

This course operates under two fundamental principles: transparency and accountability. Every effort will be made to adhere to the terms of this syllabus. However, changes and adaptations might have to be made under potential *force majeure* circumstances. I will give you written notice of those changes.

OFFICE INFORMATION

Hours: Tuesdays and Thursdays, 4:00-5:30 PM. For appointments, please sign up [here](#), or contact me *via* e-mail or voice mail.
Location: Lippman Hall 218
Telephone: 518.388.6065
E-mail: motahare@union.edu
Website: <https://minerva.union.edu/motahare/Eco352/eco352.htm>

A. COURSE DESCRIPTION

Up until COVID hit us, the economic and financial crisis of 2008 had been characterized by many as the worst that the U.S. had experienced since the Great Depression of the 1930s. The objective of this course is to use analytical tools of modern macroeconomics to gain a deep understanding of some of the causes and consequences of that crisis, to explore some relevant policy options, and to examine the consequences of all of this for current macroeconomic issues and policy debates. While a version of the pandemic continues, and major geopolitical and geo-economic events are occurring, it is difficult to get a full picture of what is happening, and might happen to the macroeconomy. However, we will attempt to provide an analysis. Subjects that we will study in this course include:

1. **Growth and Productivity.** What factors account for long-run economic growth? After many years of slow productivity growth, the U.S. appeared to enter a new era of sustained resurgent productivity growth in the 1990s. In the mid to late 90s commentators were hailing the boom in some western economies as the dawn of a “New Economy.” Near the end of the 90s, with the U.S. economy slowing down, dot.coms folding, and information and telecommunication technology firms feeling the pinch globally, some were saying that the “New Economy” was all a myth. Was it? What has been the nature of U.S. growth and productivity since the late 90s? Overall, this segment of the course provides us with the necessary long-term benchmark against which we can better assess and analyze the various aspects of recent macroeconomic crises.
2. **Causes and Consequences of the Global Financial Crisis and the Current Crisis**
 - 2a. **Causes.** In this segment we will try to make sense of the details of the modern ‘financial architecture’ that turned a predictable burst in the U.S. housing bubble, traceable to the subprime mortgage phenomenon, into a full-scale financial meltdown. We will augment the standard *IS/LM/PC* framework in macroeconomics to study the relevant problems. We will examine whether there were remediable ‘mistakes’ made on the part of financial institutions, regulators, or policy-makers, or are the root causes deeper and more difficult to address. We will ask a similar set of questions with regard to the recent COVID-triggered crisis, as well as crises caused by current geopolitical and geo-economic events.

2b. Consequences/Policy Options. We will examine some of the policies that were proposed and/or implemented to address the GFC. In addition, we will examine policies that have been proposed to address the current crises. An important issue to investigate would be: did the weaknesses in the US economy (structural and/or otherwise) surrounding the GFC and its aftermath contribute to the recent COVID-triggered macroeconomic problems in the US. In both segments 2a and 2b we will also examine concepts such as zombie companies, liquidity trap, moral hazard, asymmetric information, adverse selection, supply chain issues, etc. Also, we will examine the effects of increasing income and wealth inequality, lack of universal healthcare, and of “trade wars,” as well as other wars, on macroeconomic performance.

B. READING

Reference Textbook: we will use *Macroeconomics*, Olivier Blanchard, 7th edition, as the basic reference textbook.

- There will be a substantial amount of required readings assigned from professional journals and other sources. Specific reading assignments for each of the above two subject areas will be given to you in separate handouts, and posted at the course’s website.
- The following books are highly recommended:

-Carlin, Wendy and Soskice, David, *Macroeconomics: Institutions, Instability, and Inequality*, Second Edition, Oxford University Press, 2024.

-Stiglitz, Joseph, *People, Power, and Profits: Progressive Capitalism for an Age of Discontent*, W.W. Norton, 2020.

-Tooze, Adam, *Crashed: How a Decade of Financial Crises Changed the World*, Viking, 2018.

-Piketty, Thomas, *Capital in the Twenty-First Century*, The Belknap Press of Harvard University Press, 2014.

