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Introductory Microeconomics ECO/1A1Y

Labour Market

Outline

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- Topics
  - How long to work?
  - Supply of labour: income and substitution effects
  - A case study: thinking small
  - Perfectly competitive markets

How long to work?

An economic decision

Decision: How long to work?

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- We can use the indifference curve analysis to decide how one allocates one's time between work and leisure

- Assume we have 16 hours maximum a day (8 hours in bed)
  - Let $T = 16$ (where is the total time available for work or leisure)

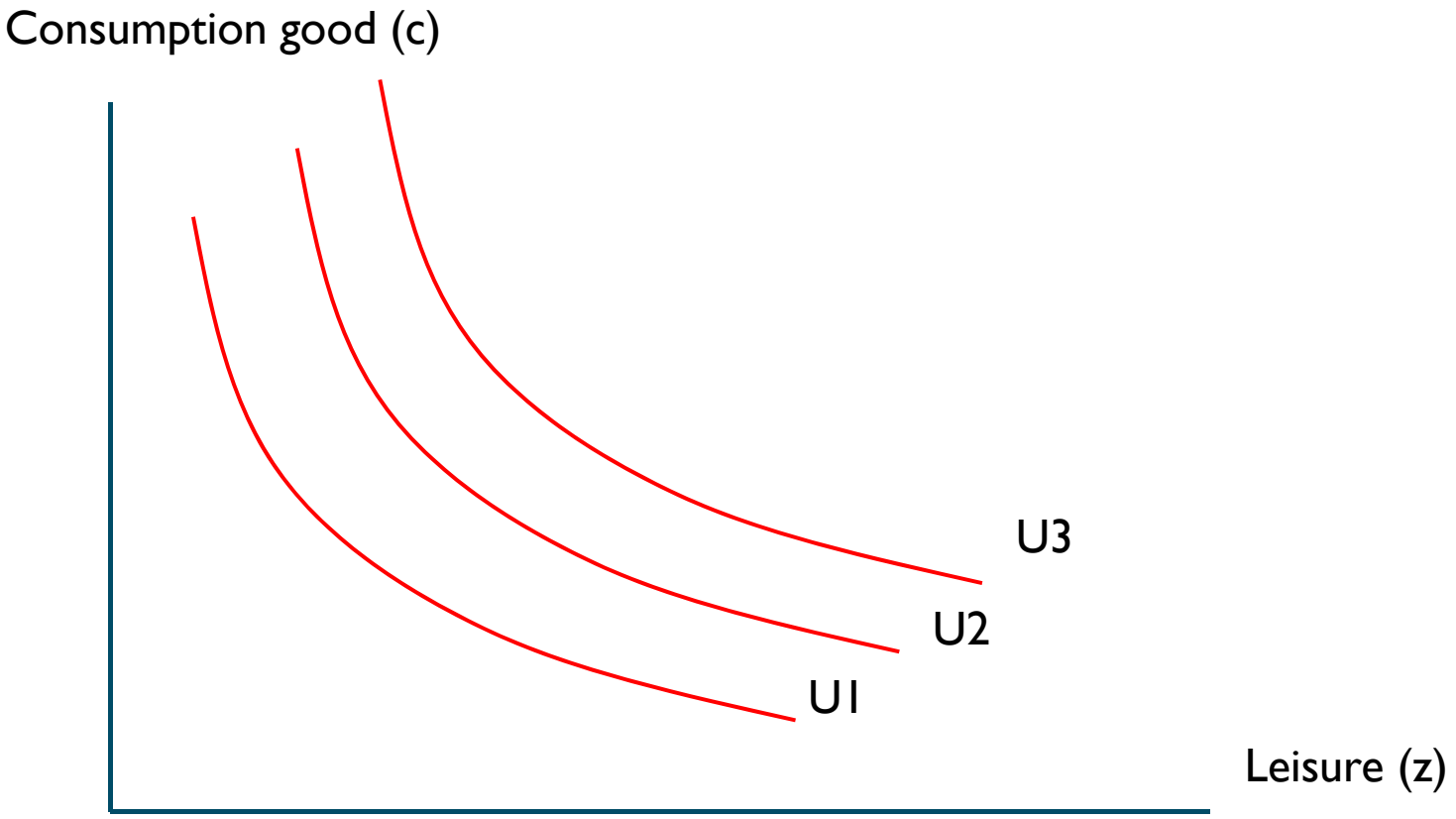
- We can potentially devote 16 hours to work or leisure

  Hrs Worked + Hours in Leisure = Total Hrs

  $H + Z = 16$

Indifference curve analysis

- Consumers have preference over two goods: leisure (doing nothing, just relaxing) and consumption (bought only after working)



Indifference curve analysis

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- Is leisure a free good?
- It may seem that way (no direct cost)
- But it is NOT
  - We have 16 hours to work and generate income to spend on consumption goods
  - By taking leisure for one extra hour, you are going to lose one hour's wage
  - So the wage lost for taking leisure is precisely the price paid to have it (indirect cost)
  - If wage rate is w pounds per hour, then the price of leisure $p_z = w$

Budget line

- The price of leisure is the (hourly) wage rate relevant for the individual concerned, say £10
  - let w be the wage rate, so $w = 10$

- By working for full 16 hours you can earn £160 (maximum)
  - Follows from $wT = 10 \times 16 = 160$
  - This £160 is your budget, which you can spend in many ways

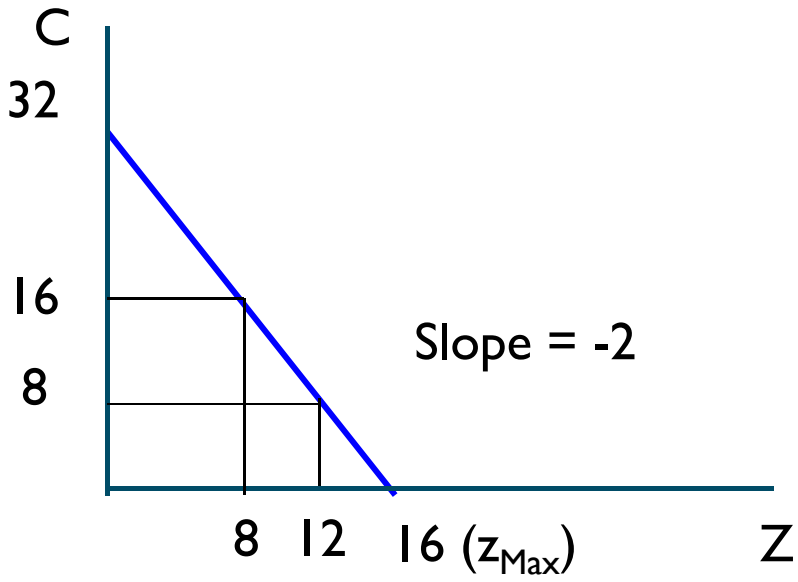
- Suppose your consumption good consists of whatever (food and clothing), for which the average price is £5 per unit
  - Let price of consumption good be p_c (so $p_c = 5$)

Budget

Consumption (c) (units)	Leisure (z) (hours)	Labour supply (L) (hours, income)
£160/5 = 32	0	16 (£160)
£110/5 = 22	5	11 (£110)
£80/5 = 16	8	8 (£80)
£40/5 = 8	12	4 (£40)
£0/5 = 0	16	0 (£0)

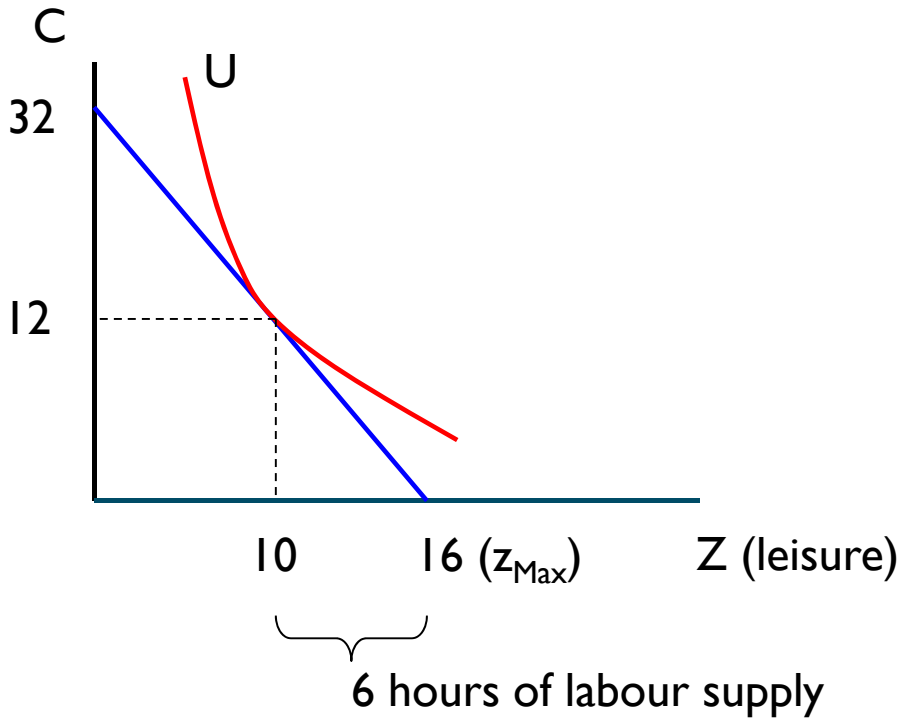
Budget Line

- $p_c C + p_z Z = wT$; But $p_z = w$, hence
- $p_c C + wZ = wT$; Solve for C to get
- $C = wT/p_c - wZ/p_c$
- Data: $p_c = 5; w = 10, T = 16;$
- $C = (160/5) - (10/5)Z$
- $C = 32 - 2Z$



Determining the choice

- Combine the earlier indifference curves with the budget constraint



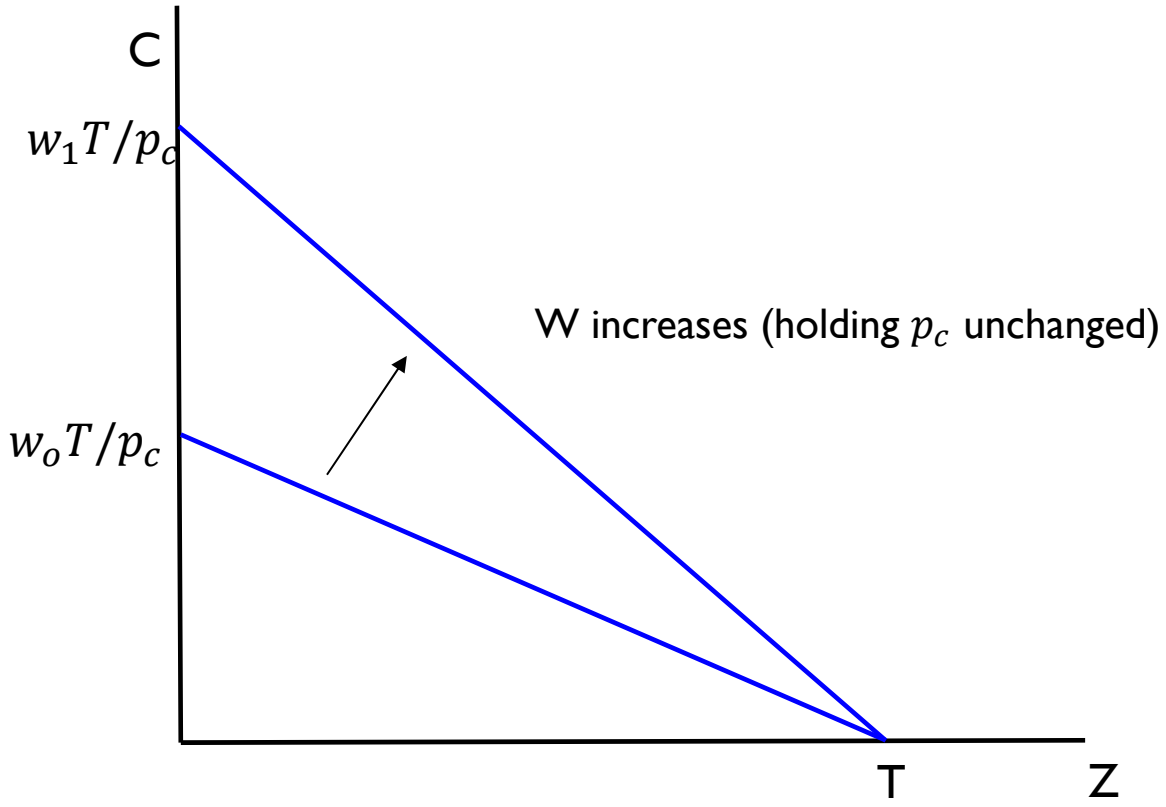
- In this case the consumer is 'buying' 10 hours of leisure (meaning supplying 6 hours of labour) and 12 units of consumption

Supply of labour

Income and substitution effects

What if the wage rate goes up?

