Class 15 Tu 3 March (Exam 1 was last class, Th Feb 27)

Part II of course: Fundamentals of Macro-economics

macro? the economy as a whole --- two sorts of Macro, exploring the performance of the economy

SR: ups and downs of performance, maybe month to month or year to year, but mostly quarterly ...

GDP is the measure of the economy's total production, and it is the basis for describing the performance of the macro-economy. In macro, we focus on the annual growth-rate of GDP -- looking at the extent to which production increases year to year.

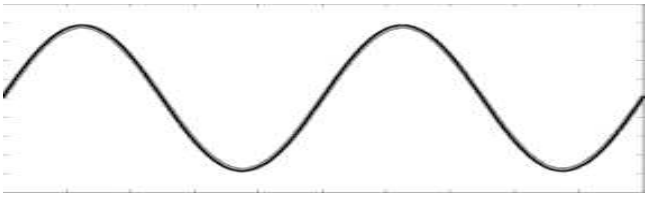
Note: with population growing yearly by almost 1% , we expect production to grow by at least 1% . In fact, because our technology (knowledge) tends to grow, we expect productivity to increase and production to increase more than 1% annually. But the issues of productivity-growth and "usual" GDP-growth are part of Long-Run (LR) macro.

SR macro focuses on the ups and downs of ? GDP-growth and U (business cycles)

* illustrate with a PPF model ... poor performance is production inside the PPF, due to unemployed resources.

Business Cycles are recurrent fluctuations of GDP-growth. Looking ahead, we will contrast the idea of a business cycle with the reality of business-cycles.

The model business cycle has GDP-growth regularly moving up and down. [Looking ahead: periods when GDP-growth is rising are called expansions; periods when GDP-growth is falling are called contractions.



In reality, GDP-growth is much more irregular, and the unpredicatability of business-cycles is a major problem for efforts to use maco-economic policies (Monetary and Fiscal policies of the federal government) to deal with business-cycles.

LR -- performance of the economy, from decade to decade, and in international comparison. Perfomace in terms of living conditions. Focus on economic growth -- expansion of production relative to population. Issues like the share of world's people who don't get enough to eat dropped from about one-fourth in 1990 to less than one-eighth these days.

Look at FRED and contrast the graphs of the level and the LN of population. Looking at the LN, the slowdown of population growth is pretty easy to see. The goal here is just a sense of how the LN function turns the gentle curve of constant-growth rate into a staright line.

Whether short-run or long-run, for performance of the economy we focus on production of goods -- of stuff people want. key question: how much? Like at a dinner table -- how food is there (and not, how much of what).

Class 16 (last class before Spring Break, and our last class meeting, before the pandemic)

Topic 4. Total Product, in theory & practice **4.0 math** 4.1 theory 4.2 practice

We start simply, with a one-good model, in order to develop our math tools. And for economists, until 19C, availability of food seemed like the key to welfare for most humans -- survival. So start with a 1-good model, -- food (loaves of bread) ... Here output as simple as possible -- simply add up loaves of bread.

year	**1**	**2**	**3**	**4**	**5**	**15**	**16**		**25**		**101**		**1001**	
y (loaves)	80	100	80	110	80	160	200		80		500		2 mill	
changes?		yay	boo	yay		yay				boo			yay/YAY?	

So how describe performance? -- yay / boo .... That's not informative, it's too simplistic!
use this to introduce a simple tool for comparisons ... *Compare the outputs of years 1 &2 ...*

You learned one way to compare in 1st or 2nd grade: subtraction ... latest on top earliest on bottom ... find "the difference" *(write in +20 +60). Evaluate performance from year 1 to year 2 - + 20 loaves*

Economists use the big brother of subtraction -- = ? *division ...*
100/80= ? 1.25 ... English: year 2 production is 1.25 times as much as year 1's (125% as much).
80/100=? 0.80 ... English: year 3 production is 0.80 times as much (80% as much)
160/100=1.60 in English, say year 15 production is 1.6 times as much as year 2's ... twice as much as year 1.

