

The Digital Economist

Lecture 1 -- An Overview of Economics

INTRODUCTION

Economics is a social science that seeks to understand how different societies allocate scarce resources to meet the unlimited wants and needs of its members. As with any social science, economics is concerned with human social behavior--behavior of individuals and interaction among these individuals. What makes economics notable among the other social sciences is that this particular discipline addresses the necessary requirements for human survival and sustainability. For those living in developed countries, notions of human survival might seem trivial. However, for much of the world's population survival is barely within their grasp.

Some might label economics as the science of human progress; that is, how choices are made such that living standards for individual human beings improve. This is not to say that economics only has comment for the accumulation of material wealth. Improvement in living standards includes, *lower infant mortality, the provision of basic and essential health care, appropriate shelter and infrastructure, and of-course meeting the caloric needs of every human being.* In addition, improved living standards *support greater levels of literacy and education* necessary to sustain political systems that celebrate human initiative, creativity and spirit.

An improvement in the *standard of living* as a problem of production with its foundation in technological expertise and the accumulation of human knowledge. However, even if we overcome this technological problem, as we have in much of the world, difficulty in the distribution of what is produced prevents a significant number of individuals from enjoying the fruits of human progress. This problem of distribution is often rooted in weak political institutions and ineffective methods of governance. And yet the strength of the political institutions depends much on the level of education of the governed. Human progress is only accomplished with growth in educational attainment.

The study of economics begins with an understanding of technology, the creation of new technology, and the efficient use of that technology all to address the problem of production. But just as important, an understanding of the workings of an economic system must acknowledge the political system that exists and the potential for political change to address the problem of distribution. An economic system must provide for the physical needs of human beings and, just as important, satisfy their wants and desires that will provides much of the incentive for human progress.

The past decade has provided witness of amazing events in the economic progress of different nations. Economists were more than impressed with the extraordinary rate of economic growth in much of South-east Asia only to see these countries experience massive economic collapse in the late 1990's. Huge transformations and transitions have

taken place in Eastern Europe and the nations of the former Soviet Union. Socialism has given way to uncertainty and confusion as well as the market-oriented ideals all associated with capitalism. Japan, once thought to be the true dominant economy at the dawn of the new millennium now suffers under the weight of an ineffective financial system based on large portfolios of non-performing loans and lack of political will to correct the problem. The United States has experienced a prolonged steady expansion such that many of the problems of inflation, unemployment, and stagnation seem to be eliminated. And yet, economic history has taught us that economic success should never be taken for granted.

ECONOMICS AS A SOCIAL SCIENCE

The science of Economics seeks to understand how individuals interact within a particular social framework to address key questions about the production of goods and services. First, how are individual needs and desires communicated such that the correct mix of goods and services become available? Second, how does society as a whole provide the incentives for these individuals to participate in the production these goods? Third, how is production organized such that maximum-possible quantities are made available given existing resources and production technology? Finally, given that these individuals are at one time involved in the production process and at other times seeking to acquire the goods that have been produced, how are trading rules and exchange agreements established?

The above questions stress the importance of understanding the process of production. The goal here is to understand the basic features of production without getting mired in great technical detail. This is accomplished by developing a simple model that maintains the important features of what are, otherwise complex, engineering relationships.

Production is about the conversion of **factor inputs** into desired goods and services.

However, we do live in a world of scarce resources. **Scarcity** refers to a physical condition where *the quantity desired of a particular resource exceeds the quantity available in the absence of a rationing system*. Potential candidates for rationing systems include:

- **Tradition and Culture**, where the problem of allocation is addressed via social norms, customs and past history.
- **Planning and Central Government Command**, making use of complex mathematical tables to determine output goals and input requirements.
- **Voting and Political Activities**, communication about resource allocation among individuals thorough the development of a consensus or perhaps majority rule.
- **Markets** -- using a system of prices to act as a means of communication about the availability of resources and the desire for those resources.

Goods and services refer to:

- **Final Goods and services** -- those products that are directly consumed by individuals to satisfy their needs and wants.
- **Intermediate or Capital Goods** -- are those goods used to produce other goods.

In the case of final goods, **Needs** are satisfied by those goods and services required for human survival. These needs are determined by nature, climate and region, and are often finite. **Human Wants or Desires** refer to everything else. Human wants are determined by society and the culture in which an individual lives. These wants are indeed unlimited and represent the source of the problem facing all economic systems.

We must be careful in noting that Economics is not just about the production of goods and services. Equally important is developing an understanding about how wants and needs are communicated to the economic system and how to involve individuals in the production process. The system must provide the incentives for these individuals to specialize in areas of production where their talents are best used and where the fruits of their efforts can easily be exchanged with others.