- Will the consumer work for more hours, or fewer hours?
- We need to see how the budget line shifts
  - Recall $C = wT/p_c - wZ/p_c$



Effect #1: Positive

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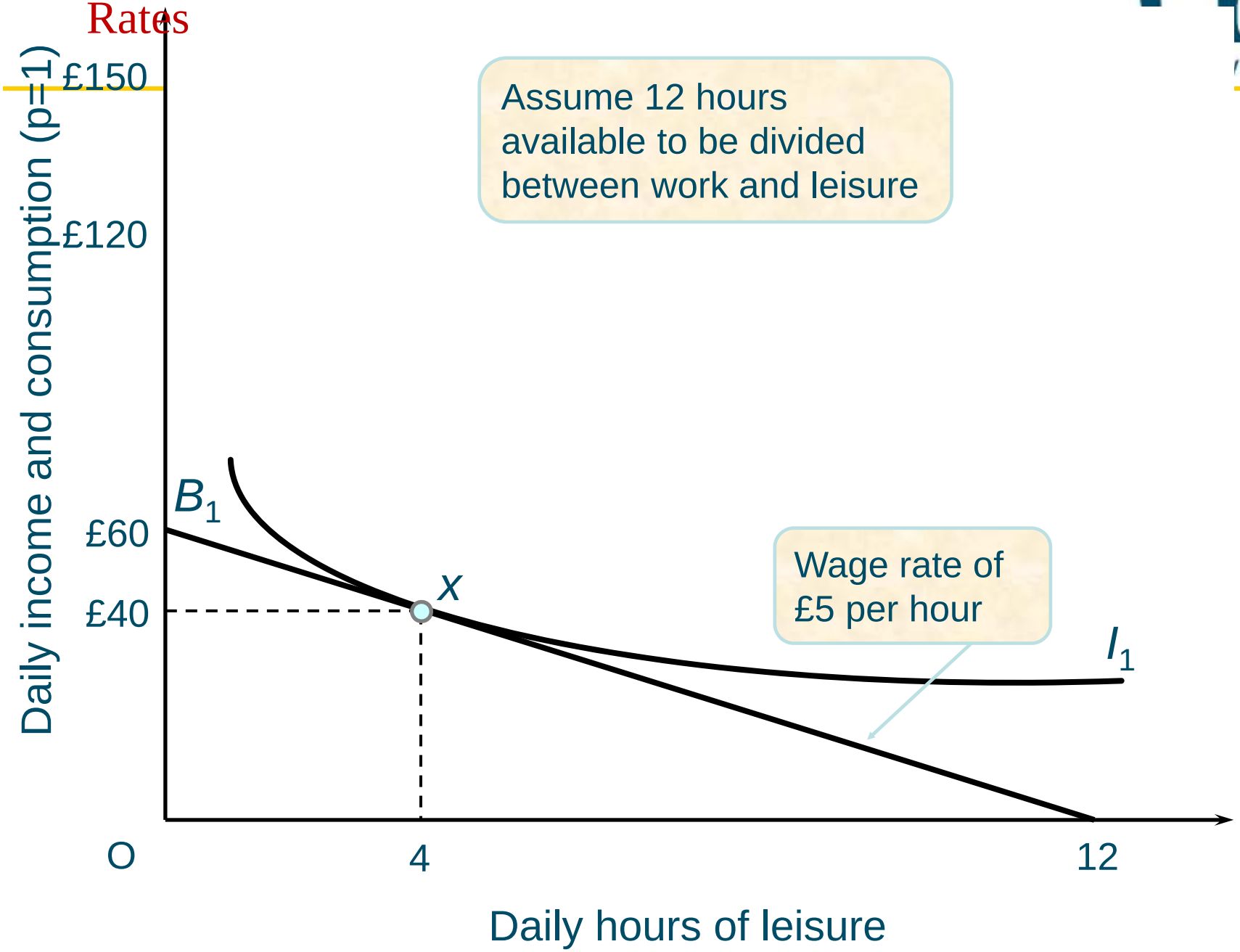
- The individual is buying less of leisure as the wage rate (which is the price of leisure) is increasing
- Less leisure is bought because is more expensive, substituted by more work (if wage rate has increase price of leisure has increased)
- More labour is supplied as the wage rate increases
- The labour supply curve is upward sloping (not a big surprise)
- Substitution effect

Effect #2: Negative

- At some point (with further wage increase) I want to work less and get time to spend my money!
- So, the labour supply curve need not always be upward sloping, but backward-bending
- …this is known as the case of backward-bending labour supply curve
- Income effect

The Choice Of Hours Worked At Different Wage Rates



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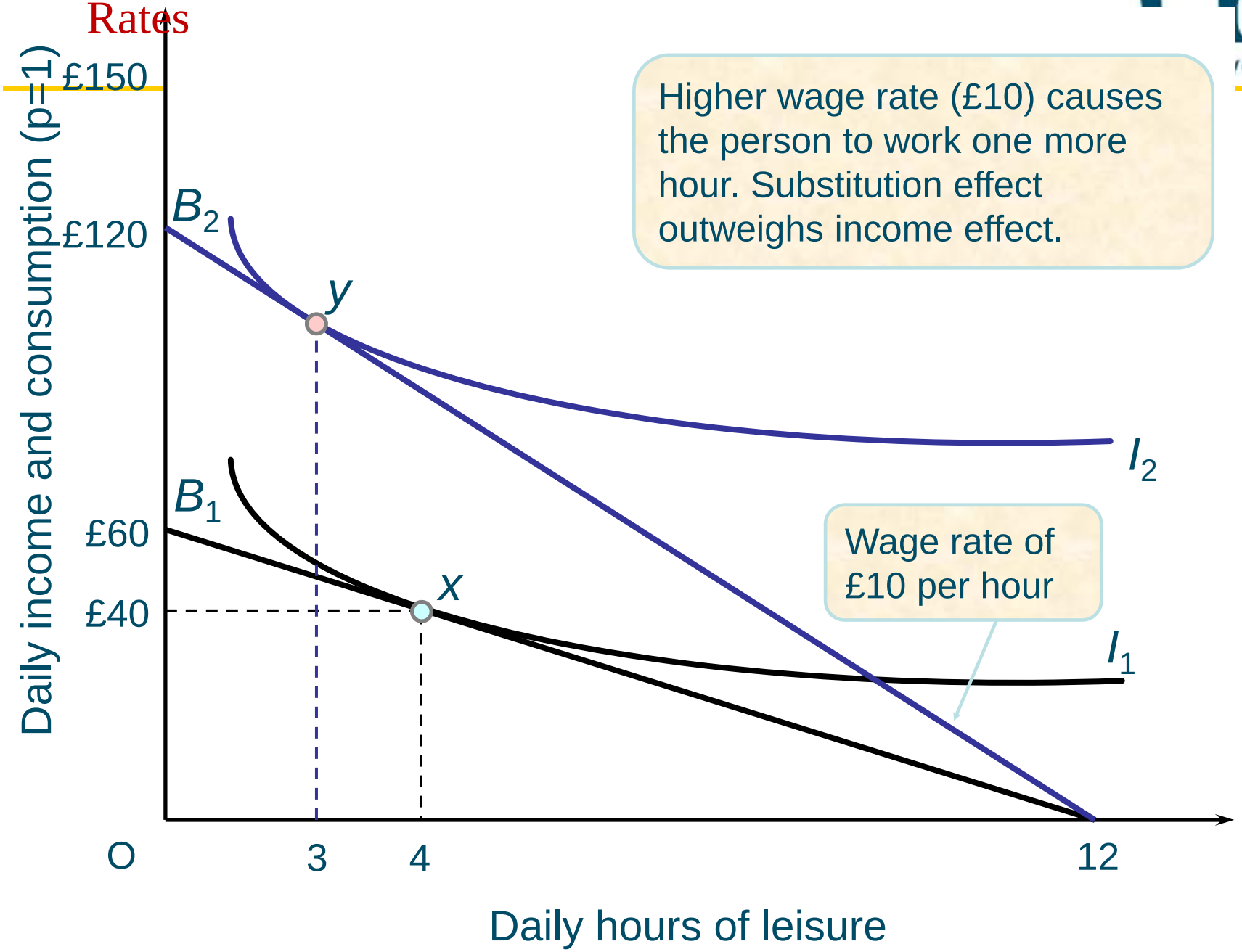