C. COURSE REQUIREMENTS, GRADING POLICY and RELATED MATTERS

There will be one **executive summary**, one **oral presentation**, one **term paper**, and two **examinations**, as follows:

Executive Summary. During the course of the term, you are required to write one executive summary on a topic chosen from one of the above subject areas (1 or 2). Your executive summary will be at most three pages long¹ (references, charts or graphs, or other ancillary material may be put onto additional pages).

The Executive Summary for **Subject Area 1** is due on Thursday, January 23.

The Executive Summary for **Subject Area 2** is due on Tuesday, February 25.

Presentation. You are required to make an oral presentation to the class, and be prepared to answer questions, corresponding to your term paper. You will be allocated a 25-minute time slot

¹Typed, double-spaced, one-inch margins all around, Times New Roman 12-point font.

for this purpose. Presentations will take place during the 2/27-3/13 period. You may sign up for your presentation slot [here](#).

Term Paper. A term paper of no more than eight pages in length¹ (exclusive of graphs, charts, data appendices, *etc.*), is due on **Tuesday, March 18th, at 4:00 pm**. You should choose a topic from a subject area in which you will **not** have written an executive summary.

Submission of the Executive Summary and the Term Paper. You may, if you wish, submit your executive summary and/or your term paper earlier than the above due dates. Submission of the executive summary is due at the beginning of class. All submissions must be made electronically: **e-mail them to me in the pdf format**. Late submissions will be subject to a penalty of one point per hour (or a fraction thereof).

Detailed instructions for the executive summary, the presentation, and the term paper are provided [here](#).

Examinations

There will be two examinations, each corresponding to one of the two subject areas. The schedule is as follows:

Examination 1	Thursday, 1/23 at the beginning of class, 45 minutes
Examination 2	Tuesday, 2/25 at the beginning of class, 90 minutes

There will be **no** time extensions for the examinations. For detailed information about the examinations, see the course's website.

Other Matters

a. The contribution of each of the above, plus attendance and class participation, towards your course grade is as follows:

Executive summary	12%
Oral Presentation	14%
Term Paper	30%
Examination 1	12%
Examination 2	24%
Attendance and participation	8%

b. **Professional Conduct.** You are required to adhere to the following professional code of conduct during classroom sessions. It is in your best interest to **drop this course** if you are unable and/or unwilling to adhere to this code. "In order for everyone to benefit from the educational process in an appropriate environment, adherence to professional conduct during classroom sessions is expected. Eating, late arrival, leaving the classroom while it is in progress, conversation which interferes with session activity, and similar unprofessional conduct is not acceptable. **Such conduct will lead to point deductions (one point per occurrence) from your course grade.** ***The use of any electronic devices is not allowed*** unless you obtain prior permission from me. Unauthorized use of electronic devices will be subject to the same penalty points as above. (Electronic devices include, but are not limited to: cellphones, laptops, notebooks, iPads and iPad-

like devices, Apple watches, etc.) **The recording of lectures in any format is strictly prohibited.**

c. **Honor Code.** The College's Honor Code is now in effect. "Union College recognizes the need to create an environment of mutual trust as part of its educational mission. Responsible participation in an academic community requires respect for and acknowledgement of the thoughts and work of others, whether expressed in the present or in some distant time and place.

Matriculation at the College is taken to signify implicit agreement with the Academic Honor Code, available at honorcode.union.edu. It is each student's responsibility to ensure that submitted work is his or her own and does not involve any form of academic misconduct. Students are expected to ask their course instructors for clarification regarding, but not limited to, collaboration, citations, and plagiarism. Ignorance is not an excuse for breaching academic integrity. Students are also required to affix the full Honor Code Affirmation, or the following shortened version, on each item of coursework submitted for grading: "I affirm that I have carried out my academic endeavors with full academic honesty." [Signed, Jane Doe]"

d. **Accommodative Arrangements.** Any student with a documented disability needing academic adjustments or accommodations is **required** to notify me, **and to make the necessary arrangements with me**, by no later than **5:00 PM, January 17th, 2025**. Notifications received after this date will **not** be accommodated (unless a case is made as to why the deadline was not met). All discussions will remain confidential.