MICROECONOMICS AND RELATIVE PRICES

Microeconomics, as one branch of economic theory, is defined as the study of the behavior of individual economic agents. These agents are divided up into **producers** (business firms) and **consumers** (households) and thus microeconomics is the study of how these agents react to changes in **relative prices**. In any market economy, these relative prices act as signals about surpluses or shortages that may exist in individual markets and will guide in the allocation of resources to their best use.

A **relative price** may be expressed in terms of a ratio between any two prices or the ratio between the price of one particular good and a weighted average of all other goods (aog) available in the market.

$$P^R = (P_x / P_y) \text{ or } (P_x / P_{aog}).$$

For example given the price of two goods -- *houses and apartments*, where we may observe that the price of houses are increasing relative to apartment rents.

$$(P_{\text{houses}} \uparrow / P_{\text{apartments}}) = P^R \uparrow,$$

This may be the result of increased desire (preferences) for detached housing. A developer would react to this signal by allocating resources (land, labor, materials) to the construction of houses. These scarce resources would be pulled-away from alternative uses -- apartment construction. The result is the construction of more houses and fewer apartments.

Suppose that in contrast we find that the rental rate of apartments is decreasing:

$$(P_{\text{houses}} / P_{\text{apartments}} \downarrow) = P^R \uparrow$$

This outcome may be the result of an over-supply of apartment units. Developers would react by building fewer apartments thus releasing scarce resources for alternative uses -- housing. The result is the same: more houses are built and fewer apartments constructed. More importantly, we find that more houses are built even though the price of houses has not changed.

In general, we would expect that if a relative price increases (the price in the numerator is larger or the price in the denominator is smaller), resources will be reallocated towards that good in the numerator. If, however, a relative price decreases (a smaller numerator or larger denominator), resources will be reallocated towards that good in the denominator.

Relative prices with respect to final goods and services (i.e., P_x/P_y) address the economic question of *what to produce*? These ratios can also aid in the understanding how factor inputs are used in the production of these final goods; that is, the question of *how to produce*?

In a country where capital is relatively scarce we might find that capital is expensive relative to other factors of production -- i.e., labor. This country might engage in **labor intensive** production relying on workers rather than machines to produce different goods. In other countries we might find that labor is relatively scarce and thus relatively expensive. Production in these countries might rely more on **capital intensive** production. In each case similar goods are produced. However, the methods used might differ -- not because one type of production is better than another but because these methods reflect the relative price of the factor inputs.

For example, we might find that:

In country-A:

Wage Rate (w) = \$20.00/hour

Rental Cost of Capital (r) = \$50.00/hr

and

In country-B:

Wage Rate (w) = \$5.00/hour

Rental Cost of Capital (r) = \$20.00/hr

To focus just on the price of capital, one might conclude that **country-B** might engage in capital intensive production given that capital is cheaper in dollar-terms. However, when expressed as a pair of relative prices:

$$(w/r)^{\text{country-A}} > (w/r)^{\text{country-B}}$$

We find that **Country-A** will rely on capital intensive production given that labor is relatively more expensive and thus scarce. **Country-B** will rely more on labor intensive production given that capital is relatively more expensive.

MACROECONOMICS AND POLICY

Macroeconomics is the study of economic behavior in the aggregate. The approach is to understand the activities of households and business as a group in addition to the behavior and role of local and national governments. The study of macroeconomics must begin with a solid understanding of the individual behavior of these households, business firms, and government entities such that there is consistency with behavior in the aggregate. It is important to note that macroeconomic understanding and explanation must rest on solid microeconomic foundations.

The primary topics to be analyzed in the field of macroeconomics include:

- sustainable rates of economic growth,
- the employment of resources,
- stability of prices essential to the proper functioning of a market economy, and
- the international linkages that bind individual nations into a world economy.

These topics are all in support of determining the best way to improve living standards for each person, country, and region around the planet.

Economic Growth

It must be assumed that populations will grow. The world population is growing at a rate of 1.5 - 2% per year. At this rate, world population will double in the next 35 to 50 years. In order to maintain current living standards, the production of food, clothing, shelter, health care, and educational services must also grow by, at least, an equivalent rate. An improvement in living standards requires that growth in output exceed the rate of population growth.

