Wages, Rent, Interest, and Profit

In Chapter 16, we discussed the general principles of input markets. However, some special issues arise when considering particular input markets, and these are discussed in Chapter 17. We begin with the labor market because wages account for 75% of U.S. national income.

Supply of Labor

Overall wages are determined by the market supply and demand for labor. The aggregate demand for labor reflects the MRPL, but the supply curve is somewhat unique. There are a fixed number of hours in the week so a decision to supply labor is also a decision to demand leisure. After deducting time for sleeping and eating, a person has 90 usable hours in a week. So a decision to work 40 hours is a decision to use 50 hours for other purposes. We can study the labor supply curve by examining the demand for leisure.

Consumers can buy back leisure time just as they can buy cars and groceries. Recall that any price change has two effects: an income effect and a substitution effect. These effects impact the demand for leisure and therefore the shape of the labor supply curve.

(1) Substitution Effect (SE): Consumers can buy their leisure by giving up an hourly wage. So the wage rate is the price (or opportunity cost) of leisure. When the wage rate rises, the price of leisure increases relative to other things a consumer can buy with a wage. So an increase in the wage leads to a reduction in the demand for leisure and an increase in the supply of labor.

(2) Income Effect (YE): Higher wages make consumers richer. The increase in wealth should lead to an increase in the demand for all goods, including leisure. Thus, a higher wage can lead to a reduction in the supply of labor.

Consider the labor supply curve drawn below.
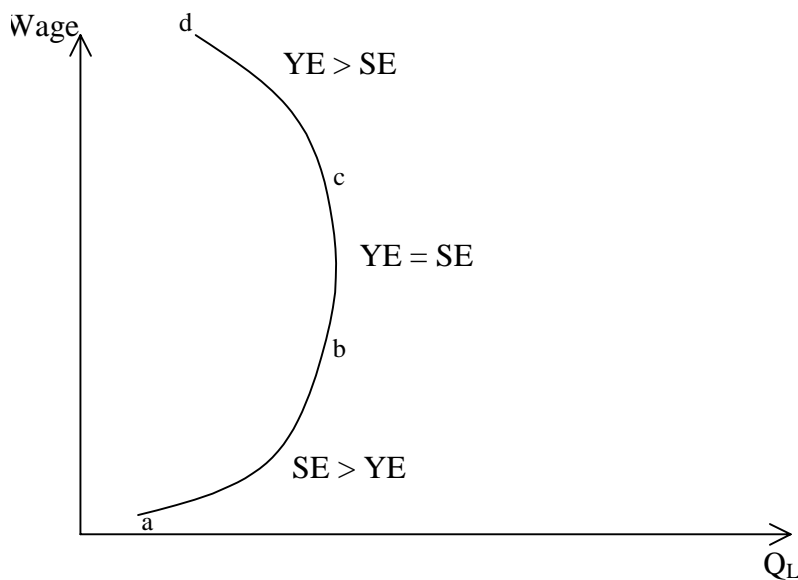
Depending on the worker, higher wages could lead to more, the same, or less labor supplied. Studies indicate that labor supply changes from wage changes are not very strong, so the market labor supply curve in the U.S. looks like the b-c segment in the graph above. However, the labor supply curve for low-wage workers resembles the a-b segment. High-wage workers in the U.S. typically supply the same number of hours when their wages rise, so their labor supply curve resembles the b-c segment.

The Demand for Labor and Wage Determination

Profit-maximizing firms hire workers up until the point where the wage equals the MRPL. Recall that the demand for labor is a derived demand. If product demand rises and increases the price of the good, then the MRPL rises and the demand for labor shifts outward. Equilibrium occurs where the supply and demand for labor intersect. In the diagram below, the average daily wage is $100 and 500,000 workers are employed.
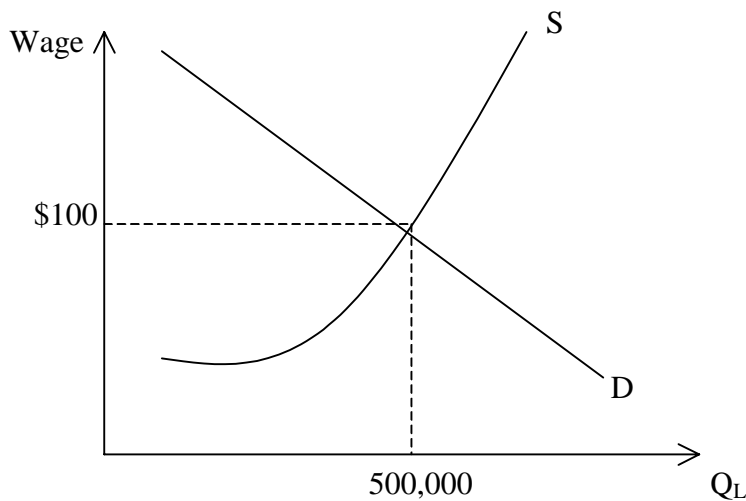
Why Wages Differ