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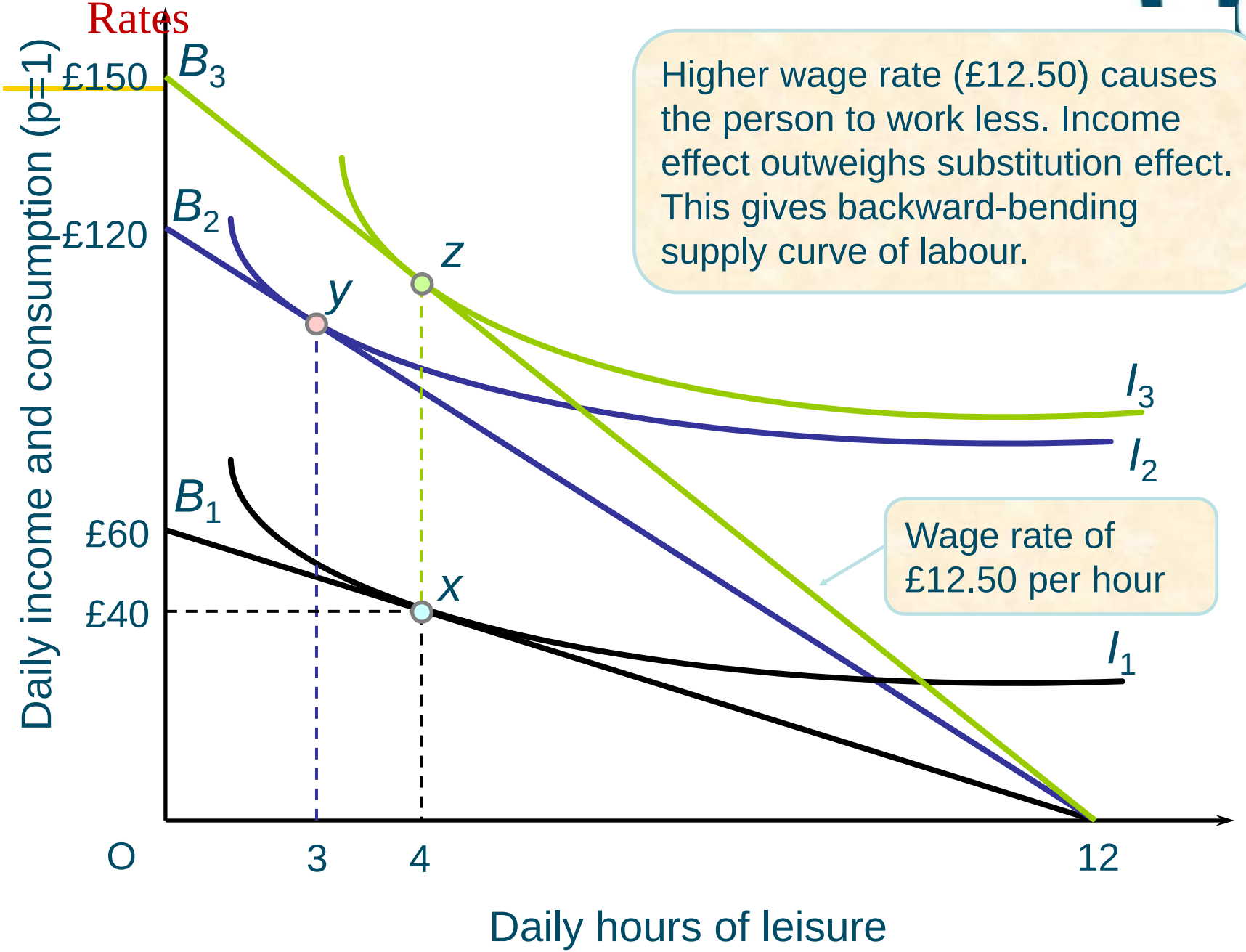
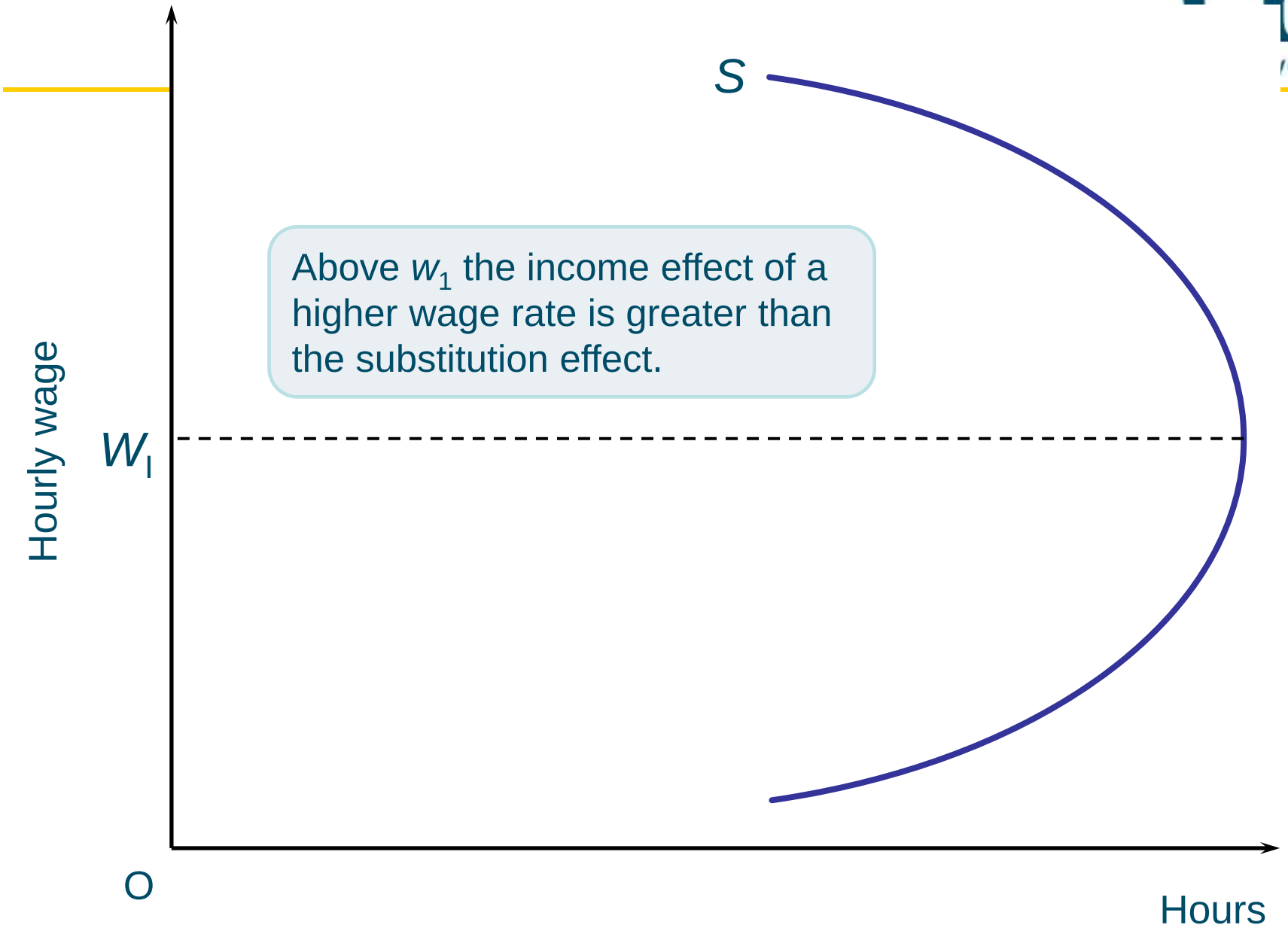


Backward-bending Supply Curve of Labor



Why does the labour supply curve sometimes bend backward?

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- With an increase in wage rate, there are two effects:
- Income effect (value of your work time increases and therefore your budget expands)
- Substitution effect (price of leisure goes up)
- Income effect dominates →Consume more leisure (and work less) and (possibly) more consumption goods →Wage and labour will be negatively linked
- Substitution effect dominates → Consume less leisure (and work more), but more consumption good → wage and labour will be positively linked.

Case: An empirical question

NYC cabdrivers

CBLT (QJE, 1997)

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- Test relationship between hours supplied and transitory changes in wages

- $lnH = \alpha + \beta lnW + \gamma Z + \eta$
- where
  - lnH is log of hours worked
  - lnW is log of wages
  - Z is the other variables that effect hours worked
  - η is the error term
- Interested in estimating β … elasticity of hours worked with respect to wage
- They use three samples of wages and hours of New York City cabdrivers, whose wages are correlated within days but uncorrelated between days

- Three different samples of data coming from different NYC cab companies

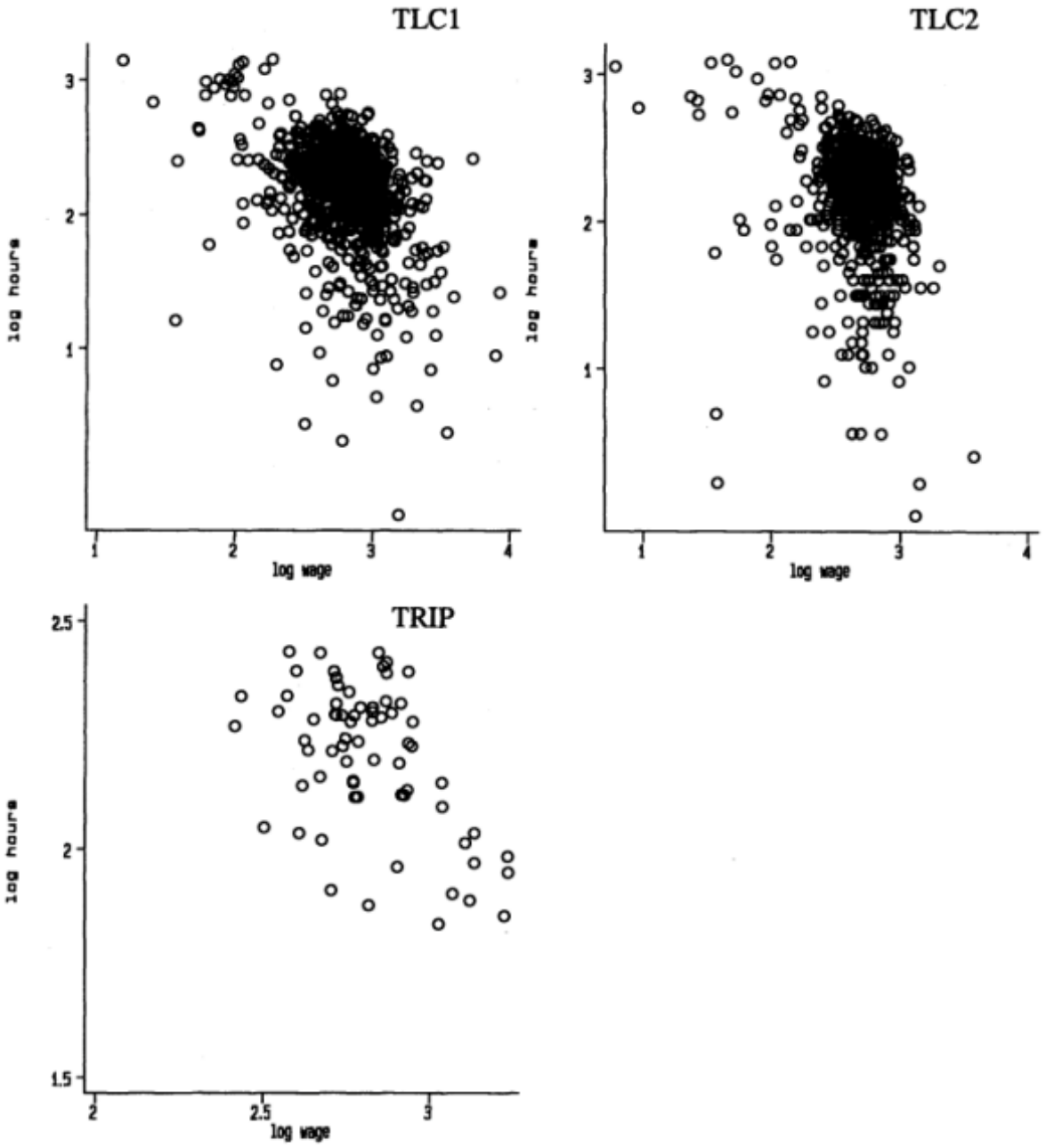

FIGURE I
Hours-Wage Relationships

Elasticities

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TABLE V

IV LOG HOURS WORKED EQUATIONS BY PAYMENT STRUCTURE TLC1 DATA

Type of cab	Fleet	Lease	Owned
Log hourly wage	−.197	−.978	−.867
	(.252)	(.365)	(.487)
Fixed effects	Yes	Yes	Yes
Sample size	150	339	305

Dependent variable is the log of hours worked. Standard errors are in parentheses. Regressions also include weather and shift characteristics (dummy variable for rain, high temperature during the day, dummy variable for shift on a weekday, and time of shift dummy variables) as explanatory variables. Instruments for the log hourly wage include the summary statistics of the distribution of hourly (log) wages of other drivers on the same day and shift (the 25th, 50th, and 75th percentiles). Fleet cabs are rented daily; leased cabs are rented by the week or month; and owned cabs are owned by the drivers.