Some might argue that the best way to improve the **standard of living** in a given nation is to reduce the rate of population growth. But this is to ignore demographic considerations. It is true that the rate of population growth can be excessive such that human beings tend to live at the edge of subsistence and their basic needs are seldom met. The result is greater infant mortality, a less productive population, and shorter life expectancy. Life at the edge of subsistence requires that most resources be used for the production of food, shelter, and clothing such that few resources are available for the creation of capital.

However, it is also true that population growth rates below replacement levels create structural difficulties for the demographics of a nation. Lower birth rates and lack of immigration imply fewer young people to support the labor requirements of a nation and inability to support a growing cohort of elderly and retired citizens.

Economic growth is typically measured by growth in the production of final goods and services in addition to the accumulation of capital. This latter concept represents the addition to a nation's wealth -- wealth that will be used to produce future output. Nations that often experience high rates of economic growth find that this growth is due to the creation of capital goods: office buildings, apartments, and houses; factories and machinery; transportation equipment and networks; and other types of public and private infrastructure. Resources are often devoted to the creation of capital goods in the expectation of future need and demand. However, between the time resources are committed and the project is completed economic or market conditions may have changed such that the need for the project no longer exists. It may be the case that managerial or technical expertise is lacking such that productive use of these capital goods is not possible. A completed capital project for which no market demand exists can not be considered an addition to the wealth of a nation. Resources were committed and wasted. Economic growth based on the over-accumulation of capital is not sustainable.

Sustainable economic growth should be that rate that at a minimum exceeds the rate of growth in population and supports growth in living standards but is not excessive such that poor choices are made with respect to the development of the capital stock. Determination of this rate of growth is a primary consideration for any nation.

Employment of Resources

An economy should use its resources to attain the maximum output possible with the inputs available and, as a related issue, employment of people to allow them to privately earn an income that allows for satisfying basic needs. In addition, it should provide the incentives for individuals to produce in excess of their physical needs and human desires. These resources should be used in an efficient and effective manner. **Under-utilization** of factor inputs results in an economy producing at a level below its potential. The opportunity to produce goods and services that are needed or desired is forever lost.

Lost output is not the only problem with under-utilization of resources but also the real effect on human beings that cannot find work and earn a sufficient income necessary for their survival. Unemployment in labor markets takes its toll on individual workers and households. Lack of work results in lack of income to purchase needed goods and services in addition to the lack of an opportunity to contribute to the production these goods and services.

Over-utilization may also be a problem in that machinery is not properly maintained and thus wears-out sooner or labor markets become so tight that wages and thus production costs increase at an undesirable rate.

The proper balance in the employment of resources is dependent on an efficient functioning of labor, capital, and natural resource markets. Inefficiencies are introduced due to the information and transactions costs inherent in the functioning of these markets. Information cost include the costs of dissemination information about employment opportunities and labor needs of business firms in addition to information about worker availability, ability, and productivity. Transaction costs include those costs related to the

maintenance of the legal and political framework required to ensure the enforcement of contracts, the provision of insurance, and the avoidance of discrimination.

Price Stability

As stated above, in a market economy, relative prices act as signals about surpluses or shortages that may exist in individual markets. Understanding this concept of **relative prices** helps us understand how **inflation** (an increase in the general price level) can cause problems for a market economy. In an inflationary environment, all prices are rising although often at different rates. It may be that the price of housing is increasing by 5% per year and the price of food is increasing by 8% per year. The overall rate of inflation would be some average of these two values combined with prices of other consumer goods. For individual producers and consumers, it becomes difficult to distinguish between a change in relative prices (such that one good is more valuable relative to other goods) and a change in all prices due to the inflation. In this inflationary environment, individual producers may often confuse a change in the price of her/his particular good as a relative change with the reaction that s/he allocates more resources towards production of that good. A reallocation of resources mistakenly takes place. Thus, inflation can cause inefficiencies in the marketplace in that it distorts the signals necessary for the proper allocation of resources.

Price stability is also important for the proper function of financial market in that savers seek to protect the purchasing power of their wealth invested for different periods of time.

The savings of a household represent the difference between what was produced by the household, as measured by the income earned, and consumption of goods and services desired by that household measured by spending. This difference represents a release of resources for other uses. These savings are an addition to that household's wealth to be drawn upon at some point in the future for spending needs. Other households, business firms or governments may borrow these resources to meet immediate spending needs, acquisition of inventory, creation of capital or other infrastructure projects. The actual process of savings involves the placement of funds into the financial sector of an economy.

