

Political Economy of European Integration: Labour Economics

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Schedule : TBA

References :

- **Boeri, T. & van Ours, J. (2013), *The Economics of Imperfect Labor Markets*, Princeton University Press.**
- Cahuc, P. & Zylberberg, A. (2001), *Le marché du travail*, De Boeck Université.
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✓ Aim of the course ?

1. Overview of the labour market

- a) Key definitions
- b) Facts & trends

2. How does the labour market work?

- a) Labour supply and demand
- b) Competitive equilibrium
- c) Disturbing the equilibrium

3. Labour market imperfections

- a) Discrimination
- b) Minimum wages
- c) Unions & collective bargaining

1. Overview of the labour market

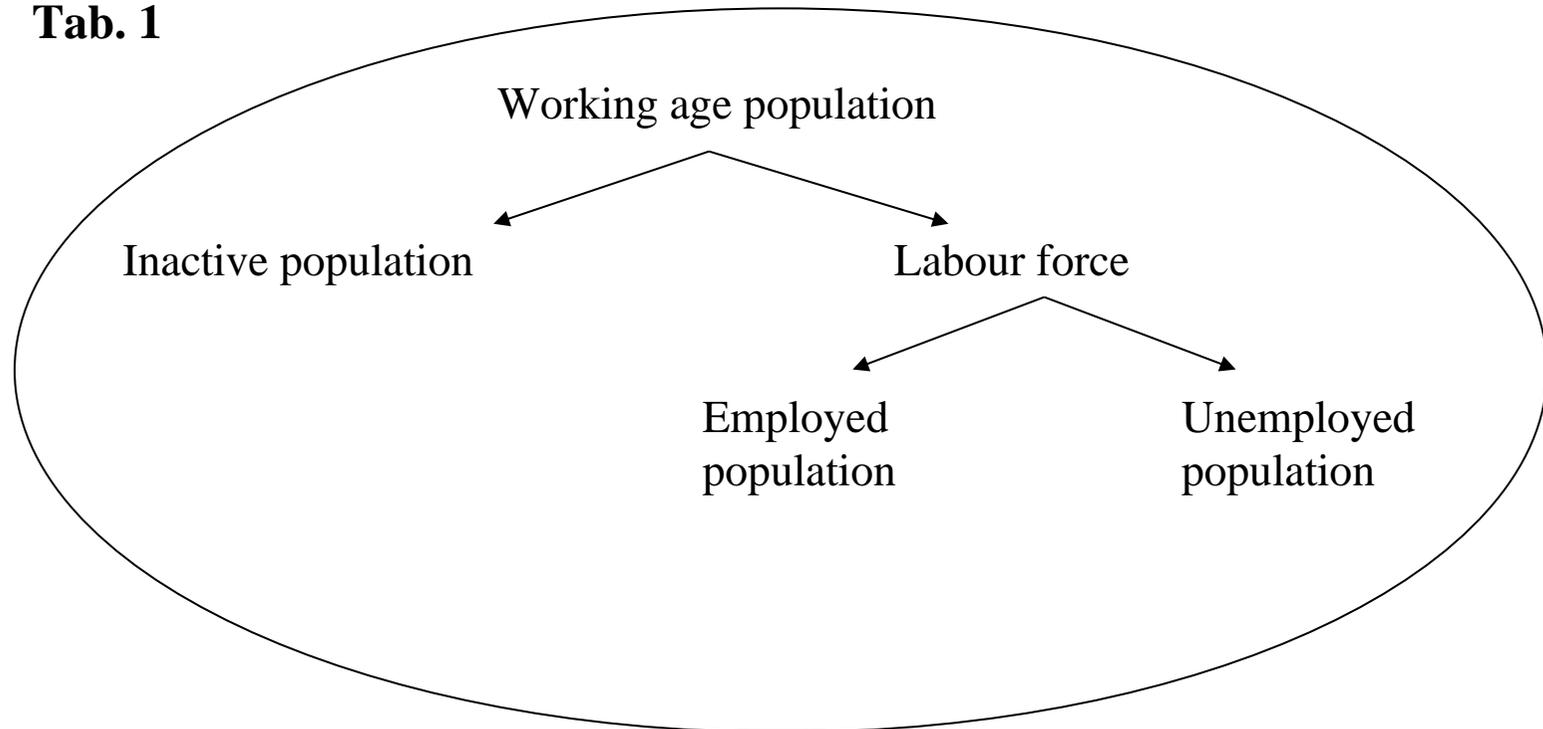
1.1. What is labour economics?

Labour economics is the study of the markets in which labour services are exchanged for wages.

- ↳ In general, income earned by working (i.e. wages) is the largest component (around two-thirds) of total income.
- ↳ A large part of the population is made up of wage-earners and of people who aspire to become wage-earners but have not yet left the educational system or are looking for a job.
- ↳ Covers a very large field and sheds lights on various important economic and social issues, e.g. wages, employment, unemployment, the labour cost, working time, unions, workplace injuries or discrimination.

1.2. Key definitions

Tab. 1



- **Working age population, N** : population aged 15-64.
- **Employed, L** : people in working age who, during the reference week (or day), have made for at least one hour :
 - Paid work *or*
 - Self-employed work

Paid work also includes people who are temporarily not working but who have formally paid work (e.g. they are on maternity leave).
- **Unemployed, U (ILO convention)** : people in working age who, during the reference week (or day), were:
 - without either paid or self-employed work,
 - willing and able to work *and*
 - looking for a job.
- **Inactive, O** : people in working age neither employed nor unemployed.

Tab. 2

Labour force survey

During the survey, respondent asked if s/he had a paid work during the reference period.

If the answer is:

Yes

Person is asked how many hours s/he works per week, in which sector, for which salary, etc.

Employed

No

Person asked if s/he fulfils criteria to be classified as unemployed

Answer :

Yes

Unemployed

No

Inactive

Labour force

Working age population

- **Labour force :** $LF = L + U$

- **Working age population:** $N = L + U + O$

- **Unemployment rate:** $u = \frac{U}{LF}$

- **Employment rate:** $e = \frac{L}{N}$

- **Participation rate:** $p = \frac{LF}{N}$

Remarks :

a) Changes in a ratio may be the outcome of different variations in the numerator and/or denominator

Example : Employment rate increase can be explained by employment growth and/or decrease in working age population

b) The employment rate reflects more accurately employment dynamics (i.e. employment creation and destruction) than the unemployment rate. Indeed, the unemployment rate is affected by cyclical changes in the labour force.

Example :

Situation at start:

$$E = 90, U = 10, LF = 100, O = 10, N = 110 \rightarrow \mathbf{u = 10\%, e = 81,8\%}$$

Scenario A : 1 job created, 0 new entrant

$$E = 91, U = 9, LF = 100, O = 10, N = 110 \rightarrow \mathbf{u = 9\%, e = 82,7\%}$$

Scenario B : 1 job created, 1 new entrant (looking for a job) :

$$E = 91, U = 10 - 1 + 1 = 10, LF = 100 + 1 = 101, O = 10 - 1 = 9, \\ N = 110 \rightarrow \mathbf{u = 9,9\%, e = 82,7\%}$$

c) Unemployment indicator is imperfect :

- Difficult to distinguish an unemployed from an inactive (cf. “discouraged” workers).
- “Under-employed workers” are not taken into account.

1.3. Facts & Trends

- a) Development of the services sector.
- b) Feminisation of the labour market.
- c) Diversification of employment contracts and growing flexibility
- d) Technical progress and globalisation
- e) Different unemployment experiences

✓ Development of the services sector

- In advanced economies, the services sector is the largest industry in terms of value added, investments and employment.

- Principal components :
 - Education and health services.
 - Retail and wholesale trade.
 - Financial activities (e.g. banking and insurance services).
 - Transport et telecommunications.
 - Professional services (e.g. consultancy).

Tab. 3 : Share of tertiary employment in total (civil) employment

<i>En %</i>	1974	1984	1994	2004	2014	2017
Italy	43,2	53,6	58,6	64,6	69,5	70,2
Germany	46,3	53,9	59,0	66,0	70,5	71,3
Japan	50,1	56,3	60,2	67,1	70,6	72,7
Spain	39,6	50,1	60,2	63,9	76,3	75,6
Ireland	44,6	54,7	59,6	65,9	76,1	76,2
France	49,9	59,4	68,6	73,8	76,8	77,2
Belgium	55,2	66,1	70,7	72,8	77,4	78,0
Denmark	58,0	66,5	68,1	73,1	78,3	79,2
Sweden	56,4	65,1	71,4	75,2	79,5	80,1
United Kingdom	55,1	62,2	70,3	76,4	80,0	80,7
United States	63,4	68,2	73,1	78,4	80,7	80,9
Netherlands	58,4	66,8	73,0	77,7	82,9	83,1
EU(15)*	47,9	56,7	63,7	69,4	75,9	76,6

Source : OECD (2018), *Labour force statistics*, Paris (p.43).

* Mean of national %. EU(15) : European Union Member States before May 1st 2004, i.e. Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, United Kingdom and Sweden.

- Specific features :
 - Diversity of production techniques.
 - Large fraction of female workers.
 - High incidence of part-time and flexible jobs.
 - Major consequences for trade unions and collective bargaining..

✓ Feminisation of the labour market

Share of female employment in total (civil) employment in EU(15) :
25% in 1965 → 46% in 2017.

Source : OECD (2018), *Labour force statistics*, Paris.

Tab. 4 : Female employment and participation rate

In %	Participation rate = Labour force / working age pop		Employment rate = Employment / working age pop	
	1973	2018	1973	2018
Italy	33,7	56,2	29,9	49,5
Belgium	41,3	64,3	39,9	60,7
France	50,1	68,5	47,9	62,5
United States	51,1	68,2	48,0	65,5
United Kingdom	53,2	73,6	52,7	70,5
Germany	50,3	74,3	49,7	72,1
Denmark	61,9	76,6	61,2	72,7

Source : OECD (1995, 2019), *Employment outlook*, Paris.

Tab. 5 : Employment by sector of activity in EU(15), 2016

<i>In %</i>	Men			Women		
	Agr	Ind	Serv	Agr	Ind	Serv
Germany	1,6	39,7	58,7	0,8	13,8	85,3
Austria	4,1	38,2	57,5	3,6	12,0	84,2
Belgium	1,5	32,7	65,7	0,7	8,2	91,1
Denmark	3,5	27,0	68,4	0,9	9,2	88,7
Spain	5,9	29,0	65,1	2,1	8,5	89,4
Finland	4,9	35,0	59,9	1,9	8,8	88,8
France	3,9	30,4	64,3	1,6	9,3	88,0
Greece	12,3	20,6	67,1	11,0	8,2	80,8
Ireland	7,5	29,1	62,9	1,2	8,9	89,4
Italy	4,6	36,1	59,3	2,4	13,0	84,5
Netherlands*	2,6	23,4	74,0	1,2	5,5	93,2
Portugal	5,7	34,9	59,2	3,2	15,5	81,2
UK	1,4	28,1	70,0	0,5	7,6	91,4
Sweden	2,3	28,8	68,3	0,9	6,9	91,5
EU(15)	3,4	32,5	63,4	1,6	10,3	87,4

Source : Eurostat (2017), *Labour force statistics*, Luxembourg.

Note : Agriculture : NACE A ; Industry : NACE B-F ; Services : NACE G-Z.

- Strong occupational and sectoral segmentation.

- Part-time jobs are essentially hold by women :

Tab. 6 : Part-time employment in the EU, 2018

<i>In % of corresponding employment :</i>	Total	Women	Men
Portugal	7,1	9,6	4,5
Greece	10,5	15,5	6,8
United States	12,7	17,2	8,4
Spain	13,3	21,6	6,2
Sweden	13,7	17,4	10,3
France	14,0	21,4	7,1
Finland	14,1	17,8	10,7
Belgium	16,6	28,0	6,6
Italy	18,0	31,9	7,8
Denmark	20,0	25,4	15,2
Germany	22,0	36,6	9,3
UK	23,2	36,4	11,4
Netherlands	37,3	58,0	19,2
EU(15)*	17,6	27,3	9,2

Note : * Non weighted average of EU(15) countries. Part-time employment refers to people working usually less than 30 hours per week in their main employment. Source : OECD (2019), *Employment outlook*, Paris.

- Share of women in part-time employment = 78,9% in Belgium; 71% in EU(15) and 66% in the US in 2018. Source : OECD (2019), *Employment outlook* , Paris.
- There is often some substitution between full- and part-time employment growth.

Example :

In France, between '89 et '96, employment has increased by 470.000 units, namely -40.000 full-time jobs and +510.000 part-time jobs. Source : CERC (1997).

Southern European countries since 2008.

- Significant and persistent gender wage gaps.

Article 119 of the Treaty of Rome – establishing the European Communities in 1957, introduced the principle that women and men should receive equal pay for equal work. Since 1975, this basic principle has been refined and took further through a number of European Directives. The latter extend the equal pay to work of equal value and notably guarantee the right to equal treatment within the workplace, such as access to employment, vocational training, promotion and working conditions.

While EU countries have brought their laws into line with European Directives, significant gender wage gaps still persist in all Member States.

Gender wage gaps have been decreasing in most EU countries over recent decades but only very slowly.

In spite of EU legislation, there appears to be no ‘natural trend’ towards pay equity.

Tab. 7 : Female gross hourly wages in % of male gross hourly wages in the private sector

	2002	2006	2010	2014
Sweden	84,7	86	84,6	84,2
Belgium	83,5	85,7	89,8	90,1
France	83,4	84,3	84,4	84,7
Luxembourg	81,1	84,2	91,3	91,4
Italy	81,2	83,4	94,7	93,5
Denmark	n.d.	82,2	84,1	84,2
Finland	82,1	80,2	79,7	82,0
Greece	74,5	78,9	85,0	n.d.
Portugal	80,3	78,9	87,2	85,5
Spain	75	76,2	83,8	81,2
Ireland	73,4	73,9	86,1	n.d.
Germany	73,9	73,8	77,7	78,4
Austria	73,6	73,4	76,0	77,1
Netherlands	75	72,1	82,2	83,8
UK	69,3	71,8	80,5	81,7
EU(15)*	77,9	79	84,4	84,4

Notes : * Mean of countries reported in the table. Results obtained from the Europeans Structure of Earnings Survey 2002, 2006, 2010 and 2014. This survey covers only establishments with at least 10 workers. The private sector encompasses NACE categories C to K, i.e. industry, construction and services (except public administration, defence, compulsory social security). Source : Eurostat database.

✓ Diversification of employment contracts and rowing flexibility

Tab. 8-1 : Temporary employment in % of total salaried employment, 2018

Spain	26,8
Portugal	22,0
Netherlands	21,5
Italy	17,0
France	16,8
Sweden	16,5
Finland	16,5
Germany	12,6
Denmark	11,2
Greece	11,3
Belgium	10,8
Austria	9,1
United Kingdom	5,6
United States	4,0*
EU(15)	14,5

Source : OCDE (2019), *Employment outlook*, Paris. *2017

Tab. 8-2 : Temporary employment according to individual characteristics, 2014

	Sex*		Age groups*			Level of education**		
	♂	♀	15-24	25-49	50-64	Low	Middle	High
Espagne	23,6	24,6	69,1	25,2	11,9	0,39	0,24	0,37
Portugal	21,6	21,1	63,0	21,2	10,8	0,43	0,30	0,27
Pays-Bas	20,2	22,0	55,5	17,6	7,1	0,30	0,42	0,27
Suède	14,7	18,8	56,2	13,5	6,9	0,21	0,47	0,32
Allemagne	13,1	13,2	53,4	10,4	3,9	0,31	0,50	0,19
Finlande	12,3	18,2	42,5	14,0	7,1	0,15	0,50	0,35
France	15,0	16,9	57,3	13,5	8,2	0,21	0,47	0,32
Italie	13,1	14,2	56,0	13,9	6,2	0,33	0,47	0,20
Grèce	11,0	12,4	29,4	11,7	7,3	0,29	0,41	0,30
Danemark	8,2	9,0	21,3	7,5	3,5	0,34	0,33	0,31
Autriche	9,2	9,2	35,1	5,8	2,8	0,39	0,32	0,29
Belgique	7,6	9,7	34,2	7,7	3,5	0,24	0,36	0,40
Royaume-Uni	5,8	6,8	15,2	4,9	4,7	0,13	0,41	0,46
UE(15)	13,3	14,4	43,5	12,5	6,2	0,29	0,41	0,29

* Share of temporary employment in total employment of corresponding age group, in %.

** Distribution of temporary workers by highest attained level of education. Total not always equal to 100% because of « non response » category. Low = max. lower secondary education. Middle = upper secondary education. High = tertiary education.

Source : Eurostat database.

**Tab. 8-3 : Change in incidence of temporary employment
(as % of total salaried employment) between 1995 and 2018,
in percentage points**

Portugal	12,0	(10,0 / 22,0)
Netherlands	10,6	(10,9 / 21,5)
Italy	9,8	(7,2 / 17,0)
Belgium	5,5	(5,3 / 10,8)
France	4,5	(12,3 / 16,8)
Austria	3,1	(6,0 / 9,1)
Germany	2,2	(10,4 / 12,6)
Sweden	1,9	(14,6 / 16,5)
Greece	1,1	(10,2 / 11,3)
Denmark	-0,9	(12,1 / 11,2)
United Kingdom	-1,4	(7,0 / 5,6)
Finland	-1,8	(18,3 / 16,5)
Spain	-8,2	(35,0 / 26,8)
EU(15)	3,1	(11,4 / 14,5)

Note: Temporary employment frequencies (as % of total salaried employment) in 1995 and 2018 are indicated between parentheses.

Source : OECD (2019), *Employment outlook*, Paris.

✓ Globalisation

- Sharp increase of international trade among rich countries but also between rich and poorer countries.

**Tab. 9-1 : Evolution of the degree of openness of economies
(Mean of exports and imports in % of GDP)**

	1970	1985	2000	2018
Belgium	49,5	69,9	76,8	87,8
Germany	17,2	25,9	33,2	44,3
UK	21,9	28,2	28,6	33,3
France	15,6	23,9	28,1	31,7
Spain	12,9	20,5	30,6	33,3
EU(15)	20,7	29,1	35,2	42,7
United States	5,6	8,5	12,9	13,7
Turkey	5,1	17,5	21,6	27,1*
Japan	10,2	12,7	10,3	17,3*

Source : Eurostat database (National accounts). * 2017 (OECD, 2019)

**Tab. 9-2 : Exports and imports of goods in Belgium, 1995 and 2015
(in % of total exports and imports, respectively)**

	Exports		Imports	
	(To...)		(From...)	
	2010	2015	2010	2015
EU-15	69,2%	66%	70,6%	65,9%
GBR	6,8%	8,3%	6,3%	5,2%
EU-13*	4,5%	5,7%	3,8%	4,8%
USA	4,5%	5,6%	4,0%	5,5%
NAFTA	5,3%	6,5%	4,8%	7,2%
CHN	1,9%	2,1%	2,8%	3,1%
JPN	0,7%	0,8%	2,5%	1,5%

Notes : * Eastern and Central Countries from the EU(28), notably Slovenia, Slovakia, the Tchech Republic, Poland, Hungary, Romania and Bulgaria.

Source : Plan Bureau and Eurostat.

Consequences :

- ↪ Growing competition from rich but also low-wage countries.

- ↪ Competitiveness is a crucial issue of growing importance at the forefront of current socio-economic debates.

- ↪ Discussions, especially in Western Europe, notably focused on :
 - Whether and how we should reduce labour costs.
 - The optimal taxation scheme.
 - The potential need to flexibilize the labour market.

✓ Technical progress

- Enhances the efficiency of production factors (labour and capital).

Examples :

- 17th & 18th C. Introduction of new crops and the abandonment of fallowing land → increase in agricultural production per hectare and per worker.
- 19th & 20th C. Mastery of the powers of steam, electricity and internal combustion → increase of ratio between production and input factors in the industry (but also in the agriculture)
- End 20th & 21st C. Innovations in the information technology (IT) and telecommunications → increase of productivity in services (but also in the industry and agriculture)

- **Other consequences :**

Efficiency of input factors generally not equally affected.

