I. ECONOMIC INDICATORS

Contents

"Economic Indicators" and "Financial Indicators", *The Economist*, October 4, 1997

Selected U.S. National Income and Product Accounts Tables, *Survey of Current Business*, August 1997

Economic indicators are variables that provide information about the state of the aggregate economy. These variables are sometimes called macroeconomic time series, because successive measurements occur sequentially in time. The major ways of displaying time series data are a simple tabular listing and a graph called a time-series plot, in which time is recorded on the horizontal axis and the value of the variable is measured on the vertical axis. Time series data display patterns that are of interest to macroeconomists and to anyone whose decisions depend on the state of the economy. These patterns can be observed in part by examining listings and time-series plots of the data. They can also be measured by summary statistics such as the mean, standard deviation, and autocorrelations of a single variable and the correlation between two variables. We refer to these patterns as *empirical regularities* or *stylized facts*.

The purpose of this module is to define some of the more important economic indicators and to document some of the empirical regularities or stylized facts that characterize their behavior. Documenting these empirical regularities is a necessary first step, but only a first step, in understanding the macroeconomy. In subsequent modules, we will document additional stylized facts and study economic models that attempt to explain the reasons for the empirical regularities we observe.

Two of the common features of many economic indicators are a long-term, upward *trend* and irregular up-and-down movements that we call *business cycles* (see, for example, Figure 1-1 of Mankiw's text). Chapter 2 of Mankiw discusses one of the most important and comprehensive sets of indicators, the National Income and Product Accounts.

II. PRODUCTION AND DISTRIBUTION

Contents

Discussion Questions

Nasar, "U.S. Rate of Output Called Best", *The New York Times*, October 13, 1992
"Workers of the World Unite", *The Economist*, October 23, 1993
"The Shock of the Not Quite New", *The Economist*, June 18, 1994
"It's Wise to Deindustrialise", *The Economist*, April 26, 1997

A firm theoretical framework is necessary for understanding the stylized facts about the macroeconomy documented in the previous module and studied more extensively in the rest of the course. We now begin the process of developing that framework.

We use a single neoclassical model to explain most features of both long-term economic growth and business cycles. At least since the mid-1950s, the neoclassical model has been the primary tool for analyzing growth. During the last two decades, neoclassical macroeconomics has also emerged as a viable alternative to the once-dominant Keynesian model for explaining business cycles.

For our purposes, the most important feature of neoclassical macroeconomics is that it builds on microeconomic foundations. During the last two decades, most macroeconomists have come to the conclusion that a good macroeconomic model must be firmly based on microeconomic principles. The model presented here has such microeconomic foundations and draws on the microeconomic tools you studied in GSBA 511. To reinforce your knowledge of those tools, we have assigned portions of the Pindyck and Rubinfeld microeconomics text. Some of these readings review material you covered last semester, and some go beyond that material.

For the moment, our model has only a real sector. We can learn much by studying such a simple, real economy without introducing all the complications of a monetary sector. We add money to the model later.

Our analysis of the real sector of the economy takes up this and the next two modules. In the next module, we take up long-run economic growth, and in Module 4 we study the market for one of the two major factors of production – labor. Finally, we turn our attention to monetary economies in Module 5.

Before proceeding to the neoclassical growth model, this module reviews some basic concepts. The first is the production function, which relates the quantity of output to the quantities of factors of production employed. Important concepts related to the production function are returns to scale and the average and

marginal products of a factor of production. An important result is that firms employ each factor of production up to the point where the factor's marginal product equals its price (e.g., the wage rate for labor).

We saw in the circular flow diagram of Module 1 (*Economic Indicators*) that the income of any economy is equal to its output. We now see how the total output of an economy gets distributed as income to the factors of production. The most important result here is that factors of production get paid their marginal products.

This basic material on production and distribution is vital for understanding important macroeconomic phenomena, because fluctuations in production technology alter the amount of output that can be produced by given inputs. Thus, long-run improvements in production technology can lead to sustained growth in total output, the marginal product of labor, and wage rates. Temporary up-and-down movements in production technology can lead to business cycles that entail short-run fluctuations (business cycles) in output, employment, wage rates, and other variables.

III. ECONOMIC GROWTH

Contents

This module deals with one of the most important questions in macroeconomics – what determines the long-run rate of growth of the economy.

Mankiw begins by presenting the standard neoclassical growth model with a constant population and technology. A major implication of this model is that an economy cannot grow forever simply by accumulating more capital. The model leads to another important prediction called convergence. The convergence hypothesis states that all countries with similar economic institutions, similar saving rates, and similar production technology will converge over time to the same level of per capita output, regardless of the level of income from which they start.

Mankiw then adds population growth to the model. He makes clear two important predictions of the standard growth model. One prediction is that, other things equal, a country will have a lower standard of living the higher its population growth rate. The second prediction (which also applies to an economy with a stable or declining population) is that a country will have a higher standard of living, although not a higher growth rate, the higher its saving rate.

The last piece of the standard growth model adds exogenous technical progress. This is the only factor that can generate continued growth in the standard of living.

We conclude this module by briefly considering some material that goes beyond the standard growth model. This material includes endogenous technical progress and evidence that the convergence hypothesis does not hold for all countries.

