Big Ideas about Factor (or Resource) Markets

1. The economic concepts are similar to those for product markets.
2. The demand for a factor of production is **derived** from the demand for the good or service produced from this resource.
3. A firm tries to hire additional units of a resource up to the point where the resource's marginal revenue product (MRP) is equal to its marginal resource cost (MRC).
4. In hiring labor, a perfectly competitive firm will do best if it hires up to the point where MRP = the wage rate. Why? Because wages are the marginal resource cost of labor in a perfectly competitive labor market.
5. If you want a high wage:
   - Make something people will pay a lot for.
   - Work for a highly productive firm.
   - Be in relatively short supply.
   - Invest in your human capital.
6. Real wages depend on productivity.
7. Productivity depends on real or physical capital, human capital, labor quality, and technology.

Marginal product (MP) is the change in your firm's total output (Q) from adding an extra worker: $MP = \Delta Q/\Delta Q_L$, where Q_L stands for quantity of labor.

Marginal revenue product (MRP) is the change in your firm's total revenue (TR) from adding an extra worker: $MRP = \Delta TR/\Delta Q_L$. Because, as a perfect competitor, you can sell all products you want at the market price (P), MRP = (MP)(P of product).

Marginal resource cost (MRC) is the change in your firm's total cost (TC) from adding an extra worker: $MRC = \Delta TC/\Delta Q_L$. Because, in a perfectly competitive market you can hire all the workers you want at the market wage, MRC = Wage.

The **profit-maximizing rule** for an employer is to hire the number of workers at which MRP = MRC.

The Demand for a Resource When the Product Market and Resource Market are Perfectly Competitive

(1) Units of resource	(2) Total product (Q)	(3) Marginal product (MP) = Δ (2)/Δ (1)	(4) Product price (P)	(5) Total revenue (TR) = (2)x(4)	(6) Marginal revenue product (MRP) = Δ (5)/Δ (1)
0	0	—	$5.00	$0.00	—
1	12	+12	$5.00	$60.00	+$60.00
2	26	+14	$5.00	$130.00	+$70.00
3	38	+12	$5.00	$190.00	+$60.00
4	48	+10	$5.00	$240.00	+$50.00
5	56	+8	$5.00	$280.00	+$40.00
6	62	+6	$5.00	$310.00	+$30.00
7	66	+4	$5.00	$330.00	+$20.00
8	68	+2	$5.00	$340.00	+$10.00

- How many units of the resource would be hired at each of these perfectly competitive resource prices: $45, $35, and $25?
- Why does the value of MRP decrease as more units of the resource are added by the firm?
- Is the MRP curve the firm's demand curve for the resource?

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The Demand for a Resource When the Product Market is Imperfectly Competitive and the Resource Market is Perfectly Competitive

(1) Units of resource	(2) Total product (Q)	(3) Marginal product (MP) = Δ (2)/ Δ (1)	(4) Product price (P)	(5) Total revenue (TR) = (2)x(4)	(6) Marginal revenue product (MRP) = Δ (5)/ Δ (1)
0	0	—	$5.80	$0.00	—
1	12	+12	$5.60	$67.20	+$67.20
2	26	+14	$5.40	$140.40	+$73.20
3	38	+12	$5.20	$197.60	+$57.20
4	48	+10	$5.00	$240.00	+$42.40
5	56	+8	$4.80	$268.80	+$28.80
6	62	+6	$4.60	$285.20	+$16.40
7	66	+4	$4.40	$290.40	+$5.20
8	68	+2	$4.20	$285.60	–$4.80

- How many units of the resource would be hired at each of these perfectly competitive resource prices: $45, $35, and $25?
- Why does the value of MRP decrease as more units of the resource are added by the firm?
- Is the MRP curve the firm's demand curve for the resource?

Combining Labor and Capital

1. In the long run the firm must decide on the best combination of all resources. In a simple model, the firm operates with labor and capital.
2. What combination of labor and capital should the firm employ to be *economically (productively) efficient*?
   - Produce a given output level at the lowest total cost, or
   - Produce the most output possible from a given total cost.

This requires the firm to have a resource combination such that the *marginal product per dollar* (MP/$) is the same for all resources.

3. What combination of resources will maximize the firm's total profit?
   - The Marginal Revenue Product is equal to the Marginal Resource Cost (MRP = MRC) for each input.
   - However, being economically efficient may not be enough to guarantee the highest profits.

The Least-Cost Combination of Resources

What should a firm do if it wants to produce the most output possible from a given resource budget?

What should it do if it wants to produce a given level of output at the lowest total cost?