Technical progress often arrives as an abrupt change, and sometimes leads to the disappearance of some production factors.

Profound changes in the qualifications that are requested by firms.

Skill/task-biased technological change.

Skill/education mismatch.

✓ Different unemployment experiences

- **In a nutshell:**

1960s	Low unemployment rate, almost full-employment.
Mid '70 – begin of '80	Oil shocks → sharp economic slowdown → strong increase of unemployment in most countries.
Until autumn 2008	Unemployment remained high in many countries, especially in Europe.
Since then:	Great Recession → heterogeneous increase, and subsequently improvement of unemployment across countries (e.g. US vs Germany)

- **Conséquences**

High social security contributions, waste of resources, labour deskilling.

Tab. 10 : Key labour market statistics

<i>In %</i>	Unemployment rate ¹		Participation rate ²		Employment rate ³		Low-wage jobs in 2016 (%) ⁶
	2018	(2007)	2018	(2007)	2018	(2007)	
Australia	5,5	(4,4)	78,0	(76,2)	73,8	(72,8)	15,7
Austria	4,9	(4,4)	76,4	(74,7)	73,0	(71,4)	15,4
Belgium	6,0	(7,5)	68,6	(67,1)	64,5	(62,0)	4,6
Canada	5,9	(6,0)	78,4	(78,4)	73,8	(73,6)	22,3
Denmark	4,9	(3,8)	79,4	(80,2)	75,5	(77,1)	8,2
Finland	7,5	(6,9)	78,0	(75,7)	72,2	(70,5)	7,1
France	8,8	(8,4)	72,2	(69,5)	65,9	(64,0)	9,1
Germany	3,5	(8,4)	78,6	(75,6)	75,9	(69,0)	18,9
Italy	10,8	(6,1)	65,6	(62,5)	58,5	(58,7)	7,7
Luxemburg	5,6	(4,2)	71,1	(66,9)	67,1	(64,2)	12,2
Netherlands	3,8	(3,2)	80,3	(77,5)	77,2	(74,8)	14,5
Norway	4,0	(2,5)	78,0	(78,9)	74,9	(76,9)	n.d.
Portugal	7,3	(8,1)	75,1	(74,1)	69,7	(67,8)	11,4
Spain	15,4	(8,3)	74,9	(72,6)	63,4	(66,6)	14,6
Greece	19,5	(8,4)	68,2	(67,0)	54,9	(61,4)	15,8
Ireland	6,2	(4,7)	73,1	(72,6)	68,5	(69,2)	22,5
Sweden	6,5	(6,1)	82,9	(80,6)	77,5	(75,7)	n.d.
Zwitsersland	4,9	(3,6)	84,2	(81,6)	80,1	(78,6)	10,2
UK	4,3	(5,3)	78,3	(76,3)	75,0	(72,3)	19,3
USA	3,9	(4,6)	73,6	(75,3)	70,7	(71,8)	24,9
Japan	2,6	(4,1)	78,9	(73,6)	76,8	(70,7)	12,7
EU(15)⁴	7,7	(6,7)	74,9	(72,0)	68,1	(66,9)	13,0
OECD ⁵	5,5	(5,8)	72,4	(70,6)	69,3	(66,5)	15,7

¹ Ratio between unemployment and labour force. ² Ratio between labour force and working age population. ³ Ratio between employment and working age population ⁴ Non weighted average. ⁵ Weighted average. ⁶ % full-time workers earning less than 2/3 of the median wage. Sources : OECD (2019), *Employment outlook*, Paris.

✓ **Does a high unemployment rate reflect a higher participation rate ?**

▪ **Illustration :**

A generous unemployment benefit system may incite more workers to declare that they are actively looking for a job so that they may benefit from a replacement revenue (i.e. an UB).

A higher unemployment rate might thus be the result of a higher participation rate and not of a smaller employment rate.

Is this hypothesis verified?

▪ **Numerical example :**

Country A : No generous unemployment system

$$N = 120$$

$$LF = 100$$

$$O = 20$$

$$E = 90$$

$$U = 10$$

$$e = (90/120) = 75\%$$

$$\Rightarrow u = (10 / 100) * 100 = 10\%$$

Country B : Very generous unemployment system

$$N = 120$$

$$LF = 120$$

$$O = 0$$

$$E = 90$$

$$U = 30$$

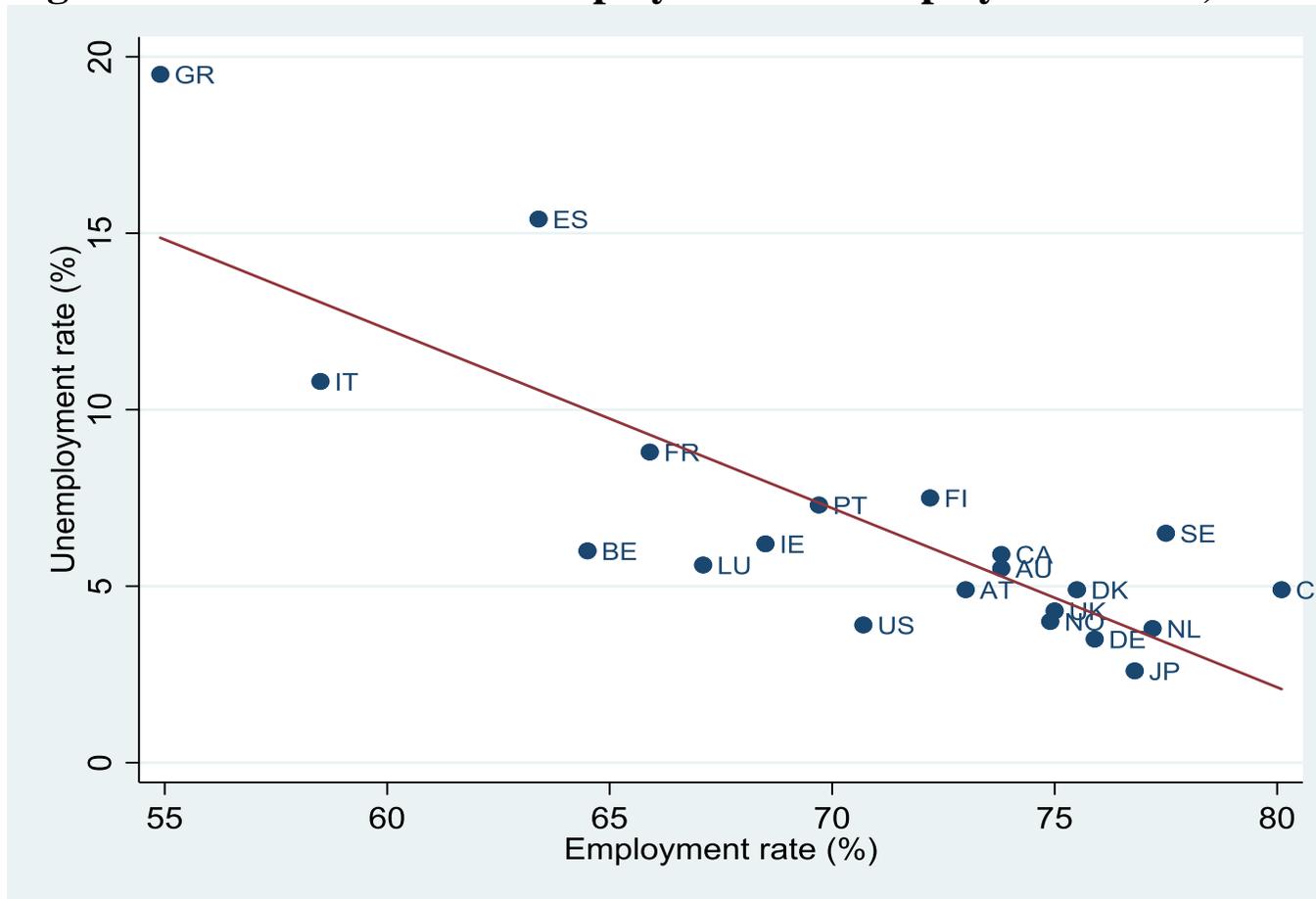
$$e = (90/120) = 75\%$$

$$\Rightarrow u = (30 / 120) * 100 = 25\%$$

Same level of employment (E and e) but u higher in country B because LF is larger.

Is this assumption empirically verified ? No!

Fig. 1 : Relation between unemployment and employment rates, 2018



Source : OECD (2019), *Employment outlook*, Paris.

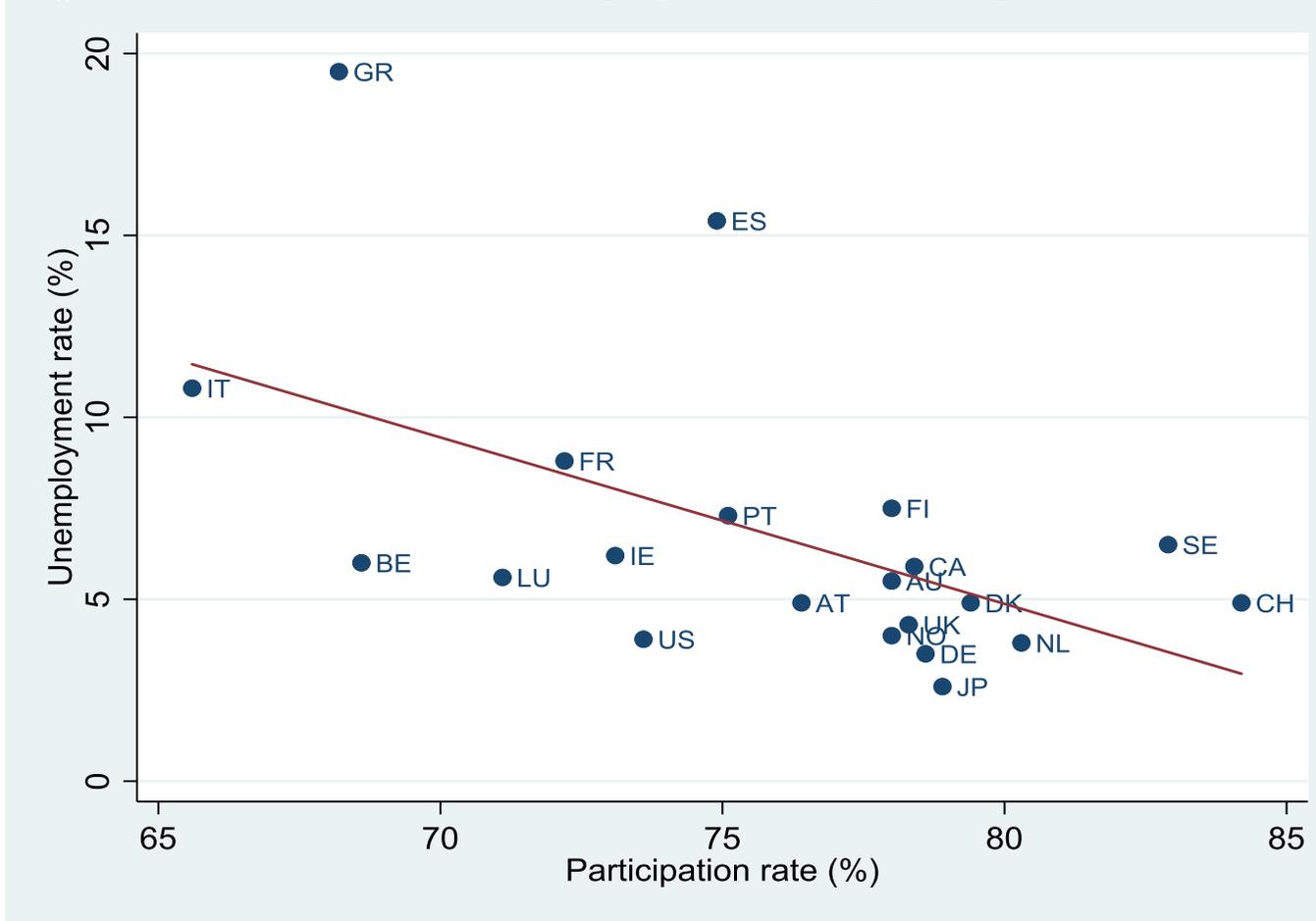
➤ On average, the unemployment rate is a relatively accurate indicator of job scarcity (i.e. the reverse of job abundance)

Tab. 10 : Key labour market statistics

<i>In %</i>	Unemployment rate ¹		Participation rate ²		Employment rate ³		Low-wage jobs in 2016 (%) ⁶
	2018	(2007)	2018	(2007)	2018	(2007)	
Australia	5,5	(4,4)	78,0	(76,2)	73,8	(72,8)	15,7
Austria	4,9	(4,4)	76,4	(74,7)	73,0	(71,4)	15,4
Belgium	6,0	(7,5)	68,6	(67,1)	64,5	(62,0)	4,6
Canada	5,9	(6,0)	78,4	(78,4)	73,8	(73,6)	22,3
Denmark	4,9	(3,8)	79,4	(80,2)	75,5	(77,1)	8,2
Finland	7,5	(6,9)	78,0	(75,7)	72,2	(70,5)	7,1
France	8,8	(8,4)	72,2	(69,5)	65,9	(64,0)	9,1
Germany	3,5	(8,4)	78,6	(75,6)	75,9	(69,0)	18,9
Italy	10,8	(6,1)	65,6	(62,5)	58,5	(58,7)	7,7
Luxemburg	5,6	(4,2)	71,1	(66,9)	67,1	(64,2)	12,2
Netherlands	3,8	(3,2)	80,3	(77,5)	77,2	(74,8)	14,5
Norway	4,0	(2,5)	78,0	(78,9)	74,9	(76,9)	n.d.
Portugal	7,3	(8,1)	75,1	(74,1)	69,7	(67,8)	11,4
Spain	15,4	(8,3)	74,9	(72,6)	63,4	(66,6)	14,6
Greece	19,5	(8,4)	68,2	(67,0)	54,9	(61,4)	15,8
Ireland	6,2	(4,7)	73,1	(72,6)	68,5	(69,2)	22,5
Sweden	6,5	(6,1)	82,9	(80,6)	77,5	(75,7)	n.d.
Zwitsersland	4,9	(3,6)	84,2	(81,6)	80,1	(78,6)	10,2
UK	4,3	(5,3)	78,3	(76,3)	75,0	(72,3)	19,3
USA	3,9	(4,6)	73,6	(75,3)	70,7	(71,8)	24,9
Japan	2,6	(4,1)	78,9	(73,6)	76,8	(70,7)	12,7
EU(15)⁴	7,7	(6,7)	74,9	(72,0)	68,1	(66,9)	13,0
OECD ⁵	5,5	(5,8)	72,4	(70,6)	69,3	(66,5)	15,7

¹ Ratio between unemployment and labour force. ² Ratio between labour force and working age population. ³ Ratio between employment and working age population ⁴ Non weighted average. ⁵ Weighted average. ⁶ % full-time workers earning less than 2/3 of the median wage. Sources : OECD (2019), *Employment outlook*, Paris.

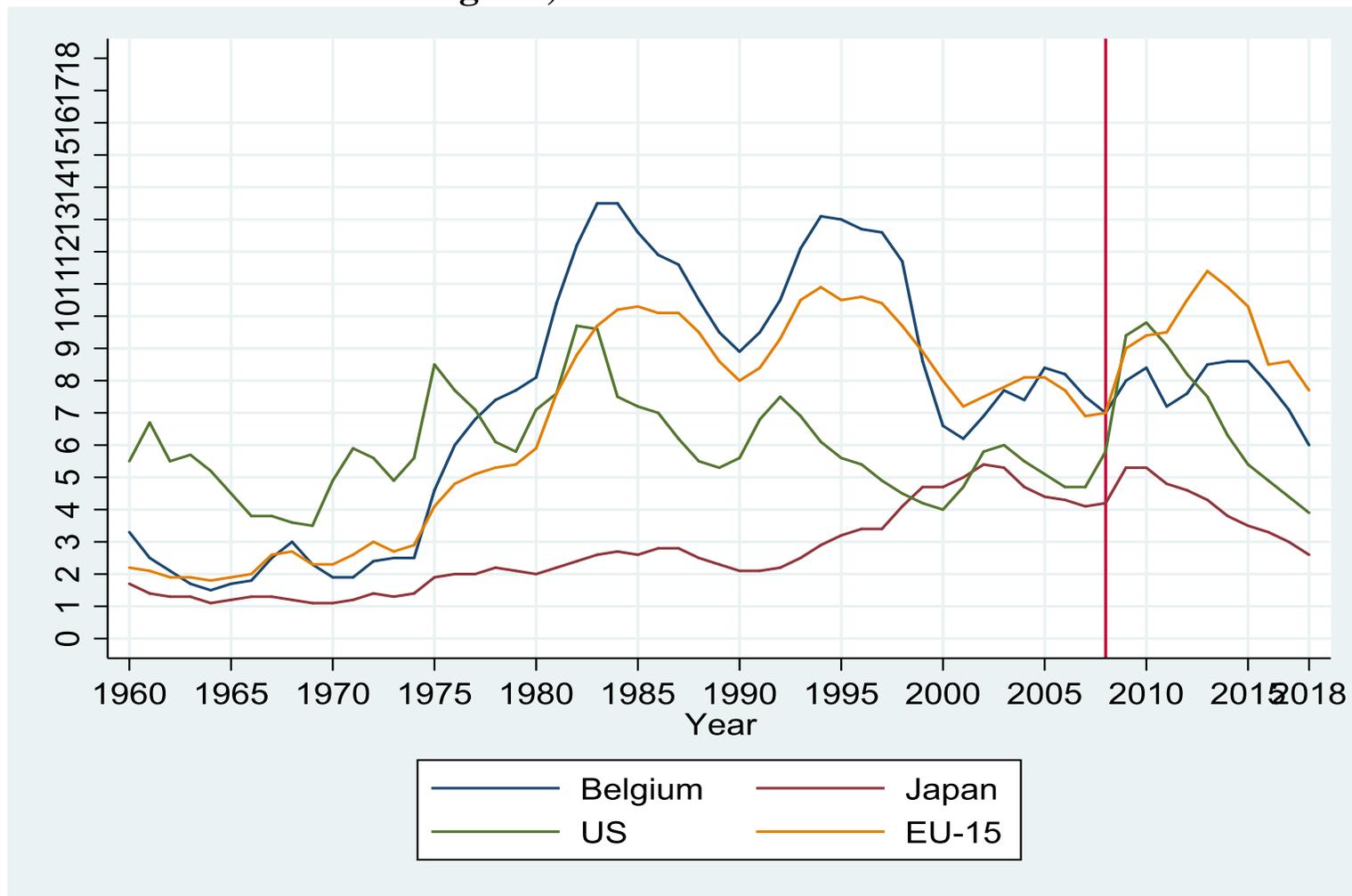
Fig. 2 : Relation between unemployment and participation rates, 2018



Source : OCDE (2019), *Perspectives de l'emploi de l'OCDE*, Paris.

↪ On average, a high unemployment rate is not associated with a high participation rate.

Fig. 3 : Evolution of the unemployment rate in the European Union 15, Japan, the United States and Belgium, 1960-2018



Source : OECD data (*Labour force statistics et Employment outlook*).