Of course, there is not one labor market --there are many, each with its own supply and demand curves and equilibrium wages. In general, low-wages are found among the young, the disadvantaged, and the uneducated. Why are some wages so low, while others are so high? Supply and demand tells us some of the story: wages are high when supply is low and demand is high, while wages are low when supply is high and demand is weak.

Why is the demand for labor greater in some markets versus others? MRPL is determined by the MPPL, which depends on workers' own abilities and efforts on the job. Sometimes these characteristics are less important than the supply of other factors of production available for workers to work with. U.S. labor is more productive than Mexican labor because U.S. workers have more machinery, natural resources, and technology to work with. As a consequence, manufacturing workers in the U.S. earn 16 times as much as their Mexican counterparts. Recall that the MRPL rises with the amount of capital employed by the firm. The MPPL is also influenced by education, training, and job experience.

The supply of labor differs across labor markets. The size of the available working population relative to the magnitude of industrial activity in an area is important. Wages are high in low populated Alaska with its pipelines and fisheries, whereas wages are low in Appalachia where industry is inactive.

There are also non-monetary components (called compensating wage differentials) of any job that affects the wages paid and influences the supply of labor. Pleasant jobs such as teaching students in suburban schools attracts lots of labor so the wage is low. Unpleasant jobs, such as garbage collection, does not attract many people so the wages is fairly high. For example, professors at CSU campuses make 10% less than California prison guards. The prison guards receive a higher salary to *compensate* them for the dangers they face at work.

The amount of training needed to enter a profession will impact the supply of labor. Neurosurgeons and NBA stars have high incomes because there are few people as highly skilled as they and it's time consuming and expensive to acquire these skills, even for people with the ability to complete the necessary training.

Human Capital Theory

To go to college you pay tuition, but you also forego earnings by attending school, and the loss of income is more costly. Your education is an investment in yourself. Like a firm that builds a plant to increase its future earnings, you are investing in the future hoping your college education will allow you to earn more in the future. You may also be able to find a job that is more prestigious or pleasant after graduating. Doctors and lawyers earn high salaries because of their many years of training. High wages are the return on their investment.

Studies have shown that a college education pays off. Recently, the gap between the wages of high school and college graduates has been growing. In 1973 (1994), college graduates earned 45 (65) % more than high school graduates.

Jobs requiring more education pay higher wages to encourage people to go to school. Firms are willing to pay educated workers higher wages because they are more productive on the job. Schooling and training raises the MRPL. Universities are the factories that take unproductive workers as raw materials and apply training to produce workers that are productive as outputs. This view of what happens in school makes educators happy and agrees with common sense. However, some social scientists doubt that this is how schooling increases earnings power. The dissenting views are summarized below.

(1) Education is a sorting mechanism: Education doesn't teach students anything relevant to their jobs. People differ in ability before they enter school and leave the same way they came into school. Education sorts people by ability --more intelligent and disciplined people are successful in school and they will be more successful on the job. Harder working, more intelligent people stay in school longer and employers know this, so they hire educated workers.

(2) Radical view: Education doesn't sort people by ability, it sorts them by socio-economic class. The rich can buy better education and keep their kids in school regardless of ability. Education

allows wealthy families to pass their economic status to their children, while making it appear valid for firms to give them higher salaries.

Schools don't teach knowledge, they teach discipline --how to show up for work on time, how to speak respectfully, follow authority, etc. Businesses prefer these attributes and want to hire more educated workers. Schools teach docility and the acceptance of the capitalist status quo, making schooling attractive to firms.

(3) Dual labor markets: Good jobs are in the primary labor market. These jobs are interesting and offer career advancement. Education determines who will enter this market and there are financial rewards for those who go to school. Economists, who believe this theory, think that school does teach some valuable skills. But, they agree with the radicals --that wealthy kids have better access to schools and education.