- The firm should allocate its resource budget between units of labor and units of capital.
- The last dollar spent on these inputs (MRC or marginal resource cost) yields the same marginal product (MP).
- Assuming two resources, labor (L) and capital (K), a firm will minimize its total cost of a specific output level in such a way that the following condition is satisfied:

$$\mathbf{MP_L/MRC_L = MP_K/MRC_K}$$

- If the resource markets are perfectly competitive, the price the firm pays for an extra unit of a resource is equal to its MRC. In that case the condition can be written as:

$$\mathbf{MP_L/P_L = MP_K/P_K}$$

  where P_L is the price of a unit of labor and P_K is the price of a unit of capital.

Another way of stating this condition for economic efficiency is that the firm should get the same extra output from the last dollar spent on each type of resource.

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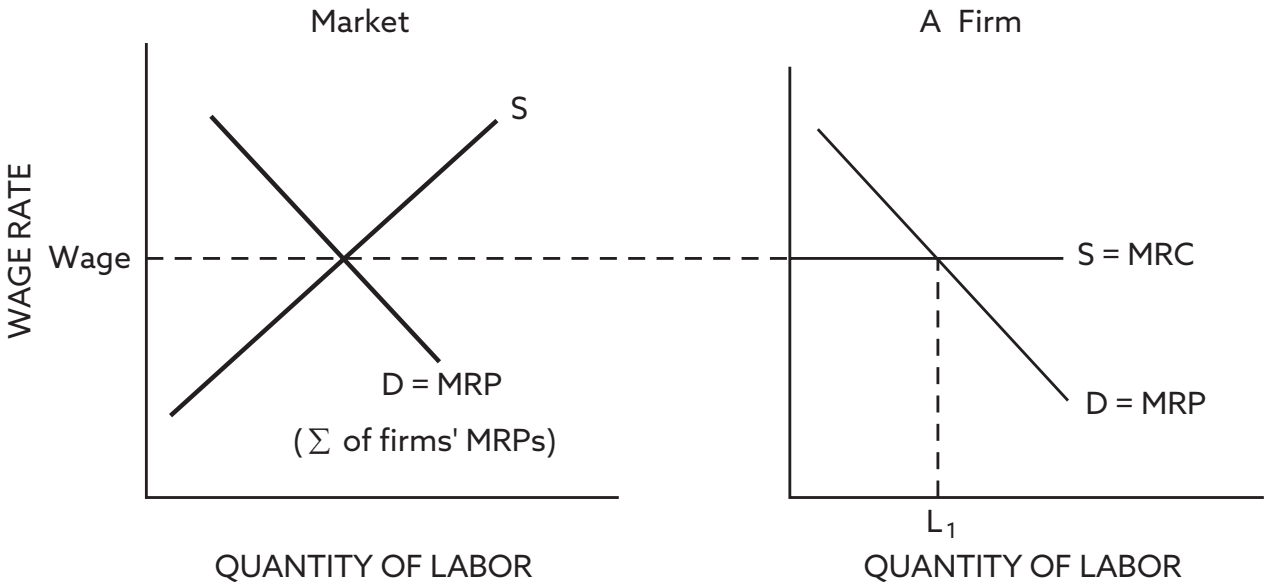
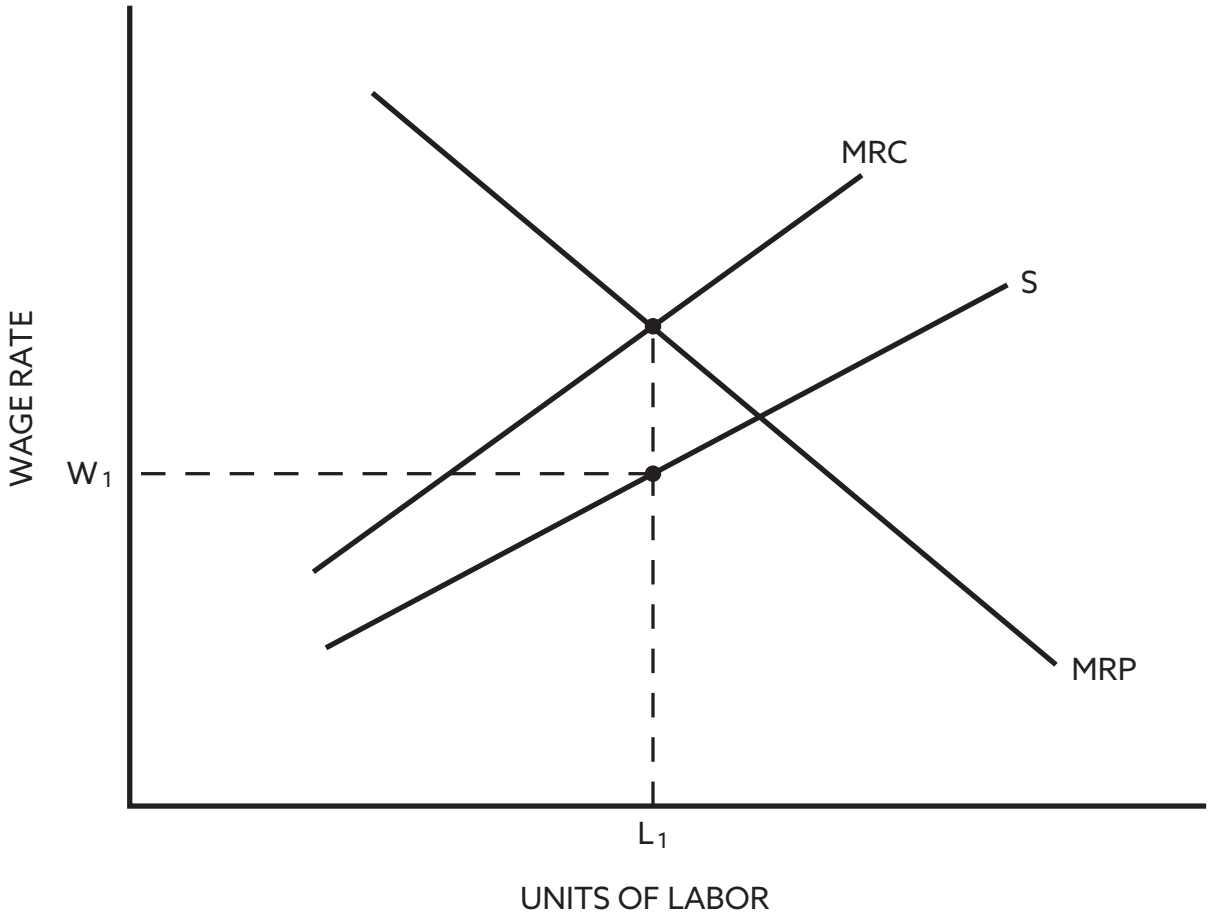
The Supply of and Demand for Labor in a Competitive Labor Market