- **Decomposing changes in the unemployment rate:**

$$\boxed{N_t p_t = L_t + U_t} \quad (1)$$

with $\left\{ \begin{array}{l} N_t \text{ working age population,} \\ P_t \text{ participation rate,} \\ L_t \text{ employment, and} \\ U_t \text{ unemployment at time } t. \end{array} \right.$

Why ?

$$p_t = \frac{L_t + U_t}{N_t} \Rightarrow N_t p_t = N_t \frac{L_t + U_t}{N_t} = L_t + U_t$$

By definition, we know that :

$$u_t = \frac{U_t}{L_t + U_t} \quad \Rightarrow \quad \boxed{N_t p_t = \frac{L_t}{1 - u_t}} \quad (2)$$

Why ?

$$\begin{aligned} u &= \frac{U}{L+U} \quad \Rightarrow \quad u(L+U) = U \quad \Rightarrow \quad uL + uU = U \\ &\Rightarrow \quad uL = (1-u)U \quad \Rightarrow \quad U = \frac{uL}{1-u} \end{aligned}$$

$$\begin{aligned} N p &= L + U \\ &= L + \frac{uL}{1-u} = \frac{(1-u)L + uL}{1-u} = \frac{L - uL + uL}{1-u} = \frac{L}{1-u} \end{aligned}$$

If we write equation (2) in logarithms at time t , we find that:

$$\log(N_t) + \log(p_t) = \log(L_t) - \log(1 - u_t) \quad (3)$$

Because:

- $\log(AB) = \log(A) + \log(B)$
- $\log(A/B) = \log(A) - \log(B)$

If we differentiate equation (3) totally, we find that:

$$\frac{(N_t - N_{t-1})}{N_{t-1}} + \frac{(p_t - p_{t-1})}{p_{t-1}} = \frac{(L_t - L_{t-1})}{L_{t-1}} + \frac{(u_t - u_{t-1})}{1 - u_{t-1}} \quad (4)$$

\Rightarrow

$$\frac{\Delta N_t}{N_{t-1}} + \frac{\Delta p_t}{p_{t-1}} = \frac{\Delta L_t}{L_{t-1}} + \frac{\Delta u_t}{1 - u_{t-1}} \quad (5)$$

Because:

$$- \frac{d(\log x)}{dx} = \frac{1}{x} dx, \text{ where } dx \text{ is approximately equal to } \Delta x,$$

with Δ the difference operator so that $\Delta x_t = x_t - x_{t-1}$

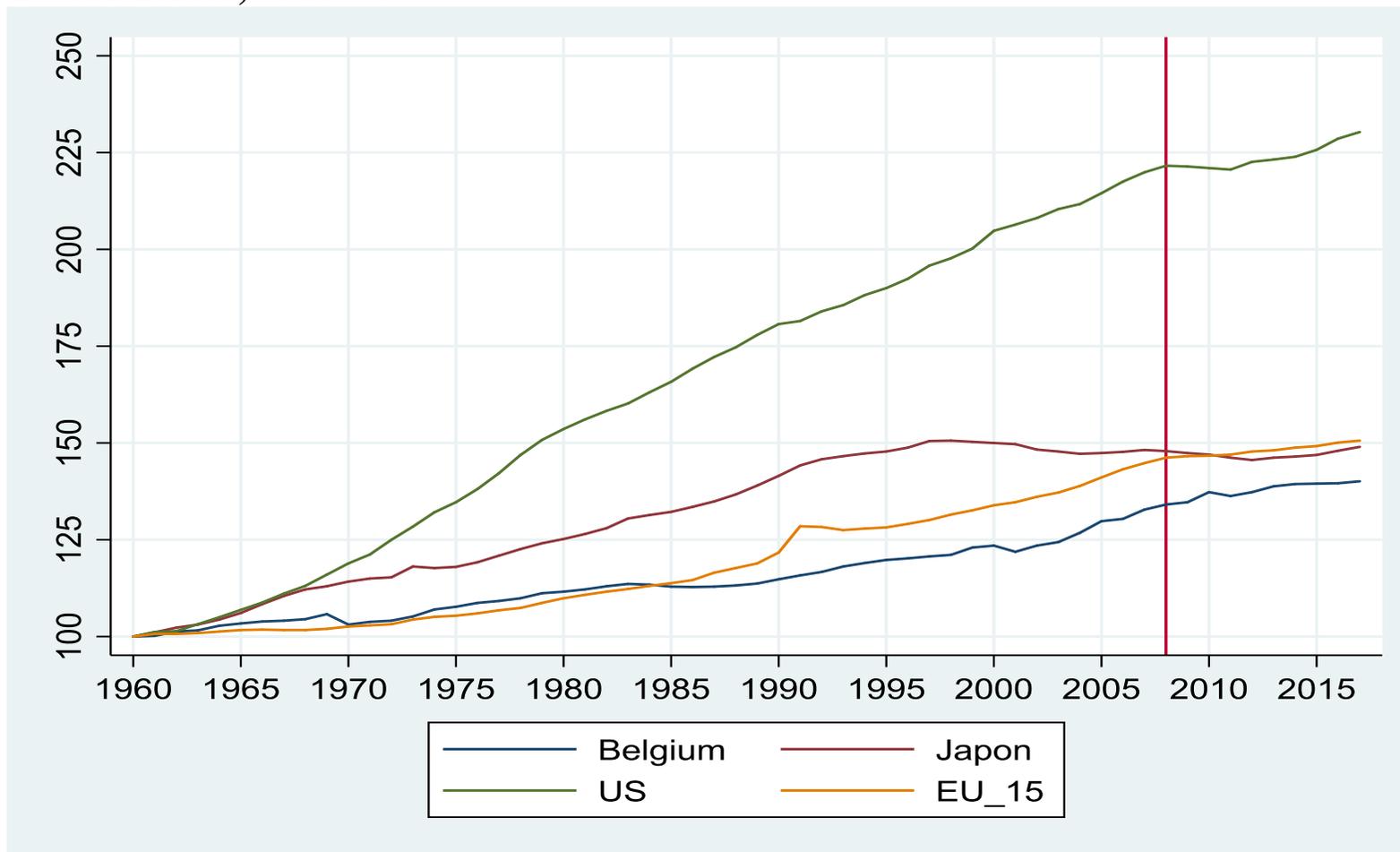
$$- \frac{d(-\log(1-u))}{d(1-u)} = - \frac{\Delta(1-u_t)}{(1-u_{t-1})} = - \frac{[\Delta(1) + \Delta(-u_t)]}{(1-u_{t-1})} = - \frac{[-u_t - (-u_{t-1})]}{(1-u_{t-1})} = \frac{(u_t - u_{t-1})}{(1-u_{t-1})} = \frac{\Delta u_t}{(1-u_{t-1})}$$

Assuming that u (the unemployment rate) is a small number, which is the case in reality, equation (5) can be re-written as follows:

$$\Delta u_t \approx \frac{\Delta N_t}{N_{t-1}} + \frac{\Delta p_t}{p_{t-1}} - \frac{\Delta L_t}{L_{t-1}} \quad (6)$$

- ↪ Variation in the unemployment rate is approximately equal to the sum of the growth rate of working age population and of the participation rate minus the growth rate of employment.
- ↪ It is entirely possible for the unemployment rate to grow without employment slowdown if, for example, the labour force increases and that working age population remains stable (i.e. if the participation rate increases).

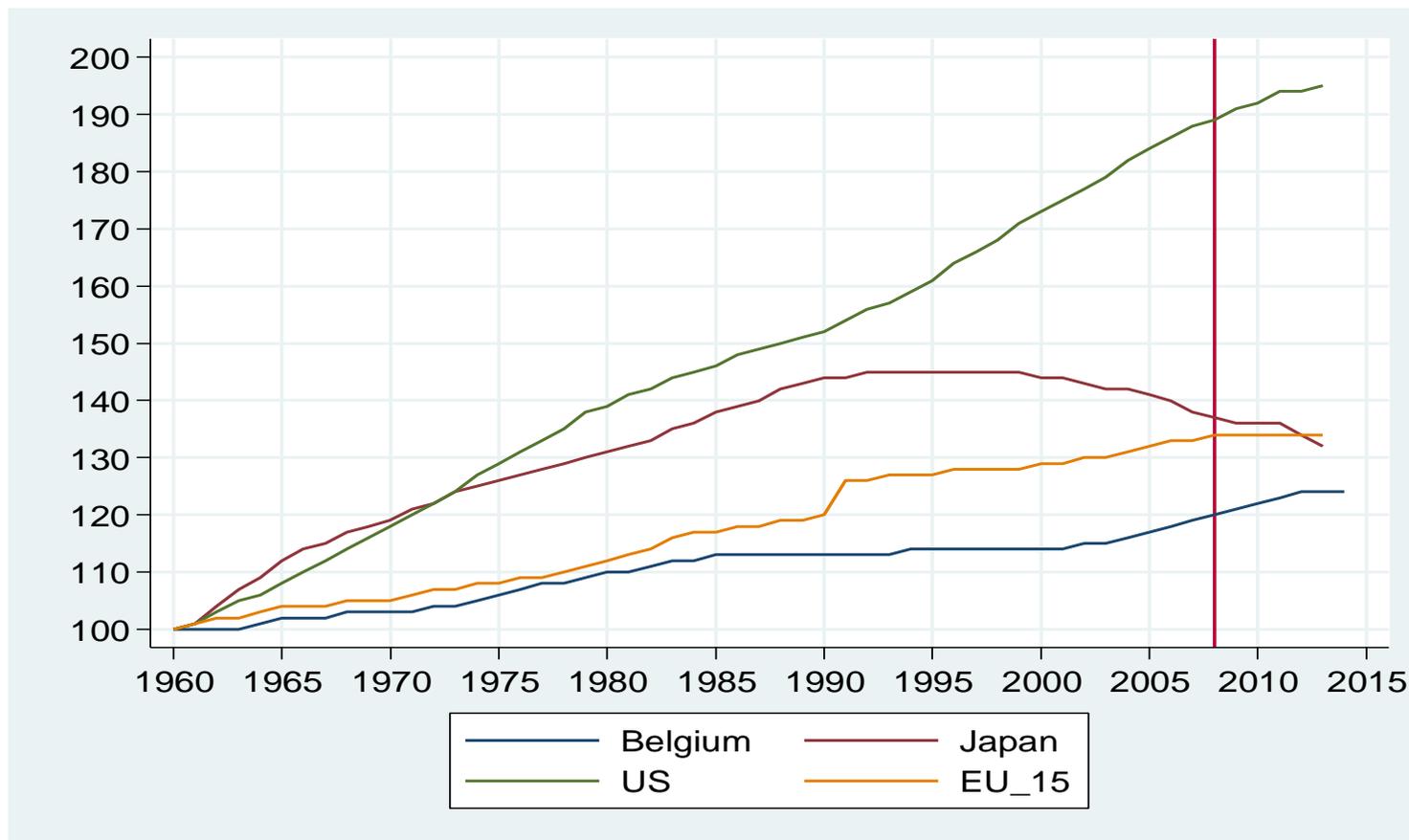
Fig. 4 : Evolution of (civil) labour force in the European Union 15, Japan and the United States, 1960-2017



Source : OECD data (Labour force statistics). (Base year 1960 = 100)

↪ Unemployment rate not higher in the European Union 15 due to a stronger labour force growth.

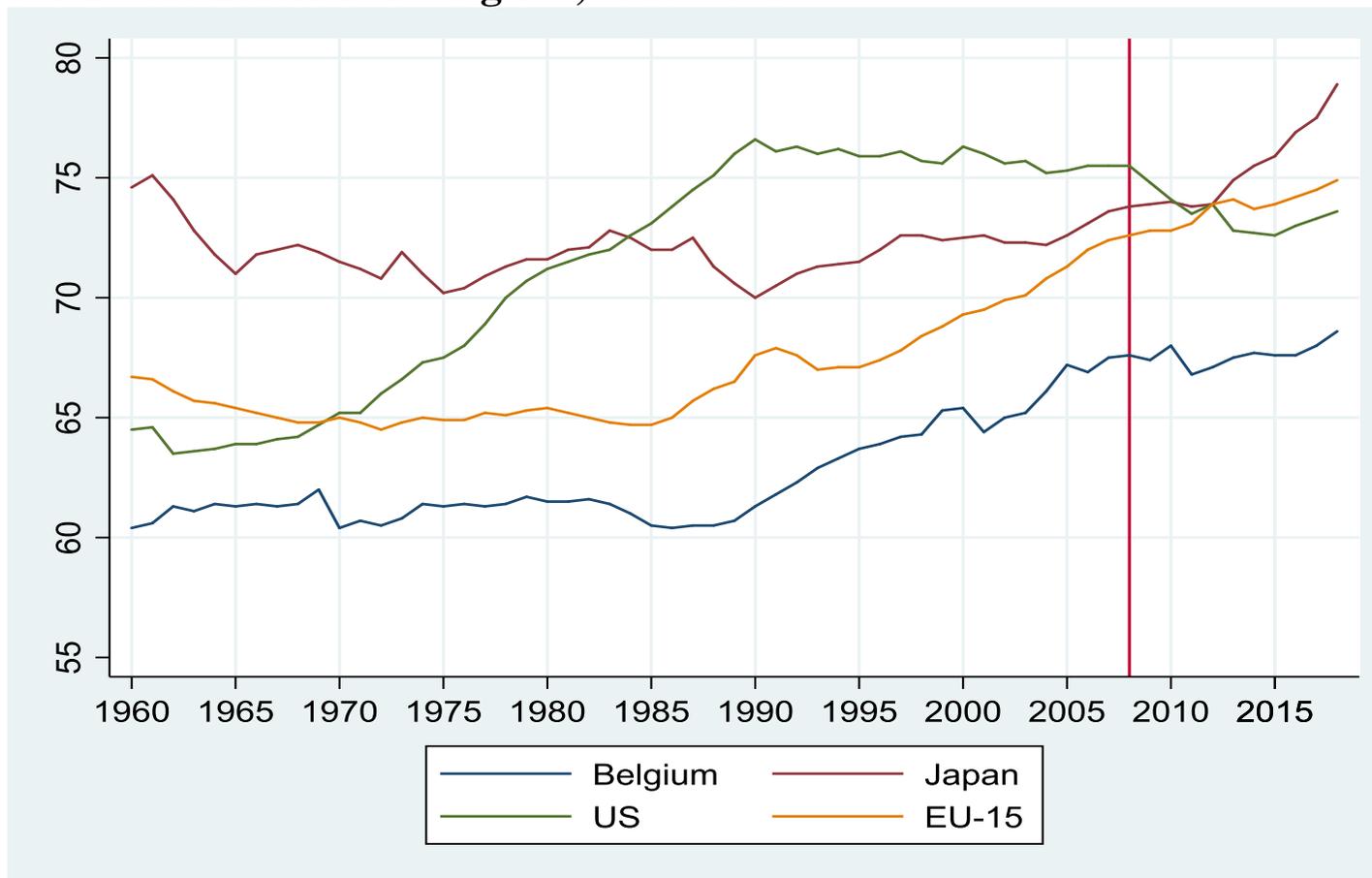
Fig. 5 : Evolution of working age population (i.e. population ages 15-64) in the European Union 15, Japan, the United States and Belgium, 1960-2014



Source : OECD data (*Labour force statistics*).

↳ Working age population increases significantly faster in the US than in Japan (especially since 1990) and the EU(15).

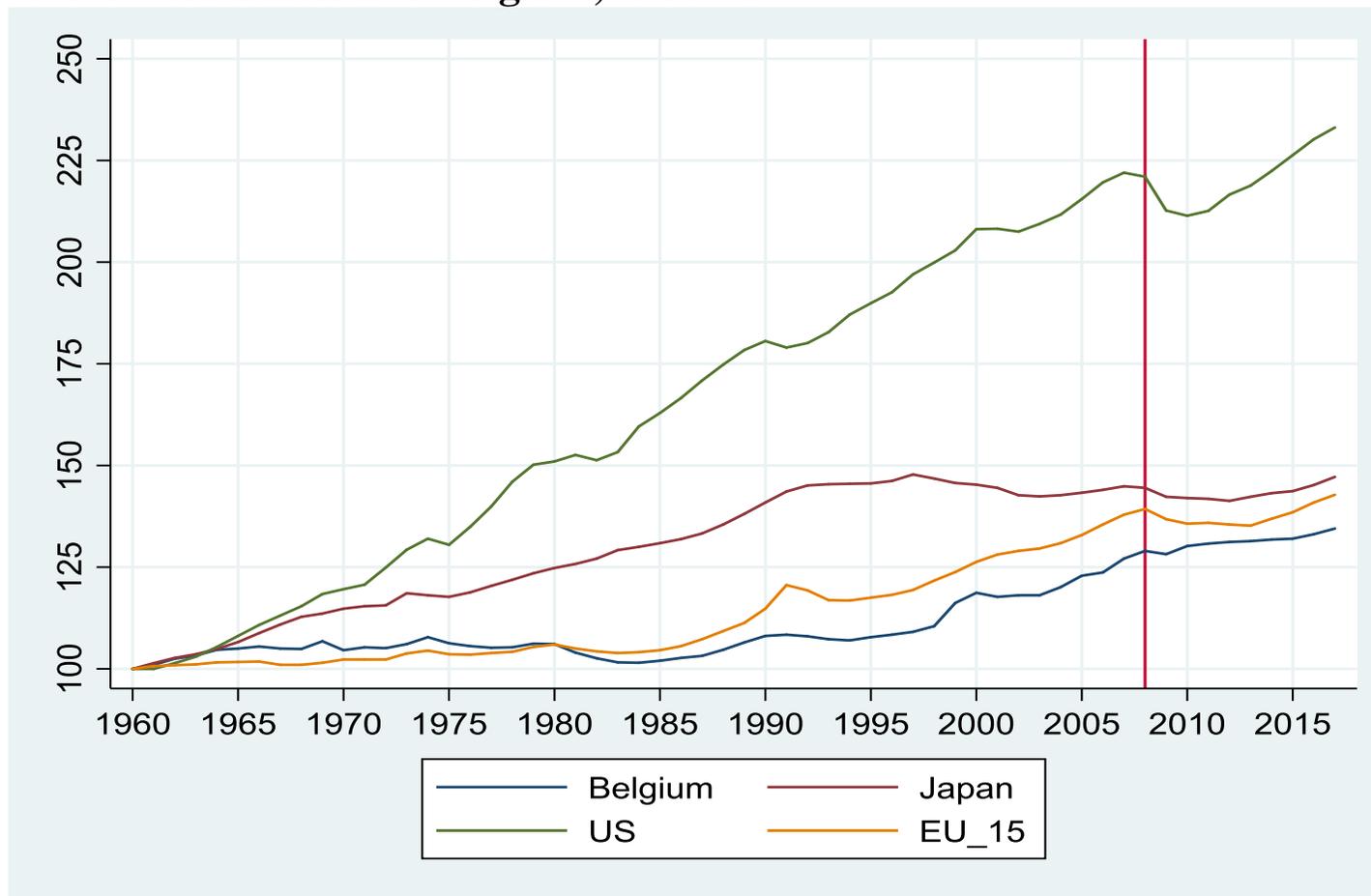
Fig.6 : Evolution of participation rates in the European Union 15, Japan, the United States and Belgium, 1960-2018



Source : OECD data (*Labour force statistics and Employment outlook*).

⇒ Strong increase in US (in EU_15) participation rate until 1990 (since mid-1980s).
Participation rates about the same in the US and the EU(15) in 2018.