WARNING

1. Given the nature of the course, procrastination could prove very costly. So, plan already! There are no bail-out provisions in this course!
2. Based on warning 1 above, it is absolutely essential that you keep up-to-date with the material covered and to do the various course requirements in a gradual fashion, starting from day one. In this spirit, there will be **no review sessions** prior to any of the examinations. Based on my experience in the past, review sessions could lead to moral hazard and free-rider problems. They may be counterproductive and work against the recommendations stated here. I am, of course, available throughout the term to help you with any questions or problems you might have regarding the course. Please do not hesitate to make an appointment to see me, if you need any help.

★ This is a WAC course.

Growth and Productivity

Reading Assignment

Required

Basic

1. Blanchard 7th edition, chapters 10-12 (including appendices to chapters 11 and 12).

Group 1

2. Dizikes, Peter, “What do we know about the economics of AI?” *MIT News*, December 6, 2024. [Here](#).
3. Hernandez, Fredrick, et al, “AI and the US Economy: Optimism, Pessimism, or Realism?” *Third Way*, January 31, 2024. [Here](#).
4. Manning, Sam, “AI’s impact on income inequality in the US.” *Brookings*, July 3, 2024. [Here](#).
5. Acemoglu, Daron, et al, “Can we Have Pro-Worker AI? Choosing a path of machines in service of minds.” *Center for Economic Policy Research*, October 2023. [Here](#).
6. [transitioning to groups 2 and 3] “In Conversation with Gabriel Zucman.” *Washington Center for Equitable Growth*, August 7, 2019. [Here](#). [For an update on Zucman check [here](#).]

Group 2

7. Barber II, William J., et al, “Moral policy = Good economics: Lifting up poor and working-class people—and our whole economy.” *Economic Policy Institute*, October 27, 2021. [Here](#). [This article overlaps with those in *Group 3*.]
8. Bivens, John, and Mishel, Lawrence, “Understanding the Historic Divergence Between Productivity and a Typical Worker’s Pay: Why It Matters and Why It’s Real.” *Economic Policy Institute*, September 2, 2015. [Here](#); plus, the 2022 update [here](#).

Group 3

9. Stiglitz, Joseph E., “The Ethical Economist.” *Foreign Affairs*, November/December 2005 [review of the book: Friedman, Benjamin, *The Moral Consequences of Economic Growth*, Knopf, 2005.] [Here](#).
10. Moss, Emily, Nunn, Ryan, and Shambaugh, Jay, “The Slowdown in Productivity Growth and Policies That Can Restore It.” *The Hamilton Project/Brookings*, June 2020. [Here](#).
11. Stern, Nicholas, and Stiglitz, Joseph, “Climate change and growth.” *Industrial and corporate Change*, April 2023. [Here](#).
12. De La Maisonnette, Christine, et al, “Quantifying the macroeconomic impact of COVID-19-related school closures on human capital.” *CEPR*, January 24, 2023. [Here](#). [Full paper [here](#).]
13. Lake, Robin, and Pillow, Travis, “The alarming state of the American student in 2022.” *Brookings*, November 1, 2022. [Here](#).

14. Hanauer, Nick, and Rolf, David M., “The Top 1% of Americans Have Taken \$50 Trillion From the Bottom 90% — And That’s Made the U.S. Less Secure.” *Time*, September 14, 2020. [Here](#).

