Principles of Microeconomics: Chapter 7
Equilibrium, Growth, Entrepreneurship, and Market Outcomes

I. Markets in Equilibrium, A Review

From the previous chapters, you are familiar with the effects of market structure on equilibrium prices and outputs.

i. In competitive markets, prices equal marginal cost and marginal cost equal revenues.
ii. In noncompetitive markets prices exceed marginal cost, but marginal cost still equals marginal revenue.
iii. These are consequences of rational decision makers attempting to maximize their net benefits (consumer surplus and/or profits).
iv. You should also know that input and output markets are connected and that as demand for outputs rises, demand for inputs also rise, and thus input prices also tend to rise, and the quantity of inputs used in particular industries also tends to increase.
v. In equilibrium each input earns its marginal revenue product (at the margin).
vi. Such connections among markets imply that prices help to coordinate the decisions of firms, consumers, and input providers—and tend to draw resources into markets where they are most demanded.

Market equilibria all have prices that set demand equal to supply, matches inputs to markets, and competition among producers and the quest for profits tend to minimize the cost of production.

In competitive markets, social surplus (social net benefits) is maximized (in the absence of externalities). In less competitive markets, social surplus is increased by the trade that takes place, but not necessarily maximized—the latter being the economic justification for antitrust policies. The division of that surplus varies by market type, with consumers getting the lions share in perfectly competitive markets and somewhat less in monopolistic markets. (How much less depends on the degree of price discrimination.)

Trade is a voluntary activity, so it takes place only if both consumers and firms expect to benefit from their purchases and sales of the goods traded. It is this property that assures that social surplus tends to increase as trade expands.

All of our models and the analysis based on them has assumed that individuals are all the same in the sense that they all try to maximize net benefits—although they may disagree about how to best do so. The latter explains why people buy different things, why firms produce different things, and why they do so in different ways. This is not to suggest that people make a lot of mistakes, but simply that although they are the same in one sense (maximizing net benefits), but they are also different in their preferences, understanding of a good life, have different skills and access to capital, and so choose different goods, careers, and organize production in different ways.

We have also studied factors that may disrupt a market equilibrium.

For example, consumer demand tends to increase for most goods (normal and superior goods) when consumer income increases (although it may fall for inferior goods). Thus, as consumer income increases on average, the demand for most goods increases and their prices tend to increase. (When demand shifts out to the right, prices tend to rise if supply curves are upwards sloping and remain where they were.) Demand also tends to increase if the price of a substitute increases or if the price of complements fall.

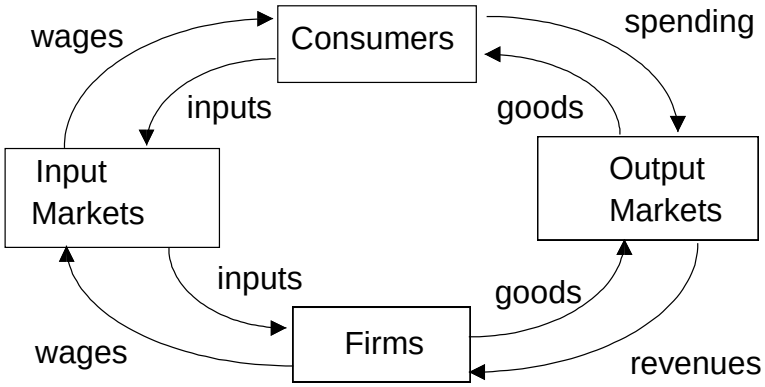
Market equilibria are also disrupted by changes in the price of inputs or in the opportunity cost of the folks that own the firms that make the things and services sold in markets. If the price of inputs increases, then the supply curve tends to shift to the left, which causes market prices to increase.

Another factor that can shift the supply curve is technology. As technology improves, the cost of producing goods and services tends to fall which shift the supply curve out to the right, reducing prices and increasing total sales of the products that make use of the improved technology.

If technology is stable and no capital accumulation occurs, the logic of

rational choice implies a static economy. All markets clear simultaneously (including input markets). And, stable income and production costs yield a stable pattern of consumption and prices. In effect, everyone simply repeats what they did yesterday.

Joseph Schumpeter called such an economy an "**evenly rotating economy**. See the diagram below to see why.