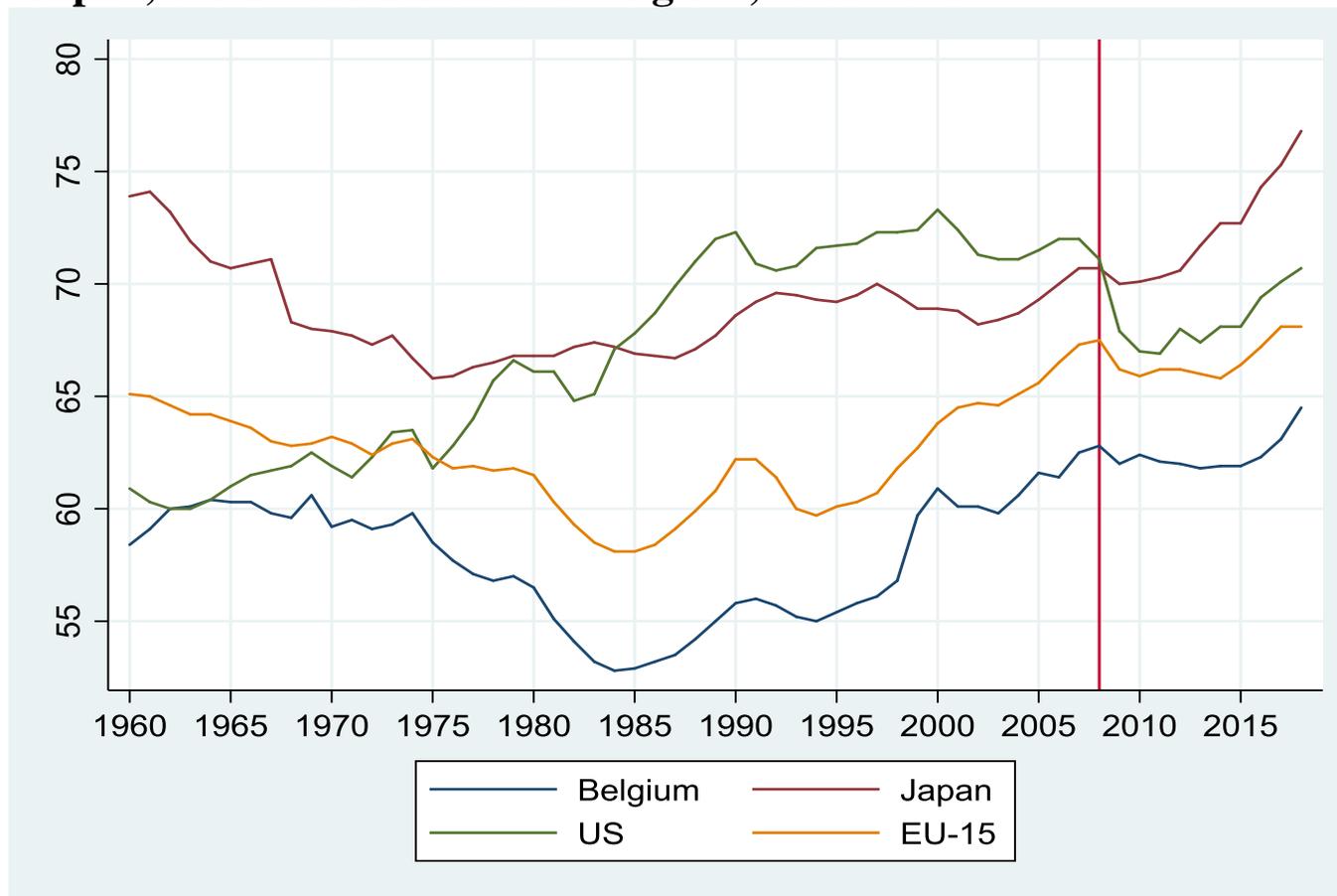
Fig. 7 : Evolution of (civil) employment in the European Union 15, Japan, the United States and Belgium, 1960-2017



Source : OECD data (Labour force statistics). (Base year 1960 = 100)

↪ US have a greater capacity to create jobs than the EU 15 and Japan.

Fig. 8 : Evolution of the employment rate in the European Union 15, Japan, the United States and Belgium, 1960-2018



Source : OECD data (*Labour force statistics et Employment outlook*).

↳ European Union 15's poorer performance in terms of job creation led to lower employment rates (especially before the Great Recession) but average situation was improving.

▪ **To sum up:**

– Differences in employment and unemployment rates between the European Union 15 and the US and Japan on the other hand, are significant but they were more pronounced before the Great Recession (especially relative to the US).

- Countries in the EU 15 (on average) :

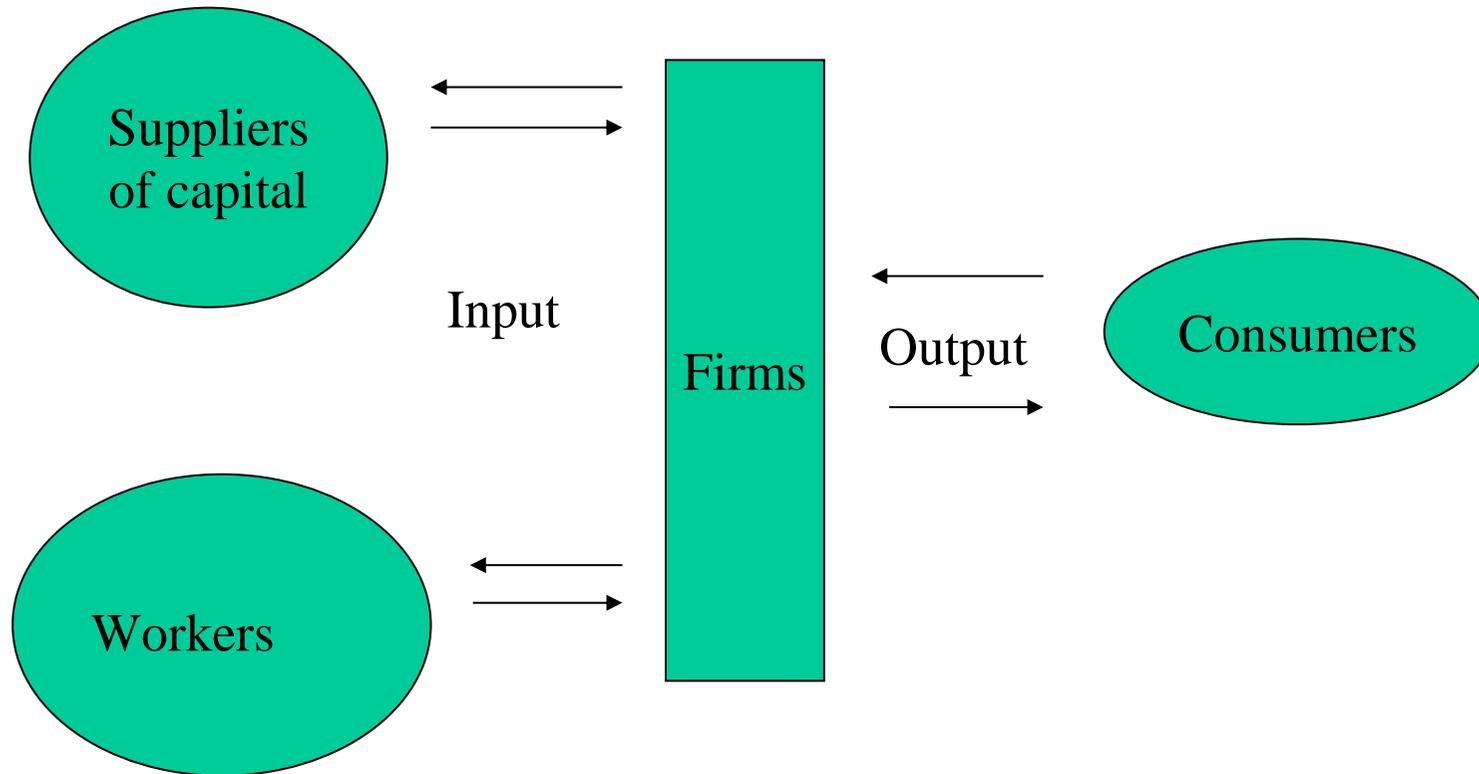
Difficulty to create a sufficient number of jobs.

During the 1960s, this lack was offset by a significant fall in the overall participation rate.

Between 1970 and the mid-80s the latter variable has remained stable but it increased substantially afterwards \Rightarrow weakness of job creation has stronger detrimental effect on the unemployment rate.

2. How does the labour market work?

Fig. 2.1. : The markets on which firms must operate



2.1. Labour demand and supply

Demand side: employers whose decisions are influenced by conditions in all three markets, namely the capital, labour and product markets.

Supply side: workers and potential workers (i.e. the labour force), whose decisions about where (and whether) to work depends on their other options on how to spend time.

Perfect competition hypotheses :

- ✓ Labour is homogeneous (i.e. workers are perfect substitutes).
- ✓ Many sellers and buyers (i.e. economic agents are ‘price takers’).
- ✓ Perfect information (i.e. economic agents have instantaneously all available information at zero cost).
- ✓ Perfect mobility of workers and other production factors (i.e. no obstacle to labour and capital mobility).

a) The demand of labour

Labour demand depends on three factors:

- the demand for the product,
- the amount of labour and capital that can be acquired at given prices, and
- the production technology that is available.

When studying labour demand, we are interested in finding out how the number of workers employed by a firm or a set of firms is affected by changes in one or more of these three factors.

✓ **Wage changes**

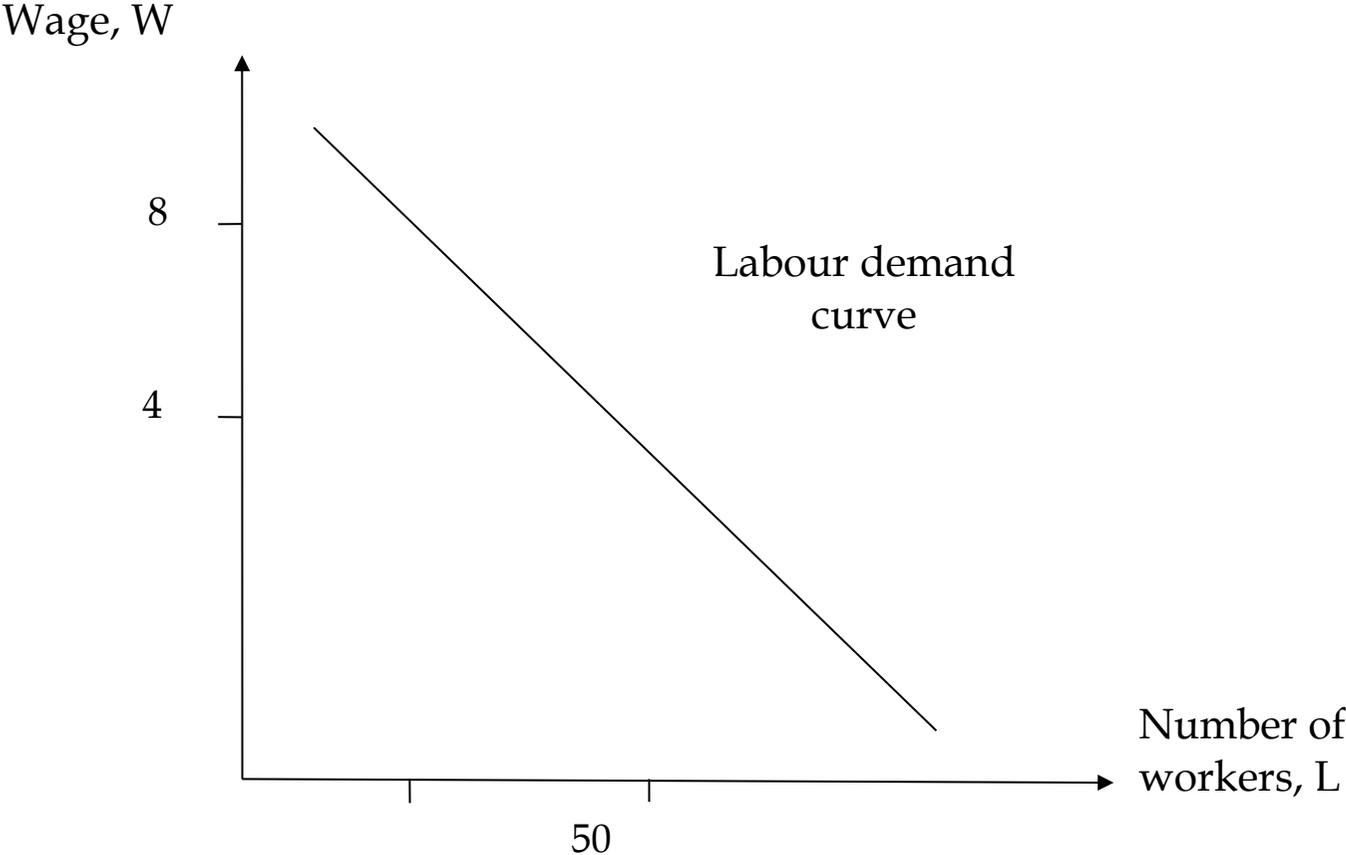
What happens to labour demand if the wage rate increases (ceteris paribus)?

Two effects :

a) $W \uparrow \Rightarrow$ higher production costs \Rightarrow higher output prices \Rightarrow consumers buy less \Rightarrow firms reduce their levels of output and employment (ceteris paribus) \Rightarrow **Scale effect**.

b) $W \uparrow$ and price of capital remains constant \Rightarrow firms adopt new technologies more capital-intensive \Rightarrow labour demand $\downarrow \Rightarrow$ **Substitution effect**.

Graph 2.1. : Labour demand curve



✓ Changes in product demand

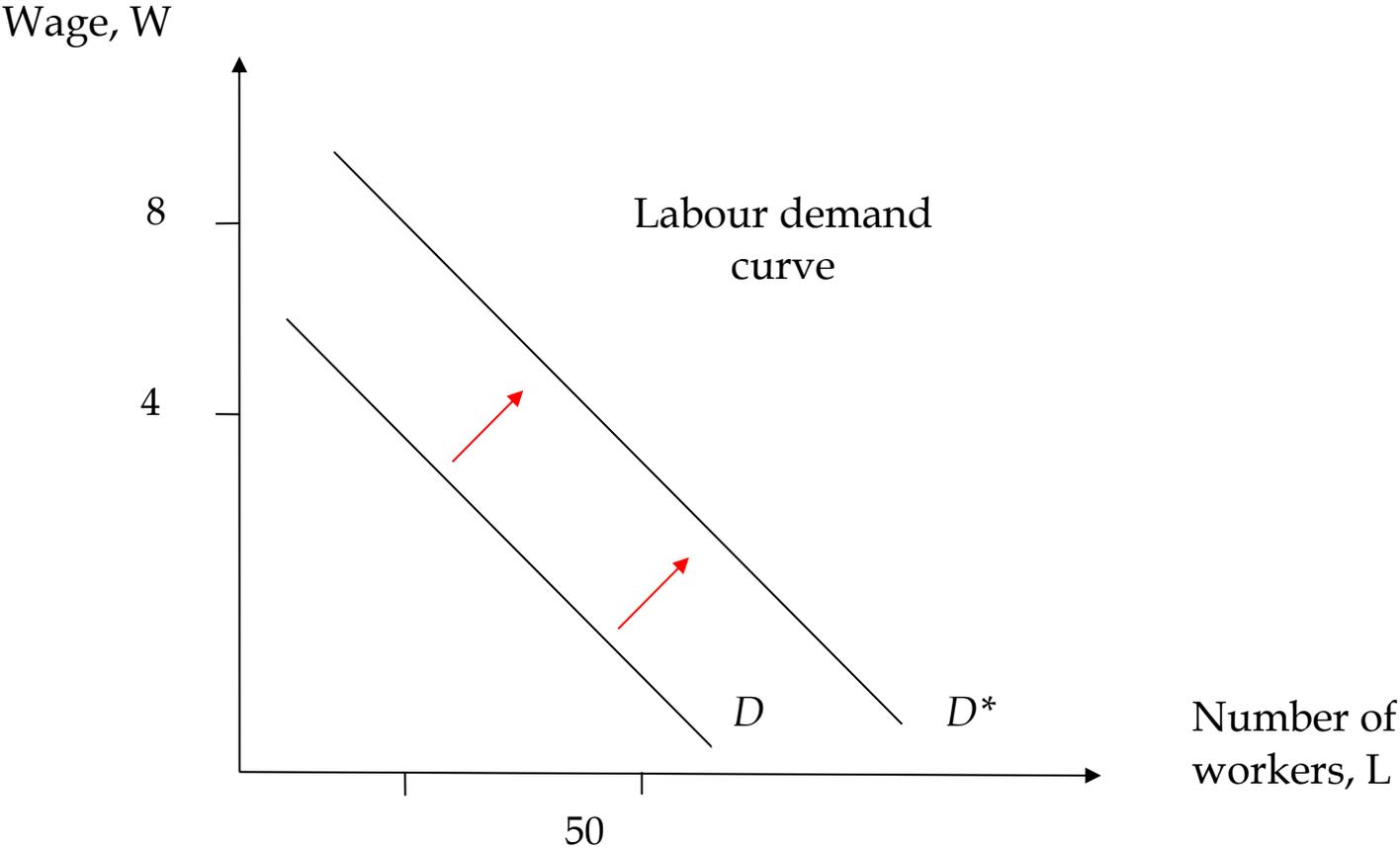
What happens to labour demand if the demand for the product of a particular industry increases (ceteris paribus), so that at any output price, more of the goods or services in question could be sold?

Firms in this sector will maximize their profits by increasing their level of production \Rightarrow labour demand increases \Rightarrow **Scale effect**.

Substitution effect ?

Given that the relative prices of capital and labour remain unchanged, there is no substitution effect.

Graph 2.2. : Shift in demand for labour due to increase in product demand



✓ Changes in capital prices

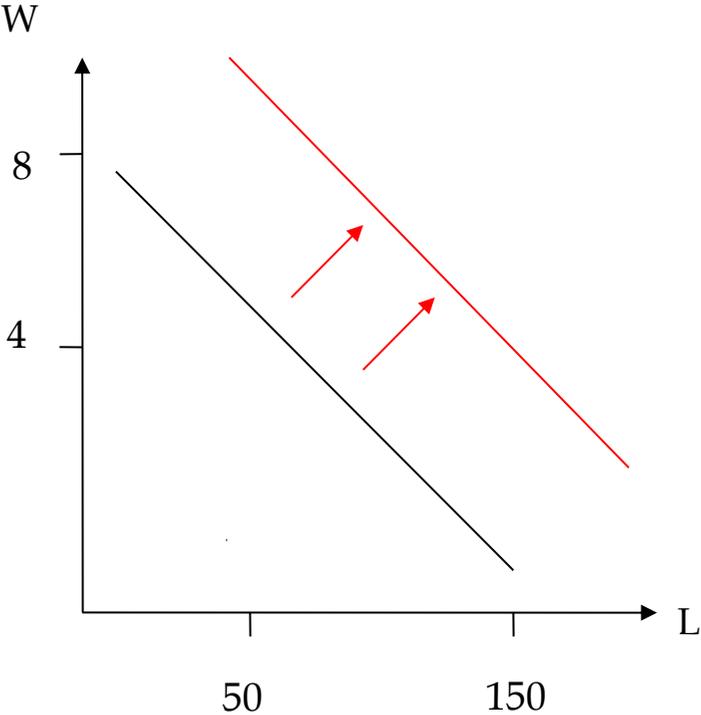
What happens to labour demand if capital prices fall (ceteris paribus)?

Two effects :

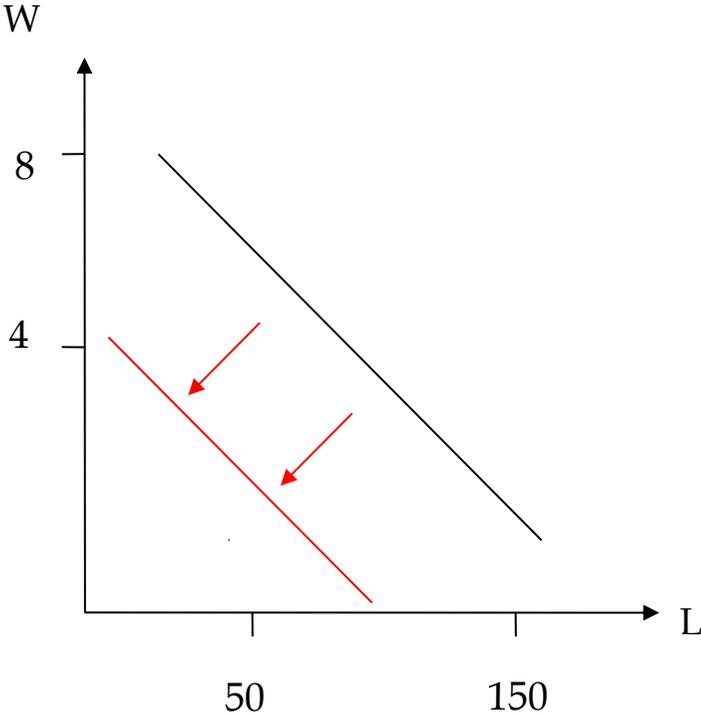
- a) $r \downarrow \Rightarrow$ production costs diminish \Rightarrow firms \uparrow their level of output and employment (at any given wage rate) \Rightarrow **Scale effect** (labour demand curve shifted to the *right*).
- b) $r \downarrow$ and price of labour constant \Rightarrow firms adopt new more capital-intensive technologies \Rightarrow demande of labour $\downarrow \Rightarrow$ **Substitution effect** (labour demand curve shifted to the *left*).