IV. THE LABOR MARKET

Contents

Module 2 ("Production and Distribution") dealt with the relation between output and inputs and with the firm's decision about how much of each factor of production to employ. As applied to labor, we saw that firms demand labor up to the point where the marginal product of labor equals the wage rate. This module deals with the household's decision about how much labor to supply. It shows how the labor supply choice is affected by technological shocks, and how such technological changes alter labor supply, real wages, labor productivity, and output in the long run. Module 5 ("Business Cycles") will examine the short-run behavior of these variables as well as the cyclical behavior of unemployment.

V. MONEY, INFLATION, AND INTEREST RATES

Contents

This module adds a monetary sector to the real economy we have studied up to this point. We will consider several important features of a monetary economies, but some of this material is best left until later in the course. This module begins with a simple analysis of the long-run consequences of ongoing money growth. It shows how money growth affects the rate of inflation and how inflation affects interest rates. Module 7 ("The Open Economy") deals with money and foreign exchange rates, and Module 9 ("Monetary Policy") deals with the money supply process and the short-run effects of monetary policy on the economy.

VI. THE GOVERNMENT BUDGET

Contents

Discussion Questions

"Russia Faces Pressure to Push New Fiscal Plan", *The Wall Street Journal*", June 1, 1998
"The Hole in Your Future", *The Economist*, September 9, 1995
Wessel, "The Outlook: As Populations Age, Fiscal Woes Deepen", *The Wall Street Journal*, September 11, 1995
Long, "Pensions in Chile Pay Off Handsomely", *Los Angeles Times*, September 28, 1993
Feldstein and Feldstein, "Social Security Has Been a So-So Deal", *Los Angeles Times*, January 7, 1997
Becker and Ehrlich, "Social Security: Foreign Lessons", *The Wall Street Journal*, March 30, 1994
Kotlikoff and Sachs, "Fix Social Security for Good", *Los Angeles Times*, April 5, 1998

Government budget deficits and the resulting public debt are the subjects of hot debate among macroeconomists, government policy makers, and many in the business community. Mankiw's chapter 16 discusses these issues in detail. The additional readings by Barro and Summers provide a concise summary of the controversy over whether deficits adversely affect the economy and apply the competing views to an analysis of the large U.S. government budget deficits of the early 1980s.

Finally, we devote some class time to a discussion of public pension systems, which are becoming an increasingly important political issue. As we shall see, public pensions are analytically similar to national debt and may have important macroeconomic effects.

VII. THE OPEN ECONOMY

Contents

This module deals with the economic interactions between the domestic economy and the rest of the world. We begin with an enumeration of several types of international transactions. We shows how these transactions are recorded in the Balance of Payments Accounts and how those accounts are related to the National Income and Product Accounts. Exchanges (exports and imports) of newly produced goods and services are recorded in the current account of the balance of payments. Exchanges of assets are recorded in the capital account. The current account balance must be equal to but opposite in sign from the capital account balance, implying that the two balances must sum to zero. We show how the exchange rate adjusts to bring about this equality.

VIII. BUSINESS CYCLES

Contents

In Module 1, we discussed some stylized facts about business cycles. We now present the standard real business cycle (RBC) model that explains the nonmonetary reasons for these stylized facts. The study of RBC models is motivated not by the view that monetary factors are unimportant, but rather by the belief that understanding simple nonmonetary economies is necessary before proceeding to more complicated monetary models.

Module 3 dealt with the household's labor supply decision. This module examines the household's second major economic decision – the choice about how much of its income to devote to current consumption and how much to save. Consumption is the largest component of GDP. After dealing with consumption, we take up the investment decision made by firms. In addition, we study the effectiveness of government fiscal policy in counteracting business cycles.

IX. MONETARY POLICY

Contents

This module continues the study of monetary economics, giving particular attention to the central bank's conduct of monetary policy and the effects of monetary policy on the real economy.

The module begins with an examination of the Federal Reserve system, financial intermediation, and the money supply process. The primary analytical material is a set of notes and a portion of chapter 18 of Mankiw.

The module then examines the short-run effects of monetary policy on the economy. An important feature of the monetary sector studied up to this point is that money is *neutral*. The real sector of the economy affects the monetary sector, but not vice versa. This feature of the economy is called the *classical dichotomy*. The classical dichotomy is a good characterization of the long-run behavior of the economy.

Most economists believe that the classical dichotomy between the monetary and real sectors holds only in the long run but breaks down in the short run. We now break the classical dichotomy and study how money affects real variables in the short run, beginning with the simplest case of a closed economy. The main analytical readings for this class are three "Schools Briefs" from *The Economist*. The central result is that an

unexpected increase in the money supply (or in its growth rate) results in a temporary increase in real output and a temporary decline in unemployment. In the long run, however, a change in the money supply is fully perceived and ceases to have any real effects on the economy.

Economists have not yet come up with a single, fully satisfactory model that reconciles the short-run non-neutrality of money with long-run neutrality. The "Schools Briefs" articles describe several alternative theories. Chapter 11 of Mankiw, which is optional, describes four alternative models in more detail. The truth may consist of some combination of these theories and possibly of others that we have not yet thought of.

Some of the theories described in the "Schools Briefs" imply that business cycles are a natural, efficient, and optimal result of the workings of a market economy, and that government should not try to eliminate cycles or reduce their magnitude. Other models imply that business cycles lead to inefficiently low output and employment during recessions. If government were wise and skillful enough, it could and presumably should pursue countercyclical macroeconomic policies to reduce the cost of recessions. There is serious dispute about whether government is skillful enough to pursue these policies effectively, however. This is the question of rules versus discretion. Chapter 12 of Mankiw, which is also optional, deals with this debate in more detail.