EE211
PRINCIPLES OF MICROECONOMICS

Topic 9:

Factor Markets

Topics

- Demand for factor as a derived demand
- The firm’s demand for a factor
- The supply of a factor
- Determination of factor prices

Introduction

- Recall that a firm's objective is to maximize its profit:

$$\pi = TR - TC = PQ - (wL + rK)$$

- We've talked about the output markets, and how the output price is determined in the previous lecture.
- This lecture will focus on the factor market, and how the factor price is determined.

- In this class, we only look at the competitive factor market in the short run under 2 scenarios:
  - Competitive output market
  - Monopoly output market

The Demand for Factors

- In previous topics, we talked about the demand for goods – this is the demand by consumers for their own consumption.
- Producers also have a demand for the goods for their production. This producer's demand is a result of consumer's demand for goods, and is called "derived demand".

- **Derived demand** is the **demand for a factor of production** that results from the demand for the products that it is used to make.
- E.g. Demand for wood by carpenters

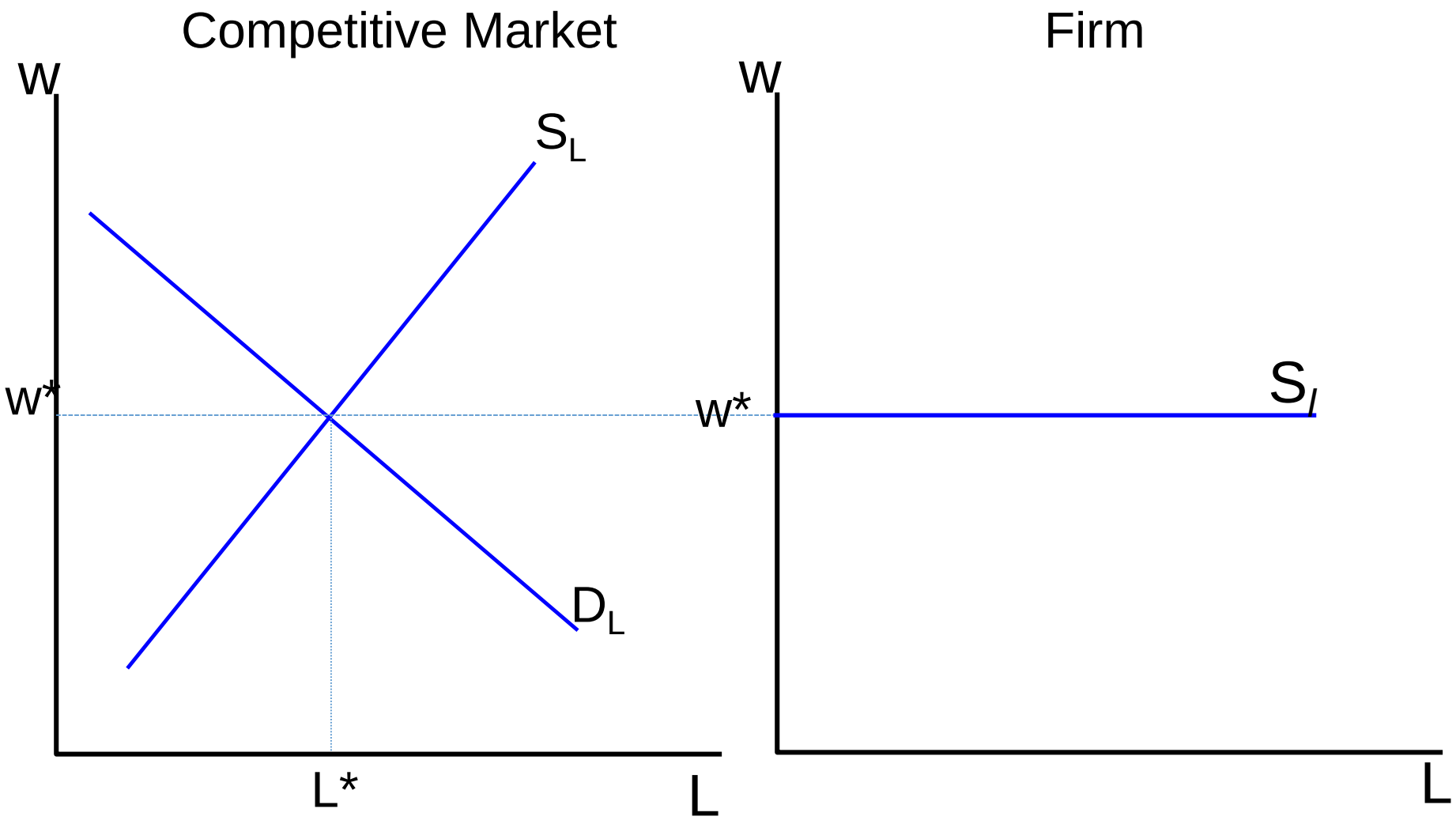
COMPETITIVE FACTOR MARKET & COMPETITIVE OUTPUT MARKET

Assumptions

- There are many buyers and sellers in both factor market and output market.
- In both markets, buyers and sellers are price takers.

- In the short-run production, labor is the only variable input, where capital is fixed.
  - Wage (input price) is determined by the labor market.
  - Producers in the output market take wage as given.

Supply of Labor Faced By Firm



Firm's Demand for a Factor

- Firm will hire an additional worker as long as:

the additional cost (paid to additional worker) **<**

the additional revenue (received from additional worker).