Graph 2.3. : Possible shifts in demand for labour due to fall in capital prices

(a) Scale effect dominates



(b) Substitution effect dominates



■ **Remarks :**

a) Shift of the demand curve vs. movement along the curve.

b) Labour demand in the short and long run :

In the short run :

- Often difficult for employers to substitute capital to labour (and vice versa).
- Consumers' demand generally less sensitive to product prices.

↳ Adjustment of consumption and production behaviours takes time. Labour is thus generally more sensitive to changes in wages and other market conditions in the long run.

b) The supply of labour

Assumption : Workers have already decided to work and that the question facing them is what occupation and employer to choose.

✓ The supply of labour to the entire market

How does the supply of labour for a particular occupation (research positions in finance at universities) respond to changes in wages ?

If wages in other occupations are held constant and that the wages of researchers rise, we would expect to find more people wanting to become researchers.

Intuition:

Suppose that each of 100 students graduating from a business school has the option to become a financial analyst in a bank or to do research in finance at university.

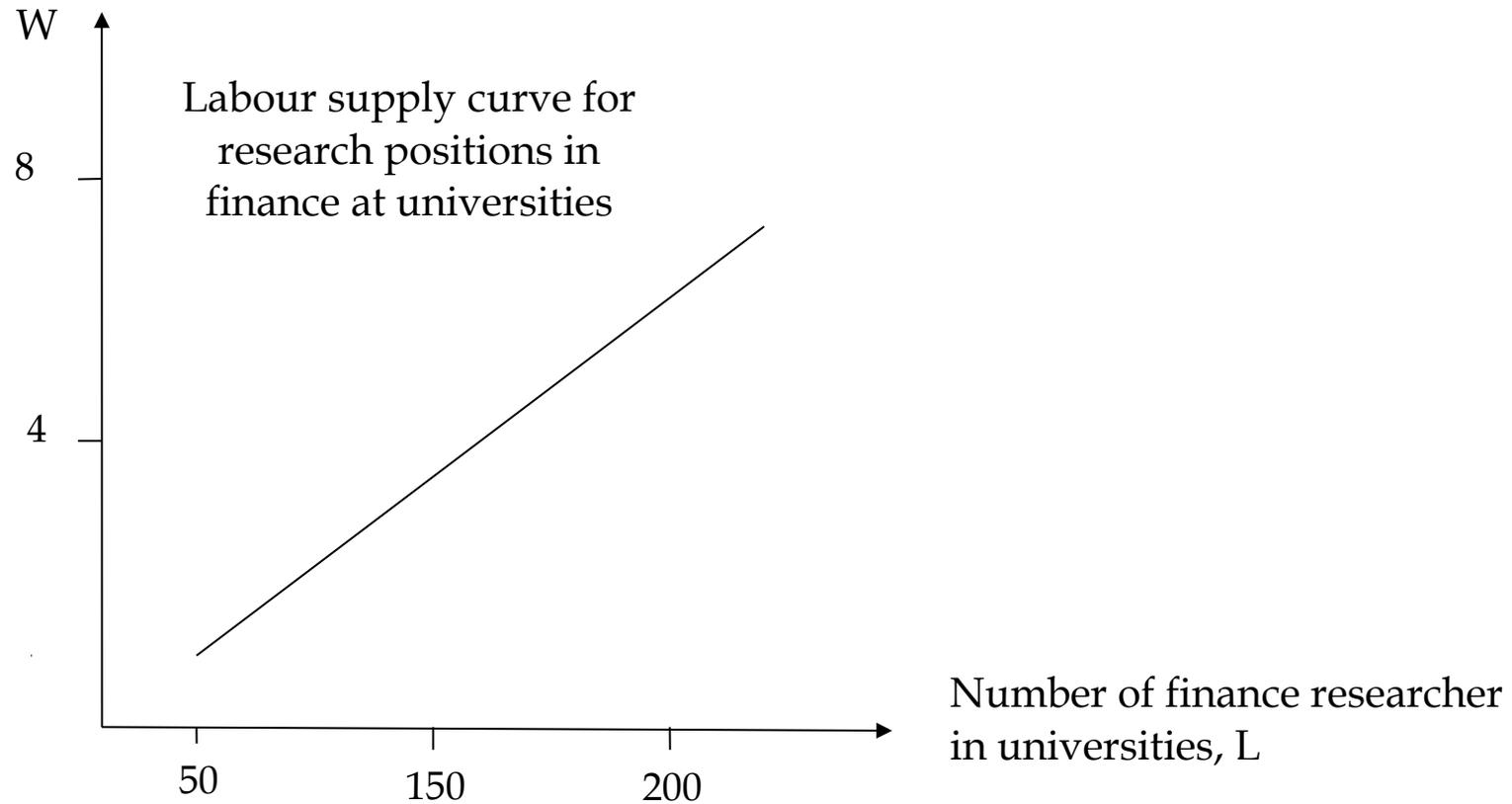
Some of these 100 people will prefer to be financial analysts even if university researchers are better paid, simply because they like working in a bank.

In contrast, some people might prefer to be researchers even if they earn relatively less, because they like to do research and to publish.

However, it is reasonable to believe that many of these 100 people could see themselves doing either job. And in this case, the compensation in each occupation will be the major factor in their decision.

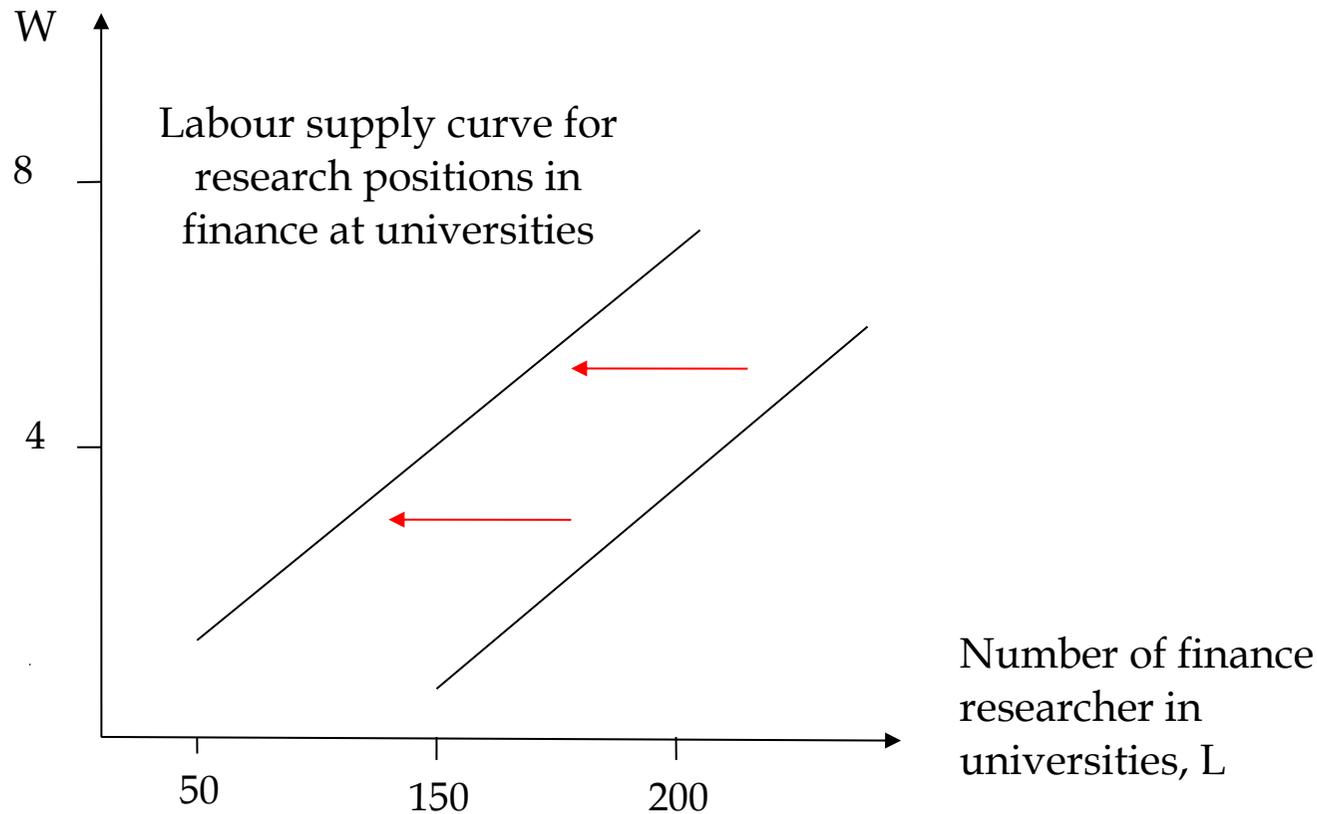
Overall, the supply curve to a particular market (or occupation) is positively related to the wage prevailing in that market, holding other wages constant.

Graph 2.4. : Market labour supply for research positions in finance at universities



Each labour supply curve illustrates the relationship between the labour supply to a given occupation and the corresponding wage, all other wages being equal.

If the wages of other occupations rise, for instance that of financial analysts, than some people will change their mind about becoming researchers and choose to become financial analysts



✓ **The supply of labour to an individual firm**

When someone has decided to become a finance researcher in a university, he still has to decide in which university he wants to work.

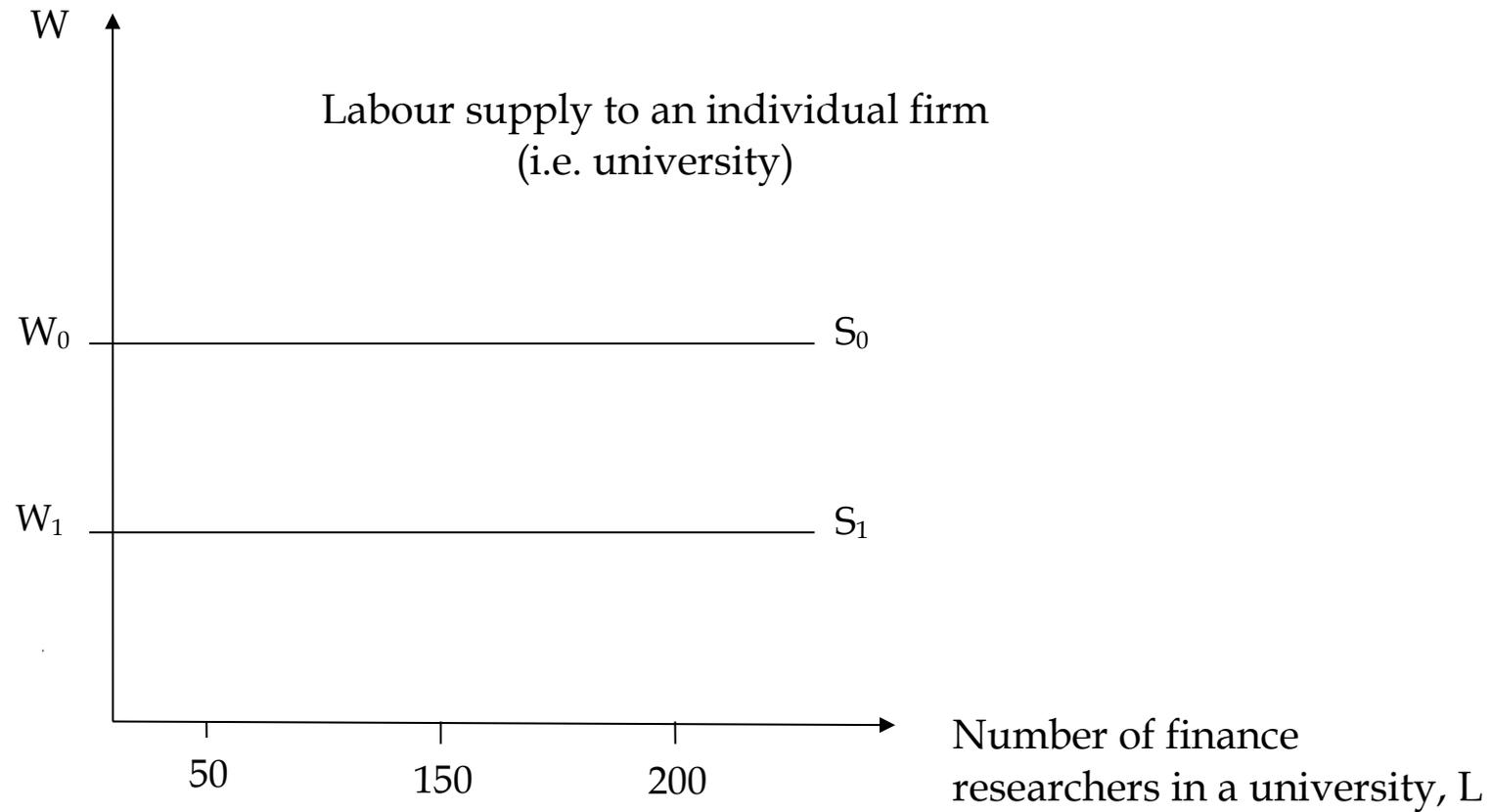
If all employers (i.e. all universities) offer exactly the same jobs, than the choice will be entirely based on compensation.

If wage in the firm $<$ market wage : labour supply to the firm will be null.

If wage in the firm $>$ market wage : labour supply to the firm will be infinite.

↳ If all jobs are identical and labour supply homogeneous, firms will offer the same wage, i.e. the market wage.

Graph 2.5 : Labour supply for research positions in finance in a particular university



c) The determination of the wage

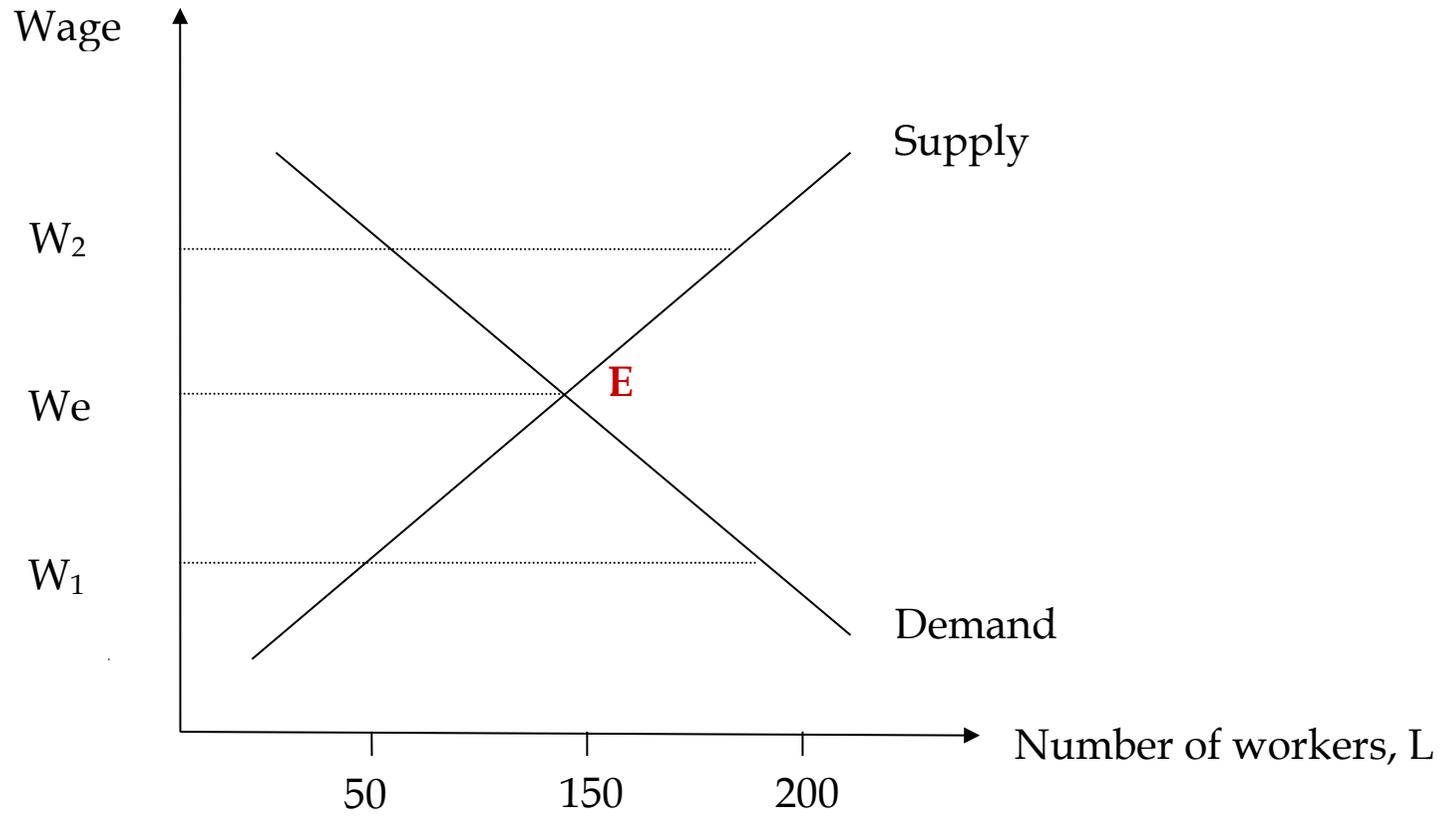
✓ The competitive equilibrium

The wage that prevails in a competitive labour market is determined by the interplay between labour supply and demand.

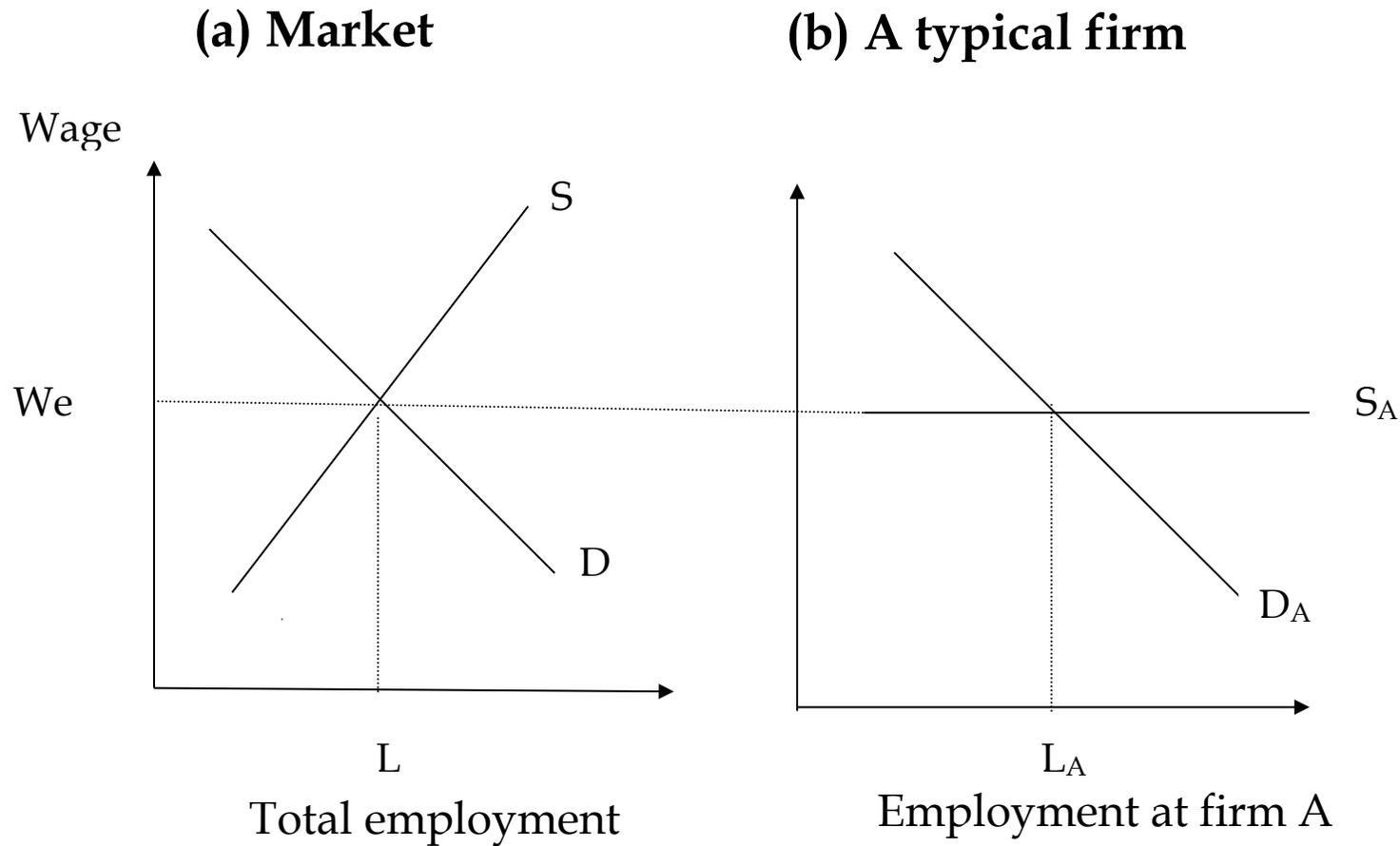
The market demand curve indicates how many workers employers are willing to hire at each wage rate, holding capital prices, technology and product demand constant.