II. Growing Markets

This chapter shifts our attention away from such stable—non growing—markets towards ones where the overall scope of trade expands through time, more or less one market at a time.

There are two main models of economic growth. One focuses on capital accumulation and the other focuses on innovation. The first of these approaches worked out is the one the focuses on capital accumulation, and that is where we'll start.

The capital accumulation model of economic growth (or economic development) is a "smooth" one. As capital is accumulated, labor becomes more productive, and the outputs of all capital intensive goods tends to expand, which introduces a downward trajectory in their prices—other things being equal.

That model will be followed by ones in which various forms of innovation are focused on. Those models imply that growth takes place in jumps with some jumps being larger than others.

III. Capital Accumulation and Growth in a Simple Neoclassical Model

Whenever additional capital in an economy has accumulated, the evenly rotating economy becomes a "spiral," because productivity and income tends to increase as capital is accumulated.

A. Capital is accumulated, for example, when a firm uses some of its profits to purchase additional equipment, expand its factories, or hires more educated, skilled, or talented people so that it can expand production—as would tend to happen if the owner(s) expects future demands to increase and prices to rise for their existing products.

B. Capital is also be accumulated when consumers save part of their income, places in banks or other intermediaries, which lend out the money to firms that use the money to expand production. An increase in savings, thus tends to increase capital stocks and outputs.

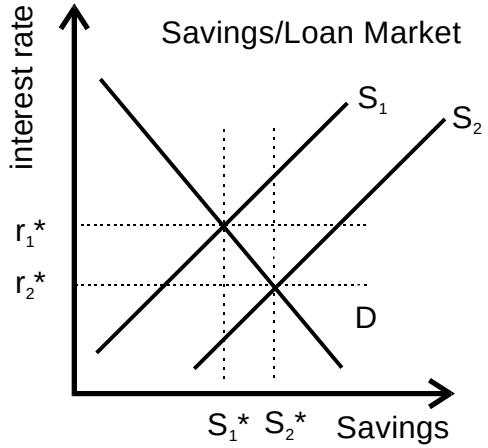
C. New capital may be either **physical capital** (machines, computers, equipment) or **human capital** (knowledge and skill). What you are doing here at WVU is accumulating more human capital—which hopefully will increase your productivity and lifetime wages and/or quality of life.

Saving and the Supply of Capital

The accumulation of capital ultimately depends on the extent of savings. Firms may "put aside" some of their net revenues to purchase new (rather than simply replace old worn out) equipment, buildings and other facilities. Or they may attempt to borrow it from persons and organizations outside the firm who decide to save part of their income for use in the future. For

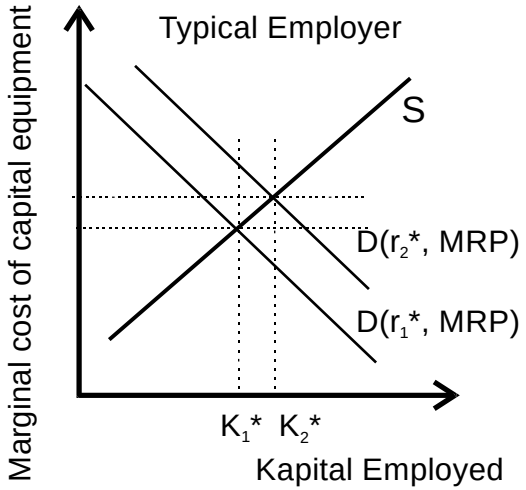
example, such persons may put their money in a bank that pays interest on deposits with the understanding that the banks will loan most of it to other consumers and to firms who use their loans to purchase additional capital equipment.

The combination of these two types of saving is the source of new capital investments. When savings are just sufficient to replace existing equipment, then no accumulation occurs. When it is more than sufficient, then capital accumulation occurs. When it is less than sufficient, capital may be drawn down, the opposite of growth may occur.