- The additional cost for one extra unit of factor is called **"marginal factor cost (MFC)".**
- In this case, MFC is wage (w).

- The additional revenue received from one extra unit of factor is called **"marginal revenue product (MRP)"**:

$$MRP_L = MR \times MP_L.$$

Firm's Demand for a Factor (Cont'd)

- **Value of marginal product (VMP)** of labor is the marginal product of labor multiplied by the output price:

$$VMP_L = P \times MP_L.$$

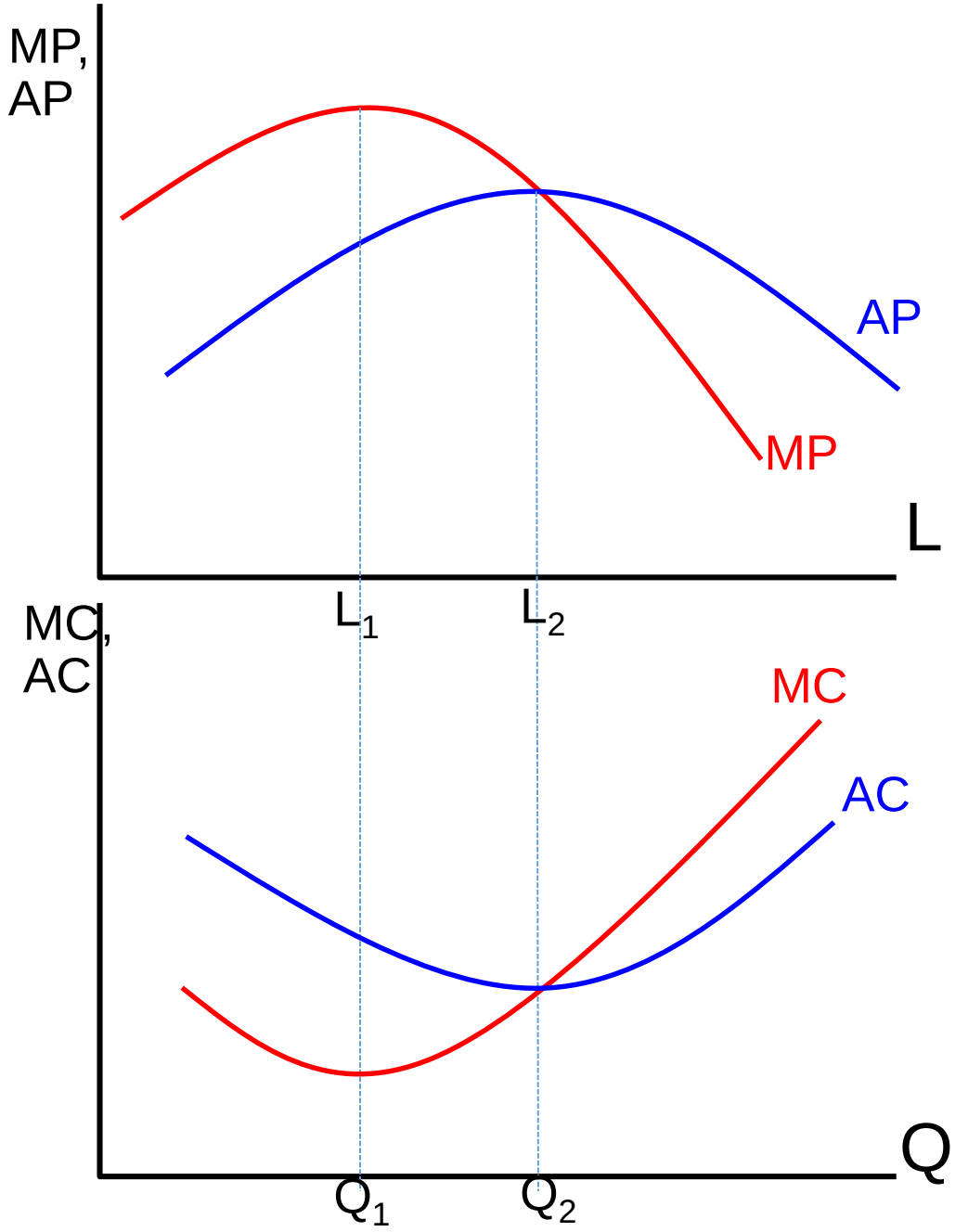
- In perfectly competitive market, P = MR.
- Hence,

