level information on 100 largest German firms (CEO compensation and performance)
- Data set 2: Branch-level (establishment-level) information (workers' pay and labor structure)
- Data set 3: Match book of the firm ID and the branch (establishment) ID.

Slide 37 Data structure



Slide 38 **Organize your folder**

- Organize your folder for better readability.
- A parent folder, and several sub-folders.
- /orig: Contains original data sets. Do not change data sets in this folder.
- /data: Contains modified or intermediate data sets saved for further analysis.
- /prog: Do files.
- Other sub-folders if needed.

Slide 39 **Create a do-file**

- We need to create a do-file.
- Save it under "analysis/prog/"
- Save the file in time.

Slide 40 **Locate the path of the parent folder**

- Locate your parent folder.
- For example, it is named "analysis".
- `cd "C:\Data\...\guest_lecture\analysis"`

Slide 41 **Open a data set**

- We begin with open a data set.
- use `"orig/firm_level_data.dta", clear`

Slide 42 **Generate variables**

- `generate ln_market_capital = ln(market_cap)`
`gen return_on_asset = ebitda / total_asset`

Slide 43 **Summarize**

- Summarize the variables.
- Missing values are not summarized.
- With option `detail`, you can obtain more detailed descriptions including quantiles.
- `summarize ceo_total market_cap total_sales`
`sum ceo_total, detail // Show more details.`

Slide 44 **Correlation matrix**

- You can create correlation matrix of many variables.
- `correlate ceo_total ceo_cash board_total`
`corr market_cap total_sales employees`

Slide 45 **Sort**

- Sort by variable name(s).
- ```
sort market_cap
sort market_cap total_sales
sort id_iab // Sort firm id.
```

Slide 46 **Merge data sets**

- Step 1: Find the common key(s)
- Step 2: Identify the matching mode: 1-to-1, m-to-1, or m-to-m.
- Step 3: Decide the master and the using data sets.

Slide 47 **Command joinby**

- Syntax: `joinby [varlist] using filename [, options]`
- ```
sort id_iab // sort before joinby
joinby id_iab using "orig/match_book.dta"
```

Slide 48 **Command merge**

- Syntax: `merge m:m varlist using filename [, options]`
- * Many-to-many matching

```
merge m:m betnr year using "data.dta"
* Keep only matched observations
keep if _merge==3
* Drop the auto-created variable
drop _merge
```

Slide 49 **Rename variables**

- You maybe want to rename variables to make them easily recognized.
- ```
rename id_iab firm_id
rename betnr branch_id
```

Slide 50 **Handle duplicates**

- Sometimes there are duplicates within sample.
- For example, for each branch and each year, there should be only one variable.
- But there are some times multiple values (mistakes during data collection, or just change of id).
- ```
duplicates drop branch_id year, force
```

Slide 51 **Generate dummy variables**

- We need dummy variables for descriptive information.
- For example, we want to create a dummy indicating whether the union within the firm is "igmetall".
- * Generate a dummy with value 0.
gen is_igmetall = 0
- * Change it to 1 under certain conditions.
replace is_igmetall = 1 if union == "igmetall"

Slide 52 **Generate fixed effects dummies**

- If you want to do regressions with fixed effects, you need to create dummies.
- STATA create N new dummy variables for N groups.
- tabulate year, generate(year_fe_)
tabulate id_iab, generate(firm_fe_)
tabulate state_branch, generate(state_fe_)
- For example, year dummies: *year_fe_1*, *year_fe_2*, and so on.

Slide 53 **Save modified data sets**

- After modifications, we can save our data sets that are ready to be used for analysis.
- The option replace is important!
- save "data/panel_data_zhu.dta", replace

Slide 54 **Begin regressions**

- Now we can use the modified data sets to do regressions.
- clear all
use data/panel_data_zhu.dta, clear

Slide 55 **Declare data structure**

- Before panel analysis, you need to declare the data structure.
- Time series, cross-sectional, or panel data set.
- For panel data set: xtset [group] [time].
- For time series data set: tsset [time].
- This enables time operators l.year, f.year, or l2.year.
- xtset branch_id year

Slide 56 **OLS**

- Example 1: Normal OLS with 1 explanatory variable.
- `regress ln_worker_wage ln_ceo_total`

Slide 57 **OLS**

- Example 2: Normal OLS with multiple explanatory variables.
- `reg ln_worker_wage ln_ceo_total ///
return_on_asset leverage_ratio`

Slide 58 **OLS**

- Example 3: OLS when year is after 2006.
- `reg ln_worker_wage ln_ceo_total ///
return_on_asset leverage_ratio ///
if year >= 2006`

Slide 59 **OLS**

- Example 4: OLS when year is after 2006, using robust standard errors.
- `reg ln_worker_wage ln_ceo_total ///
return_on_asset leverage_ratio ///
if year >= 2006, vce(robust)`