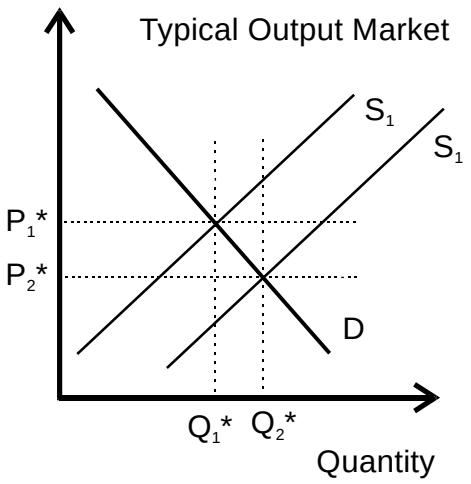
Capital Accumulation and Savings

An increase in the supply of savings tends to lower interest rates which encourages firms to borrow from banks (or from their own reserves) to purchase additional capital equipment. The quantity purchased reflects its contribution to production and its cost, which can be thought of as the interest that has to be paid on loans (or the opportunity cost of its own reserves).



Supply Curves in Final Goods Markets

The effect of employing more capital (at a lower interest cost) is to reduce the marginal cost of production at the level of firms that are relatively capital intensive. This increases the supply (shifts the market supply to the right), which other things being equal tends to increase market sales and lower the prices of final goods. (This adjustment reduces the profits from the capital employed.)



Capitala Accumulation and Labor Markets

In a setting where labor and capital are used together to produce goods and services, a decrease in the cost of capital tends to induce the substitution of capital for labor. However, the effect of capital on the marginal product of labor tends to increase wage rates for those persons still employed at the firms using additional capital.

The overall effect on employment is theoretically ambiguous. However, historically, the effect of capital accumulation is to increase (real) wages and overall employment. The labor released from one type of occupation tends to be hired by other firms or redeployed to help out with maintaining the new capital stock, transport the increased sales, and keep track of all the new contracts and planning necessary.

Thus, although the direct effect is to reduce employment, the indirect effects on employment and wages tend to be positive. In the long run, empolyment increases and (real) wages tend to increase as firm owners (entrepreneurs) find new uses for labor in the industries hiring fewer workeres.

An increase in either the physical capital used in production or the human capital used in production tends to **increase the marginal product of labor** and therefore tends to **increase wage rates where the new capital is employed**—other things being equal.

The increase in income associate with a higher marginal revenue product, then increases the demand for all normal and superior goods (although it reduces them for inferior goods).

The result is an increase in the economy's total output measured in real value terms (social net benefits) and in terms of revenues from sales (real gross national product, RGNP).

Such an economy is no longer "evenly rotating." A continual increase in its capital stock creates a spiral of ever-increasing output.

It is this capital-accumulation model of growth that many economists refer to when they discuss "classical growth models."

Classical growth models rely upon capital accumulation to propel an economy forward (e.g. to increase average income).
In principle, there are many different kinds of capital, just as there are many inputs and outputs, and these models only capture a few key relationships.

Increases in the Stock of Capital May Effect Many Markets

Economies are complex connected systems with many inputs, products, firms, and consumers, most of which are connected to each other. Capital is not a single homogeneous type of input any more than labor is. There are all kinds of capital goods, from pins and needles to computer and cell phones, to nuclear power plants and hydro electric dams. Expanding one type of capital use, often increases the demand for many others—which is doubtless partly why the accumulation of capital has tended to increase employment opportunities rather than diminish them.

Macro-economists simplify this system by assuming that there are just two inputs (capital and labor) and one final output, but that is only to make the

models easier to understand and manipulate.

(We'll leave further discussion of the classical growth model to your macroeconomics classes, but it is important to understand that classical growth models are essentially micro economic models that are based on rational choices and capital accumulation.)

Practice Problems. As an exercise, draw a series of diagrams to illustrate market prices, a typical firm's output decision, a typical consumer's purchase decisions, and the market for labor.

(i) Note that average wages determine income for the average consumer, and that w* = MRP = P* x MP

(ii) Now assume that the marginal product of labor increases because human or physical capital increases.

(iii) Show the effects on consumer income, market demand, and market equilibrium.

(iv) How does this change affect the distribution of profits and consumer surplus in your model?

(v) How does this change increase total social surplus and total sales in your model?

(vi) How would your results change if you shift from Marshallian to Ricardian models of long run supply?

(vii) Repeat for another set of diagrams with different slopes.

IV. Innovation and Growth (Schumpeter: Creative Destruction)

A. The classical model, growth implies that more and more of the same final goods and services are produced as capital is accumulated. There are larger supplies of most preexisting outputs and so higher real incomes for the persons living and working in an economy.