Bad jobs (such as fast food or retail services) are in the secondary labor market. The jobs in this market are characterized by low-wages, few benefits, and no on-the-job training or advancement. Lateness and absenteeism are frequent because the jobs are so bad that these workers develop bad work habits, which confirms the prejudice of those who assigned them to the bad jobs in the first place. Higher education doesn't lead to higher wages or greater benefits. So workers in the secondary labor market have little incentive to invest in education.

In summary, educated workers earn higher wages, but there are different beliefs about how education contributes to higher wages.

Determination of Rent

Rent is the payment for use of land. The supply of land is unique --it is generally considered to be fixed. People can clear land, drain swamps, and fertilize it, but it's difficult to change the total supply of land with human effort. Consider the diagram below for a small town.

Annual rent per acre

S

$2,500 ------------------- 1

$2,000 ------------------- 0

D'

D

1,000

Q_T (acres)

4
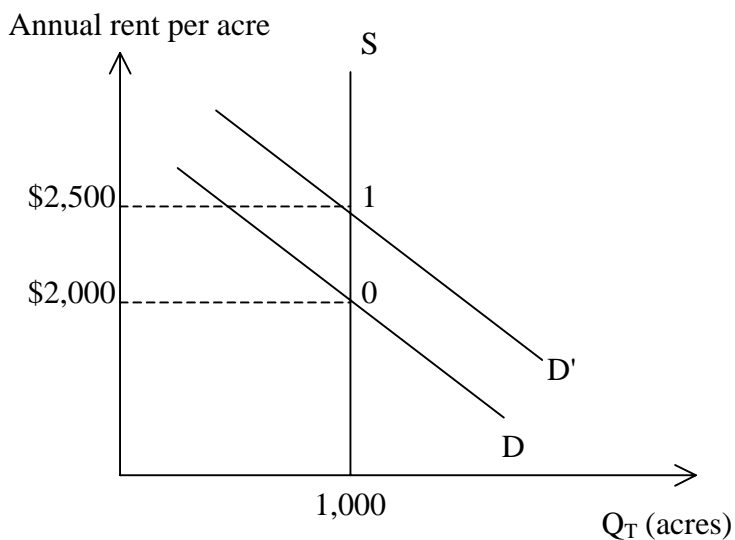
Notice the vertical supply --there are 1,000 acres in the town no matter what the rent. The demand for land (T) reflects the MRP$_T$. Rent is determined by the intersection of supply and demand --$2,000 per year. The level of rent is determined entirely by the demand side of the market. If the demand for land increases to D' as people move into the area, the annual rent rises to $2,500 per acre. The landowners earn more money, but they do not supply additional land.

An economic rent is a payment for a factor of production (e.g., land) that does not change the amount of the factor that is supplied.

Some Complications in the Rent of Land

All land is not identical --it differs with respect to soil, topography, access to sun and water, and proximity to the marketplace. Capital invested on any piece of land must yield the same return as capital invested on any other piece of land. For example, if a crop is produced for $160,000 (in labor, fertilizer, equipment, and fuel) a year on plot A and for $120,000 on plot B, then the rent on B must be $40,000 higher. Otherwise, the production on plot B is cheaper and this would lead farmers to bid for plot B until the rent was $40,000 higher than plot A.

Some pieces of land are such low quality that it doesn't pay to use them (e.g., remote deserts). Any land on the borderline between use and non-use is called marginal land. It earns no rent because if rent were charged no one would use it.

Rent on any piece of land will equal the difference in the cost of producing output on that land and the cost of producing output on marginal land.

If the population increases, the demand for land rises and (1) it will now pay to use some land whose former use was unprofitable. For example, land that could not be given away in the west is now quite valuable. And (2) people will begin more intensive use of the land already in use. For example, build high rise condos instead of single family homes.

Land that is marginal after the change must be inferior to land that was marginal previous to the change. Thus, rents increase by the difference between the production costs on the old and new marginal lands. Consider the non-rent costs and rent on 3 pieces of land.