A Monopsonistic Labor Market



- MRC = Marginal Resource Cost
- MRP = Marginal Revenue Product
- Because it faces the upward sloping market supply of labor, a monopsony must raise its wage if it wants to increase the quantity supplied of workers.
- The company pays the same wage to all its employees, so if it increases the wage to attract another worker, the marginal resource cost of that worker is greater than the wage paid to the worker: MRC > Wage.

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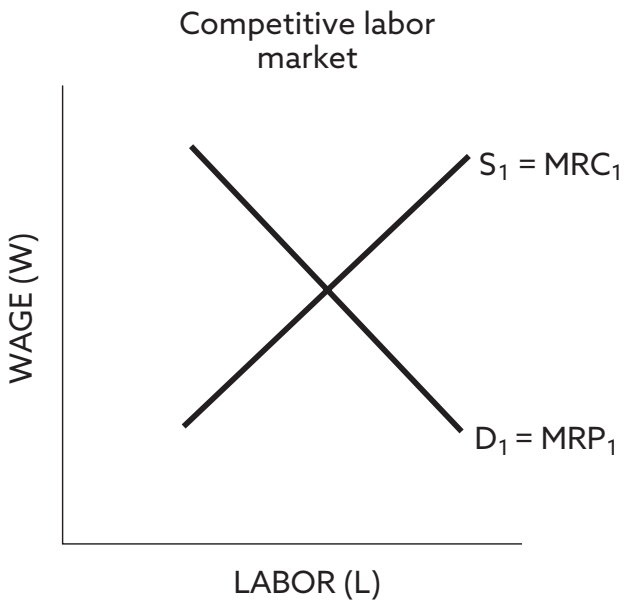
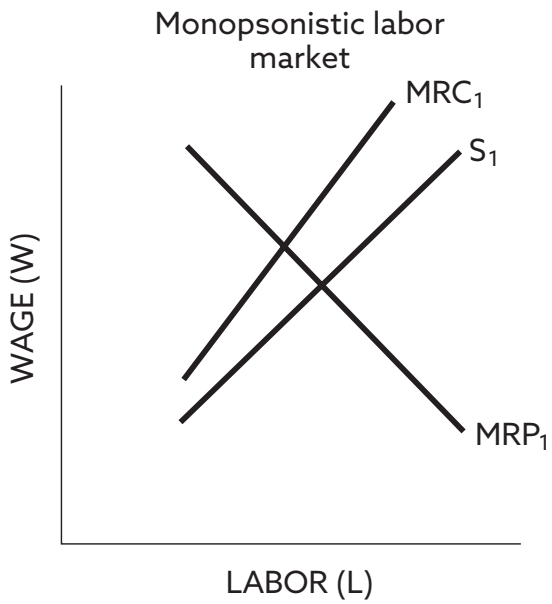
