ECON7350: Econometrics for Macroeconomics and Finance

Research Report 2

Due date: 5 June 2023, 3:59pm

Instruction

The project consists of two research questions. Please use *multiple equations models* (MEMs) to answer both questions as clearly and completely as possible. Each question is worth 50 marks, for a total of 100 marks. This report will constitute 35% of your overall grade in this course.

We suggest that you use R for all empirical work involved. However, you should be able to use another statistical software (e.g. Eviews, Stata, Python, etc.) without a problem. If you do choose to work with an alternative software, please note that support for software-specific issues from the course coordinator and tutors may be very limited.

Please upload your report via the "Turnitin" submission link (in the "Assessment / Research Report 2" folder). Please note that hard copies *will not* be accepted. At the moment, the due date is 3:59 PM on 5 June 2023, but please check BlackBoard regularly for announcements regarding any changes to this. Your report should be a write-up of your answers (in PDF format, single-spaced, and in 12 font size).[1]

You are allowed to work on this assignment with others, i.e., you can discuss how to answer the questions with your classmate(s). However, this is not a group assignment, which means that the report must be written individually: you must answer all the questions in your own words and submit your report separately. The marking system will check for similarities, and UQ's student integrity and misconduct policies on plagiarism *strictly apply*.

Questions

The dataset for this project is contained in `report2.csv`, which is an extension of the dataset used in Research Report 1. Recall that in the Research Report 1 dataset, the variables are quarterly time-series of macroeconomic indicators in Australia for the period 1990Q3—2021Q4. In particular, the dataset contains the following variables:

[1] Please *do not* include or attach any software specific material such as R source code and output. In particular, you should summarise the output in the report, but please do not copy-paste the "dump" produced by the software.

- *real_gdp*: natural logarithm of seasonally adjusted gross domestic product measured in chain volume millions of dollars;
- *unemployment_rate*: seasonally adjusted unemployment rate for all persons at the end of each quarter;
- *cpi_inflation*: the annual percentage change from the corresponding quarter of the previous year of all groups CPI;
- *cash_rate*: the cash rate target at the end of each quarter.

The dataset for Research Report 2 is nearly identical to that of Research Report 1—the only difference is that the data is extended to cover the period 1990Q3—2022Q4. (specifically, it is extended to include 4 quarters of observations past 2021Q4).

Please answer the following two questions using an MEM approach.

1. Use the data provided for the subsample period 1990Q3—2021Q4 to forecast *cpi_inflation* for 2022 and 2023 (two years or equivalently eight quarters past the end of the sample). In other words, repeat the exercise from Research Report 1, Question 1, but this time using MEMs. Please describe all potential sources of uncertainty, on a conceptual level, and to the extent possible, quantitatively as well.

   Use the observed *cpi_inflation* data for 2022 to qualitatively evaluate and compare forecasts generated by the MEMs to the forecasts you generated in Research Report 1. Next, compare the forecasts for 2023 generated by MEMs to the same period forecasts generated in Research Report 1.

   Finally, use the full available sample (1990Q3—2022Q4) to forecast *cpi_inflation* for 2023 using MEMs. How do these forecasts change relative to those produced for the same period (2023) but only using data up to 2021Q4?

   The break down of marks for this question is as follows (total 50 marks):

   - forecast model identification (10 marks);
   - forecasts computation (10 marks);
   - forecast evaluation and comparison (10 marks);
   - interpretation and inference (10 marks);
   - writing and organisation (10 marks).

2. Use the data provided to obtain inference on the possible effects of monetary policy on the economy using MEMs. In particular, consider a one-time structural shock to the *cash_rate* and analyse the dynamic effects of such a shock on *cpi_inflation* and *unemployment_rate*. You should consider the possible effects that may result in the

short-run, the medium-run and the long-run. In answering these questions, please consider implications for policy, and in doing so, describe the various sources of uncertainty that may affect your inference.

In addition, pl nference regarding dynamic effects on *cpi_inflation* obtained from e inference obtained in Research Report 1, Question 2. Please consi pare across different classes of models using the same sample (1990Q also consider how results compare when obtained from the full s 22Q4) relative to those obtained from the shorter sample (1990Q

The break down of marks for this question is as follows (total 50 marks):

- model identification (10 marks);
- estimation and testing (10 marks);
- assumptions and identifying restrictions (10 marks);
- interpretation and inference (10 marks);
- writing and organisation (10 marks).