Borrowing involves the demand for these funds with the promise to repay the principal borrowed plus a percentage of the income earned with the use of these borrowed funds. Borrowing allows an individual or institution to acquire resources to create income-producing assets -- assets that contribute to the wealth of a nation. Repayment allows the lender to consume in the future in excess of income earned. The accumulation of wealth and the income it produces (through production of desired goods and services) allows for the payment of the percentage in excess of the principal -- interest. Interest payments represent a reward to lenders (savers) for lending to an increasingly productive economy.

Inflation can reduce the purchasing power of funds to be repaid. The quantity of goods and services that could have been purchased at the time lending took place is greater than the quantity of goods that may be purchased given the higher prices that might prevail

when repayment occurs. Lenders attempt to protect the purchasing power of their wealth by attaching an inflation premium to what they think is a proper reward for lending to a productive economy. This inflation premium is based on expectations of the future rate of actual inflation. Borrowers will agree to this premium if they share the same expectations. However, if these expectations are incorrect either lender or borrower may suffer. If the actual rate of inflation exceeds what is expected, lenders will be repaid with funds that have less than expected purchasing power. The reward for lending may be wiped out. If the actual rate is below expectations, the borrower may find himself in the position of having to pay an interest rate (inflation premium included) that exceeds the rate of return of a given investment project--the debt becomes difficult to service with the income earned.

Finally, inflation can act as a tax--used to transfer resources from the private sector to the public sector. Governments can print money to buy goods that were previously purchased by private individuals. The printing of money does not lead to any new production of goods. But, the competition from the public sector causes a shortage with an attendant increase in prices such that the money incomes in the private sector have less purchasing power--fewer goods and services are purchased by private individuals releasing those goods to the public sector.

We must also note that **deflation** also has serious consequences for a market economy. In deflationary times all prices are falling; goods and services, financial assets, and factor incomes. Just as inflation erodes the purchasing power of money lent, deflation increases the burden of **debt**. If the deflation is not fully anticipated, borrowers will find that they have agreed to debt contracts under the assumption of steady or perhaps growing income and revenue. If these incomes are falling, then the interest payments and repayment of principal will represent a larger fraction of this income. Borrowers often react by defaulting on this debt leading to problems for the financial sector of the economy and consequent liquidation of collateral assets. This liquidation just furthers the price decline of assets -- fueling the deflation. Debt combined with deflation, a **debt-deflation**, can easily tip an economy already in recession into a full-blown depression.

International linkages.

Over the past generation, a global economy has evolved through the lowering of trade barriers, freer movement of factor inputs (labor & capital), and the development of highly efficient financial markets. Individual economies have come to realize that shocks in world markets can have a profound effect on their economy. Exchange rates, which facilitate the movement of goods, services, factor inputs and financial assets, are highly sensitive to domestic economic and political conditions.

Be sure that you understand the following concepts and terms:

- Economics
 - Production
 - Factor Inputs / Factors of Production
 - Final Goods and Services
 - Intermediate (Capital) Goods
 - Human Needs and Wants
 - Scarcity
 - Markets as Rationing Systems
 - Microeconomics
 - Relative Prices
 - Labor Intensive / Capital Intensive Production
 - Producers / Business Firms
 - Consumers / Households
 - Macroeconomics
 - Economic Growth
 - Standard of Living
 - Over-utilization / Underutilization of Resources
 - Inflation / Deflation
 - Debt-Deflation
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Suggested Readings

- Friedman, Milton, *Capitalism and Freedom*, University of Chicago Press, 1982.
 - Galbraith, John Kenneth, *The Affluent Society*, Houghton Mifflin, 1958.
 - Hayek, Friedrich A, *The Road to Serfdom*, University of Chicago Press, 1994.
 - Heilbroner, Robert L., *The Making of Economic Society*, Prentice-Hall Inc., 1962.
 - Heilbroner, Robert L., *The Worldly Philosophers*, Simon and Schuster, 1980.
 - Keynes, John Maynard, *The Economic Consequences of the Peace*, 1920, Harcourt Brace Jovanovich, Inc. Chapters I & II
 - Krugman, Paul, *The Age of Diminished Expectations*, 1992, MIT Press.
 - Malthus, Thomas Robert, *An Essay on the Principle of Population*, W.W. Norton & Co., 1976, (Original: 1798).
 - Thurow, Lester, *The Future of Capitalism*, 1996, Penguin Books.
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See also:

The Commanding Heights: <http://www.pbs.org/wgbh/commandingheights/lo/story/index.html>

- **Episode 1: The Battle of Ideas.**

The Digital Economist: http://www.digitaleconomist.com/macro_data.html

- follow the instructions to look at time series plots of: *Real GDP, Inflation, Unemployment, the Real Interest Rate, and Exchange rates.*