► *Please note: there is a lot of overlap among these papers. This is deliberate. More papers may be assigned as appropriate.*

Recommended

1. Acemoglu, Daron, “The Simple Macroeconomics of AI.” *NBER Working Paper*, 32487, May 2024. [Here](#).
2. Filippucci, Francesco, et al, “The impact of Artificial Intelligence on productivity, distribution and growth: Key mechanisms, initial evidence and policy challenges.” *OECD Artificial Intelligence Papers*, April 2024. [Here](#).
3. Atkins, Charles, et al, “Rekindling US productivity for a new era.” *McKinsey Global Institute*, February 16, 2023. [Here](#).
4. Gordon, Robert J., “U.S. Productivity Growth: The Slowdown Has Returned After a Temporary Revival.” *International Productivity Monitor*, Number 25, Spring 2013, pp. 13-19. [Here](#).
5. “Baily, Martin Neil, Manykia, James, and Gupta, Shalabh, “U.S. Productivity Growth: An Optimistic Perspective.” *International Productivity Monitor*, Number 25, Spring 2013, pp. 3-12. [Here](#).
6. Sichel, Daniel E., “Two Books for the Price of One: Review Article of *The Rise and Fall of American Growth* by Robert J. Gordon.” *International Productivity Monitor*, Number 31, Fall 2016, pp. 57-62. [Here](#).
7. Gordon, Robert J, “Comments on Daniel Sichel’s Review on *The Rise and Fall of American Growth*.” *International Productivity Monitor*, Number 31, Fall 2016, pp. 57-62. [Here](#).
8. Murray, Alexander, “What Explains the Post-2004 U.S. Productivity Slowdown?” *International Productivity Monitor*, Number 34, Spring 2018, pp. 81-109. [Here](#).
9. Stiglitz, Joseph, “Navigating the COVID Challenge.” *Green Templeton Lecture*, Oxford University, June 10, 2021. [Here](#).
10. Aidoo, Daniel Kwame, and Donkoh, Antwi, “Gender Inequality, Income Inequality, Educational Inequality and Economic Growth Across Continents of the World.” *Research Square*, July 5, 2023. [Here](#).
11. Wilson, Valerie, “Inequities exposed: How COVID-19 widened racial inequities in education, health, and the workforce.” *Institute for Policy Studies*, June 22, 2020. [Here](#).
12. Santor, Eric, “The Impact of Digitalization on the Economy: A Review Article on the NBER Volume Economics of Artificial Intelligence: An Agenda.” *International Productivity Monitor*, Number 39, Fall 2020, pp. 81-90. [Here](#).
13. Staiger, Matthew, “In the United States, it’s not what you know but who your parents know.” *Washington Center for Equitable Growth*, December 4, 2020. [Here](#).
14. “Is Green Growth Possible? A Debate.” Institute for New Economic Thinking, December 5, 2018. [Here](#).
15. Alvaredo, Facundo, Atkinson, Anthony B., Piketty, Thomas, and Saez, Emmanuel, “The Top 1 Percent in International and Historical Perspective.” *Journal of Economic Perspectives*, Winter 2013, pp. 3-20.*
16. Byrne, David M., Oliner, Stephen D., and Sichel, Daniel E., “Is the Information Technology Revolution Over?” *Finance and Economics Discussion Series*, The Federal Reserve Board, March 2013. Click [here](#).
17. Maddison, Angus, “Measuring and Interpreting World Economic Performance 1500-2001.” *Review of Income and Wealth*, March 2005, pp. 1-35.*

*Available via *EconLit* at the Schaffer Library.

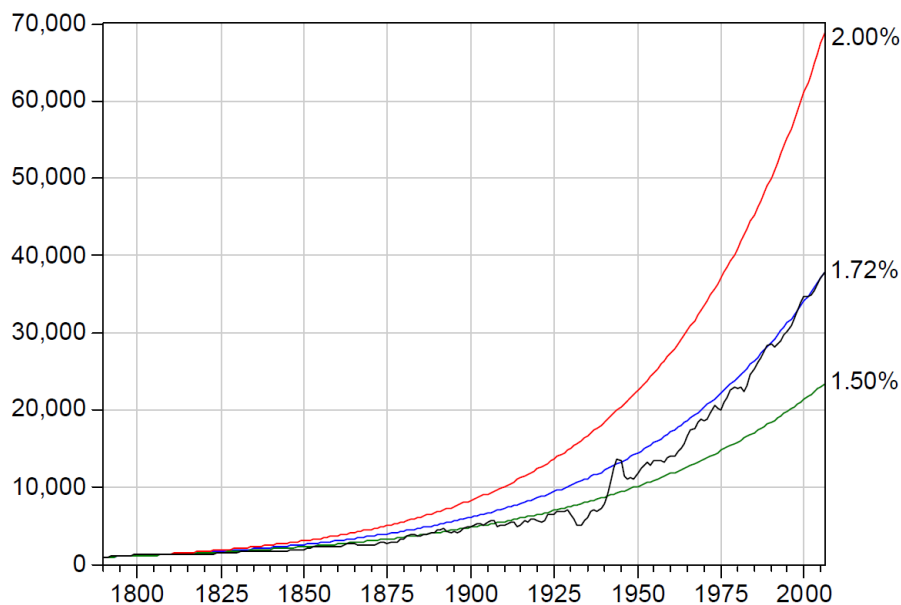
U.S. Economic Growth: Historical Perspectives