$$MRP_L = MR \times MP_L = P \times MP_L$$

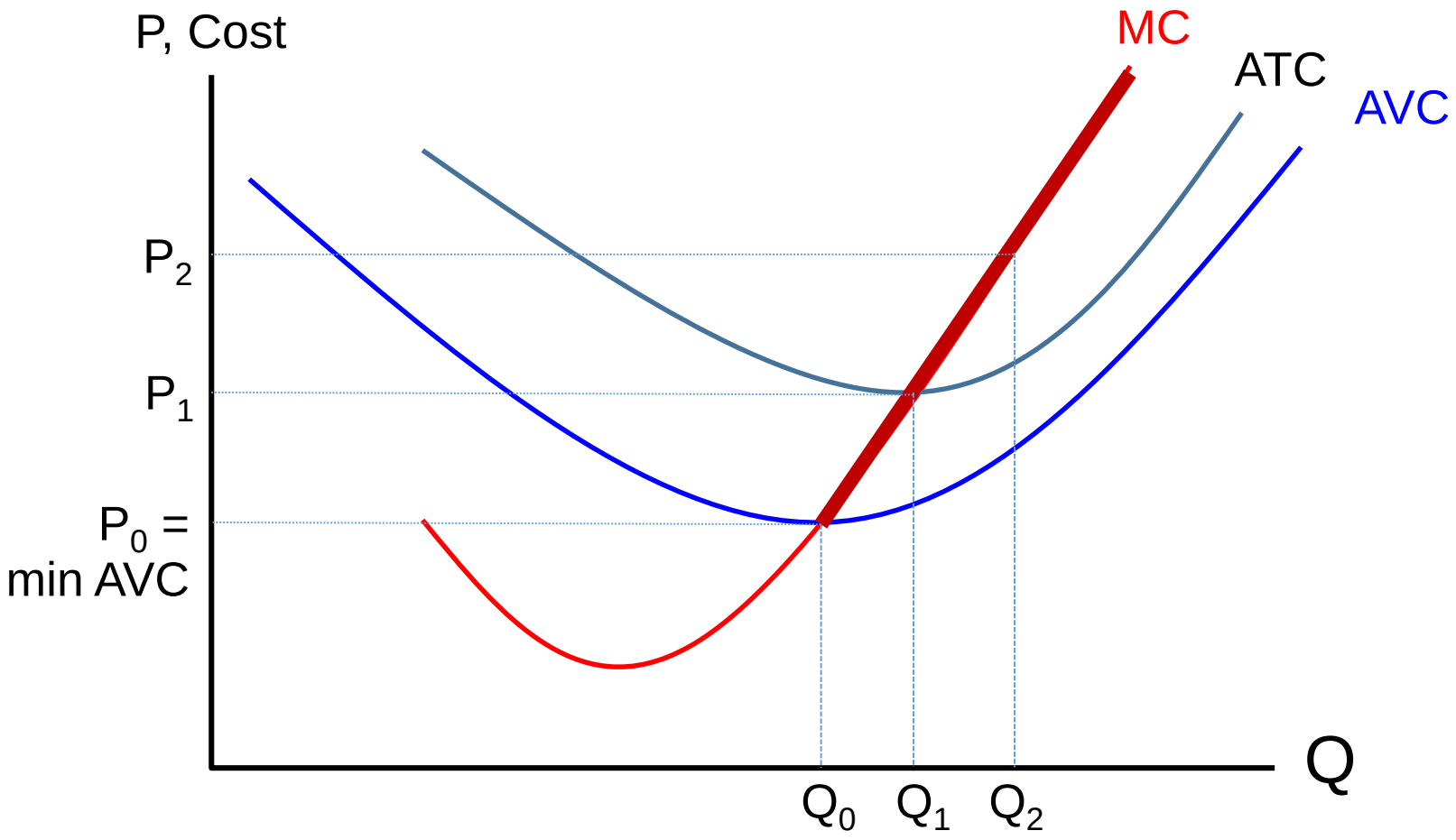
Example (Assume P = 10)