Slide 60 **OLS**

- Example 5: OLS when year is after 2006, using robust standard errors, with firm fixed effects.
- `reg ln_worker_wage ln_ceo_total ///
return_on_asset leverage_ratio ///
firm_fe_* ///
if year >= 2006, vce(robust)`

Slide 61 **OLS**

- Example 6: OLS when year is after 2006, using robust standard errors, with multiple fixed effects.
- `reg ln_worker_wage ln_ceo_total ///
return_on_asset leverage_ratio ///
firm_fe_* year_fe_* state_fe_* ///
if year >= 2006, vce(robust)`

Slide 62 **OLS**

- Example 7: One-year lagged OLS when year is after 2006, using robust standard errors, with multiple fixed effects.
- ```
reg ln_worker_wage l.ln_ceo_total ///
 return_on_asset leverage_ratio ///
 firm_fe_* year_fe_* state_fe_* ///
 if year >= 2006, vce(robust)
```

## 8 \* Essential issues and common mistakes

Slide 63 **Essential issues**

- Some issues are very essential when doing analysis or writing do-files with STATA.
- If you neglect these issues (or even ignore them), you may get error reports.
- Of course, your results are probably wrong! If your supervisor or co-reader detect this, then...
- Sometimes, remember these issues will save your a lot of time and energy. Time is money.

Slide 64 **Write comments**

- Comments start with \*, //, or be blocked by /\* and \*/.
- Sometimes you forget what you wrote yesterday. So use comments to remind yourself.
- If you want to show your do-file to others, comments may help.

Slide 65 **Example: comments**

```
* This is a single-line comment.
[commands]
// This is also a single-line comment.
[commands]
/*
This is a block of comments.
*/
```

Slide 66 **Line break**

- Sometimes it is hard to write everything in a single line.
- Use [ ///] (one space and three slashes) to break lines for your commands.

Slide 67 **merge or joinby**

- Sometimes you need to think which merging command to choose.
- merge and joinby should generate the same results.
- However, under certain circumstances, one is superior to the other.
- joinby creates all pair-wise matching. Suppose that you think you are doing 1-to-1, m-to-1, or 1-to-m matching. However, there is duplicate observations in your sample. joinby will not report his error, but merge does.
- merge is not encouraged to do m-to-m matching! The matching is unstable! You get different results every time you re-run this command.

Slide 68 **Decision: merge or joinby**

- merge for 1-to-1, m-to-1, or 1-to-m matching.
- joinby for m-to-m matching.
- Remember: I warned you...

Slide 69 **Missing values**

- Missing values should be treated carefully!
- Otherwise, you make mistakes.

Slide 70 **Missing values: problem 1**

- If most of the observations for prop\_female are missing.
- You dropped missing values during data preparation. Compare the following codes:
- ```
use data/panel_data_zhu.dta, clear
regress ln_worker_wage ln_ceo_total
```
- ```
use data/panel_data_zhu.dta, clear
keep if prop_female == .
regress ln_worker_wage ln_ceo_total
```
- Your sample size will shrink! You are measuring only local treatment effect.
- So, do not drop missing variable if the variable is a trivial one!. STATA automatically drop them during regressions.

Slide 71 \* **Missing values: problem 2**

- I want to regress for branches where more than half of the workers are female. Compare the following codes:
- ```
use data/panel_data_zhu.dta, clear
keep if prop_female != .
keep if prop_female > 0.5
regress ln_worker_wage ln_ceo_total
```

- use `data/panel_data_zhu.dta`, `clear`
`regress ln_worker_wage ln_ceo_total ///`
`if prop_female > 0.5`
- use `data/panel_data_zhu.dta`, `clear`
`regress ln_worker_wage ln_ceo_total ///`
`if prop_female > 0.5 & prop_female != .`
- Wrong sample during regression! Why?

Slide 72 * **Missing values are treated as very large numbers**

- Missing values `.` are treated as very large values in STATA. Compare the following codes:
- use `data/panel_data_zhu.dta`, `clear`
`keep if prop_female > 1`
`count prop_female if prop_female == .`
- use `data/panel_data_zhu.dta`, `clear`
`keep if prop_female < 1`
`count prop_female if prop_female == .`
- Do always treat missing values carefully!

Slide 73 **Fixed effects**

- What is fixed effects?
- How we add them into the regression?
- Fixed effects. `i.` or `fe_*`

Slide 74 **Do not use command `xtreg`**

- Many students love to use the command `xtreg`.
- Do not use it!
- use `"orig/firm_level_data.dta"`, `clear`
`xtset id_iab year`
`xtreg ceo_total employees, fe`
`reg ceo_total employees i.id_iab`
- Drawback 1: `xtreg` does not report overall R-square and adjusted R-square. Not comparable to OLS.
- Drawback 2: `xtreg` does not report coefficients for FE dummies.
- Drawback 3: It is hard to incorporate multiple fixed effects with `xtreg`.
- Drawback 4: *t-statistics* are more robust using FE dummies than using `xtreg`.