Type of Land (plot)	Non-land cost of producing crops	Total Rent	
		Before	After
A --better than marginal before and after	$120,000	$80,000	$92,000
B --marginal before but not anymore	$200,000	$0	$12,000
C --previously not worth using, now marginal	$212,000	$0	$0

Crops cost $80,000 more when produced on B versus A, so the rent on A is $80,000. The increased demand for land is great enough to bring plot B into use. Plot C is now marginal land

and B requires a rent of $12,000 --the cost advantage in using plot B over C in production. Plot A's rent must rise to $92,000 --its cost advantage over plot C (the new marginal land).

Rent also rises because of higher intensity in the use of land already in cultivation. As farmers apply more fertilizer and labor to the land, the MRPT is rising and the landowners capture this in the form of higher rents. Remember the demand for land is driven by the MRPT, so when the MRPT rises, so do rents.

What determines the Shaq's salary?

Land isn't the only scarce input whose supply is fixed, at least in the short run. For example, Shaquille O'Neal earned $30 million dollars playing basketball in 1994. Rent applies to the Shaq because there is only one Shaq --he is in fixed supply.

Economic rent: is any payment made to a factor above the amount necessary to induce any of that factor to be supplied to its present employment.

So a payment to an input has 2 components.
(1) The minimum payment needed to acquire the input --to compensate labor for the loss of leisure, unpleasantness of work, etc. Otherwise, the worker won't supply any of his labor.

(2) Bonus that goes to inputs of high quality --payments to talented workers or extra payments to a better piece of land. Understand that the bonus is great for the worker, but it isn't a deciding factor in the decision to work.

For land, the total supply of land is available for use whether rent is high, low, or zero. So payments to landowners are entirely economic rent, because they are unnecessary to induce the quantity of land in the economy.

Consider the market for Shaq's salary in 1994.

Annual wage
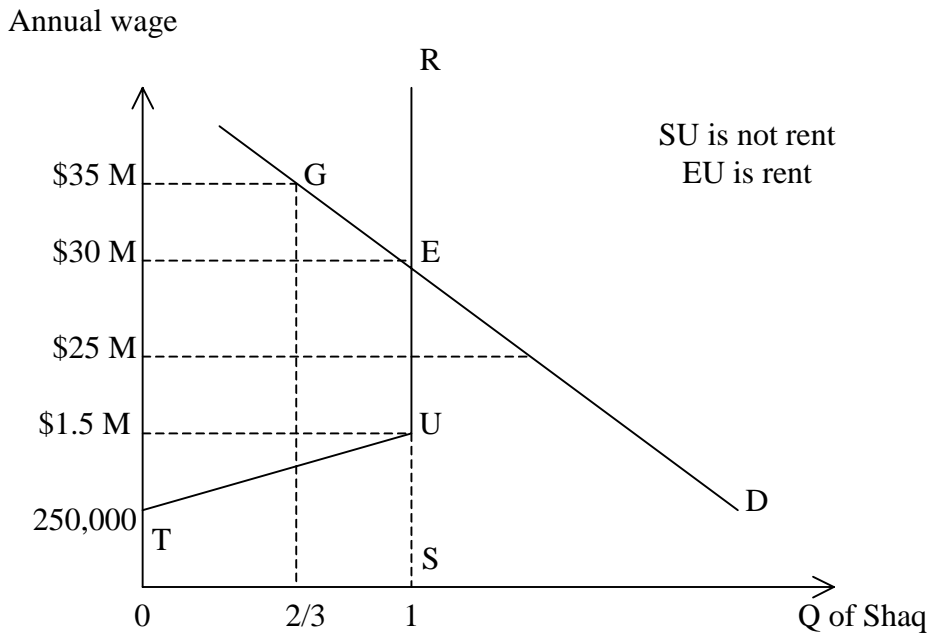
There is only one Shaq. The demand curve reflects the portion of his time demanded at various wages. No one can afford Shaq at $50 million a year. At $35 million 2/3 of his time is demanded. At $25 million the demand for his time is greater than the supply. Supply and demand are equal at $30 million. How much of Shaq's salary is rent? At $250,000, Shaq prefers to play golf and he won't work. But at $1.5 million he is willing to work full-time.