L	Q	MP	MR =ΔTR/ ΔQ	TR=PxQ	MRP =ΔTR/ΔL = PxMP
0	25				
1	40		10		
2	75		10		
3	100		10		
4	120		10		
5	130		10		

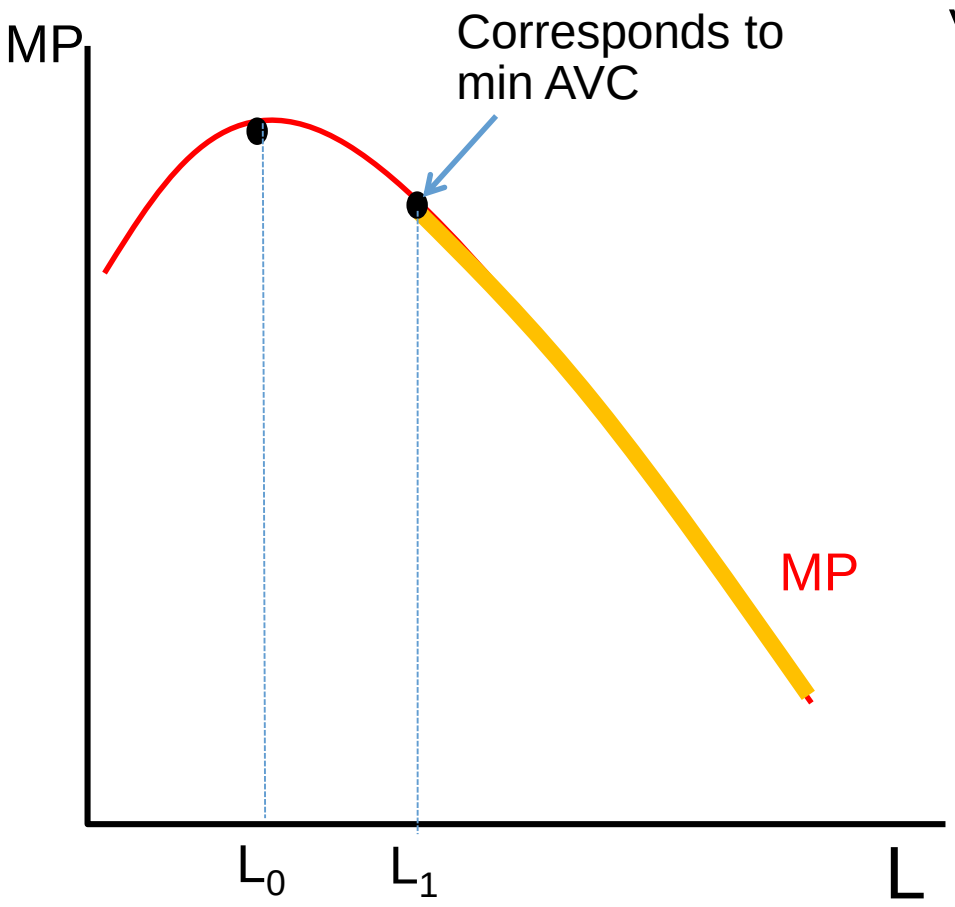
Relationship between MP&AP and MC&AC

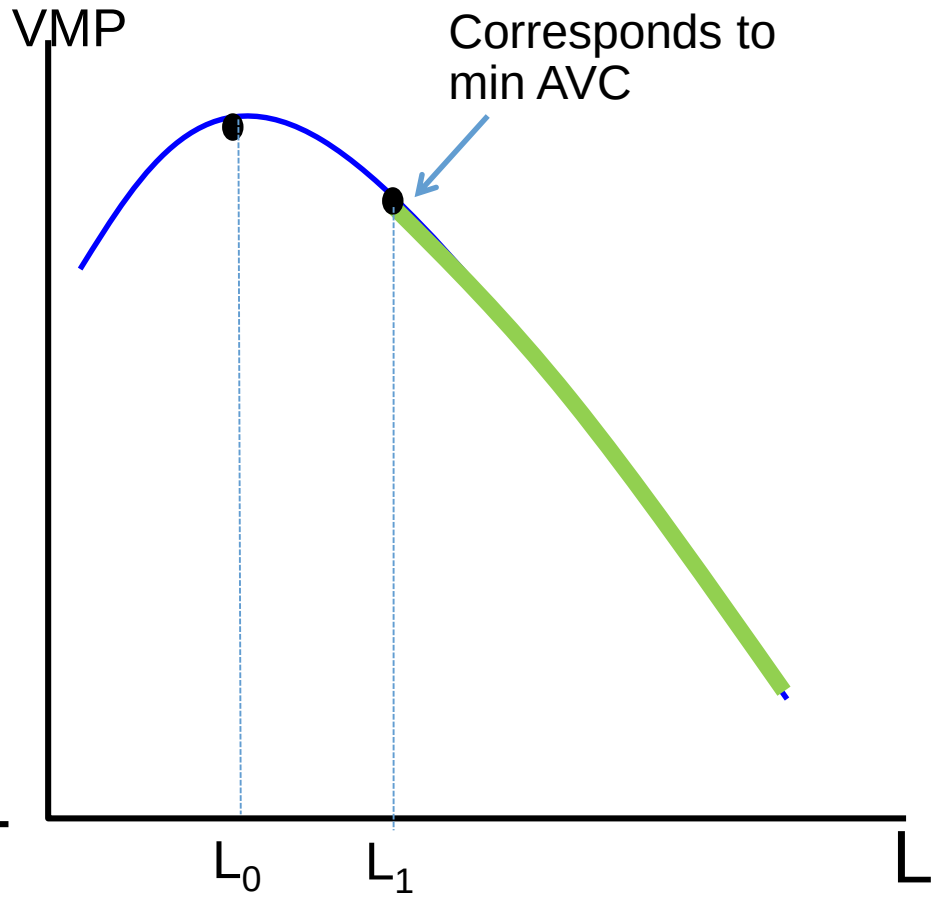