Results

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- Estimated wage elasticities are significantly negative in two out of three samples.

- Elasticities of inexperienced drivers average approximately -1 and are less than zero in all three samples (and significantly less than for experienced drivers in two of three samples)

- Our interpretation of these findings is that cabdrivers (at least inexperienced ones): (i) make labor supply decisions "one day at a time" instead of inter temporally substituting labor and leisure across multiple days, and (ii) set a loose daily income target and quit working once they reach that target

Market performance

Perfect competition

Perfectly competitive markets

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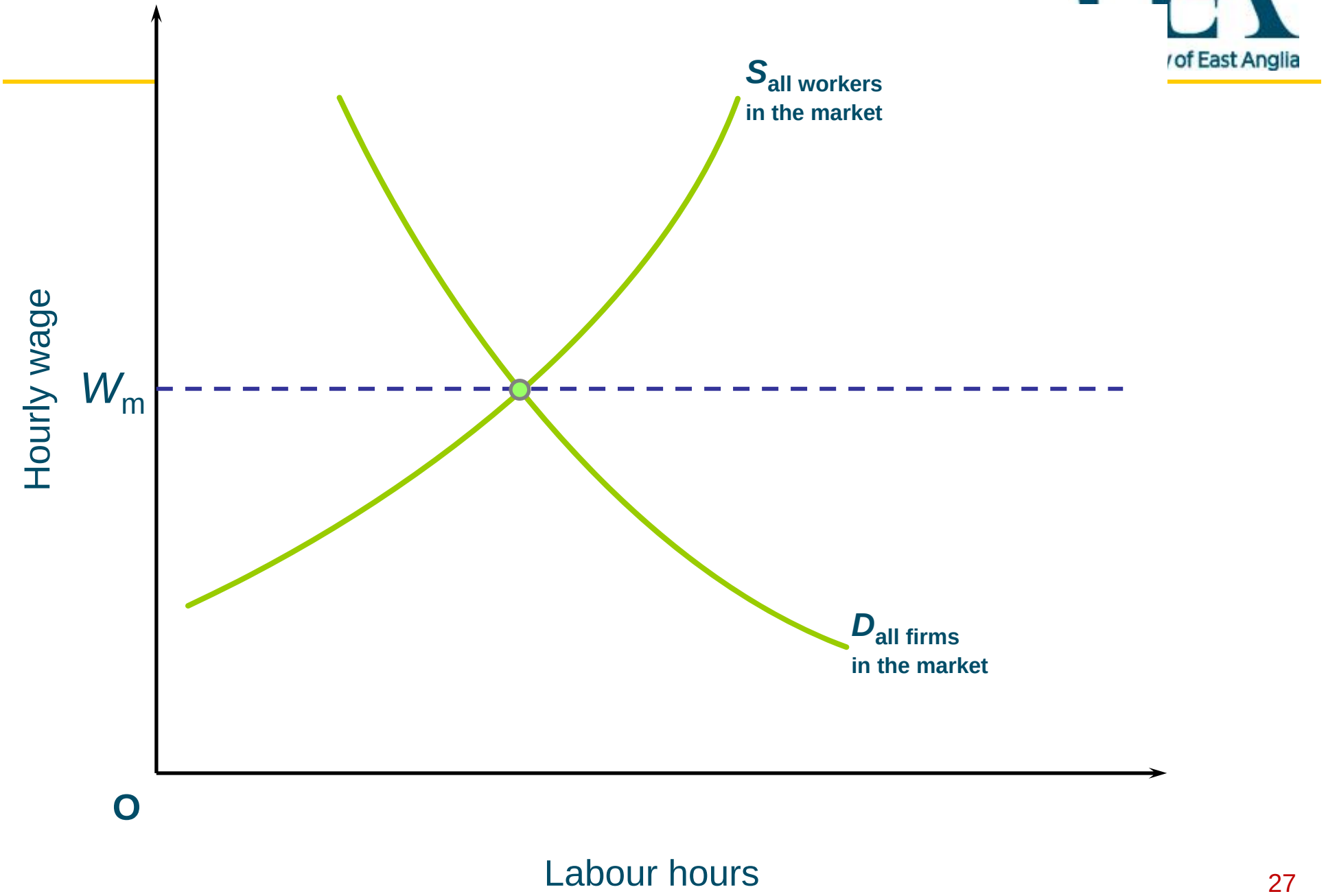
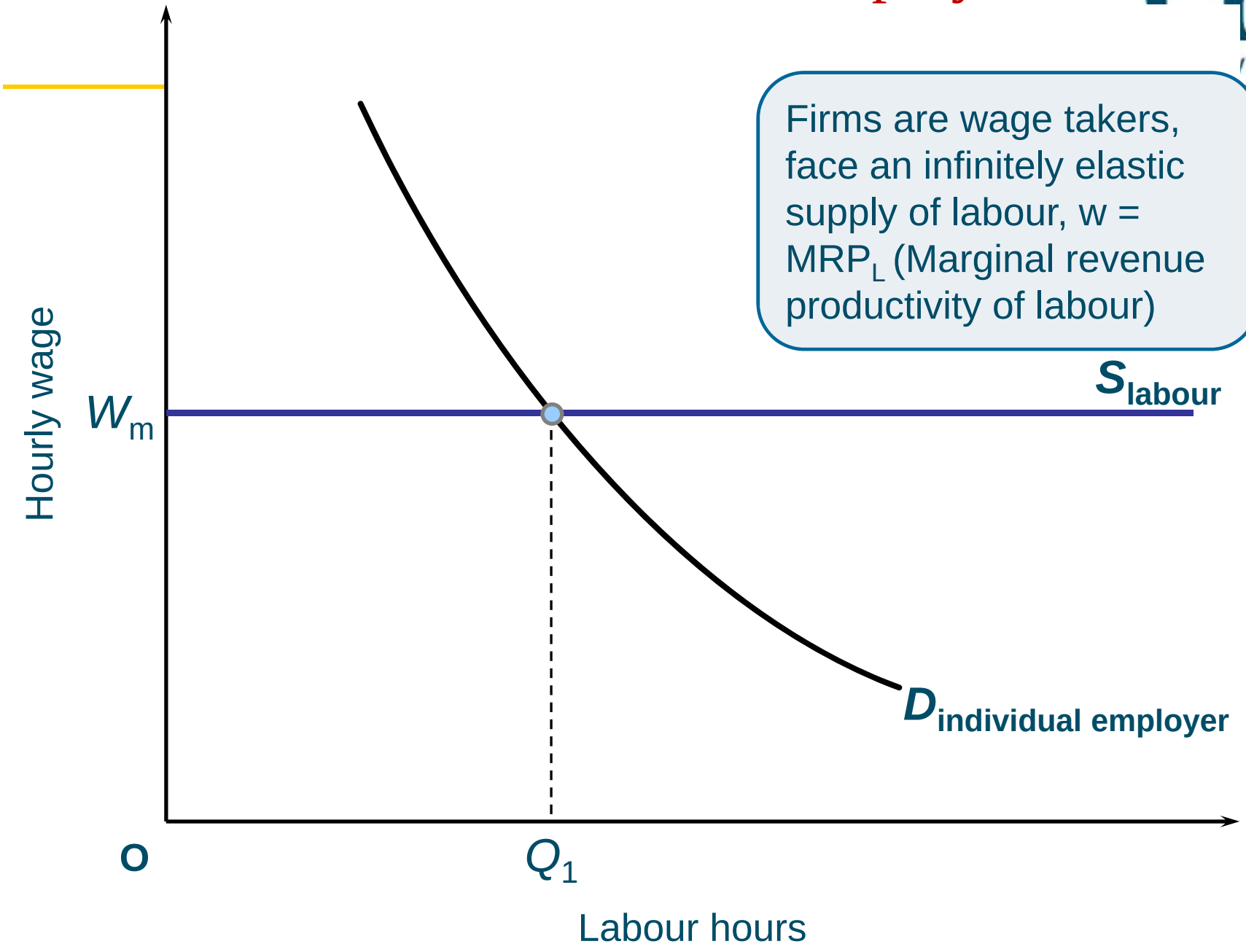
- The overall supply of labour in an economy is the sum of individual supply curves
- If each of these eventually bend backwards, so will the aggregate supply curve
- But fortunately that does not happen often. In aggregate we get upward sloping labour supply curve

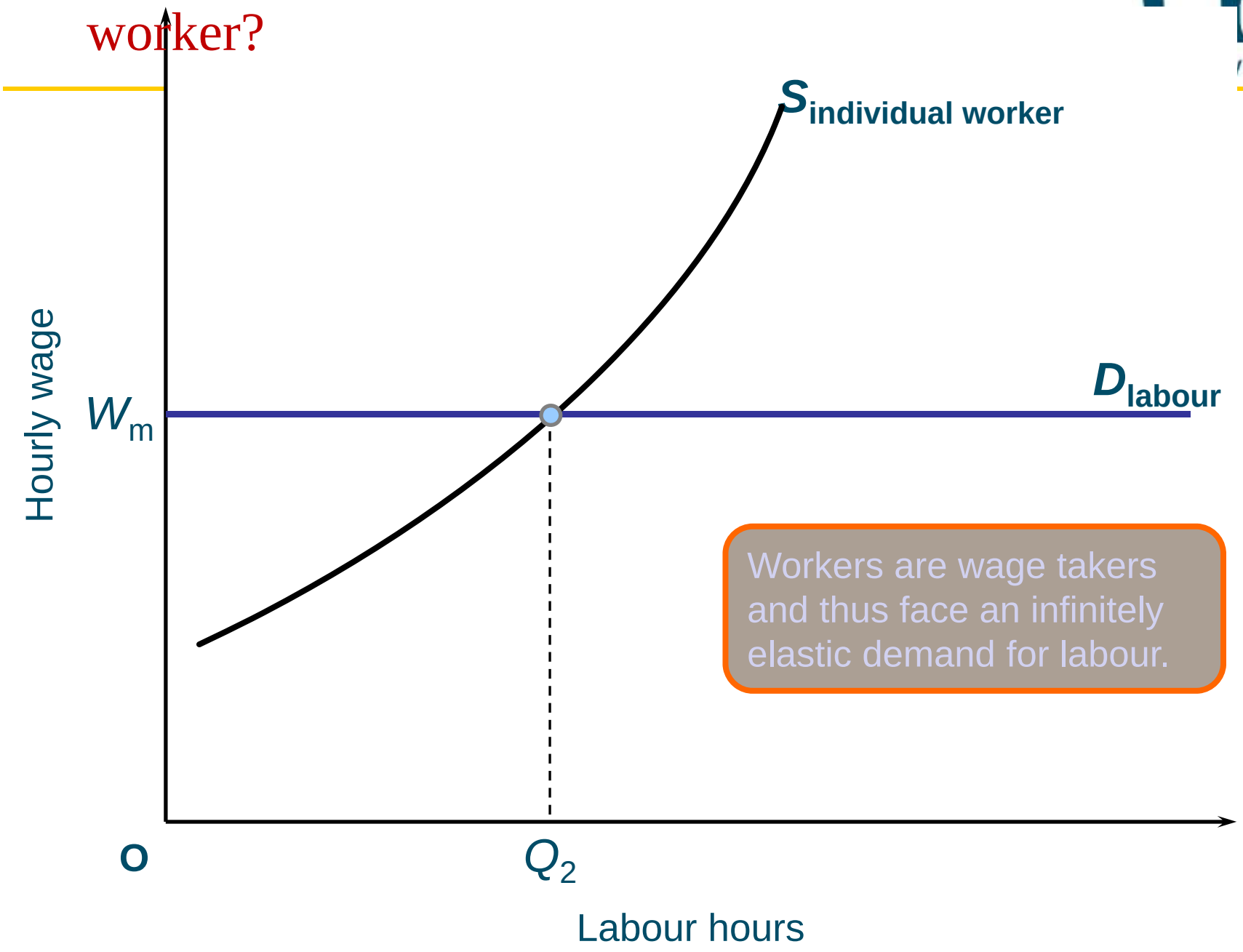
A labour Market: Whole Market



A labour market: individual employer



A labour market: what about the individual worker?