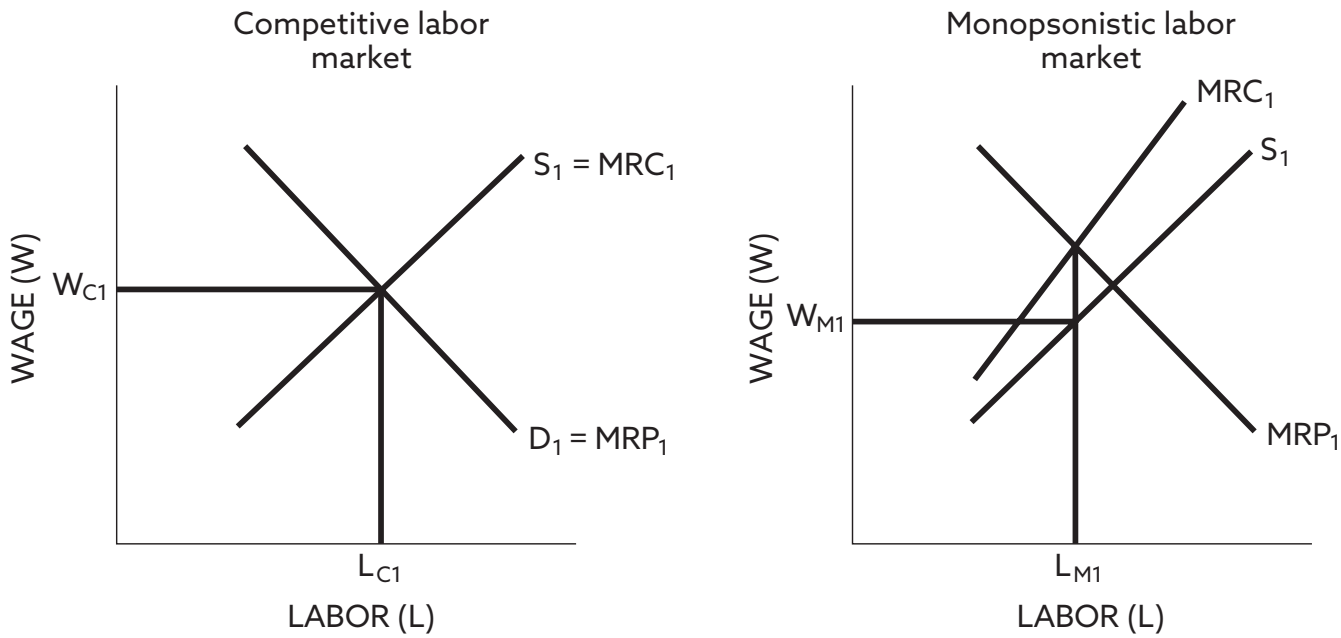
Perfectly Competitive and Monopsonistic Labor Markets





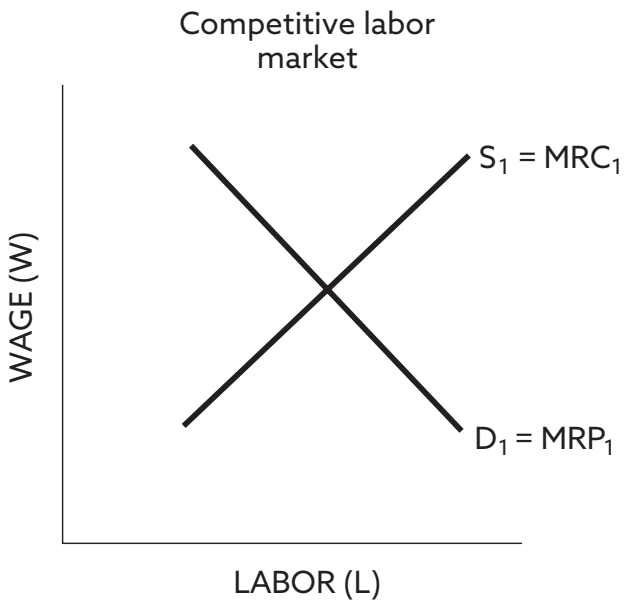
- Why is the marginal revenue product (MRP) curve equal to the market demand (D) curve for labor in the perfectly competitive labor market?
- Why is the MRP curve not equal to the market D curve for labor in the monopsonistic labor market?
- Why is the marginal resource cost (MRC) curve equal to the market labor supply (S) curve in the perfectly competitive labor market?
- Why is the MRC curve not equal to the market labor S curve in the monopsonistic labor market?