Many factors earn some rents.
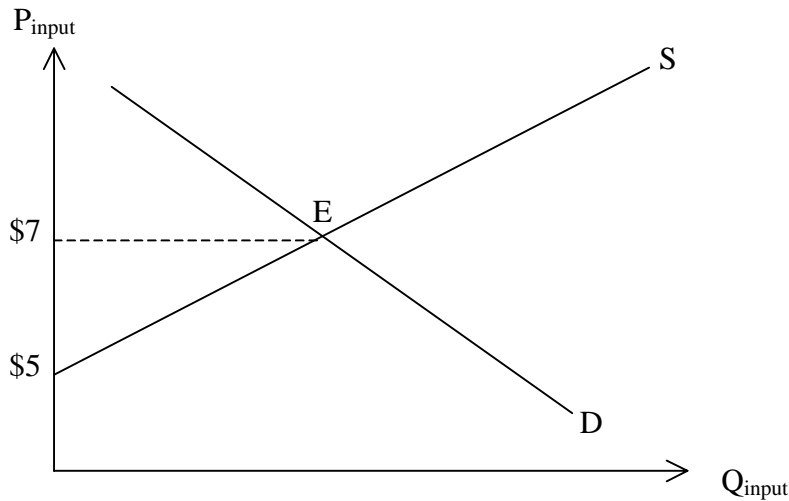
The equilibrium is at $7.00 but $5.00 induces some of the input to be supplied. So there is some rent to input suppliers who get more than the minimum to work. Almost all employees earn

rents. Are there factors that earn no rents? Ball-bearing suppliers --it cost $0.50 to produce one and competition drives price = cost.

Many people feel the rent they pay to their landlord is economic rent. After all, apartments would still exist if they paid $1500 or $1,000 per month. This is true in the SR, but not in the LR. Owners of buildings cannot collect economic rent in the LR, because other builders will construct apartments, condos, and houses and compete away those rents.

Investment, Capital, and Interest

The interest rate is the price at which funds are borrowed. Interest rates are determined by the supply and demand for loanable funds. Funds are loaned to users in many ways: mortgages, corporate or government bonds, and consumer credit. On the demand side are borrowers -- people or institutions that wish to spend more than they currently have. In business, loans are often used to finance investments.

Investment: flow of resources into the production of new capital. It is the labor, steel, and other inputs devoted to the production of plants and equipment.

Capital: refers to a stock of plant, equipment, and other productive resources held by the firm, individual, or organization.

A firm borrows funds to finance an investment, which is the acquisition of the physical capital the firm will buy.

Investment is the rate at which capital grows. The larger the level of investment, the greater the rate at which capital grows. Think of filling a bathtub. The accumulated water in the tub is the stock of capital and the flow of water from the faucet is the flow of investment. The capital stock only increases when there is investment. If investment equals 0, then the capital stock remains constant and doesn't fall to zero.

Investment Production Process
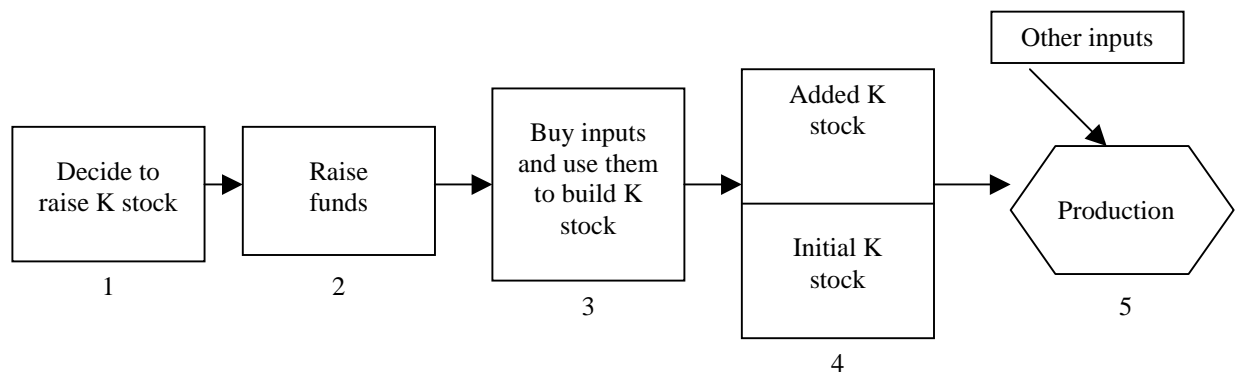
Step 1: firm decides to increase the capital stock.

<u>Step 2</u>: it raises funds to finance its expansion from outside sources, such as banks, or by holding onto part of its earnings, rather than paying them out as dividends to company owners.

<u>Step 3</u>: it uses the funds to hire inputs to build factories, warehouses, etc. This is the act of investment.