Average Annual Real GDP and Real GDP Per Capita Growth Rates

<i>Years</i>	<i>GDP</i>	<i>GDP Per Capita</i>
1947-50	4.02	2.25
1951-60	3.60	1.80
1961-70	4.27	2.96
1971-80	3.16	2.04
1981-90	3.31	2.13
1991-00	3.44	2.19
2001-10	1.76	0.82
2011-20	1.90	1.20
2021-24	3.46	3.08
1947-2024	3.12	1.99
2007-2024	1.94	1.28

Source: BEA/FRED. GDP data are in chained 2017 dollars. FRED codes: for real GDP, `gdpoc1`; for per capita real GDP, `A939RX0Q048SBEA`. The formula used to calculate the average annual growth rates is based on BEA's method, [here](#).

**Real GDP per Capita
 1790-2006¹**

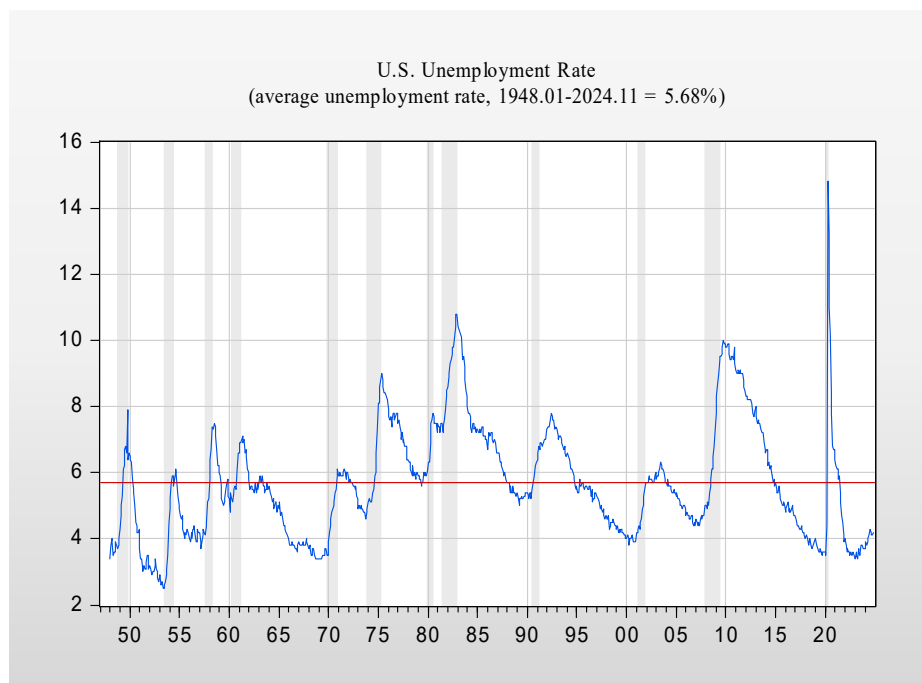
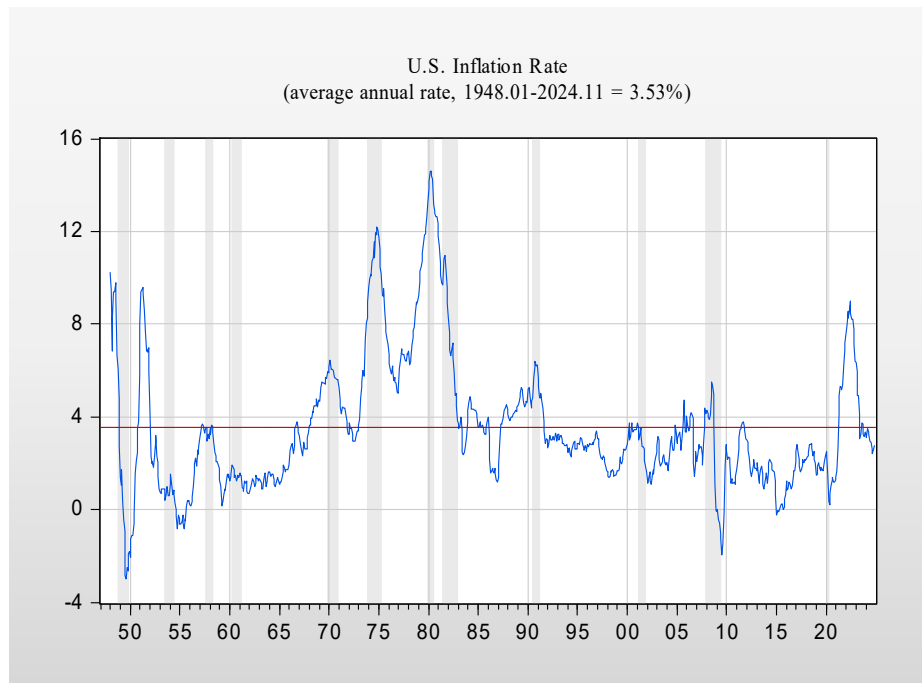