Wages under perfect competition

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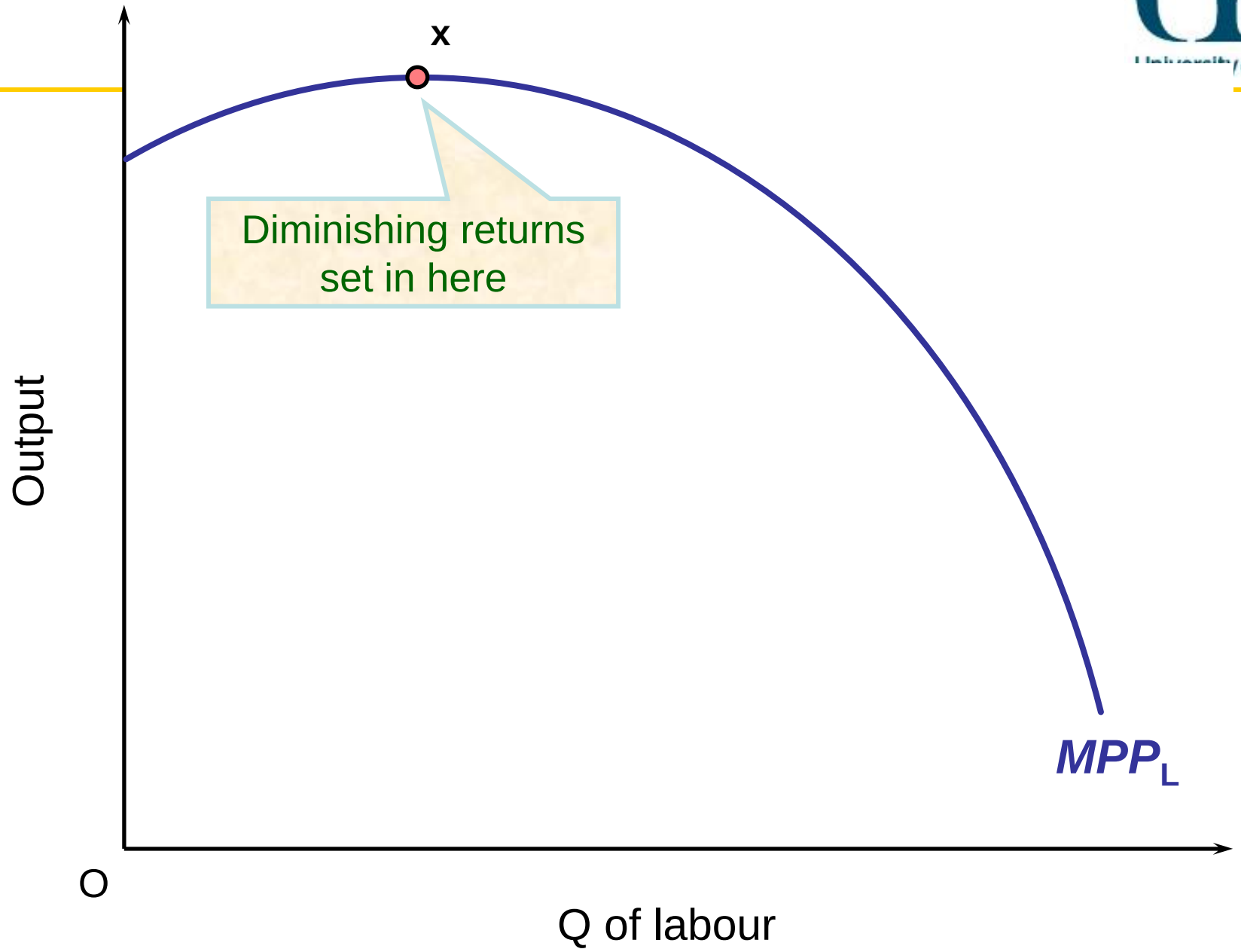
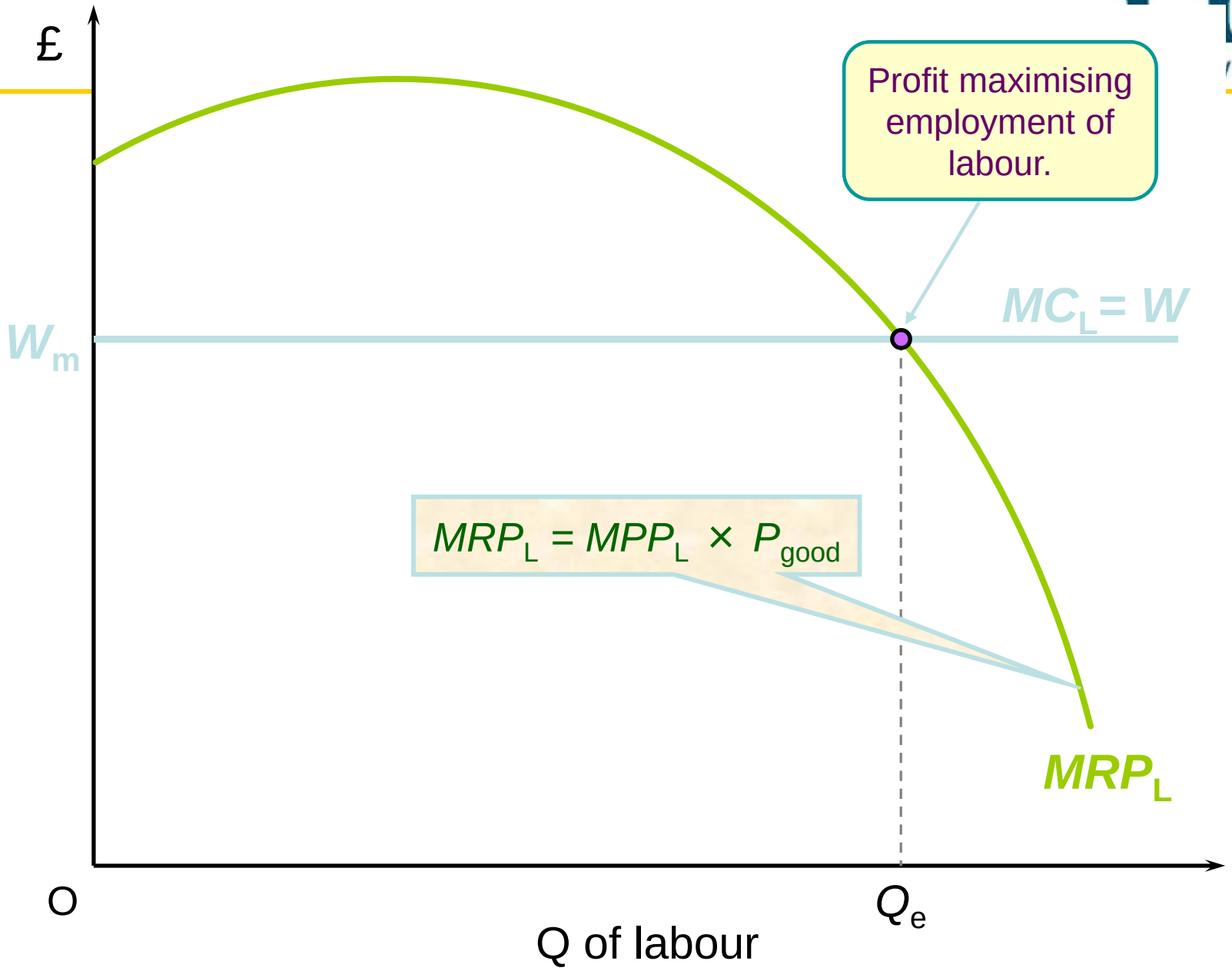
- The demand for labour:
  marginal productivity theory
  - marginal revenue product of labour (MRP_L)