Slide 75 **Fixed effect regressions: alternative methods**

- Choice 1: create dummies and include them in the regression.
- `firm_fe_*` means all variables starting with `firm_fe_.`
- ```
reg ln_worker_wage ln_ceo_total ///
firm_fe_* year_fe_* state_fe_*
```

Slide 76 **Fixed effect regressions: alternative methods**

- Choice 2: use operator `i.`
- It only applies to numerical categorical variables.
- ```
reg ln_worker_wage ln_ceo_total ///  
i.firm_id i.year i.state_branch
```
- Following codes give error report:
- ```
reg ln_worker_wage ln_ceo_total i.union
```

Slide 77 **Operations within groups**

- Sometimes we need to do operations only within groups.
- For example: generate increase rate for each firm.
- Common mistake: inter-group increase rate.
- Always be careful when you are handling lagged data.

Slide 78 **Row identifier**

- Cells can be located by variable name and row identifier `[_n]`.
- Handling lags with row identifier.
- Remember to sort before handling data.
- ```
sort id_iab year  
gen roa_increase = ///  
(roa[_n] - roa[_n-1]) / roa[_n-1]
```
- What is the problem left? Inter-group increase rate!
- Drop them!

Slide 79 **Alternative ways**

- Method 1: Use `by` command to identify groups.
- `by id_iab: gen roa_increase = ///
(roa[_n] - roa[_n-1]) / roa[_n-1]`
- Method 2: Use `xtset` command to specify the panel data set.
- Then use lagging operators.
- `xtset id_iab year
gen roa_increase = (roa - l.roa) / l.roa`

Slide 80 **by command**

- `by` is equal to looping the command for each group.
- `by id_iab: sum roa`
- We can do this also by looping.
- `levelsof id_iab, local(id)
foreach i of local id {
display "id_iab == `i'"
sum roa if id_iab == `i'
}`

Slide 81 **Third-party packages**

- Some functions are programmed by third-parties.
- For example: IV regression, table output, winsorizing, and etc.
- Can be installed by commands: `ssc install [package]`.
- Be careful in selecting third-party packages, especially about historical versions.

Slide 82 **Winsorizing**

- Sometimes we need to winsorize the outliers.
- What is winsorizing?
- For the first time you use the package:
- `ssc install winsor`
- Now we conduct single-sided winsorizing to the observations whose value exceed 99% percentile.
- `winsor prop_female ///
, generate(prop_female_winsor) p(0.01) highonly
sum prop_female, detail
sum prop_female_winsor, de`

Slide 83 **Help with commands**

- When you are not familiar with a new command, read the help documents.
- Type `help [command]`.
- Read syntax in the pop-out window.
- Click "[R] command – purpose of the command" in the pop-out window.
- Read more detailed descriptions in "STATA BASE REFERENCE MANUAL"

Slide 84 **Learn to read documentations**

- A typical STATA syntax goes as follows.
- `regress depvar [indepvars] [if] [in] [weight] [, options]`
- Also important: Description, Options, Stored results, and of course, Examples.
- Demo.

Part IV

Tables

9 Why tables are important?

Slide 85 **Tables**

- An organized way of showing your results.
- A good table (figure) is better than 1000 words.

Slide 86 **Above all**

We do not read your sentences that carefully. We read your tables!

10 * A good table

Slide 87 **Structure**

- A good title.
- Well-written descriptive words (caption).
- A nice table with necessary statistics.

Slide 88 **Title**

- Numbering: Table 1, Table 2, and so on.
- The purpose of your table.
- Not too long.
- Example: "Summary statistics".
- Example: "CEO compensation and workers' pay: Baseline regressions".

Slide 89 **Caption**

- The caption should include all information about what you are testing, so that readers do not need to refer to the main context.
- You need to specify:
- The purpose of your regressions (what relationship you want to test).
- The methods you are using (OLS, IV regression, Difference-in-difference, Probit model).
- The dependent variable and independent variables.
- Special settings.
- How standard errors are treated or clustered?
- How *t-statistics* and significant levels are expressed.

Slide 90 **Caption: an example**

This table presents results for regressions with the annual wage of employees as the dependent variable. All independent variables are lagged by one year. See Table 1 for a detailed overview of variable definitions. In specification (3), we consider the observations after 2006 only. We use the White (1980) robust standard errors clustered at firm level. The *t-statistics* are reported below the estimates. ***, ** and * indicate that the value is significantly different from zero at the 1%, 5% and 10% levels.