¹The data are from Louis D. Johnston and Samuel H. Williamson, "The Annual Real and Nominal GDP for the United States, 1790 - Present." *Economic History Services*, July 27, 2007; [here](#). The data are in 2000 dollars. Real GDP per capita in 1790 was \$916; in 2006 it was \$37,807. The average annual rate of growth of real GDP per capita for the above period was 1.72%.

U.S. Inflation and Unemployment

“Inflation” is annual percentage change in CPI, all urban consumers. “Unemployment” is for all workers 16 years and over.

Source: BLS/FRED. Codes: for CPI-U all items (82-84 = 100, SA), `cpiaucsl`; for unemployment rate (SA), `unrate`.



The Solow Growth Model

- *Version 1: No population growth, no technological progress*

Consider the following production function in which Y is real GDP, K is the capital stock, and N is the labor force:

$$Y = F(K, N). \quad (1.1)$$

Assume that the above is a constant-returns-to-scale production function. We can, therefore, write (1.1) as:

$$Y/N = F(K/N, 1). \quad (1.2)$$

Let $y \equiv Y/N$, and $k \equiv K/N$. We can then re-write (1.2) as:

$$y = f(k). \quad (1.3)$$

Assume that this is a closed economy with no government. Now, demand for goods and services in this economy can be written as:

$$y = c + i. \quad (1.4)$$

Where c and i are consumption per worker and investment per worker, respectively. In the Solow model consumers save a fraction s of their income. Therefore,

$$c = (1 - s)y. \quad (1.5)$$

Consequently, from (1.5), (1.4) can be written as

$$y = (1 - s)y + i. \quad (1.6)$$

Now, by a simple re-arrangement of terms in (1.6), we get:

$$i = sy. \quad (1.7)$$

Now, assume that the depreciation rate of capital is δ . Keeping in mind that sy in (1.7) can be

written equivalently as $sf(k)$, the change in the capital stock (per worker) can then be written as:

$$\Delta k = sf(k) - \delta k. \quad (1.8)$$

The steady-state value of k , denoted by k^* , is given by (1.8), when Δk is set to zero.