Marginal physical product of labour curve



The profit-maximising level of employment



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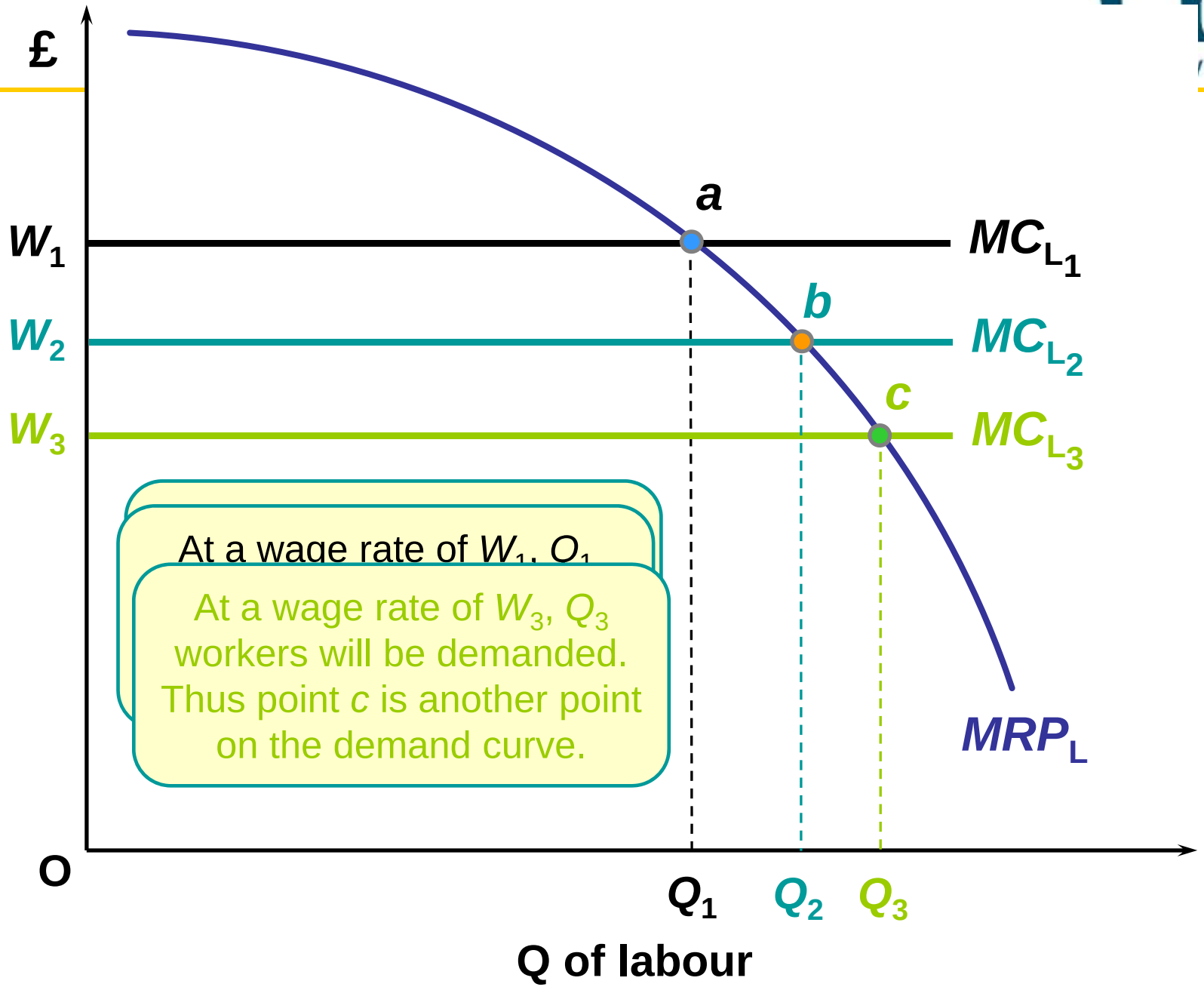
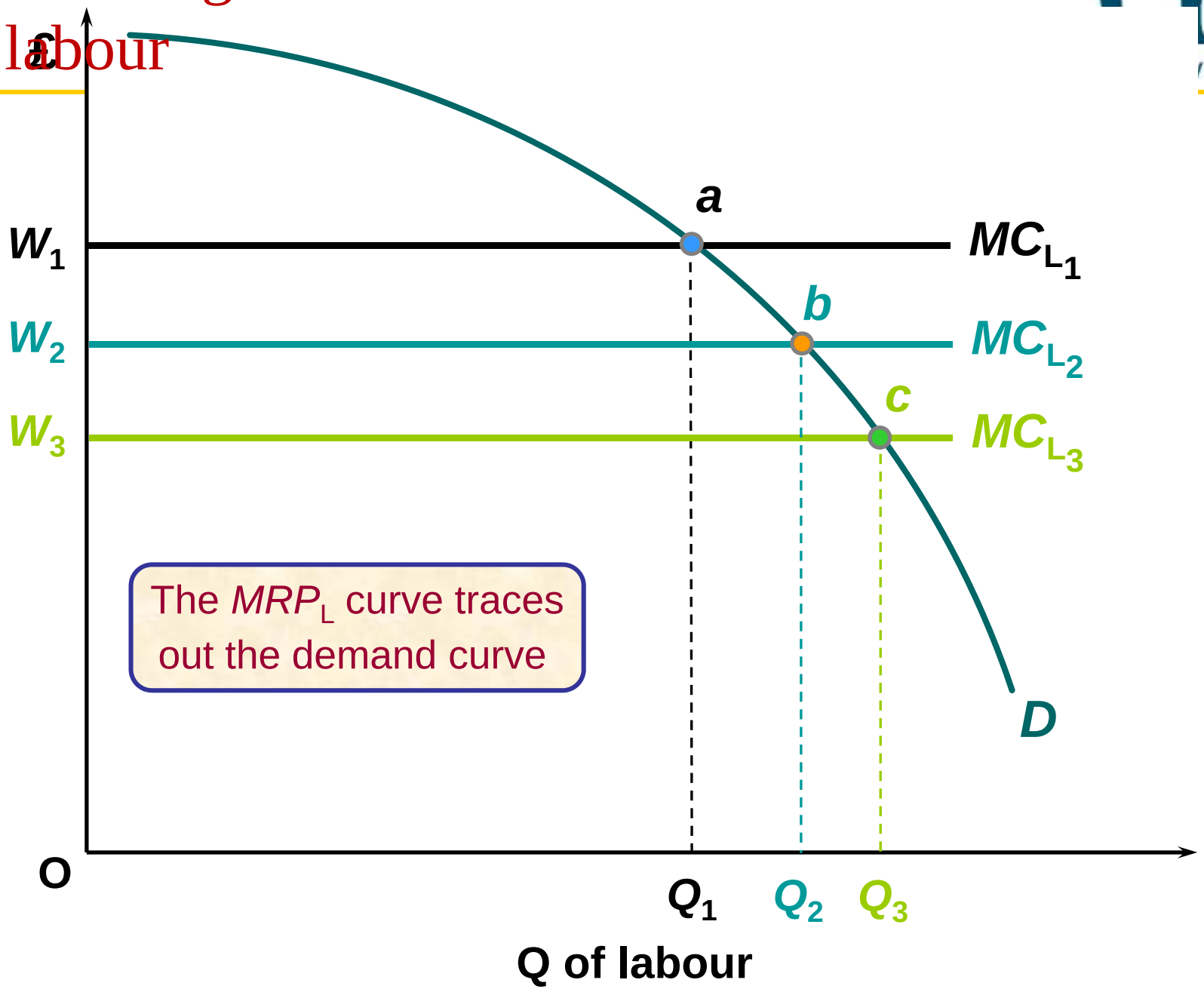
  - marginal revenue product of labour (MRPL)
  - derivation of a firm's demand curve for labour

Deriving the firm's demand curve for labour



Deriving the firm's demand curve for labour



Wages under perfect competition

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- The demand for labour:
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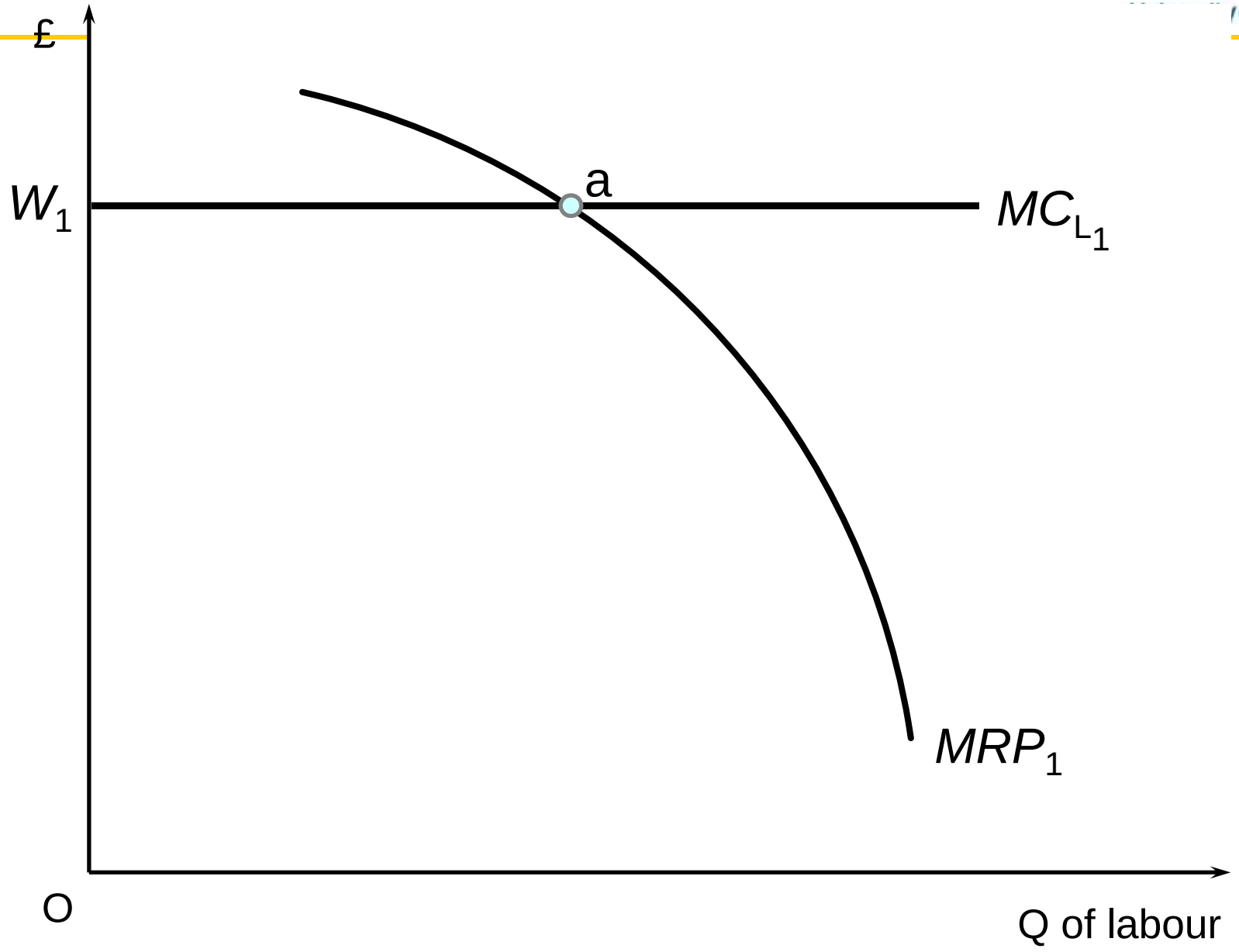
  - derivation of the industry demand curve for labour

Using the firm's demand curves for labour to derive the industry demand curves for labour