The market supply curve indicates how many people are willing to work at each wage level, holding the wages in other occupations constant.

Graph 2.6 : Market labour demand and supply



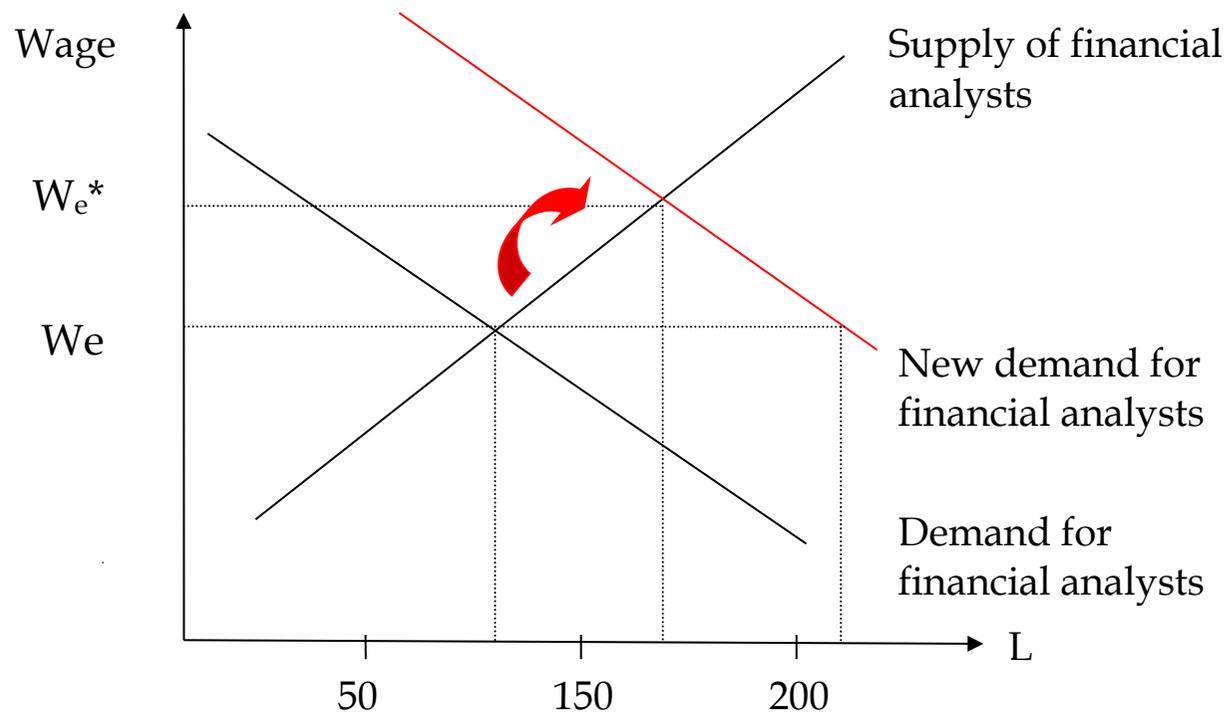
Graph 2.7 : Demand and supply and the ‘Market’ and ‘Firm’ levels



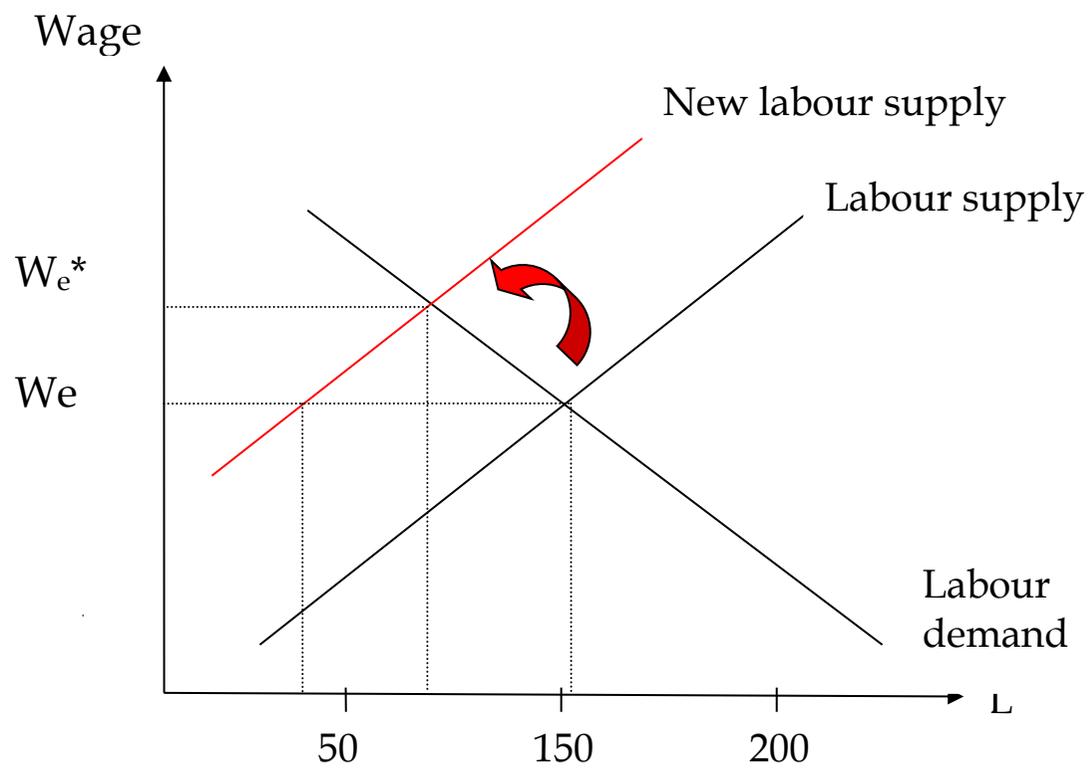
The ‘market-clearing wage’, W_e , becomes the ‘going wage’ that employers and employees must face, i.e. wage rates are determined by the market and ‘announced’ to individual market participants.

✓ Changing the equilibrium

a) **Demand curve shifted to the right** (e.g. financial market boom)



b) Supply curve shifted to the left (e.g. population ageing)



✓ **Disturbing the equilibrium**

It is not because a market-clearing wage exists in theory that it is actually reached, or at least reached rapidly, in practice.

In practice there are numerous barriers impeding the adjustment of wages and employment to changes in supply or demand:

- a) **Economic forces** (e.g. investments in new skills may be costly, hiring and firing costs).
- b) **Nonmarket forces** : laws, customs or institutions constraining the choices of individuals and firm (e.g. minimum wage laws).

Nonmarket forces usually keep wages above market levels. Minimum wages and unions are typical examples of influences explicitly designed to raise wages beyond those dictated by the market.

Likewise, if there is a widespread belief that cutting wages is unfair, laws and customs may arise that prevent wages from falling in markets experiencing excess labour supply, that is unemployment.

Labour markets adjust more quickly when market forces are calling for wages to rise as opposed to pressuring them to fall.

As a result, markets that are observed to be in disequilibrium for long periods will be more likely to be ones with above-market wages.

In this case, there will be excessive labour supply. Put differently, there will be a relatively high number of unemployed.

3. Labour market imperfections

Two types of imperfections:

3.1. Direct imperfections:

Deviations from competition directly observed on the labour market

Example: minimum wages.

3.2. Indirect imperfections:

Deviations from competition observed on other markets, for instance on product markets, affecting the labour market equilibrium

Example: rent-sharing.

Rent-sharing?

Impact of firm profits on workers' wages (all other things being equal)

Intuition:

The market power of firms enable them to generate profits which in turn might (at least partly) be captured by workers. In this case, the 'going wage' will be higher than the 'market-clearing wage'. Therefore, there will be excess labour supply (i.e. unemployment).

Magnitude: wage-profit elasticity between 0.01 and 0.10 depending on the country under investigation and the quality of the instruments to control for simultaneity (Abowd and Lemieux, 1993; Arai, 2001; Martins and Yong, 2014). Contributes to explain the gender wage gap notably in Belgium and Sweden (Nekby, 2002; Rycx and Tojerow, 2004).

Three sources of direct imperfections :

- Relaxing the hypothesis that economic agents are ‘price-takers’
⇒ **‘Transformed’ equilibrium**
- Behaviour of workers and firms obey to other criteria than that the conventional profit or utility maximization objectives
⇒ **‘Displaced’ equilibrium**
- Interventions of outside economic agents (e.g. the State) modifying the functioning of the labour market
⇒ **‘Suspended’ equilibrium**

The 'displaced' equilibrium

Labour market discrimination

Employers, notably because of prejudice, might be less likely to hire some categories of workers (such as women or migrants) even when the latter have the same productive characteristics than their male or native counterparts.

Discrimination refers to a situation in which differences in labour market positions are related to irrelevant characteristics, i.e. to characteristics that do not affect the productivity of the workers.

Our focus to illustrate this issue: gender discrimination, in terms of employment and earnings.

Anti-discrimination legislation

All advanced economies have a legal and institutional framework to fight labour market discrimination, notably on gender and ethnic grounds.

The bottom line of all these laws is that there should be no discrimination against workers on the basis of characteristics that are not related to productivity.

Effectiveness of legal discrimination framework depends on how difficult it is for workers to take action and how severe violations of employers are punished.

For the worker incentives, we can distinguish between elements of the proof to be provided by the plaintiff and protection against victimization of the plaintiff.

For the employer incentives, we can distinguish between three types of sanctions in case of non-compliance, namely publicity, fines and prison sentences.

Not only laws themselves but also interpretation and enforcement of laws are important.

Table 3.1: Workers incentives to bring a case to the court

(Boeri and van Ours, 2013)

	Proof	Protection
Denmark	Gender: presumption Ethnicity: strong presumption	Limited
France	Presumption	Limited
Germany	Presumption	Yes
Italy	Gender: strong presumption Ethnicity: proof	Gender: no Ethnicity: limited
Netherlands	Presumption	Limited
Spain	Strong presumption	Yes
United Kingdom	Strong presumption	Yes
United States	Proof	Yes

Source: OECD Employment Outlook 2008.

Table 3.2: Employers incentives to comply

(Boeri and van Ours, 2013)

	Publicity	Fines	Prison
Denmark	No	Penal	None
France	Yes	Penal	Yes
Germany	Yes	Administrative and penal, low	None
Italy	Yes	No	None
Netherlands	Yes	Penal	Yes
Spain	Yes	Some	Yes
United Kingdom	Yes	None	None
United States	Yes	Some	None

Source: OECD Employment Outlook 2008.

Various theories on discrimination

Discrimination is the valuation of personal characteristics that are unrelated to individual productivity.

In the context of a *competitive* labour market:

i) **Taste-based discrimination model**

In the context of a *non-competitive* labour market:

i) **Statistical discrimination** and

ii) **Discrimination due to occupational crowding**

Taste-based discrimination model (Becker, 1971)

Main framework used to analyse the nature and consequences of discrimination based on prejudice under perfect competition (i.e. equally productive workers and economic agents are price-takers)

Different variants of the model, depending on whether prejudice caused to:

- **Employers** (employers do not like women)
- **Co-workers** (male workers do not like to work with women)
- **Customers** (customers do not like to be served by women).

Employer prejudice

Assumption: employers have a preference for male workers. Consequence: employer does no longer maximize its profit *stricto sensu*. They now maximize their utility which depends on the profits that they make but also on the wage cost that they pay to women

$$U = \Pi - \omega w_f L_f$$

where:

- U = utility
- Π = profit
- w_f = wage females
- L_f = the number of female workers hired
- ω = the employer-specific coefficient of discrimination; $0 \leq \omega \leq \omega_{\max}$

For unprejudiced employers $\omega = 0$ (they maximize $U = \Pi$), while for employers with maximum prejudice $\omega = \omega_{\max}$ (they maximize $U = \Pi - \omega w_f L_f$).

The wage costs for *male* workers = $w_m L_m$.

The (perceived) wage costs for *female* workers = $(1 + \omega) w_f L_f$

Hiring strategy:

Non-prejudiced firms (maximizing their profit) are indifferent to hire men or women if $w_f = w_m$ (as workers are assumed to be equally productive). If $w_f > w_m$: only men are hired. If $w_f < w_m$: only women are hired.

Prejudiced firms (maximizing their utility) will hire:

- Only men if $w_m \leq (1 + \omega) w_f$
- Only women if $w_m > (1 + \omega) w_f$

For given values of w_m and w_f , the magnitude of the prejudice ω for a firm will determine if the latter hires only men or only women.

⇒ Workforce will be segregated (firms solely composed of men or women)

⇒ Conditional on the female wage, the higher the mean coefficient of discrimination ω across firms, the lower will be the number of females hired.

⇒ Because of the existence of prejudiced firms, wages of women may be lower than those of men at equilibrium

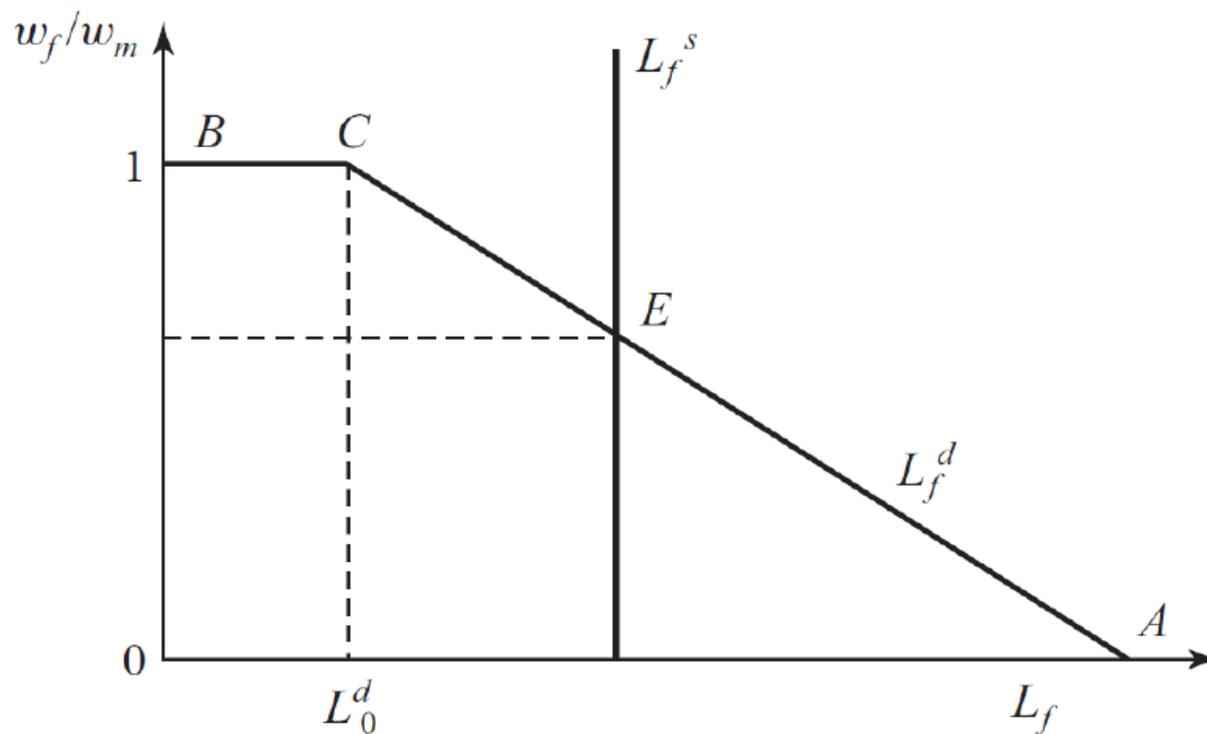


FIGURE 4.1 Employer discrimination and the gender wage gap equilibrium

Source: Boeri and van Ours (2013)

How to read this graph?

- L_0^d denotes labour demand from unprejudiced firms (which are ready to pay women as men).
- BCA shows the labour demand curve for women (from both prejudiced and unprejudiced firms)
- If male and female wages have the same wage, only L_0^d jobs are available for women.
- Female employment can only increase beyond L_0^d if the relative wage w_f/w_m falls.
- Point A represents an employer that is sufficiently prejudiced to hire no female worker even if the latter's wage is equal to zero.
- L_f^s is the female labour supply curve, which is assumed to be perfectly inelastic.
- Equilibrium is at point E, that is at the interaction of the female demand and supply curves, where $w_f^* < w_m^*$.

Model predictions?

- All firms that employ women (even those with unprejudiced employers) pay the same low wage to women, i.e. $w_f^* < w_m^*$. This is due to the fact that wages are the outcome of a market process and are not influenced by individual employers (because by definition economic agents are price-takers).
- Even if many employers are prejudiced, an increase in the number of unprejudiced firms will reduce the gender wage gap. Why? If number of unprejudiced firms increases, then point C moves to the right, the slope of CA becomes steeper, which in turn increases the relative wage w_f^* / w_m^* .

Model predictions (Cont.)?

- If $L_0^d \succ L_f^s$ (i.e. if labour demand of unprejudiced firms is higher than female labour supply), there is no wage effect of discrimination despite the presence of many prejudiced employers. Yet, there will be some segregation: women will find a job at non prejudiced firms and men at prejudiced firms.
- An increase in female labour supply (i.e. a shift of L_f^s to the right) will reduce women's wages relative to men's wages and thus increase the equilibrium level of wage discrimination on the labour market.
- Profits of firms hiring only women will be higher than those hiring only men (because at equilibrium $w_f^* < w_m^*$ and that by definition men and women are equally productive)

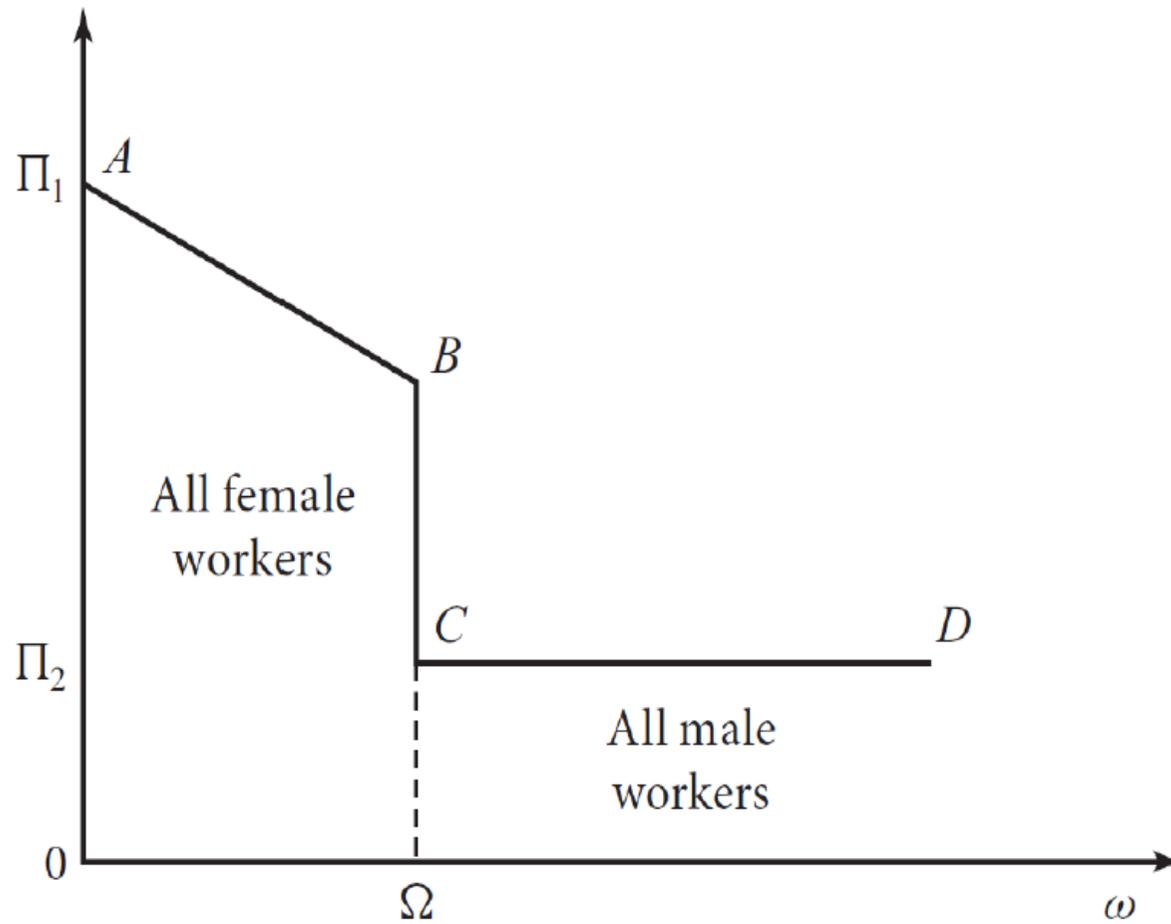


FIGURE 4.2 Profits and coefficient of discrimination

How to read this graph?

