

Exam Wednesday, Feb 27

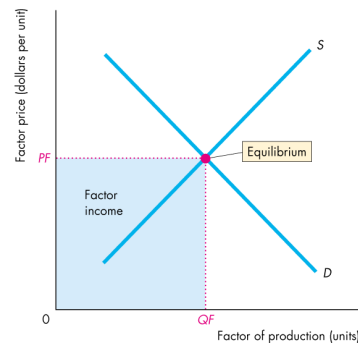
- Will cover chapters 14, 15, 16 only
- Identical format as first exam
- Practice exam reviewed in discussion sections Feb 20-26
- Extra office hours Tuesday Feb 26 1:30-2:30 in Sequoyah 231

Chapter 17: Markets for factors of production

Definition: *factors of production* are the inputs that a productive enterprise requires in order to produce its output

Factors of production

- labor (people)
- capital (equipment, buildings, tools)
- natural resources (land, raw materials)
- entrepreneur with technology to bring them together



Chapter 17: Markets for factors of production

A. Demand for labor

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Joe's Muffler Shop

Inputs:

- capital (building, tools)
- labor
- intermediate goods and services (mufflers, utilities)



Output:

- number of mufflers replaced



- Joe's shop nets: \$100 for each muffler replaced
- Question: take building, tools, and utilities fixed, vary labor

Number of workers	Output (mufflers per day)
1	5
2	8
3	9



Definitions:

The *marginal product of labor* is how much output would increase from hiring one more worker

The *marginal revenue product* is how much revenue would increase from hiring one more worker

Number of workers	Output (mufflers per day)		
1	5		
2	8		
3	9		

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	
1	5		
2	8		
3	9		

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	
1	5	5	
2	8		
3	9		

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	
1	5	5	
2	8	3	
3	9	1	

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	Marginal revenue product (\$ per worker)
1	5	5	
2	8	3	
3	9	1	

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	Marginal revenue product (\$ per worker)
1	5	5	\$500
2	8	3	
3	9	1	

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	Marginal revenue product (\$ per worker)
1	5	5	\$500
2	8	3	\$300
3	9	1	\$100

Definition:
 The tendency of the marginal product of labor to fall as the number of workers hired increases is referred to as *diminishing returns to labor*

Number of workers	MRP (\$ per worker)
1	\$500
2	\$300
3	\$100

- If Joe had to pay each worker \$200/day, he would want 2 but not 3 employees
- If Joe had to pay each worker \$100/day, he would want 3 employees

If $MRP > W$, would pay to hire more
 If $MRP < W$, would pay to hire less
 Proposition: A profit-maximizing firm would hire labor up to the point where MRP equals the wage

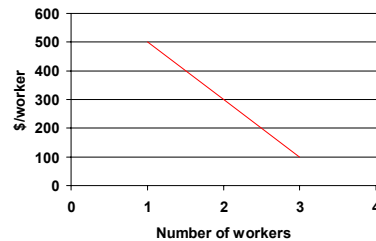
Note this is a special case of the general principle of setting marginal benefit equal to marginal cost

Marginal benefit of hiring one more worker = MRP

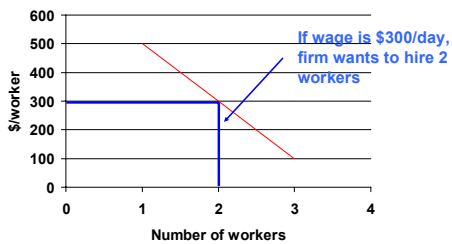
Marginal cost of hiring one more worker = wage

$MB = MC$ requires $MRP = W$

Marginal revenue product



Marginal revenue product

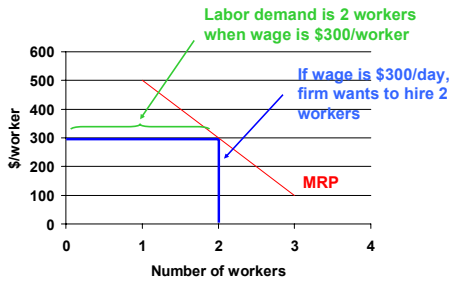


We can read firm's demand for labor off the MRP schedule

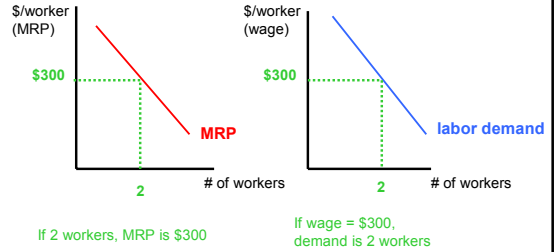
Summary: how to calculate firm's demand for labor

- Calculate how much output goes up by hiring one more worker (=MP)
- Calculate what this is worth in dollars to the firm (=MRP)
- Find largest number of workers for which MRP is greater than or equal to the wage
- This is the number of workers the firm wants to hire

On a graph, labor demand is the horizontal distance out to MRP schedule



Conclusion: MRP and labor demand are just two names for the same curve



Chapter 17: Markets for factors of production

- A. Demand for labor
- B. Supply of labor

Could ask three different questions:

How many people would be willing to work for a given wage:

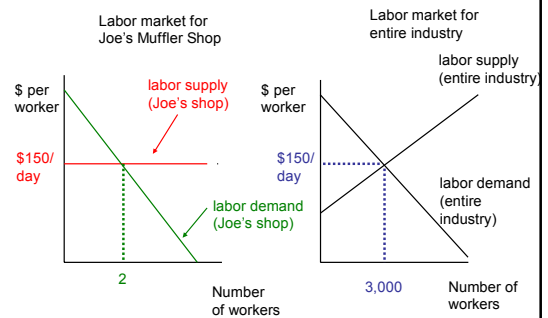
- at this particular firm? (gives us firm's supply of labor)
- in this industry? (gives us industry's supply of labor)
- in the entire economy? (gives us economy-wide supply of labor)

Perfect competition in the labor market:

- There are a large number of firms in this industry
- Workers don't care which firm they work at
- All workers have the same productivity
- No labor unions

Implications:

- All firms in this industry must pay the same wage
- The individual firm's supply of labor looks flat from point of view of the firm



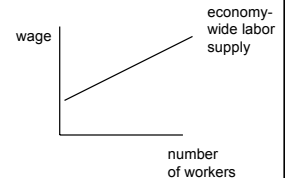
Labor supply curve for one industry: raise wage in this industry, holding wages in other industries constant

Labor supply for entire economy: raise wage in all jobs, what would happen to number of people who want jobs?

Substitution effect

One possibility: some people are attracted into labor force who wouldn't otherwise want to work

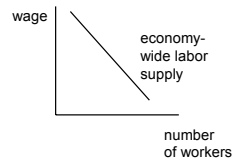
In this case, economy-wide labor supply curve would slope up



Income effect

Another possibility: if one member of couple earns more money, the other might feel he or she doesn't need to work (or each worker puts in fewer hours)

In this case, economy-wide labor supply curve would slope down



Can also focus on decision of how many hours each person works

- At low wages, substitution effect might dominate (increase wage induces more hours)
- At high wages, income effect should dominate (increase wage induces fewer hours)

This effect could result in a "backward bending" labor supply curve



Unclear (from both theory and evidence) which effect (income or substitution) dominates at which regions

Assumption for some simple illustrations: for small changes from current values, income and substitution effects exactly cancel out (vertical labor supply)