The Golden Rule level of capital

The steady-state value of k that maximizes c is called the *Golden Rule* level of capital.

Policymakers may be able to choose s such that, in steady state, c is maximized. Now, note that in steady state

$$c^* = f(k^*) - \delta k^*. \quad (1.9)$$

A necessary condition for maximum c^* is

$$f'(k^*) - \delta = 0 \quad (1.10)$$

So, to find the *Golden Rule saving rate*, the following two equations, derived from (1.8) and (1.10), must be solved:

$$sf(k^*) = \delta k^* \quad \text{and} \quad f'(k^*) = \delta. \quad (1.11)$$

Some highlights of the Solow model:

1. At the steady state, the (per capita GDP) growth rate is zero.
2. When $k < k^*$ positive growth takes place (and vice versa).
3. An increase in s will lead to short-term positive growth. The steady-state growth will be zero but at a higher y .

- ***Version 2: Positive population growth, no technological progress***

Now, let population and labor force grow at a constant rate g_N . Equation (1.8) must now be rewritten as

$$\Delta k = sf(k) - (\delta + g_N)k. \quad (2.1)$$

The steady-state condition is

$$sf(k) - (\delta + g_N)k = 0. \quad (2.2)$$

And the *Golden Rule saving rate* can be derived by solving (2.2) and

$$dc^*/dk = d[f(k^*) - (\delta + g_N)k^*]/dk = 0 \Rightarrow f'(k^*) = (\delta + g_N). \quad (2.3)$$

An additional insight in this version of the Solow model is that, all else equal, a country with a high rate of population growth will have a low steady state k , and therefore a low level of y .

- **Version 3: Positive population growth, positive technological progress**

Re-write the production function in (1.1) as

$$Y = F(K, A \times N). \quad (3.1)$$

Where A is the efficiency of labor, and the term $A \times N$ is the labor force measured in efficiency units. Assume that technological progress causes A to grow at the rate of g_A . In this model the number of efficiency units of labor is growing at the rate $g_A + g_N$. Now, let

$y = Y/(A \times N)$ stand for output per efficiency unit of labor. The production function, as before, can be written as $y = f(k)$. Equation (1.8), previously modified to (2.1), must now be written as

$$\Delta k = sf(k) - (\delta + g_A + g_N)k. \quad (3.2)$$

The steady-state condition is

$$sf(k) - (\delta + g_A + g_N)k = 0. \quad (3.3)$$

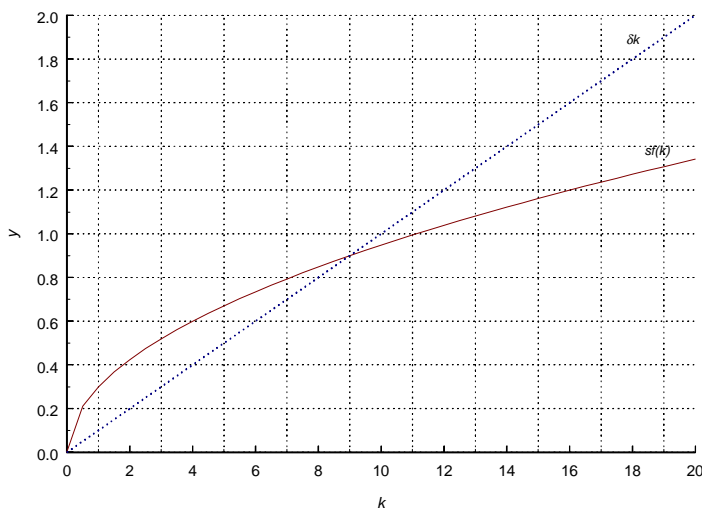
And the *Golden Rule saving rate* can be obtained by solving (3.3) and

$$dc^*/dk = d[f(k^*) - (\delta + g_A + g_N)k^*]/dk = 0 \Rightarrow f'(k^*) = \delta + g_A + g_N. \quad (3.4)$$