B. **However, there is more to economic growth and development than simply more of the same goods and services. Innovations tend to increase both range of products and the methods of production in markets undergoing continual growth.**

C. Joseph Schumpeter was an Austrian economist who took a position at Harvard in 1932. For the most part, he wrote in the period between WWI and WWII and argued **that innovation is an important engine of economic growth,** and that **innovation is generated by entrepreneurs.** Schumpeterian entrepreneurs are thus innovators.

(i) Entrepreneurs create new products and new production processes.

(ii) By doing so, they "disrupt" or "creatively destroy" previous market equilibria.

(iii) New products, for example, usually affect demands for other related products (both substitutes and complements).

(iv) New production methods affect demands for inputs through effects on marginal product.

(v) In some cases, they disrupt very long-standing patterns of life, as when the Automobile (at about this time) displaced horses as the main mode of transport.

Schumpeter called this process of innovation and market response the process of **creative destruction**. (Others, today, refer to such entrepreneurs as "disruptors," because they disrupt preexisting business models and market equilibria.)

Many innovations have major impacts on the pattern of life in a community. Automobiles, for example, greatly altered patterns of life in communities, among communities, and the landscapes of communities themselves.

(i) Road networks in old town centers had to be widened in many cases (and paved).

(ii) Buggy whip manufacturers lost markets and had to find bug whip makers had to find new jobs.

(iii) Old stable and feed networks, which extended right into downtown areas, had to find new uses for their buildings and supply networks.

(iv) New facilities were built to fuel, repair, and service automobiles (sometimes in the old stables, but often in completely

new buildings with completely new designs).

(v) Economic growth is not simply "more of the same," rather it is new products and new methods of production.

Contemporary economics agrees with Schumpeter that innovation is a significant source of growth, perhaps half of it.

Schumpeter further argued that large profitable firms often undertake much of the innovations. Thus, there are often dynamic advantages of monopoly power that ordinary static models of monopolies ignore. These dynamic benefits may more than offset their static deadweight losses.

- (This point is still debated.
- After all, Apple computer began as a very small firm in a garage. Similarly, Facebook started off in college dorms, etc. etc.)
- However, once up and running and profitable, both firms engaged in a good deal of innovation, bringing new products and services to markets.

Practice Exercises and Thought Questions. Draw a series of graphs to represent the market for Automobiles and Horses in 1900 (when automobiles were still luxury goods).

(i) Now imagine that Henry Ford invents the assembly line and reduces the price of cars by 60% through improved production methods and introduces the model T in 1908.

(ii) Show the effects of this innovation on the markets for automobiles and horses.

(iii) Repeat for the markets for land line telephones and cell phones (Blackberries, Nokias, etc.) after the introduction of the I-phone by Apple in 2007.

V. Risk and Uncertainty in Economic Activities (Knight: Entrepreneurs as Risk Takers)

A. Frank Knight had a somewhat different take on the role of entrepreneurs. He was a professor at the University of Chicago in the early twentieth century and during the same period as Schumpeter. His work was better known in the United States because he wrote in English rather than German..

B. Knight's analysis of competitive economies, profits, and growth focuses on risk and uncertainties, rather than creativity.

(i) He argues that some risks can be understood, and others cannot. Those that can be understood can be insured against, but those that cannot, cannot be insured against.

(ii) The latter can be a source of true profits even in a perfectly competitive market.

(iii) (Note that Schumpeter's innovative entrepreneurs take risks in markets where they cannot be sure of success.)

(iv) (Note also that innovation can generate risks for market participants, especially major ones of the creative destruction variety.)

C. Most neoclassical models and classes ignore risk and uncertainties and focus on price theory, income, and scarcity in a world where there are few risks and both firms and consumers are very well informed. (This was true of our models covered in the first part of this course.) .

D. However, as Knight reminds us, much about life in the real world is uncertain, including the weather, illness, accidents, and close elections. All these events affect markets by affecting the productivity or wealth (marginal product of land, labor, capital, or their value) and thereby marginal costs.

All kinds of factors that influence patterns of demand or production costs vary year-by-year, season by season, and from time to time.

Such random shocks imply that market demand and supply are also somewhat random and thus so are market prices.