Firm's Short-Run Supply Curve in Perfect Competition

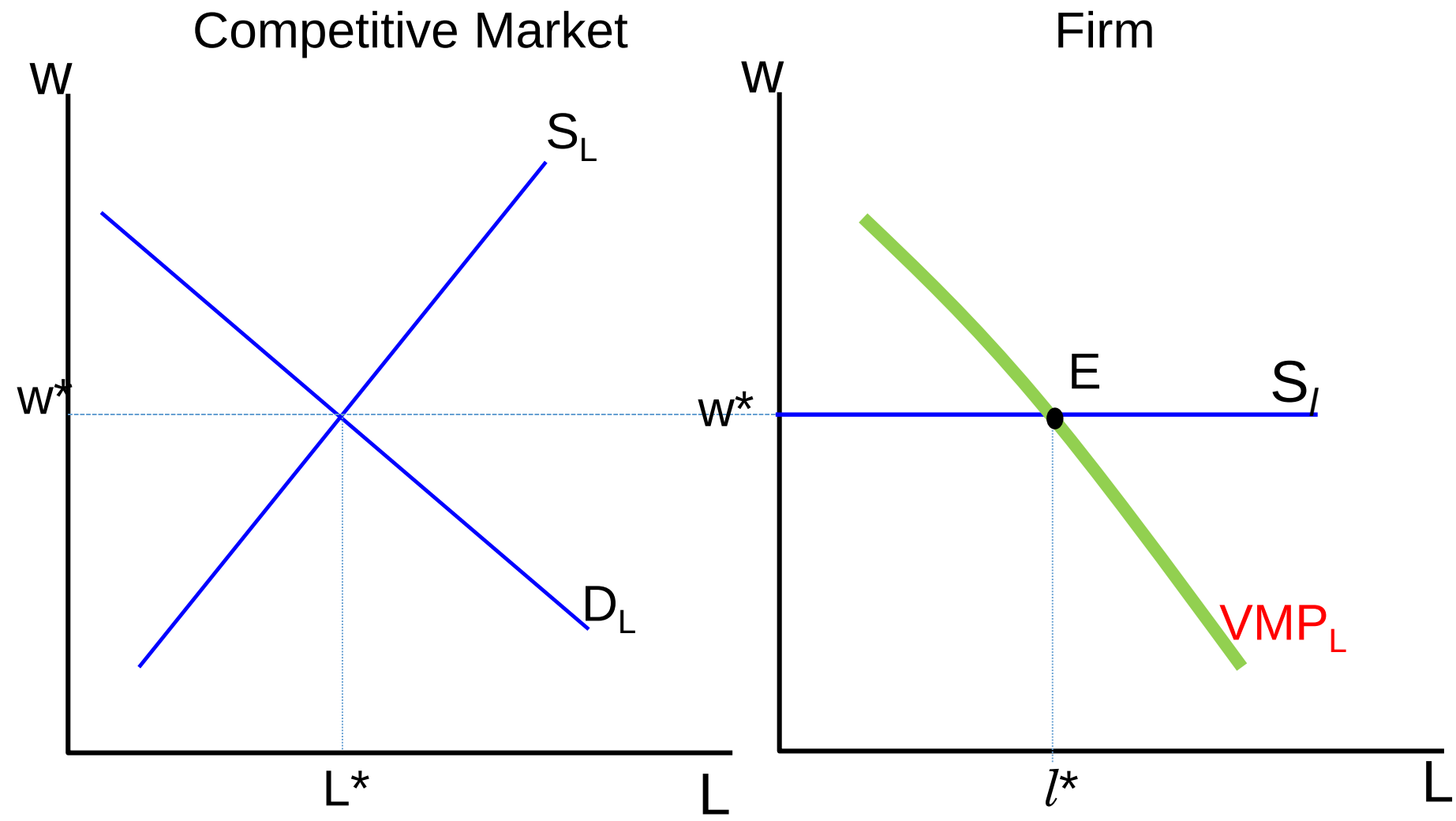


The Firm's Demand Curve for a Factor

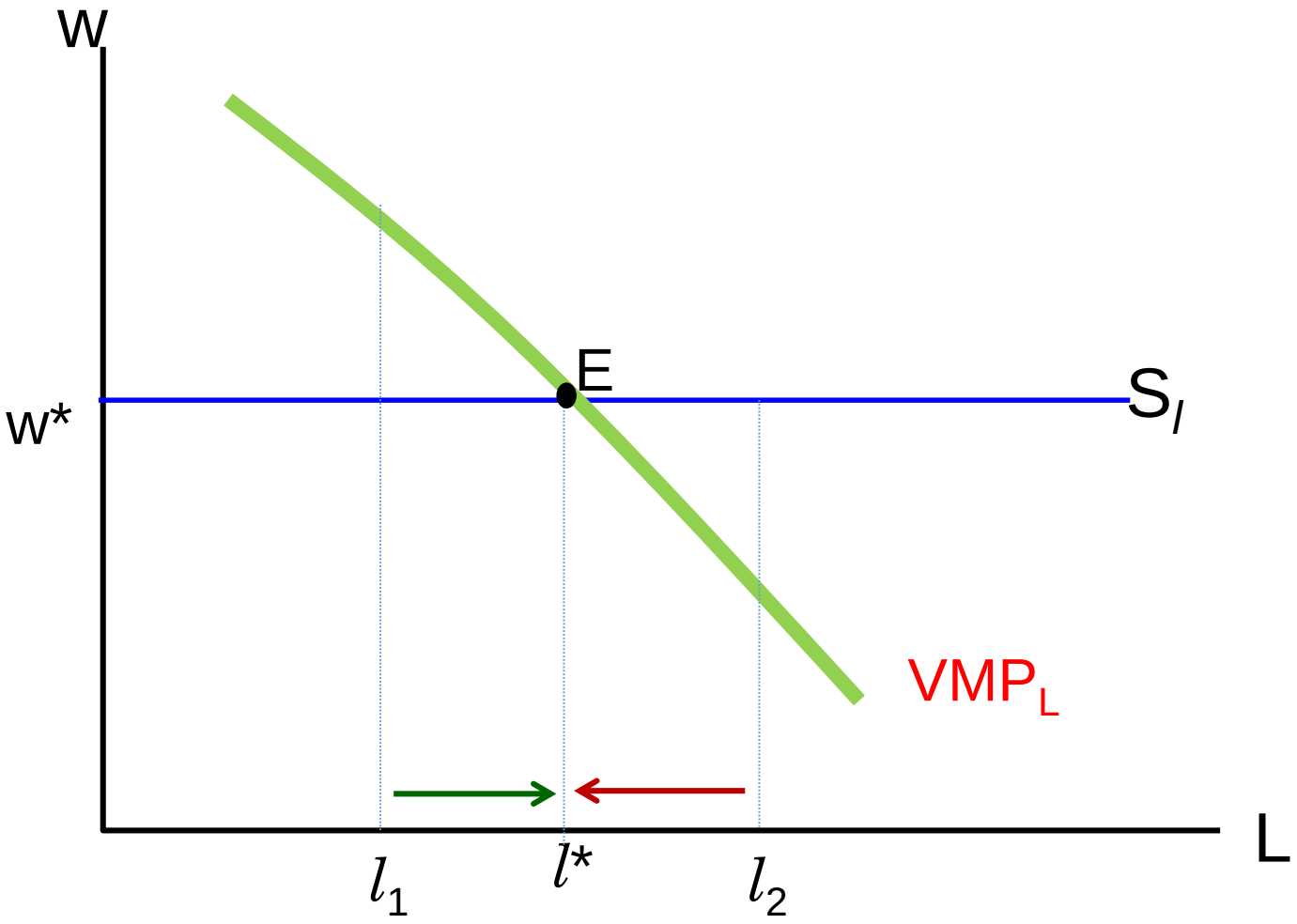




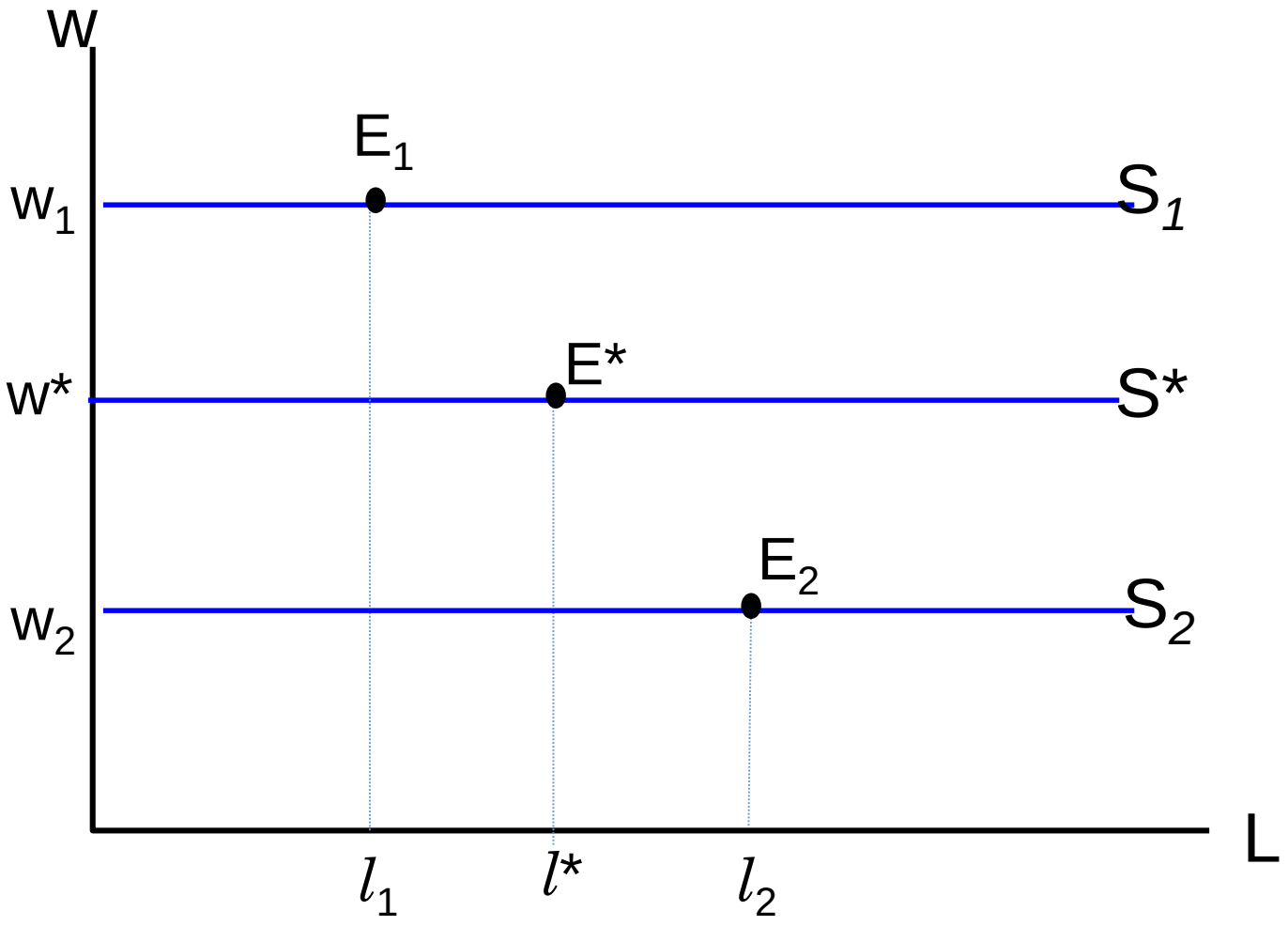
Equilibrium in the Labor Market



