Economics of Finanical Markets
ECON30024, Shuyun May Li

Assignment 1 (80 marks)

(due: 31/3/2025, Monday, 4pm)

Please read the instructions very carefully. Questions that have been clarified here will not be answered on discussion board or through emails.

In your submission, include a page that provides the following information.

- **The time and attendants for each group meeting you have had in the process of completing the assignment (you can, but not required to, include a brief description of the tasks for each meeting)**
- **The role of each group member in completing this assignment, such as collecting data, writing report for Question 1, etc. (you can, but not required to, give a percentage of each member's contribution to the assignment)**
- **The signatures of all group members to indicate an agreement to what's being stated on the page (sign and scan, or using electronic signatures)**

After the assignment is due, a survey on the assignment will be conducted on a voluntary basis.

1. (30 marks) This question asks you to document some data facts on the growth of finance in Australia. For each of the following, present and describe its growth trend in past few decades.

   (a) (10 marks) Ratio of total financial assets to GDP, where 'total financial assets' refers to **total financial assets owned by Australian households and private nonfinancial businesses or corporations**.

   (b) (10 marks) The financial sector's **contribution to GDP** (i.e., its **value added share of GDP**), where the financial sector refers to the financial and insurance services industry in Australia.

   (c) (10 marks) The financial sector's average wage relative to the average wage in all industries, where 'average wage' is usually measured by a full time male adult's average weekly earnings.

   Notes:

   - You need to find the data series that best represent what's being asked in each question. The data series should cover at least 20-30 years, depending on data availability.

Hint: The assets data for households and businesses can be found in RBA statistical tables (Household and Business Finances), Gross value added by industry can be found in ABS Statistics (Economy, Australian National Accounts: National Income, Expenditure and Product) and wage data by industry can be found on ABS website (Labour, Earnings and work hours).

- For each question, clearly state your data source (i.e., which table under which category on which website) and what data series you have used.
- You can use nominal or real data series, but need to ensure consistency and comparability among data series.
- You can use tables and/or figures to present the data facts, followed by a brief description. Clearly label your tables and/or figures.[1]
- The total report for (a), (b) and (c) should be no more than 5 pages, including graphs and tables you choose to include.
- You may refer to the first 4 pages of Greenwood and Scharfstein (2013) for some guidance. However, you are NOT expected to exactly replicate their results for Australia, in particular, considering sub-sectors of the financial sector or sub-classes of assets is NOT required.
- There is no single correct answer for this question. Evaluations will be based on accuracy of data evidence and clarity of writing.

2. (30 marks) This question asks you to test the weak form efficiency of the Australian share market using share price data. Refer to Topic 2 lectures and Groenewold and Kang (1993) (available via Readings Online on LMS) for guidance on how to perform the tests and interpret the results.

   (a) (2 marks) Find monthly data series for All Ordinaries and S&P/ASX 200 indices.[2] Clearly state your data source and sample period in your report, but please do not include the observations of the data series in your report.

   (b) (14 marks) For each price index, calculate the corresponding return series. The rates of return on a price index can be calculated as

$$r_{t+1} = \frac{p_{t+1} - p_t}{p_t}$$

   or as the log-difference of the price index

$$r_{t+1} = \log(p_{t+1}) - \log(p_t).$$

[1] You can think about the possible reasons underlying the data facts, but you are NOT required to explain the data facts, as the focus of this question is to find some data facts.

[2] One data source is Yahoo Finance. Use adj. close price series which also account for dividends. You can choose the data sample you would like to work with, but make sure your sample covers at least the most recent 10 years of data. You need to fetch the data series from the website, which can be done in Excel or using other softwares (if you ask ChatGPT, it would provide a step-by-step guide for doing this in Excel). You are allowed to consult your tutor for how to get the data ready.

Then use the Box-Ljung test (also called Ljung-Box test) to test the joint significance of the **first 12 autocorrelations** of each return series.

(c) (14 marks) Use a unit root test or a regression to test whether the logarithm of each price index follows a random walk. For the regression analysis, you can estimate a simple regression as discussed on slide 11 of Topic 2 (if you don't have much experience in Econometrics), or try to estimate the regression of Groenewold and Kang (1993) as given in Eq. (3) of the paper, or estimate an alternative regression that you think suitable.

Notes:

- The tests in (b) and (c) can be performed in Excel, R, or any other software. Which software to use is up to you.
- The total report for this question is no more than 5 pages, including tables and graphs you choose to include.
- In your report for (b) and (c), clearly cover the following:
  - What is the model of share prices underlying the test, and what is the information set used to predict future share prices or returns?
  - Why does such a test provide evidence for or against the weak form of the EMH?
  - What is the test statistic or the econometric model for the test? And what is the null hypothesis of the test?
  - What are the results of the test? Is the null hypothesis rejected or accepted?
  - How do you interpret the results of the test, i.e., whether the results support or contradict the weak form of the EMH? In your interpretation, be aware of the joint hypothesis issue in the testing of EMH.
- Again, there is no single correct answer for this question. Evaluations will be based on logical consistency and clarity of writing.

3. (20 marks) This question aims to deepen your understanding of the concepts of risk aversion and make you more aware of your own attitude toward risk. Consider two scenarios:

   1) Your current wealth is \$100. You need to pay \$50 to participate in a risky game. This game would allow you to win a prize of \$500 with probability 0.15 and nothing with probability 0.85.

   2) Your current wealth is \$1000. You need to pay \$500 to participate in a risky game. This game would allow you to win a prize of \$5000 with probability 0.15 and nothing with probability 0.85.

   Answer the following questions:

(a) (10 marks) Are you going to play the game in scenario 1)? Are you going to play the game in scenario 2)? Based on your decisions, comment on your degree of risk aversion in terms of absolute risk aversion (ARA) and relative risk aversion (RRA). That is, do you think you have increasing or decreasing or constant ARA, and increasing or decreasing or constant RRA?

(b) (10 marks) Choose a utility function that may describe your attitude toward risk (refer to Topic3 slides for some examples of utility function, but you are not restricted to choose from this list), and calculate your expected utilities from playing the game or staying away from it in both scenarios. Are your decisions in (a) justifiable by this utility function? If not, try different value(s) for parameter(s) in your utility function or try a different utility function until the utility function you choose to work with implies the decisions you have chosen in part (a). By doing this exercise, you somehow uncover your own utility function from your decisions.