E. **Price, outputs, and incomes** may still be fully determined by marginal product and marginal benefits, but because these vary a bit because of random shocks, prices, outputs, and income will also be **partly random**.

(Some demands are also seasonal, as with the demand for ice scrapers and snowshoes, but we'll ignore these for now.)

F. Knight points out that a variety of steps can be taken by firms and consumers to deal with risks including the accumulation of reserves (rainy day funds), purchases of loss reducing capital goods (umbrellas), and diversifying portfolios (growing more than one crop, holding more than one kind of stock, producing more than one kind of product, etc.)

G. Another way to reduce the risk of losses of various kinds is to purchase of insurance. (A topic taken up in more detail in the next chapter.)

(i) Any well understood and bounded risk can be insured.

(ii) Thus, Knight's analysis predicts the emergence of insurance markets.

H. Risk averse persons will purchase such insurance because they are willing to pay a positive price to limit their losses.

(i) Most insurance limits losses by paying insured persons some amount of money when an unpleasant surprise occurs: a car accident, a house fire, a nasty illness, etc.

(ii) Large insurers can provide insurance more cheaply than smaller firms, because of the law of large numbers in statistics (e.g. sample variance falls with sample size, as developed in the next chapter).

(iii) The latter implies that insurance markets are unlikely to be perfectly competitive, although diminishing returns in the effects of sample size together with administrative costs imply that insurance markets are probably not natural monopolies.

(iv) Frank Knight argued that average profits from insurance are approximately the average for supplier of other goods. That is to say, insurers in equilibrium earn only their opportunity cost rates of return, and thus no pure economic profits (on average). He thus assumes a Marshallian model of long run supply of insurance.

Given this, he argues that people who purchase insurance receive it at least cost--at an actuarially fair price.

Some people use the insurance (receive payouts) while others do not, but this does not imply that insurance purchasers "profit" or "lose" from their policies.

The actuarially fair price is $C = Pr*L + H$, where Pr is the probability of a particular loss, L is the amount paid by the insurance if that loss occurs, and H is the firm's overhead for selling insurance and settling claims.

I. Knight also pointed out that there are risks that cannot be fully understood. **He called these risks "uncertainties."** Uncertainties, he argued, cannot be insured.

(i) Thus, uncertainties can produce profits and losses even in Marshallian markets with perfect competition, because of the nature of uncertainty.

- Taking on such risks personally sometimes allows entrepreneurs to do a lot better than average, to earn more than their opportunity cost rate of return, e.g. true economic profits.
- These unknowable risks are sometimes called "**Knightian Uncertainty**."
- He argued, for example, that many new firms and products are instances of such **uncertain investments**.

(ii) **Entrepreneurs are those willing to take on such unknowable risks** (based on their guesses/intuitions about what they really are).

(iii) In Knight's theory of markets and entrepreneurship, **entrepreneurs are risk takers**, who may make large profits if they are right, but may earn large losses (or become bankrupt) if they are wrong.

(iv) (Note that Schumpeter's entrepreneurs are innovators as well as

risk takers--a subset of Knightian entrepreneurs.)

J. In a Marshallian world, true profits can only occur because some risks cannot be known, and entrepreneurs are brave (or foolish) enough to **take the risks** that produce them.

(i) Otherwise, average returns will be the normal competitive one of the Marshallian world.

(ii) Only entrepreneurs can earn true economic profits or losses, on average, because they take risks that others will not, often without much competition..

(iii) (Note that Knightian entrepreneurs may also earn a monopoly profit, but Knight does not address such issues.)

VI. Markets as Coordinating Systems (Kirzner: Finding and Eliminating Market Opportunities and Inconsistencies)

A. Israel Kirzner, who wrote in the post WWII period, suggests that markets do not always clear by themselves. Sometimes they need a bit of help from entrepreneur speculators.

- That is to say, Kirzner suggests that the inventory adjustments of suppliers and shopping efforts of buyers are not always enough to clear markets within a region, nation, or world.

(i) Alert speculators--those who buy low and sell high--are often necessary for markets to clear at a single price.

(ii) Kirznerian entrepreneurs are especially insightful businessmen. They may not be risk takers in the Knightian sense, nor particularly creative in the Schumpeterian sense, but they also undertake activities not included in neoclassical models.