Firm's Decision in Hiring Labor



Firm's Derived Demand for Labor



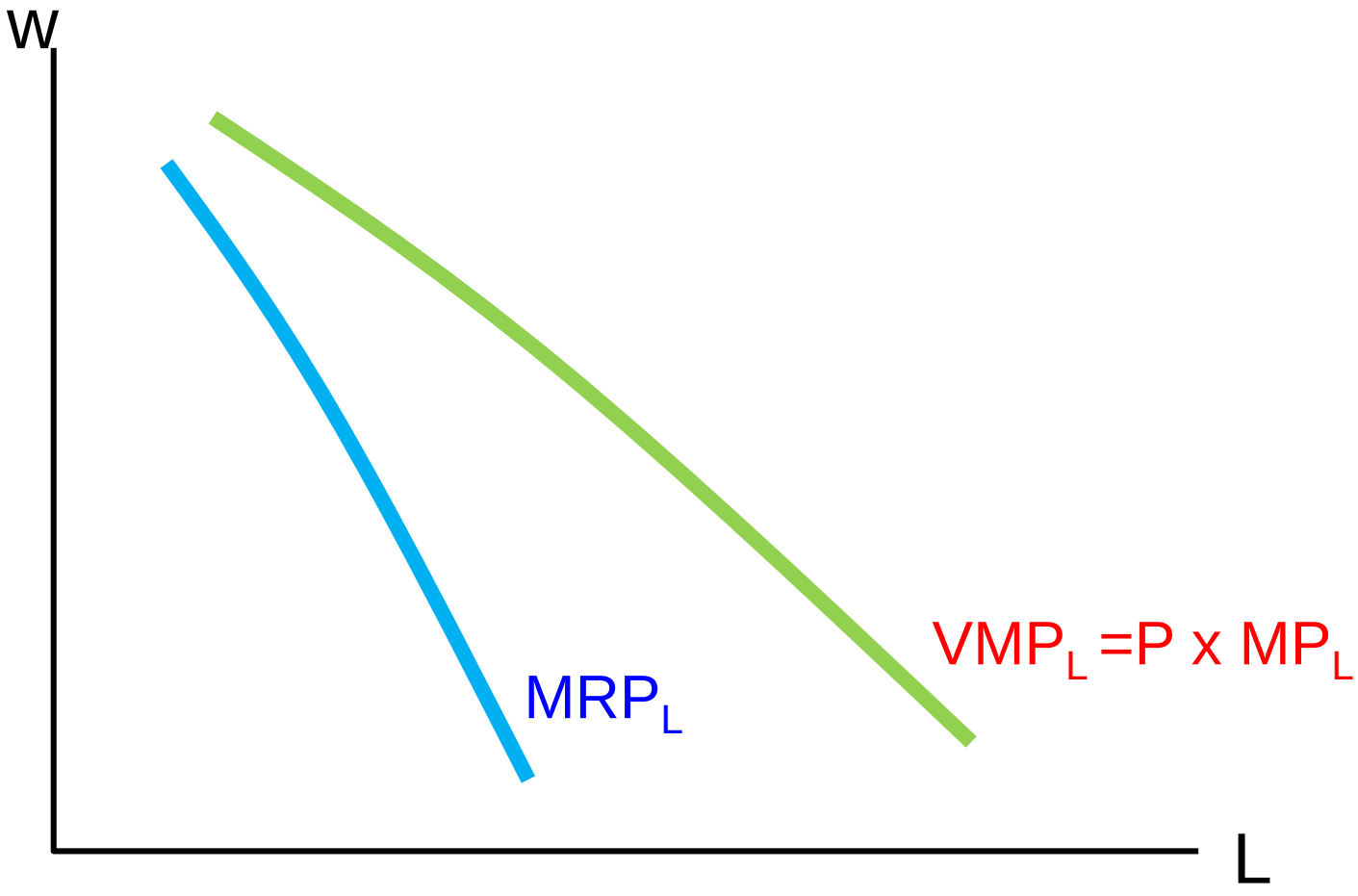
COMPETITIVE FACTOR MARKET & MONOPOLY OUTPUT MARKET

Assumptions

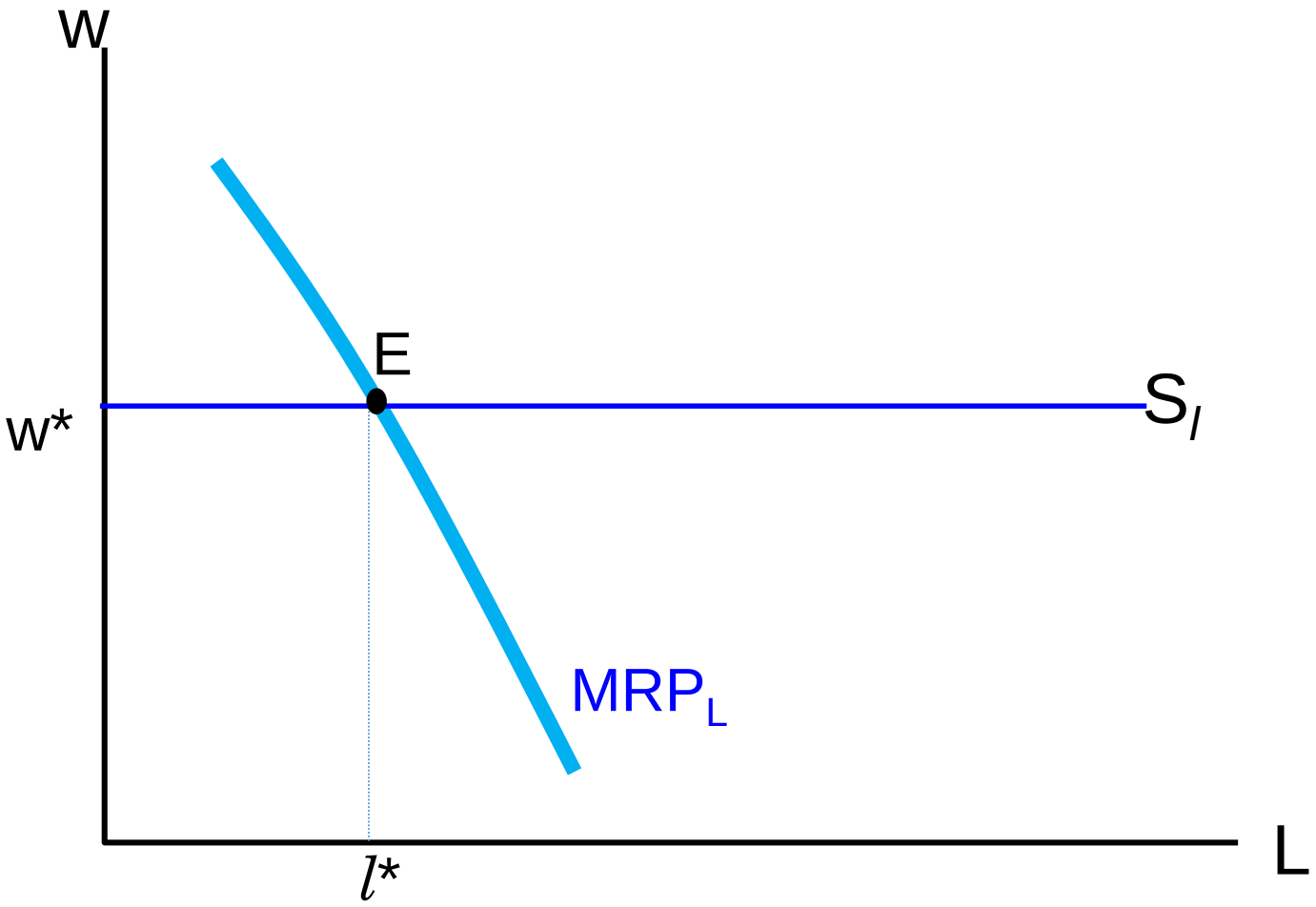
- There are many buyers and sellers in the factor market, but there is only seller in the output market.
- In factor markets, buyers and sellers are price takers.
- In output market, seller is the price setter.
  - Set price where MR = MC.