<u>Step 4</u>: the firm has a larger stock of capital once the investment is complete.

<u>Step 5</u>: capital is used (with other inputs) to increase production or lower costs. At this point, the firm begins earning returns on the investment.

If funds are borrowed, the firm must repay the lender. The payment is called interest and it is calculated as an annual percentage of the amount borrowed. For example, $1,000 is borrowed at 12% per year then the annual interest payment is $120.

Firms will demand the quantity of borrowed funds that makes the MRP of investment financed by the funds just equal to the interest payments.

Capital is different from any other input because it is durable and lasts for years. For example, a blast furnace (used in the production of steel) is a durable good because it contributes to today's production and to future production. Thus, calculating the MRPK is more complex than other inputs.

To determine whether an investment is profitable (i.e., MRPK > interest), requires a comparison of money values received at different times. To do this, economists use a procedure called "discounting".

It is important to know:

(1) A sum of money received in the future is worth less than the same sum of money received today.

> Compare $1 today versus $1 one year from today. If the interest rate is 10% then you could lend the $1 out for one year and earn $0.10 and receive $1.10 in one year. Thus, one dollar received today is worth more than $1 received one year from today. In fact, the discounted value of $1 paid one year from now is only $1/(1 + 0.10) = $0.91 today.

> And the discounted value of $1 received 2 years from now is $1/(1 + 0.10)^2 = $0.83 today. In other words if you placed $0.83 in the bank today and received a 10% annual interest rate, then in two years, you would have $1 in the bank.

> A little more work (shown on page 486 of the textbook) gives the formula for discounting a sum of money ($X) paid n years from now = $X/(1 + i)^n$ --where i is the interest rate.

(2) The difference in values of money today and money in the future is greater when the interest rate is higher.

> Now suppose the interest rate is 15%. Then $1.00 today yields $1.15 in one year (instead of $1.10). So the higher the interest rate, the greater the difference between a $1 received today and $1 in the future.

When looking at the discounting formula [$X/(1+i)^n$], you can see that higher interest rates lower the value of X paid in n years.

Interest rates are crucial in determining the economy's level of investment --or the amount of current consumption that people will forego to use resources to build machines and factories that can increase consumption in the future. The interest rate largely determines the allocation of society's resources between the present and future.

The Demand and Supply of Funds

The quantity of loanable funds demanded will fall as interest rates rise. The demand for borrowed funds is derived from the desire to invest in capital goods. But, the MRPK is received in the future. Thus, the MRPK in terms of today's dollar shrinks as the interest rate rises. Why? Because future returns must be discounted when the interest rate rises. So a machine that looks like a good investment at a 10% rate of interest may look terrible at 15%. So higher interest rates lower the demand for capital.

Loans look better to lenders when they receive higher interest rates, so the supply of loanable funds is upward sloping. The equilibrium interest rate occurs where the supply and demand curves intersect. This is shown below.

i Market for Funds S

12 ---------------------- E

A   B
8 - - - - - - - - - - - - - - - -

D

Q_{funds}
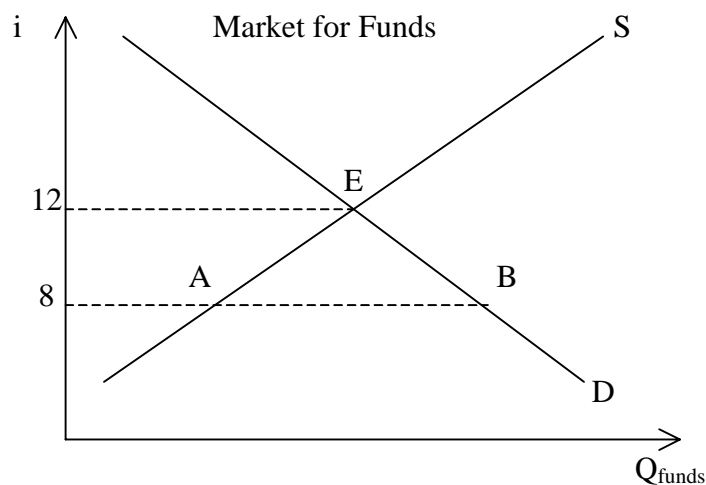
Are interest rates too high? Usury laws try to restrict the interest rate. Black markets often develop and people who are willing to lend charge rates of interest that are higher than the equilibrium rate to compensate them for the risk of being caught. If a usury law prohibits interest rates above 8% then the quantity demanded is greater than the quantity supplied. So applicants for bank loans are turned down even if they have good credit. The people who gain are the lucky consumers who get the loans at the cheaper interest rate. Banks who want to lend at 12% and borrowers who want funds at 12% lose. Few people sympathize with bank stockholders and the consumers who get the loans at 8% are happy. The unlucky consumers

don't blame the government's usury law. Usury laws have no effect if the limit on interest is 8% and the equilibrium is 6%, but the law does have an effect if the equilibrium interest rate is 12%.