(iii) Their efforts tend reduce unrealized gains from trade and bring prices toward their theoretical values.

B. Speculators move markets towards a single price equilibrium by purchasing goods (or assets) in markets where it is cheap (underpriced) and selling it in markets where the goods are more expensive (overpriced).

- Of course, this process works only for portable goods and services--of which there are many.
- But some immovable goods can be made portable by selling partial rights to them, as in stock markets where shares of immovable assets and their associated profits (net revenues) are bought and sold.
- This process of exploiting market inconsistencies (**speculation**) Kirzner calls Entrepreneurship.

C. Kirzner's entrepreneurs are simply persons who are **more alert** than average to market opportunities (inconsistencies).

(i) By exploiting disequilibrium conditions, Kirzner argues that entrepreneurs make profits and **move markets toward equilibrium**, rather than away from them, as in Schumpeter's analysis.

- Entrepreneurs in Kirzner's sense are "grease" that makes the gears of supply and demand operate more smoothly.
- This contrasts with the roles of entrepreneurs in Schumpeter's view are "shocks" to market equilibria that move markets to new equilibria.

(ii) Kirzner also argues by pushing prices toward their true equilibrium levels, the resource allocation of markets as a whole also become more efficient (more likely to minimize the cost of production).

(iii) Within the context of the social net benefit maximizing normative theory, we would conclude that entrepreneurs help to maximize social surplus (social net benefits)--although Kirzner would resist using the concept of SNB.

D. Thought Questions. All three concepts of the entrepreneur provide important explanations of economic growth and development that are not usually included in the (neoclassical) competitive model.

(i) Explain why price takers cannot be entrepreneurs in any of these three senses.

(ii) The entrepreneurial models are, however, consistent with

monopolistic competition models. Explain why.

(iii) Are all small business owners entrepreneurs? If not, why not. If so, in what sense? Discuss.

VII. Entrepreneurs and Evolutionary Economic Development

Kirzner and Schumpeter's entrepreneurs are in a sense "super men" or super-informed, very creative, men and women who recognize possibilities that no one else does.

Another way to think of these activities (innovation and speculation) allows us to dispense with such all-knowing or brilliant entrepreneurs. We can replace such imaginary persons with entrepreneurs that make **hypotheses about neglected market opportunities and by following up on their hypotheses, they test their theories. If they are correct they profit, if not they go out of business.**.

A. With such ideas in mind, Viktor Vanberg and James Buchanan suggest that markets should be thought of as **experimental laboratories**.

B. In effect, Vanberg and Buchanan combine the three theories of entrepreneurship. Their entrepreneurs are all, in a sense, like scientists testing hypotheses—not about properties of nature or society, but about market opportunities.

- Such entrepreneurs are experimenters, who test their hypotheses about markets by launching products, firms, and purchasing assets of various kinds.
- If they are right, they earn profits, as in Knight's theory.
- If they are wrong they lose money because their idea fails to attract sufficient support from consumers.

C. Prior to their investments, Buchanan and Vanberg suggest that it is impossible to really know whether their experiment will succeed.

- Will the new Panera's be profitable or not?
- Does Morgantown need another Duncan Doughnuts or not?
- Is there a market for Dick Tracy watches ala Samsung and Apple or not?
- Are stock markets too high or too low?

D. Fredrich Hayek--writing after Knight and Schumpeter, but before Vanberg and Buchanan—develops a similar argument.

i. He suggests that markets are for all of these reasons and also because of the nature of competitive market processes that affect innovation and the allocation of resources, great social mechanisms for inducing the efficient use of resources including knowledge that varies among individuals.

ii. Market prices, products, and production methods reflect a broad subset of the information of all market participants.

- No single persons or small group could have all the information that firms, consumers, and entrepreneurs take account of (jointly).
- Thus, competitive markets nearly always outperform centrally planned economies in markets for private goods.
- This is not to suggest that markets are perfect, but simply to say that they (usually) make more effective use of information that is dispersed in the minds of millions of entrepreneurs, workers, and consumers than other forms of organization.

Of course, markets would work less well without a well-functioning legal system that clearly defines and enforces property, contract obligations, and liabilities...what some people call "property rights." We'll take some of those issues up towards the end of this course if there is time.