- In this case, $MRP_L = MR \times MP_L$.

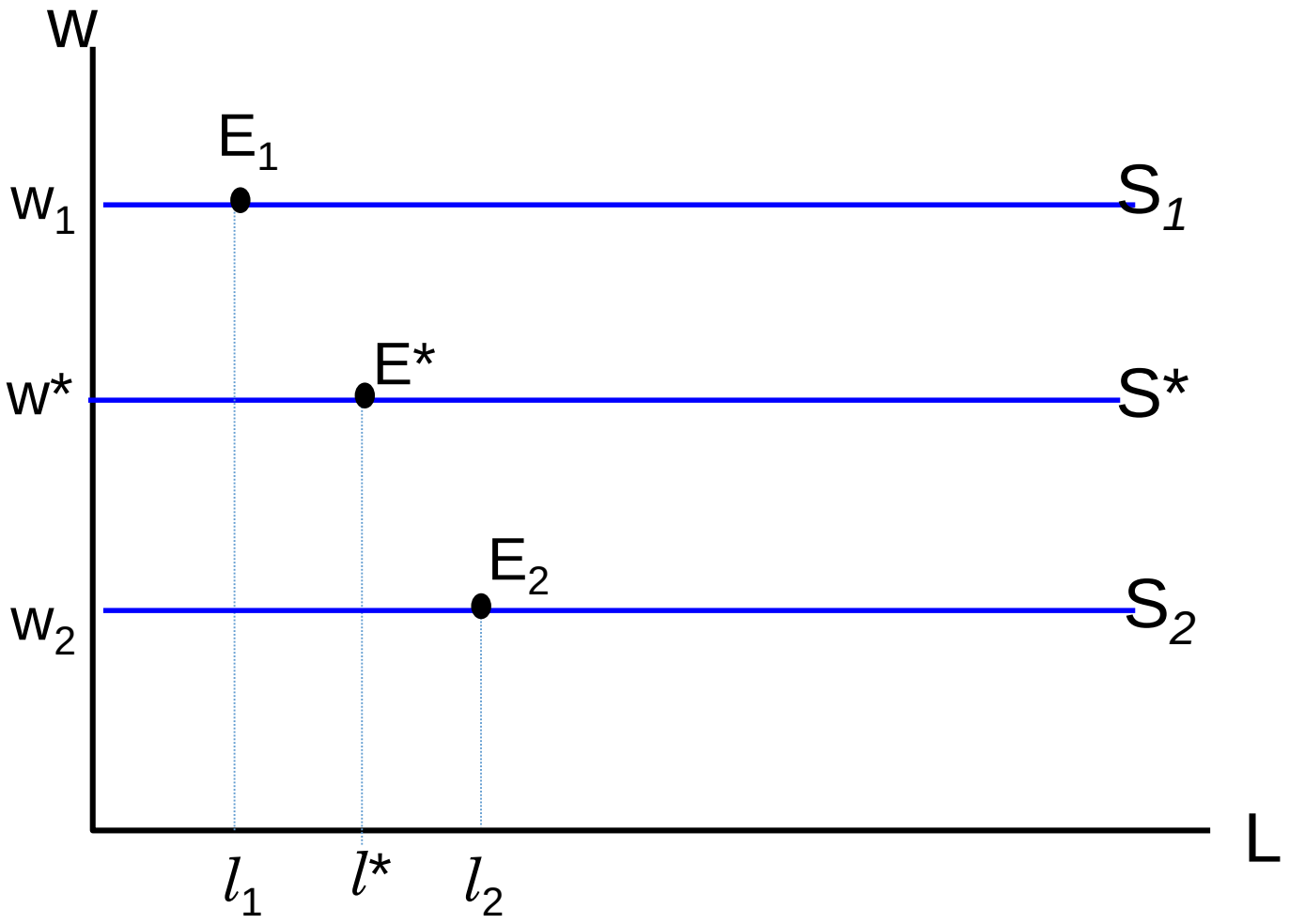
VMP and MRP in the Case of Monopoly Output Market



Equilibrium (Monopoly Output Market)



Firm's Derived Demand for Labor



Comparison