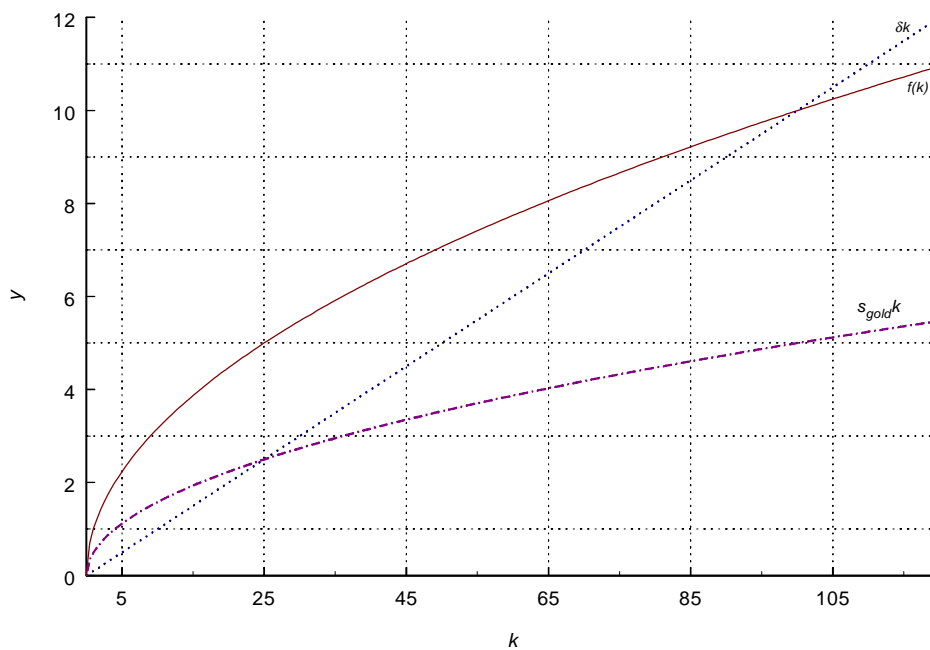
Note that in this version of the Solow model y grows at the rate of g_A in the steady state.

The Basic Solow Growth Model

Let $Y = K^{1/2}N^{1/2}$. We then have $y = k^{1/2}$. Now, let $s = 0.30$ and $\delta = 0.10$. We get:



The Golden Rule



Accounting for the Sources of Economic Growth

Consider the following simple production function:

$$Y = F(K, N). \quad (1)$$

We then have:

$$\Delta Y = (MPK \times \Delta K) + (MPN \times \Delta N). \quad (2)$$

Divide both sides by Y , multiply top and bottom of the first term on the right-hand side by K , and top and bottom of the second term on the right-hand side by N , we get:

$$\frac{\Delta Y}{Y} = \left(\frac{MPK \times K}{Y} \right) \frac{\Delta K}{K} + \left(\frac{MPN \times N}{Y} \right) \frac{\Delta N}{N}. \quad (3)$$

Now, under the assumption of competitive capital and labor markets, $\left(\frac{MPK \times K}{Y} \right)$ is the share of capital in total output (call it α), and $\left(\frac{MPN \times N}{Y} \right)$ is the share of labor in total output. Under the assumption of constant returns to scale, Euler's theorem tells us that these two shares add up to 1. Therefore, we can re-write (3) as:

$$\frac{\Delta Y}{Y} = \alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta N}{N}. \quad (4)$$

In a more general case in which the production function [with Hicks-neutral technology] is:

$$Y = AF(K, N), \quad (5)$$

(3) can be re-written as:

$$\frac{\Delta Y}{Y} = \alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta N}{N} + \frac{\Delta A}{A}. \quad (6)$$

Equation (6) is called the fundamental equation of growth accounting.

Equation (6) can also be written as:

$$g_Y = g_A + \alpha g_K + (1 - \alpha) g_N. \quad (7)$$

Equation (6), and its equivalent (7), is called the fundamental equation of growth accounting. g_A is called the rate of growth of Total Factor Productivity (TFP), or Multi-factor Productivity (MFP).

[See the Appendix on p. 261 of Blanchard, 7th edition.]