RTK TOOL #1 --**division for comparisons.** With two main advantages ?
1) no units, a pure number.
2) sense of perspective: is a 20 bushel increase small or big? (from 2 to 22 is a huge change; 10,000 to 10,020 is a tiny change). Above, from 80 to 100 is a big change (the ratio is 1.25 -- 100 is 1/4 more than 80).
Or consider a pay raise of $5 ... WOW if that's a wage bump from $15/hr to pay $20/hr not so much if $1000 to 1005 per month ...

Tool # 2 -- % growth -- take LN(ratio) for % growth. Similar to ratio-1 for % difference ...

	1	2	3	4	5	15	25	101	1001
y	80	100	80	110	80	160	80	500	2mill
change									
ratio		1.25	0.8	1.375	0.727272	2	0.5	6.25	25thous
growth		22.3%	-22.3%	31.8%	-31.8%	69.3%	-69.3%	183.3%	1013 %
% diff		25.0%	-20.0%	37.5%	-27.3%	100.0%	-50.0%	525.0%	
annual grow		22.3%	-22.3%	31.8%	-31.8%	6.9%	-6.9%	1.8%	1.013%

* 1.014% vs 1.013% 2,030,000 vs 2mill

warning: some combine subtraction and division ... yech ...
year 2 output is ?___ (25%) greater than year 1. year 1 output is ?___ (20%) less than year 2.
both right, but can be misleading ... don't use percentage differences ... possible abuse, because 25% seems bigger

Tool #3 -- average annual growth per year? growth/years BLUE: APR: $Xt = Xo(1+apr)^t$ agr LN $Xt=Xo * e^{agr}$

math tools for macro: COMPARE: ratio, GROWTH: LN(ratio), AAG= G/t ...

Illustrate at great interval -- 1000 years ... * 1.014% vs 1.013% 2,030,000 vs 2mill

RTK: doubling is growth of about 69.3% -- combine with tool #3 for **TTQ** growth at 2% doubles in ... 69/2 = 34.5 years

Topic 4.1 Total Product, and the Price Level, in Theory (y & P)

Ok, so macro looks at the **performance** of the economy as a whole -- what does performance refer to ? **production** of goods people want/need to live and be happy.

The building block of MACRO -- the concept of **total** production.

Measuring Total production -- theory. [Output: final vs. intermediate Real/Nominal y&P INP]

The economy exists to produce the goods that people want and need to live and live well.
First key macroeconomic question: **how much is produced**? The answer is "total output" variable y

DEFINE total output, **y,** the economy's total production,

"y" == is the total amount of final goods produced (in a period of time, usually a year).

Note this is a concept: google it and see definitions, not data. Attempts to measure: GDP -- google that for data. Careful not to confuse output (y) with GDP, the standard

key concept here **-- final** goods -- final like at the end of production-- as opposed to **intermediate goods**. Final as in the "final" final user had the product. The key point is to exclude INTERMEDIATE products, which are goods and services that are steps in the production of final goods ...

Two examples to illustrate the point:

1. Simple hypothetical: in a year a farmer grows 2 bushels of wheat, which she grinds into 30 lbs of flour, which she makes into 50 loaves of bread, which she feeds to her family. **Total output in this little economy ?** 50 loaves. (the rest are intermediate goods, they are included in the bread).

2. More complicated hypothetical: farmer grows 10 bales of cotton, sells it for $200 to a thread factory, makes thread sold for $300 to mill that makes it into cloth, sold for $500 to a dress factory that makes it into 50 dresses sold for $2000 to a retail store, sold for $70 each to customers ... (for $3500)
t/f/o -- activities produce output of $6500? NO -- output of $3500 the other 3000 is value of intermediate goods (values contained in the value of the dresses).
More realistic -- say at end of the year, 40 of the dresses have sold, 10 are still in the retail store?
Output now? 50 dresses produced, all 50 are "Final" for the year; 10 will use next year ...

for the 40 dresses, final user is consumer. for the other 10, the final user is the store.
What are those called? inventory, which is a type of capital (K).
When looking at real world: additions to inventory is part of I.

A level: value of output? 40x$70=2800 + 10x$40=400 ... $3200 C vs I

Ok, so now we have concept of final goods. There will be a test question on that, otherwise the final/intermediate distinction will be in the background. And we can move forward with **output** (y) as the key concept for exploring the performance of the macro-economy.