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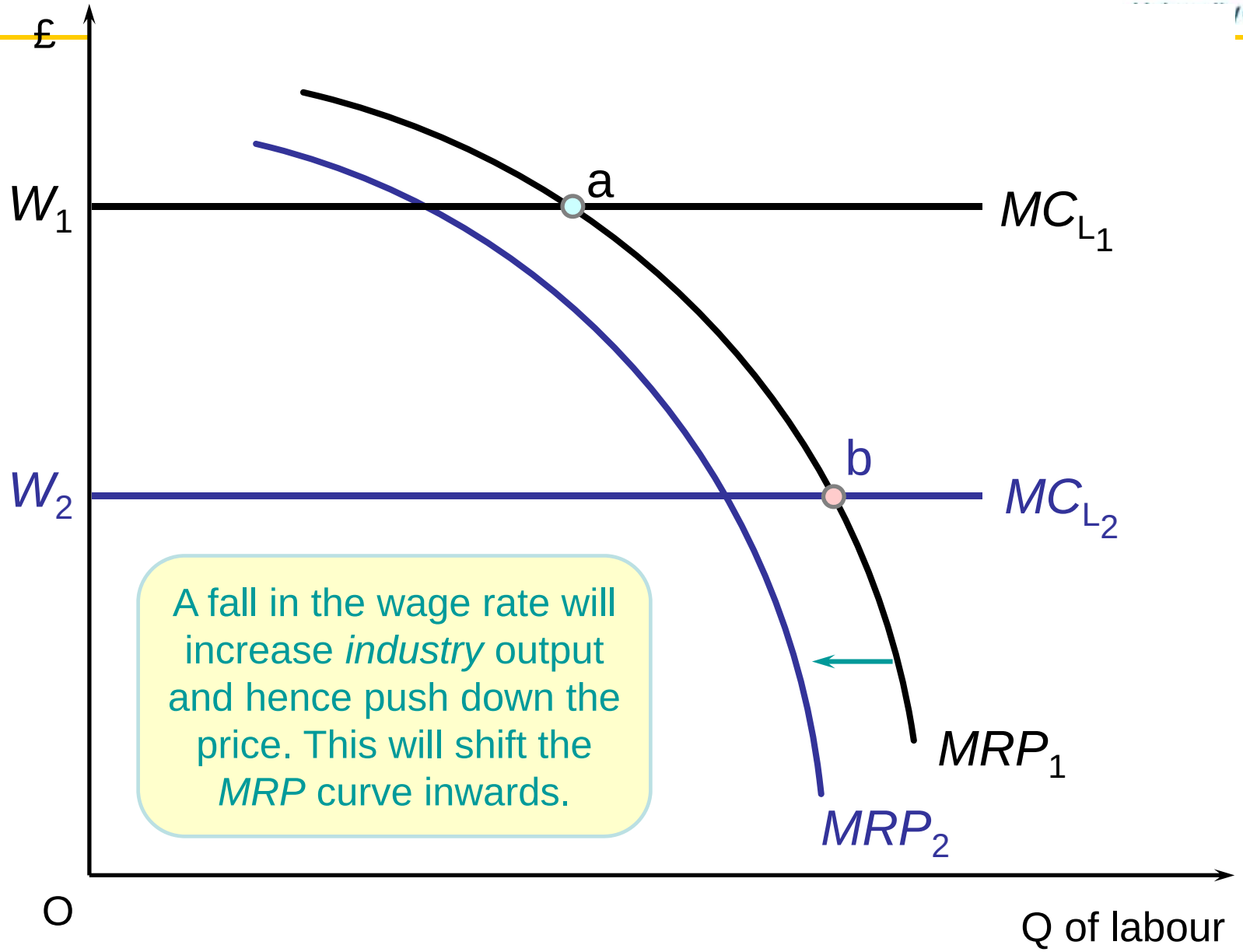

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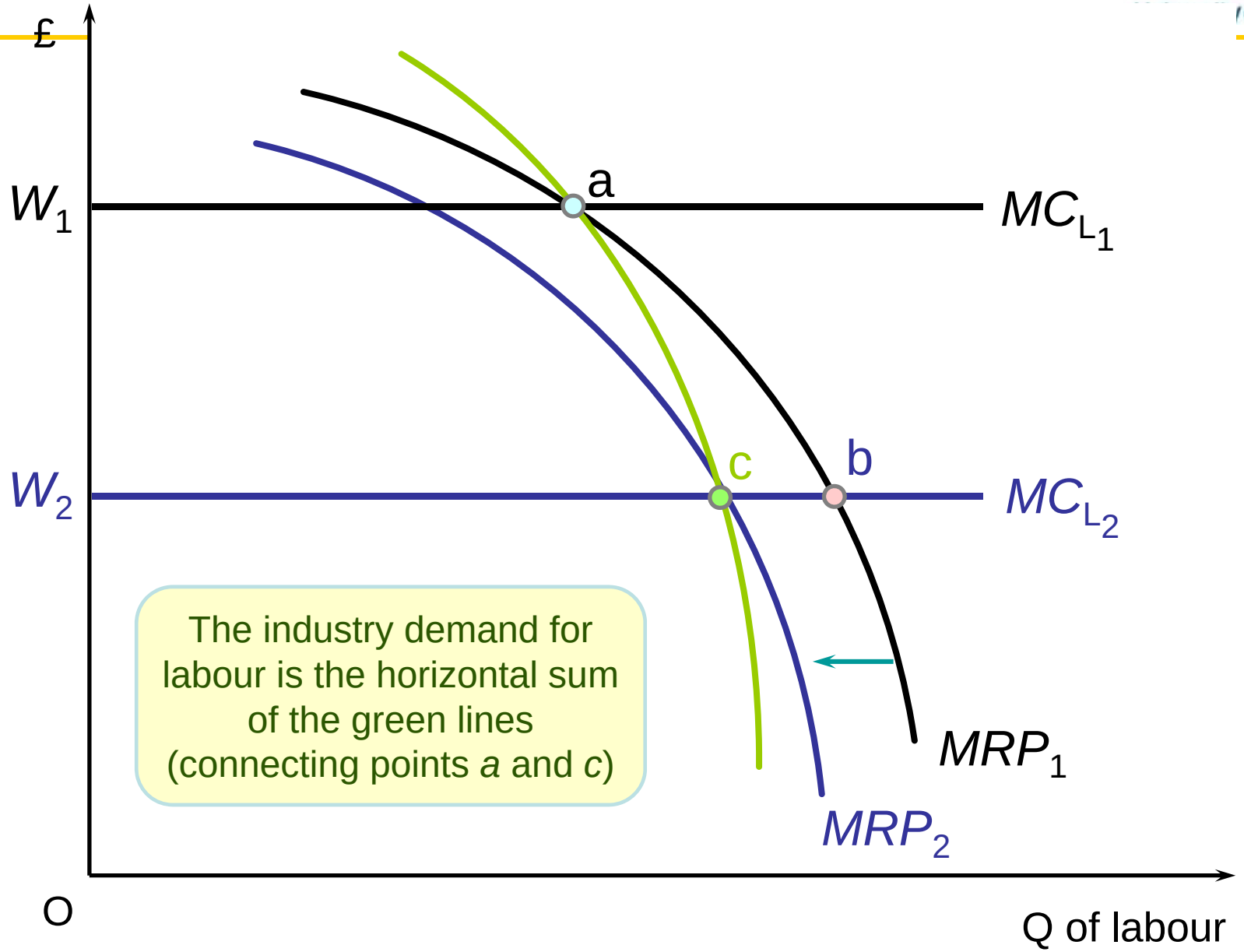

Wages under perfect competition

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- Elasticity of demand for labour
  - determinants of elasticity
    - price elasticity of demand for the good
    - ease of factor substitution
    - elasticity of supply of other factors
    - wage costs as a proportion of total costs
    - time period

Wages under perfect competition

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- Wages and profits under perfect competition
  - MRP slopes down, thus last worker adds less to revenue than previously employed workers
  - if all workers are paid the MRP of the last worker , there is a surplus for the firm over its wage bill, contributing to profits

Takeaway messages

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- Rational decision making works in the labour market
- Two effects link wages, working hours and leisure: income and substitution effects
- Cab drivers seems to think little by little (bracketing)
- Labour supply curve has typically the standard positive slope

EXTRA SLIDES

Wages in imperfect markets

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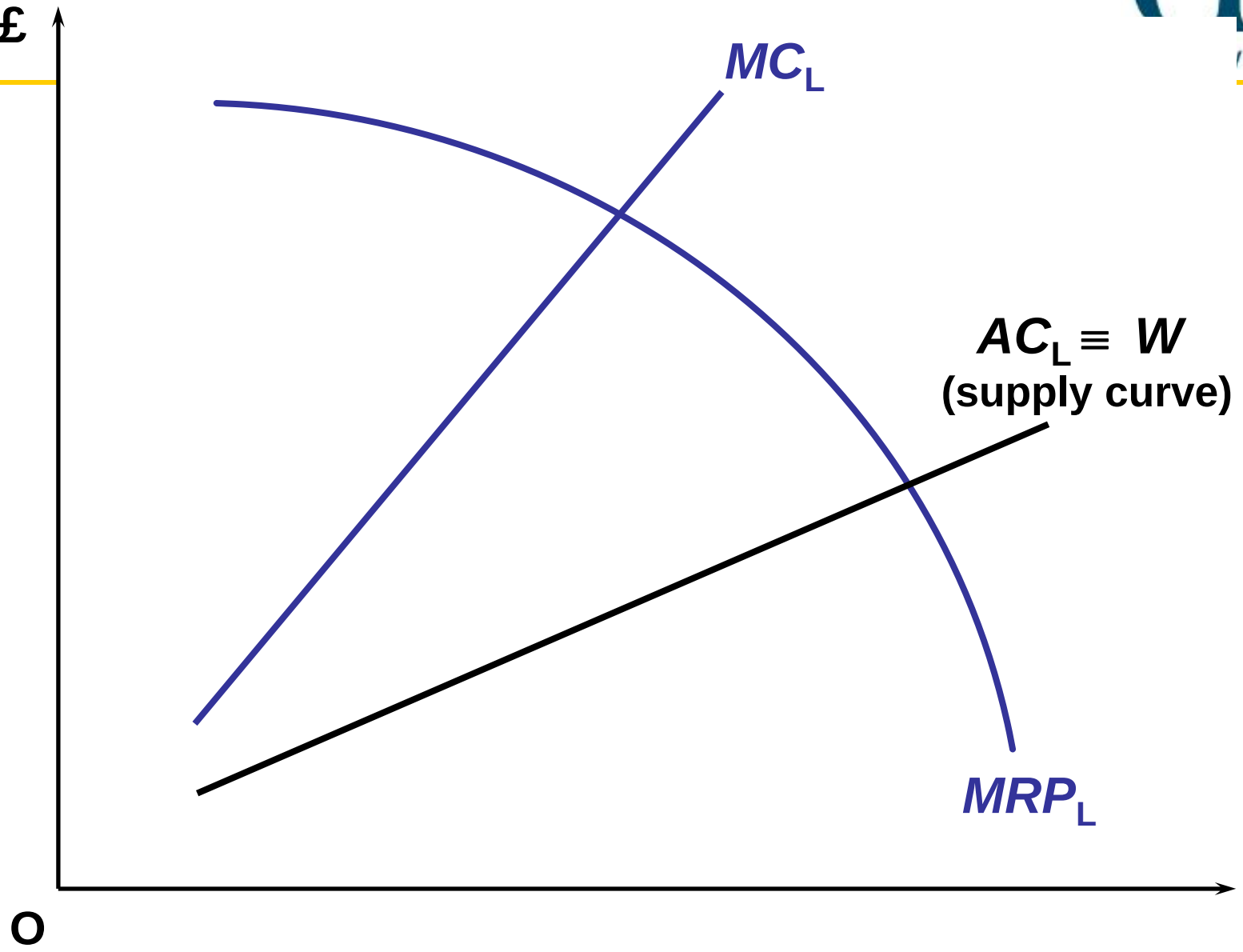
- Types of factor market power
- Firms with monopsony power in employing labour
  - $MC_L > W$

Monopsony



Wages in imperfect markets

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  - effects on wages and employment