- A firm will hire only women if its coefficient of discrimination ω satisfies the following condition:

$$w_m^* > (1 + \omega) w_f^* \quad \Rightarrow \quad \omega < (w_m^* - w_f^*) / w_f^*$$

Suppose:

$$(w_m^* - w_f^*) / w_f^* = \Omega^* \equiv \text{Coefficient of market discrimination at equilibrium}$$

$$\Rightarrow \text{Firm will only hire women if: } \omega < \Omega^*$$

$$\Rightarrow \text{Firm will only hire women if: } \omega \geq \Omega^*$$

\Rightarrow A non-prejudiced firm at equilibrium will only hire women in order to maximize its

profit (as $w_f^* < w_m^*$, while men and women are equally productive)

Relation between firm profits and ω ?

- The profit is maximum at point A, i.e. for non-prejudiced firms ($\omega = 0$), and equal to Π_1 .
Non-prejudiced firms will only hire women and pay them w_f^* (which also corresponds to their *perceived* wage cost as they have no prejudice employing women).
- As the coefficient of discrimination ω increases, profits decrease. Indeed, prejudiced firms, only employing women (i.e. for which $\omega < \Omega^*$), will see their profits (i.e. utility) decrease as their perceived cost for women $(1 + \omega) w_f^*$ goes up.
- When $\omega = \Omega^*$, profits drop from B to C, as from then on firms will only hire male workers and will have to pay $w_m^* > (1 + \omega) w_f^*$
- Any further increase in prejudice (ω) will not lower profits as male labour costs will not be affected. Put

differently, firms will pay w_m^* whatever the level of prejudice (and $\omega \geq \Omega^*$).

Long run equilibrium?

Prejudiced firms (hiring only women or men) have lower profits than unprejudiced firms.

Yet, this is a short-run phenomenon. Indeed, in a competitive market, prejudiced firms will not be able to survive in the long run.

More precisely, they will be forced to leave the market either through takeover by unprejudiced firms or through competition from unprejudiced firms entering the market.

Co-worker prejudice

Discrimination against women may also appear because male workers prefer not to work with female co-workers

In this case, the utility U_m of a male prejudiced worker depends on his own wage but also on whether he has female co-workers:

$$U_m = w_m (1 - \omega I_f)$$

where:

- U_m = utility of male workers
- w_m = wage of male workers
- ω = coefficient of co-worker discrimination
- $I_f = 1$ if the worker has at least one female co-worker and 0 otherwise

⇒ Prejudiced male workers will want to be compensated for the disutility of having female co-workers. Alternatively, for a given wage, they will prefer to work in a male-only firm.

Model predictions?

- In firms in which women and men would cooperate, the male worker should earn more to overcome his dislike of female co-workers.

Given that firms maximize their profits and that all workers are equally productive, firms will choose to hire either men or women, but not both because this would imply to pay higher wages to men, which in turn would reduce profits. So, the workforce will be segregated: women will never work with (prejudiced) men in the same firm.

- Even if all men are prejudiced there will be no gender wage gap. Women and prejudiced men will not work in the same companies (workforce segregation) but they will earn the same wages (no gender wage gap) as they are equally productive.

Recall if employer prejudice: workforce segregation and gender wage gap.

Customer prejudice

If customers do not like to be served by women, the perceived price of a product or service may differ from the actual price.

Discrimination will occur if the perceived price p_w for a particular product depends on the presence of women when the transaction takes place.

In this case:

$$p_w = p (1 + \omega I_f)$$

where:

- p = actual price
- ω = coefficient of customer discrimination

⇒ Conditional on the price, prejudiced consumers will only buy from firms that have no female workers. Alternatively, prejudiced consumers will only buy from firms with female workers if the price is sufficiently low.

Model predictions?

- Since firms pay workers according to their marginal product (i.e. the additional production value they generate to the firm), in an environment with customer discrimination women will have a lower wage. There will be a gender wage gap.
- The workforce will be segregated. In an all-women firm the product price will be low and hence this firm will not be able to afford to hire a male worker. In an all-man firm the product price will be high, but the price would fall once a female worker is hired.

Comparison of taste-based discrimination outcomes

- In the short-run, the workforce will be segregated irrespective of whether the taste-based discrimination is related to employers, co-workers or customers.
- In a labour market with employer discrimination market forces will eventually remove discrimination through competition, but no such market force exists with customer discrimination.
- Co-worker discrimination does not cause a gender wage gap.
- With customer and co-worker discrimination, workforce segregation may persist.

What if the market is not perfectly competitive?

Taste-based discrimination may also occur in *a non-competitive* labour market.

In a labour market with employer discrimination and search frictions, it is more difficult for women to find a job, since an application at a prejudiced employer may not be successful.

Moreover, if women have to apply more often to find a job than men do, it implies that job search for women is more expensive and the bargaining power of women is weaker.

In the end, unprejudiced employers may exploit this by offering women a lower wage. Put differently, wage discrimination may persist in the long run in the presence of employer prejudice if we assume that the labour market is not perfectly competitive (Black, 1995).

Statistical discrimination

The theory of statistical discrimination is based on the assumption that employers have imperfect information about workers productivities. More precisely, they observe a noisy signal of the true productivity of individual workers (Aiger and Cain, 1977).

To assess individual productivity, employers use individual ‘test scores’, i.e. actual scores from a test, scores based on past experience with similar workers, interpretation from an application letter or an assessment of a CV. Because test scores are imperfect, they are combined with information about the group the applicant belongs to.

The perceived productivity of an individual worker is the weighted average of the individual test score and the perceived group productivity (i.e. the average test score of the group to which the individual belongs to).

We thus have that:

$$q_{ij} = \alpha T_j + (1 - \alpha) T_i$$

where:

- q_{ji} = perceived productivity of worker i from group j ,
- T_j = perceived productivity of group j (that is average test score of group j),
- T_i = test score of worker i ,
- α = weight attached to information about group productivity.

⇒ Workers with the same actual productivity and test scores may be treated differently if they belong to groups having different (perceived) productivity

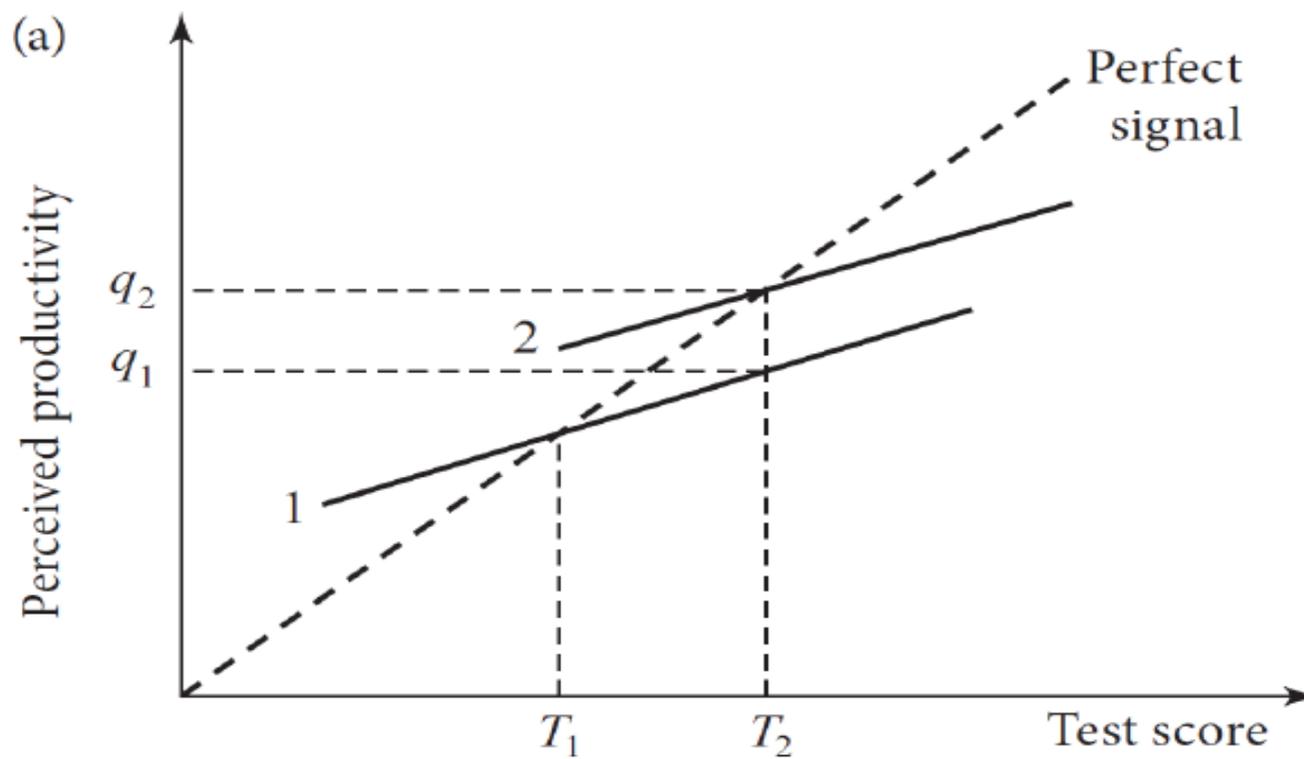


FIGURE 4.3: Statistical discrimination

Source: Boeri and van Ours (2013)

How to read this graph?

- Lines 1 and 2 show how test scores of two groups of workers are perceived in terms of productivity by employers.

Example: Perceived productivity of a worker with test score T_2 is equal to q_1 (q_2) if he belongs to group 1 (group 2).

- The ‘perfect signal’ line shows the true productivity of a worker given his test score.

Example: True productivity of a worker with test score T_2 is equal to q_2 whatever the group of workers to which he belongs.

- Lines 1 and 2 are parallel → quality of the signal provided by test scores (in terms of perceived productivity) is the same for the two groups of workers.
- Average test score of group 1 (2) = T_1 (T_2) → actual mean productivity is lower in group 2 than in group 1.

What about individual discrimination?

At test score T_2 , an individual of group 1 (group 2) will have a perceived productivity of q_2 (q_1), with $q_2 > q_1$.

⇒ The firm will hire the worker from group 2 because he has a higher perceived productivity. The worker from group 1 either will not be hired or will be hired at a lower wage (than his counterpart from group 1).

⇒ Two workers with the same actual productivity will not be treated equally because they belong to groups having different (perceived) productivity.

⇒ This type of statistical discrimination could be based on stereotypes, where the perceived productivity differences between groups are based on prejudice or lack of information.

What about *average* discrimination between groups?

- If perceived group differences are real, on average there is no discrimination between groups, because on average perceived and actual productivity differences coincide.
- On average workers in each group will be paid at their marginal productivity. But some will be underpaid (when perceived productivity is lower than actual productivity) and other will be overpaid (when perceived productivity is higher than actual productivity).

Discrimination due to occupational crowding

The theory of occupational crowding explains how wage differences between occupations may occur when some groups of workers are restricted in their entrance to certain occupations.

According to this theory, wage discrimination is not within occupations or industries but across occupations and industries.

Suppose that women are not allowed (or not supposed) to enter a particular occupation. In this case, women will enter other occupations, and they will push wages in these other occupations down.

The barriers for women to enter specific occupations may come of unions, traditions or because of self-selection.

Historically, some occupations had marriage bars, which prohibited the employment of married women.

Because of marriage bars, employed single women had to give up their jobs as soon as they got married. If they wanted to remain employed after marriage, they had to look for a job outside the marriage-bar occupations.

Marriage bars typically caused highly skilled women to work in low-wage jobs.

Examples:

- In the US, marriage bars were in place until the 1950s, notably in teaching jobs (Goldin, 1988).
- In the Netherlands, a law prohibiting married women to work in government service was introduced in 1937 and only abolished in 1957. Although they were not legally obliged to do so, some big companies followed the example of the government and also fired women, as soon as they got married or became pregnant (Portegijs et al., 2008).

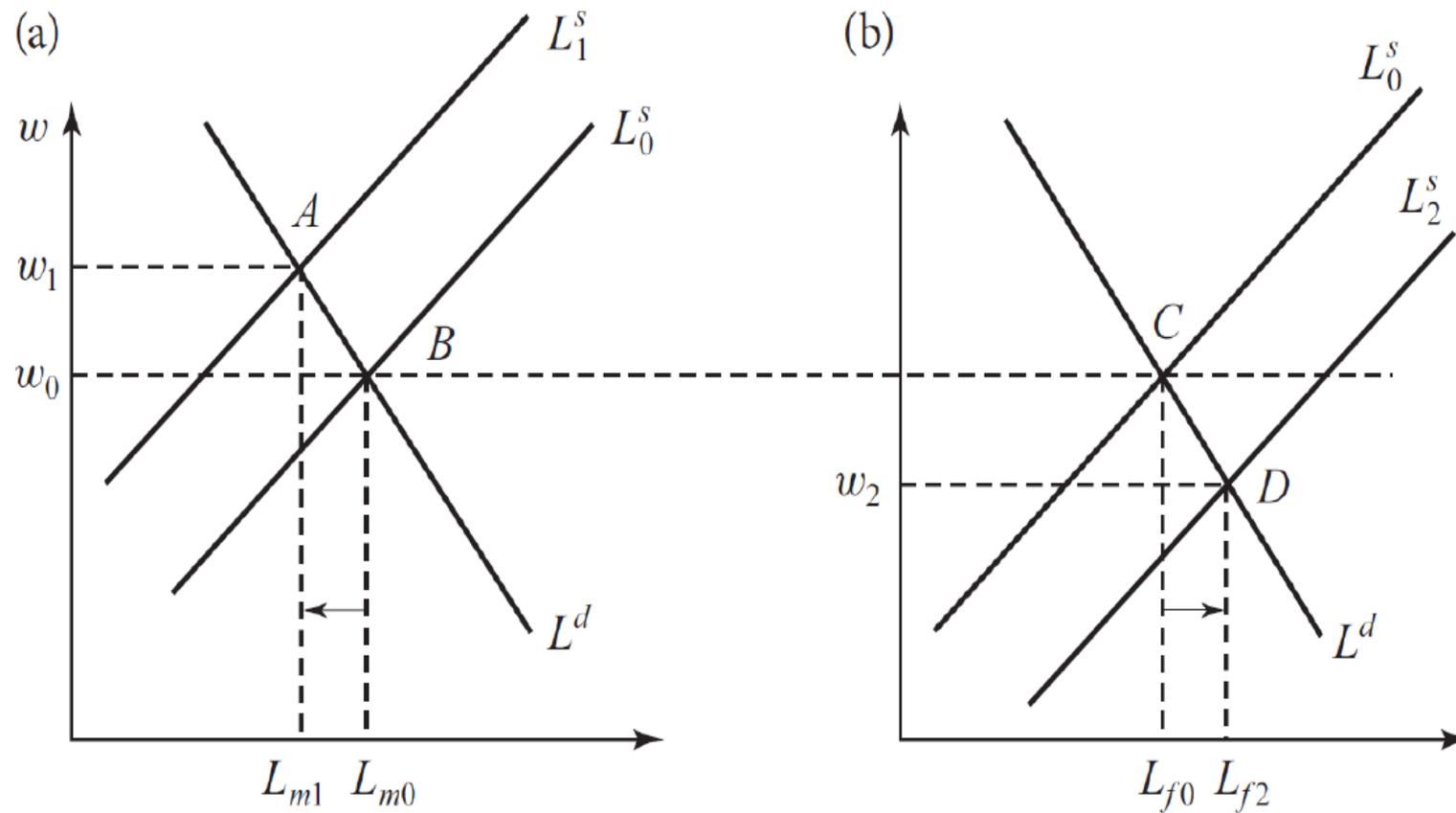


FIGURE 4.5 Occupational crowding: (a) male jobs; (b) female jobs

Source: Boeri and van Ours (2013)

How to read this graph?

- *Without occupational barriers*, the labour markets are in equilibrium, the equilibrium wage is equal to w_0 and women and men work indifferently on both markets.

There is no distinction between ‘male’ and ‘female jobs’ because women can work in ‘male jobs’ and men can work in ‘female jobs’.

- If barriers are introduced, so that women are no longer allowed to enter ‘male jobs’, the equilibrium will be modified:
 - ✓ The supply curve of ‘male jobs’ will be shifted to the left. This will reduce employment and increase the wage to w_1 .
 - ✓ If we assume that women, who are banned from ‘male jobs’, still want to work, they will have to work in ‘female jobs’ → The labour supply curve for ‘female jobs’ will be shifted to the right. This will increase employment and decrease the wage to w_2 .

A key assumption of the occupational crowding model is that men working in ‘female jobs’ will not respond to decreasing wages by moving to ‘male jobs’. This may be because of preferences or mobility costs.

- ✓ In the end, the wage will be determined by the type of job and not by the gender of the worker:
 - On average women will earn less than men, but within occupations there will be no gender wage gap.
 - Men and women working in 'female occupations' will earn less than men in 'male occupations'. But women and men working in 'female occupations' will earn the same wages.

Empirical evidence

a) Unconditional gender wage gap

Table 3.3 : Female gross hourly wages in % of male gross hourly wages in the private sector

	2002	2006	2010	2014
Sweden	84,7	86	84,6	84,2
Belgium	83,5	85,7	89,8	90,1
France	83,4	84,3	84,4	84,7
Luxembourg	81,1	84,2	91,3	91,4
Italy	81,2	83,4	94,7	93,5
Denmark	n.d.	82,2	84,1	84,2
Finland	82,1	80,2	79,7	82,0
Greece	74,5	78,9	85,0	n.d.
Portugal	80,3	78,9	87,2	85,5
Spain	75	76,2	83,8	81,2
Ireland	73,4	73,9	86,1	n.d.
Germany	73,9	73,8	77,7	78,4
Austria	73,6	73,4	76,0	77,1
Netherlands	75	72,1	82,2	83,8
UK	69,3	71,8	80,5	81,7
EU(15)*	77,9	79	84,4	84,4

Notes : * Mean of countries reported in the table. Results obtained from the Europeans Structure of Earnings Survey 2002, 2006, 2010 and 2014. This survey covers only establishments with at least 10 workers. The private sector encompasses NACE categories C to K, i.e. industry, construction and services (except public administration, defence, compulsory social security). Source : Eurostat database.

