Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Delete this before using. Two points of confusion: 1) Every geometric is fast 2) Any >2% growth is fast. DEPENDS ON THE VARIABLE.

Barreto

Macro Topics

Day 4: Growth Tools and Concepts

Your HW was to learn growth tools such as CAGR, log scale, and the Rule of 70. You were to complete tasks 1 and 2.

Open your completed workbook MaddisonData.xls.

Insert a sheet in your workbook and answer the questions below.

Arithmetic and Geometric Sequences (or progressions) are two common kinds of

"chains of numbers." An **Arithmetic Sequence** is one in which the numbers change by a **constant** **difference**. For example, 1, 4, 7, 10, 13, 16, 19 is a finite, arithmetic sequence. The constant difference is 3. A ***Geometric Sequence*** is one in which the numbers change by a ***constant ratio***. For example, 1, 2, 4, 8, 16 is a finite, geometric sequence. The constant ratio is 2: if you divide a number in the series by its predecessor, you will always get 2. 2/1 is 2, 4/2 is 2, etc. Sometimes, the constant ratio is expressed as in percentage terms. In this case, the constant ratio expressed as a percentage growth rate is 100%.

Suppose we start two series out at 1, then add 20 to the first series and multiply by 2 for the second series. The first series is ahead for a little bit—because 21 is bigger than 2 and 41 is bigger than 4. But then the Geometric Series starts really gaining steam and it eventually passes the Arithmetic Series.

1. When does the Geometric Series pass the Arithmetic Series?
2. Make a chart of your data. Draw a rough version of it in the space below:
3. Just for fun, copy the chart and make the y axis a log scale. What happens to the Geometric Series?

Say you start an Arithmetic Sequence at $1,000,000 and add $1,000,000 every day and you compare that to a Geometric Sequence that starts at $1 and grows at 10% per day. Eventually, the Geometric Sequence will pass the Arithmetic Sequence. Really. It will.

1. On which day?
2. Compute the CAGR for each series from the first day to the 100th day for each series. Report your answers below. Save your workbook.
3. What general lesson can you deduce about Arithmetic and Geometric series?

Do Task 3 (Rule of 70). Save your workbook.

HW: Watch the economic growth literacy videos in MaddisonData.xls. Do Tasks 5 and 6 and save your workbook in your I drive folder by noon of our next class meeting.