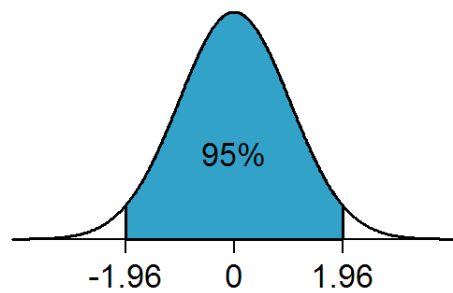
Slide 91 **Table**

- What information is necessary:
- Dependent variable and independent variables.
- Coefficients.
- *t-statistics*
- Significance level.
- R-square or adjusted R-square.
- Number of observations.

Slide 92 **STATA table output**

- The build-in table is not desirable.
- Only one regression per table. Hard to compare between models.
- Too long if fixed effects are included. We do not need them!
- Standard error, *t-statistics*, and *p-value*: Redundant.
- Confidence interval, *F-statistics*, Root MSE: we do not need them.
- Too long notes of collinearity.

Slide 93 ***t-statistics* and *p-value***



- Reject the null hypothesis at the 95% level if *t-statistics* is located in the white region.
- To know about significant level, simply count stars.

Slide 94 **We design our own table**

- Use thrid-party package `estout` to generate concise and beautiful tables.
- Ready to be included in your thesis.
- No redundant output printed on your screen.

Slide 95 **Command `estout`**

- Install it for the first time.
- Use command `quietly` before `regress`
- Save statistics using `estout store [name]`
- Show the table with following commands.
- ```
estout m_*, ///
 cells(b(star fmt(%9.3f)) t(fmt(%9.2f))) ///
 style(fixed) title(Regression Results) ///
 stats(r2_a N, fmt(%9.3f %9.0f)) ///
 starlevels(* 0.10 ** 0.05 *** 0.01) ///
 drop(*industry_fe* *year_fe* *state_fe*)
```

Slide 96 **Export STATA table, a demo**

- Copy as table.
- Modifications in Excel.
- Copy into Word / Powerpoint as pdf.

Slide 97 **Outcome**

| Dep. Var.            | ln(workers' wage) |          |          |          |           |           |                 |
|----------------------|-------------------|----------|----------|----------|-----------|-----------|-----------------|
|                      | model 1           | model 2  | model 3  | model 4  | model 5   | model 6   | model 7         |
| ln(CEO total)        | -0.001            | -0.007   | -0.002   | -0.002   | -0.02     | -0.023*   |                 |
|                      | -0.27             | -1.32    | -0.2     | -0.21    | -1.5      | -1.65     |                 |
| ln(CEO total) (t-1)  |                   |          |          |          |           |           | -0.023<br>-1.49 |
| ROA                  |                   | 0.033    | 0.079*   | 0.079*   | -0.092    | 0.026     | 0.032           |
|                      |                   | 0.93     | 1.73     | 1.74     | -0.97     | 0.27      | 0.28            |
| Leverage ratio       |                   | 0.066*** | 0.117*** | 0.117*** | 0.053     | 0.093     | 0.111           |
|                      |                   | 2.64     | 3.32     | 3.29     | 0.44      | 0.76      | 0.78            |
| Market-to-book ratio |                   |          | -0.005** | -0.005** | -0.004    | -0.001    | -0.013**        |
|                      |                   |          | -2.44    | -2.33    | -1        | -0.32     | -2.18           |
| ln(total sales)      |                   |          | -0.007   | -0.007   | -0.013    | -0.007    | -0.016          |
|                      |                   |          | -1.6     | -1.61    | -0.52     | -0.26     | -0.57           |
| After 2006           | No                | No       | Yes      | Yes      | Yes       | Yes       | Yes             |
| Robust std error     | No                | No       | No       | Yes      | Yes       | Yes       | Yes             |
| Firm fixed effects   | No                | No       | No       | No       | Yes       | Yes       | Yes             |
| Year fixed effects   | No                | No       | No       | No       | No        | Yes       | Yes             |
| State fixed effects  | No                | No       | No       | No       | No        | Yes       | Yes             |
| Constant             | 9.897***          | 9.940*** | 9.888*** | 9.888*** | 10.067*** | 10.106*** | 10.340***       |
|                      | 132.36            | 129.94   | 95.01    | 97.69    | 45.74     | 43.85     | 22.38           |
| Adj. R square        | 0                 | 0        | 0.001    | 0.001    | 0.012     | 0.018     | 0.019           |
| Obs.                 | 16578             | 16439    | 13224    | 13224    | 13224     | 13224     | 9631            |

Slide 98 **Advantage of estout**

- All necessary information is included.
- Comparable between different models.
- Ready to be used in your thesis.

## Part V

# Conclusion

## 11 Concluding remarks

Slide 99 **What we learnt**

- Databases.
- STATA.
- Design your tables.

Slide 100 **Questions**

- Thank you for your attention.
- Please feel free to ask questions.