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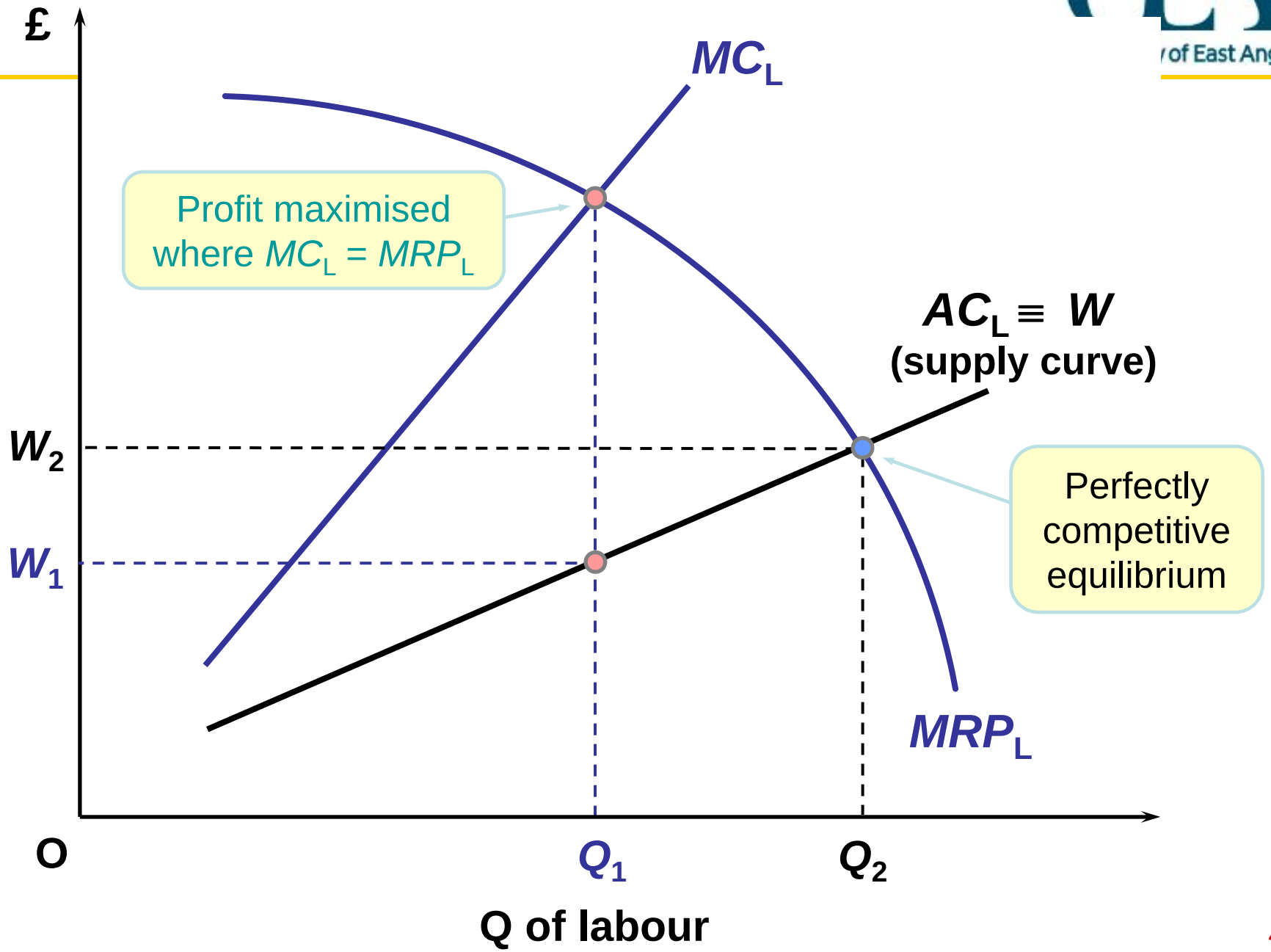
£
MC_L
Profit maximised where $MC_L = MRP_L$
$AC_L \equiv W$
(supply curve)
W_2
W_1
Perfectly competitive equilibrium
MRP_L
O
Q_1
Q_2
Q of labour

Wages in imperfect markets

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- Types of factor market power
- Firms with monopsony power in employing labour
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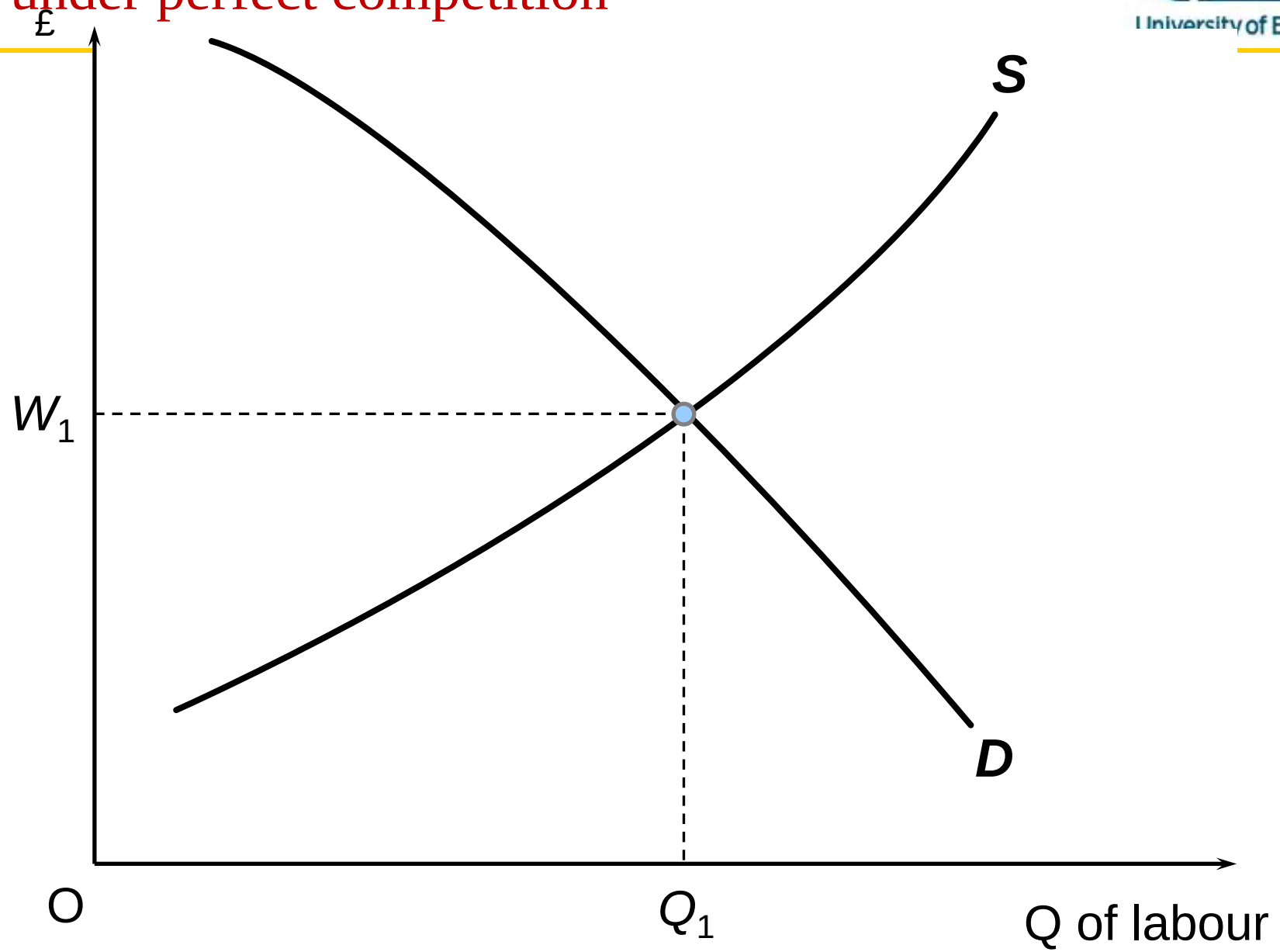
  - effects on wages and employment

- Unions with monopoly power
  - employers with no market power
  - effects of wage increases on employment

Monopoly union facing producers under perfect competition



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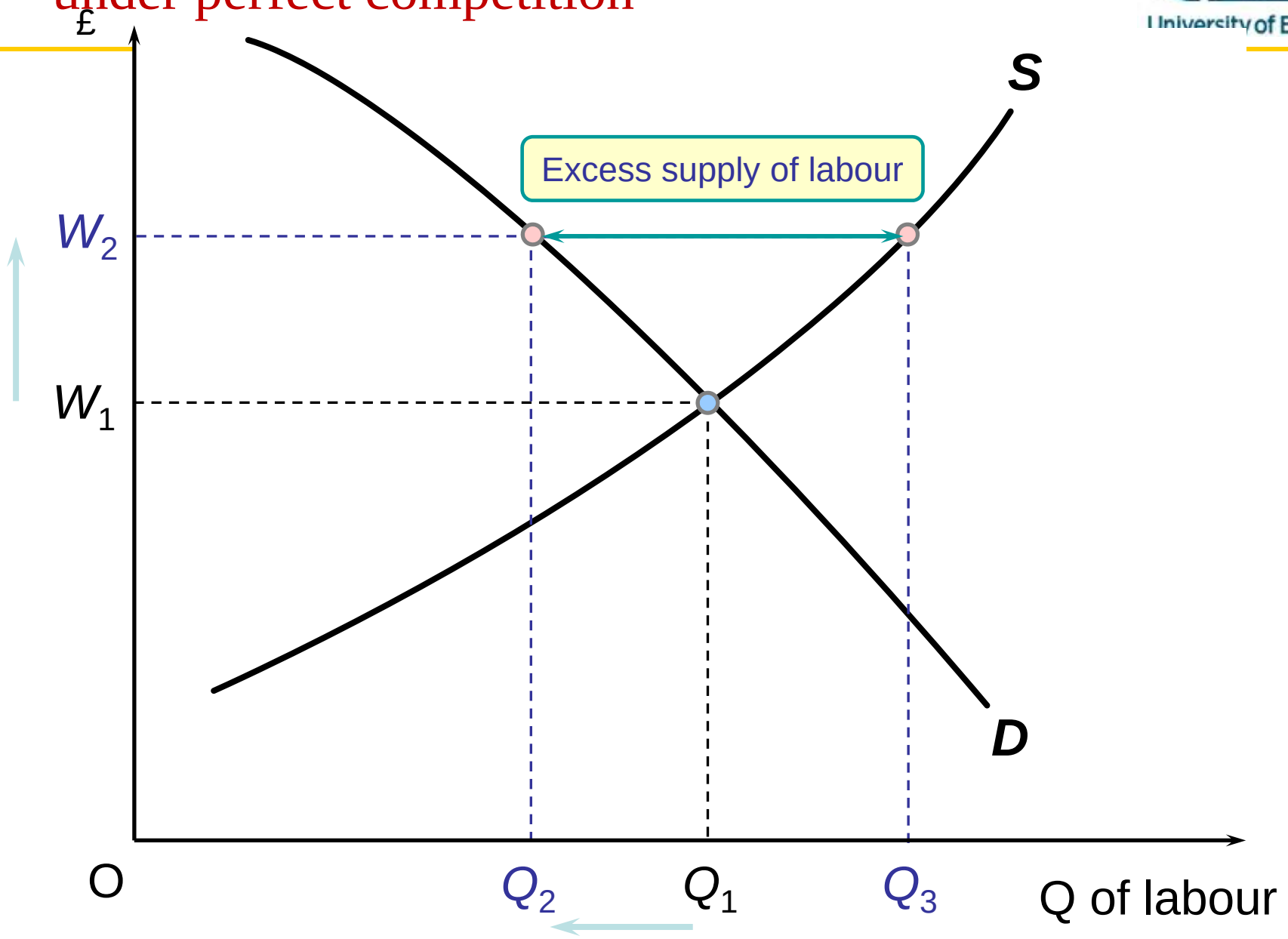

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