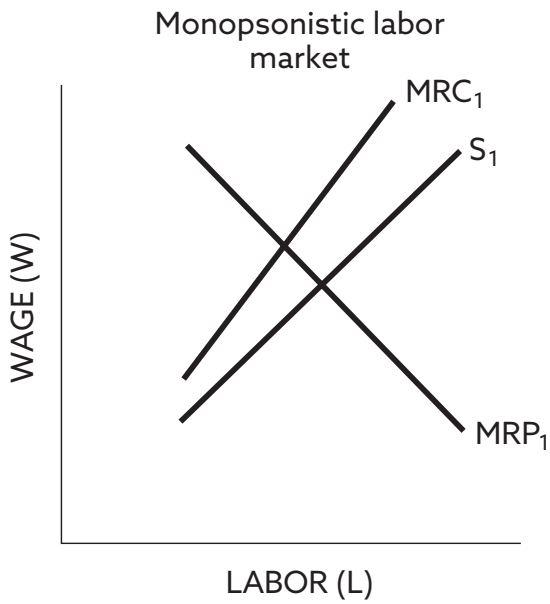
Market Wage and Quantity of Labor



- W_C and L_C refer to wages and labor in the competitive labor market
- W_M and L_M refer to wages and labor in the monopsonistic labor market

The Labor Market for Teachers



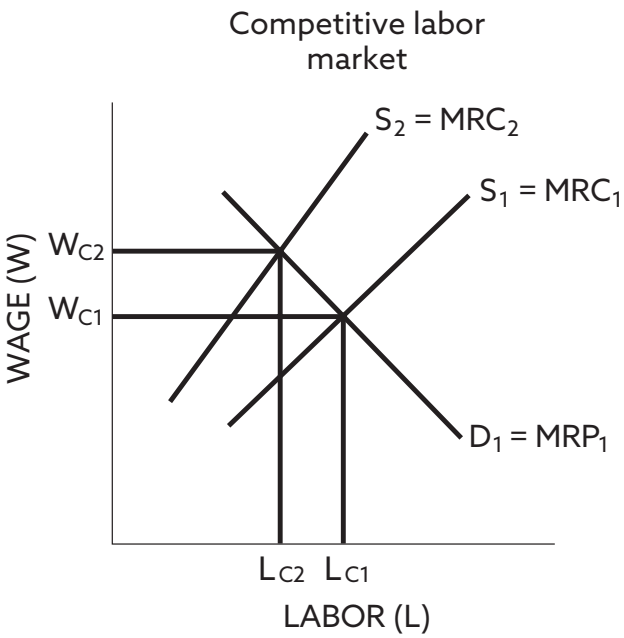


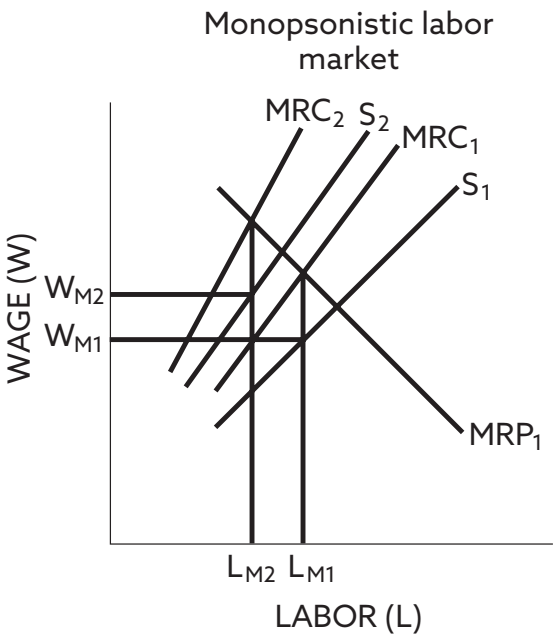
- Label the existing wage and the quantity of labor on both graphs.

Event: The state passes legislation requiring new teachers to pass a competency test in order to be employed by any school in the state.

- Shift the curves on each graph and label the new wage and quantity of labor
- Did the event increase, decrease, or not change the market wage and labor in each market?

Changes in the Labor Market for Teachers





- Competitive labor market: wage increases, labor decreases
- Monopsonistic labor market: wage increases, labor decreases