Are profits too high or too low?

Many people feel that American corporations earn too much profit. Critics argue that the billion dollar profits of giant corporations should be taxed at higher rates. Business groups, instead, complain that regulations and competition keep profits too low and they constantly lobby Congress for tax relief.

In 1995, about 8.4% of GDP was business profit. Most people think that this figure is much higher. Economists are unlikely to state that factor prices are "too high" or "too low" in some moral or ethical sense. They are more likely to ask: what is the market equilibrium price and then ask whether there are any good reasons to interfere with the market equilibrium. This analysis isn't easy to apply to profits when you are uncertain as to which factor of production earns profits.

Profits are a residual --they are what remains from the selling price after all the other factors have been paid. So what factor of production receives this reward? What factor's MRP constitutes the profit rate?

What accounts for profits?

Economic profit is the amount the firm earns over and above the payments for all the inputs, including the interest paid on any capital supplied by the firm's owners. Profit is the payment of the opportunity cost of capital the firm's owners provide to the firm. Profit is closely related to the interest rate. In a pretend world where everything is certain and unchanging, the capitalists who invested money in firms would simply earn the market rate of return on their funds. Profits above the market interest rate would be competed away and profits below this level would causes capitalists to withdraw their funds from firms and deposit them into banks. In this pretend world, capitalists are just moneylenders.

But, in the real world, capitalists are more than moneylenders and they often earn returns that exceed the interest rate. Active capitalists that seek out and create earnings opportunities are called entrepreneurs. There are 3 primary ways in which entrepreneurs are able to drive profits above interest levels.

(1) Exercise of Monopoly Power: If an entrepreneur can establish a monopoly over some or all of her products, even for a short time, she can use the monopoly power of her firm to earn profits.

(2) Risk Bearing: An entrepreneur can engage in risky activities. For example, when a firm prospects for oil, it drills an exploratory well hoping to find a pool of petroleum at the bottom. Yet, a high proportion of such attempts produce only dry holes and the cost of the work is wasted. Of course, if the investor is lucky and finds oil, she is rewarded handsomely. The income she receives is a payment for taking risk.

A few lucky people make out well, but most suffer large losses. How well do we expect risk takers to do on average? If 1 out of every 10 exploratory drilling pays off, we expect its return to be 10 times as high as the interest rate.

(3) <u>Returns to Innovation</u>: This is most important from a social welfare standpoint. The entrepreneur who is first to make a desirable new product or use a cost-saving machine will receive a higher profit than that going to a less innovative (but similar) business manager. Innovation is not the same as invention. <u>Invention</u> is the act of generating a new idea and <u>innovation</u> is the act of putting the new idea into practical use.

A person who is able to bring a new product to market or produce a product more cheaply will temporarily be ahead of the competition by selling to more customers.

Monopoly profits --the reward for innovation -- are only temporary because once other firms see that the idea is profitable, they will imitate it. Even if they can't produce the same exact product, they must find close substitutes in order to survive. The innovator's monopoly position comes to an end over time with competition. So to keep making profits above market returns, she must come up with new innovations.

The growth of the capitalist system is fueled by entrepreneurs' search for new ideas in order to earn profits.

<u>Profit Taxation</u>

Profit above the market rate of return is considered to be the return to entrepreneurial talent. But, no one knows exactly what entrepreneurial talent is, because you can't measure it or teach it. So we don't know how the observed profit rate relates to the minimum reward necessary to attract entrepreneurial talent into the market. Danger: if we tax away profits, then this may cause fewer people to enter the market in search of innovations and profit.

For example, if oil companies profits are mostly comprised of rents, then we could tax away the rents without reducing oil production and exploration. But, profits may not be largely economic rent. So increasing profit taxes may drain the lifeblood out of the capitalist system.