↪ Interesting information but provides no insight regarding the origin of the gender wage gap.

↪ Does not enable to identify:

- ✓ Part of the gender wage gap explained by differences in productive characteristics of men and women, e.g. education, experience, tenure.
- ✓ Part of the gender wage that remains unexplained after controlling for these characteristics, part that could be attributed to discrimination (but with caution, cf. *infra*).

Regression analyses and correspondence studies often used to investigate the origin of wage differentials, and in particular the presence of discrimination.

b) Regression analyses

A popular way to establish the extent of wage discrimination between any two groups of workers (for instance men and women) is based on estimates of wage equations.

Wage equation ?

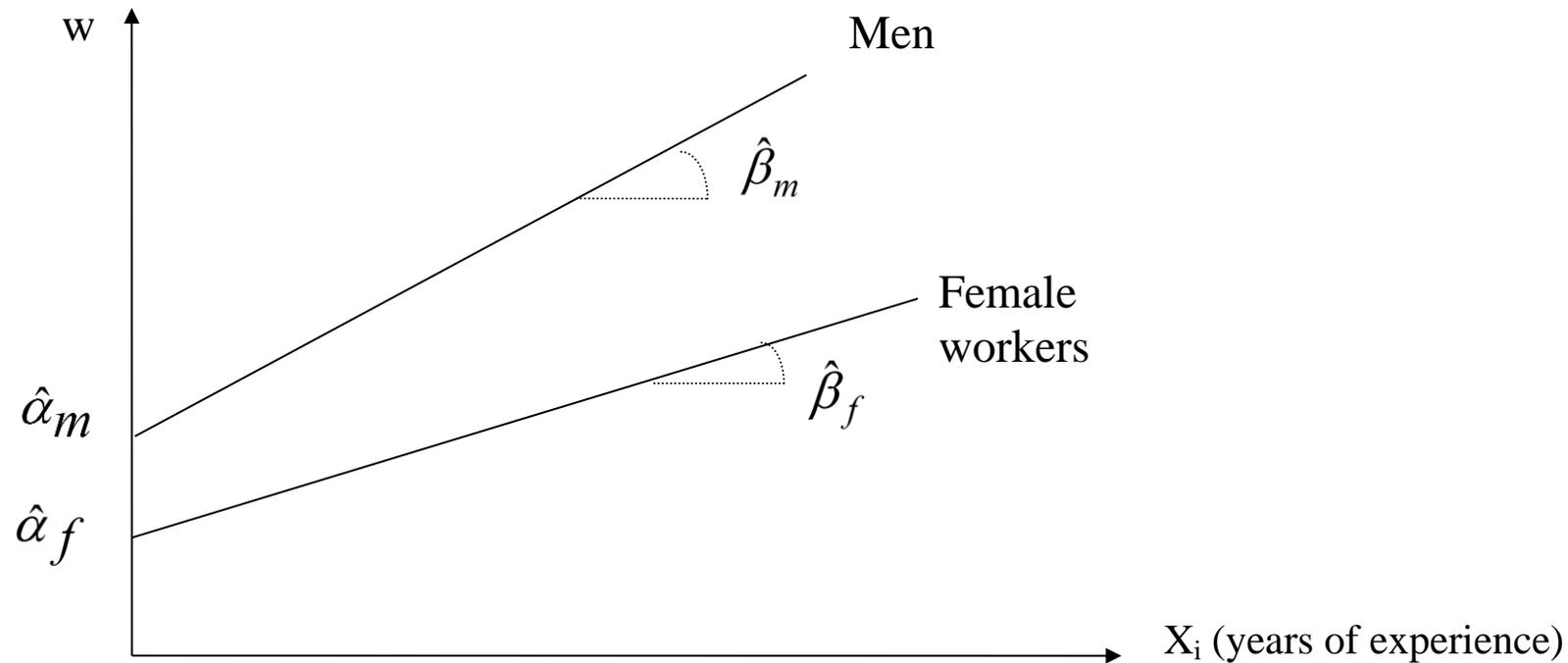
$$\log w_j = \alpha_j + \mathbf{x}_j \beta_j + \varepsilon_j$$

where:

- $j = m$ (male) or f (female)
- $w =$ hourly wage
- $\mathbf{x} =$ vector of personal and job characteristics (e.g. education, experience)
- α and $\beta =$ vectors of parameters to be estimated
- $\varepsilon =$ error term

This wage equation can be estimated separately for women and men using econometric estimation techniques.

If x only includes workers' years of experience on the labour market, wage equations of men and women might be represented as follows:



$\alpha_{m,f}$ = estimates of average wages of men and women with no experience (here: $\alpha_m > \alpha_f$)

$\beta_{m,f}$ = estimated return to a year experience for women and men (here: $\beta_m > \beta_f$)

Oaxaca – Blinder decomposition :

$$\log w_m - \log w_f = \underbrace{(\alpha_m - \alpha_f) + (\mathbf{x}_m - \mathbf{x}_f) \beta_m + \mathbf{x}_f (\beta_m - \beta_f)}_{\text{Unexplained}} + \underbrace{\mathbf{x}_f (\beta_m - \beta_f)}_{\text{Explained}}$$

where:

- $\log w_m$ = mean of male (log) wages.
- $\log w_f$ = mean of female (log) wages.
- $\mathbf{x}_{m,f}$ = mean values of male and female characteristics (e.g. average years of labour market experience respectively among men and women).
- $\alpha_{m,f}$ = intercepts of male and female wage equations (i.e.. mean wages of men and women when all characteristics included in the vector \mathbf{x} are equal to zero).
- $\beta_{m,f}$ = returns to characteristics included in vector \mathbf{x} respectively for men and women.

Total gap = explained (‘quantity/compositional effect’) + unexplained (‘price effect’)

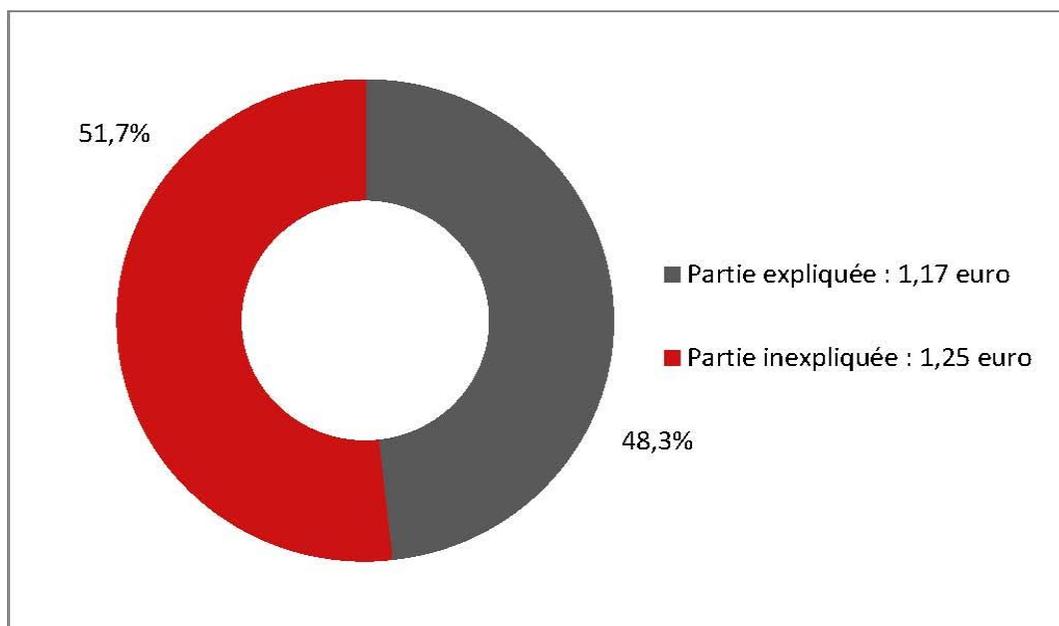
Explained = part of gap due to differences in observed characteristics of men and women

Unexplained = residual gap (i.e. not explained by observed differences), often associated to discrimination (but caution required, cf. infra)

Example with Belgian private-sector data :

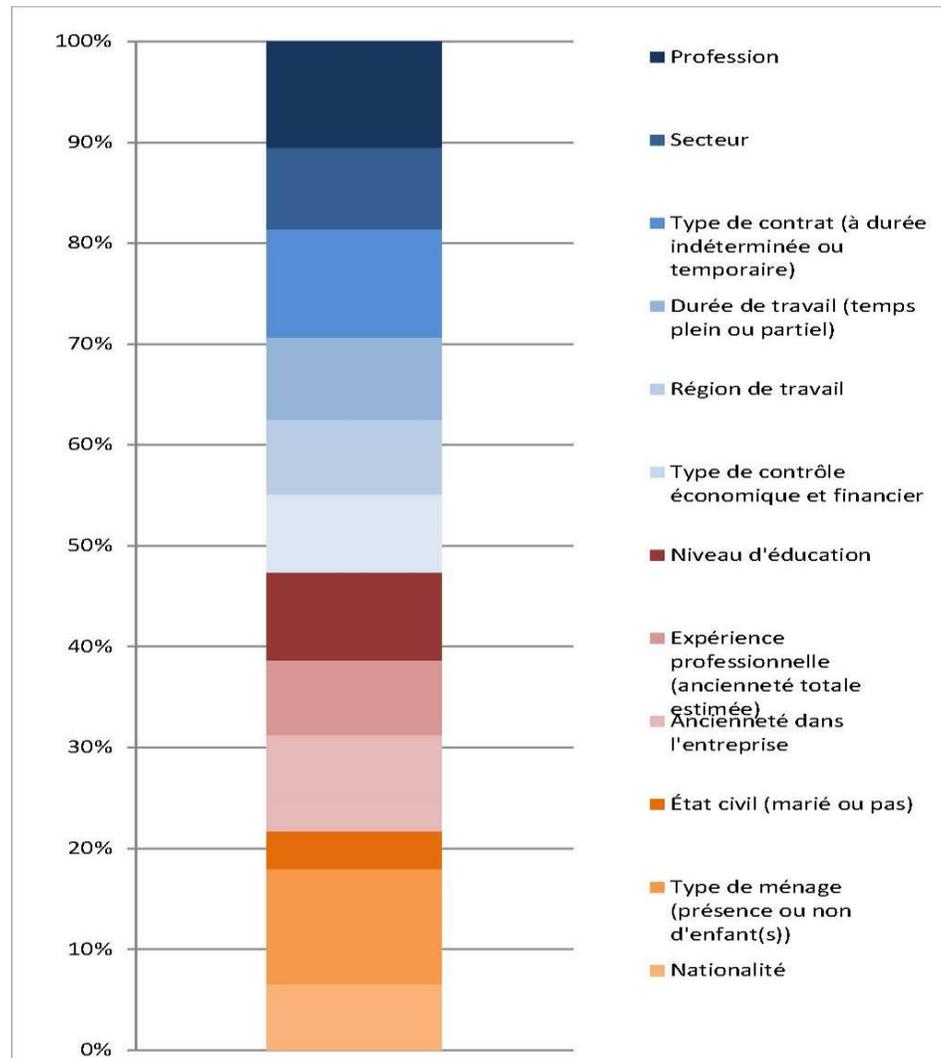
Data on gross basic wages (excluding annual bonuses, in kind benefits and 13th month, etc.) from Belgian Structure of Earnings Survey

- Annual unconditional gender wage gap = 22% (because incidence of part-time higher among women)
- Hourly unconditional gender wage gap = 9% (or 2,42 euros/hour, after controlling for differences in working time). Explained part = 51,7%, unexplained part = 48,3%.



Source : Institut pour l'Egalité entre les Hommes et les Femmes, "L'écart salarial entre les hommes et les femmes en Belgique : Rapport 2012", Bruxelles.

Decomposition of the explained part :



Source : Ibidem. Data from SES 2009.

Caution is required :

- a) The unexplained part (attributed to discrimination) may at least partly derive from the omission of key explanatory variables reflecting the productivity of men and women.

Examples : field of studies, career breaks, vocational training.

,

- b) There may be some endogenous discrimination. 'Explained' part is not necessarily 'justified'.

Example : occupations and the glass ceiling effect, involuntary part-time.

Tab.: Incidence of involuntary part-time employment, 2017

Pays	Part-time employment as a % of total employment ¹	Involuntary part-time as a % of total part-time employment ²
Portugal	8,5	36,6
Greece	11,0	69,5
Unites States	12,5	6,3
Sweden	13,8	24,7
Spain	13,8	62,0
Finland	14,0	25,2
France	14,3	42,0
Belgium	16,4	7,7
Italy	18,5	60,8
Denmark	20,4	13,4
Germany	22,2	10,6
UK	23,5	13,3
Netherlands	37,4	7,1
EU(15)*	18,1	30.4

Notes: Involuntary part-time refers to people working part-time because they can't find a full-time job. ¹ Part-time employment refers to people working usually less than 30 hours per week. ² Part-time employment is based on national definitions. * Non-weighted average of EU(15) countries.

Source : OCDE (2018), OECD Employment Outlook 2015, Paris.

In sum, the unexplained part of the gender wage gap may:

- ✓ **Overstate** the extent of wage discrimination if some key productivity-related characteristics, such as training or commitment to career, are omitted from the analysis.
- ✓ **Understate** the extent of wage discrimination if differences in mean male and female characteristics (with respect to e.g. occupations, working time or education) are the results of a discriminatory process.

Example for US (Altonji and Blank, 1999; CPS data):

Percentages	1979		1995	
	Model 1	Model 2	Model 1	Model 2
Males-Females				
Characteristics	2.6	12.6	0.8	7.6
Coefficients	43.8	33.5	27.9	21.1
Whites-Black				
Characteristics	6.3	10.8	8.2	11.4
Coefficients	10.2	6.1	13.4	9.8

Note: The numbers indicate the percentage wage difference of males-females and whites-blacks;

Model 1 includes education, potential experience and region;

Model 2 contains in addition occupation, industry and job characteristics.

Source: Boeri and van Ours (2013)

Total **gender/black-white** wage gap = **46.4%/16.5%** (in 1979) and **28.7%/21.6%** (in 1995).

Unexplained part ('coefficients') decreases as control variables increases, i.e. when moving from Model 1 to Model 2 → be cautious when interpreting OB decompositions.

c) Correspondence studies

Real vacancies, fake identical applications letters except for the characteristic that may lead to discrimination (i.e. gender, race, immigrant status, sexual orientation, beauty).

Study	Group	Callback (%)	Country	Sample
Booth and Leigh (2010)	Male	25	Australia	3,365
	Female	32		
Bertrand and Mullainathan (2004)	White	10	United States	2,435
	African-American	6		
Carlsson and Rooth (2007)	Swedish	29	Sweden	1,552
	Middle Eastern	20		
Ahmed et al. (2011)	Male heterosexual	30	Sweden	1,978
	Male homosexual	26		
	Female heterosexual	32		
	Female homosexual	26		
Ruffle and Shtudiner (2010)	Male plain	9	Israel	2,656
	Male attractive	20		
	Female plain	14		
	Female attractive	13		

Source: Boeri and van ours (2013)

The 'displaced' equilibrium

Diverse minimum wage regulations

Minimum wages may:

- Be set at the regional (e.g. in the US, Canada, Japan) and/or national level (e.g. in Belgium, France, the Netherlands, the UK, US).
- Vary across sectors (e.g. Germany, Belgium, Ireland, Portugal) or across qualification (e.g. Luxembourg).
- Depend on workers' age (reduced minimum wage rates for youngsters e.g. in Belgium, France and the Netherlands).
- Be set by law (e.g. in Eastern European countries, the UK) or through collective bargaining (e.g. in the Nordic countries, Belgium).
- Follow the price index (e.g. in Belgium) or the mean growth rate of wages (e.g. in France, Japan and Spain).

For cross-country comparisons: the 'Kaitz' index, i.e. the ratio between the minimum wage and the average wage.

Table 3.4 : Gross monthly national minimum wages

	EUR		Change between 2008 and 2019 (in %)	In PPT, en 2019	Minimum wage in % of median gross monthly earning, 2014 (Kaitz index) ^b	Proportion of wage earners earning less than 105% of the monthly minimum wage	
	In 2008	In 2019				2010	2014
Bulgaria	112	286	155	566	57	3,4	8,8
Roumania	139	446	221	846	50	4,4	14,3
Hongria	272	464	71	748	54	4,4	5,6
Poland	313	523	67	920	52	9,9	11,5
Portugal	497	700	41	807	64	3,1	3,6
Greece	794	758	-5	900	50 ^d	2,0	n.a.
Spain	700	1.050	50	1.135	45	0,2	0,2
United States	689	1.098	59	982	30 ^d	n.a.	n.a.
France	1.280	1.521	19	1.379	62	9,2	9,5
United Kingdom	1.242	1.524	23	1.323	49	3,8	4,4
Germany	^c	1.557	^c	1.497	53	^c	^c
Belgium	1.310	1.594	22	1.435	52	n.d.	n.d.
Netherlands	1.335	1.636	23	1.459	56	3,7	3,4
Ireland	1.462	1.656	13	1.301	45	9,2	4,1
Luxemburg	1.570	2.071	32	1.636	56	10,2	6,1

Note: Denmark, Italy, Cyprus, Finland and Sweden : no national minimum wage. ^b As a % of monthly earnings in the industry and services (excluding agriculture, hunting and forestry), i.e. NACE codes B to S. ^c No national minimum wage before 2015. ^d As % of the mean gross monthly wage. n.a: not available. Source: Eurostat.

Characteristics of minimum wage earners ?

In all countries, they are over-represented among:

- the low-qualified,
- youngsters, and
- women.

Also, over-represented in:

- part-time jobs, and
- traditional sectors.

To sum up:

- great diversity in scale, eligibility and operational details of minimum wages, but
- strong stability in features on minimum wage earners across countries.

Theoretical consequences of minimum wages ?

Competitive framework

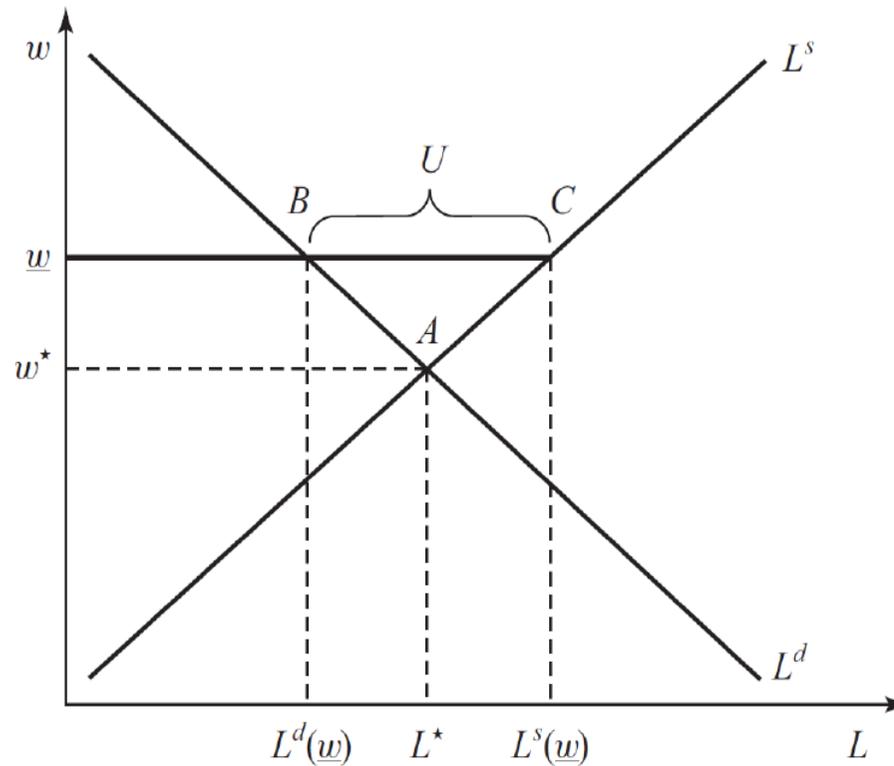


FIGURE 2.2 The minimum wage in a competitive labor market

Source : Boeri and van Ours (2013)

Non-competitive framework

Dual Labour market

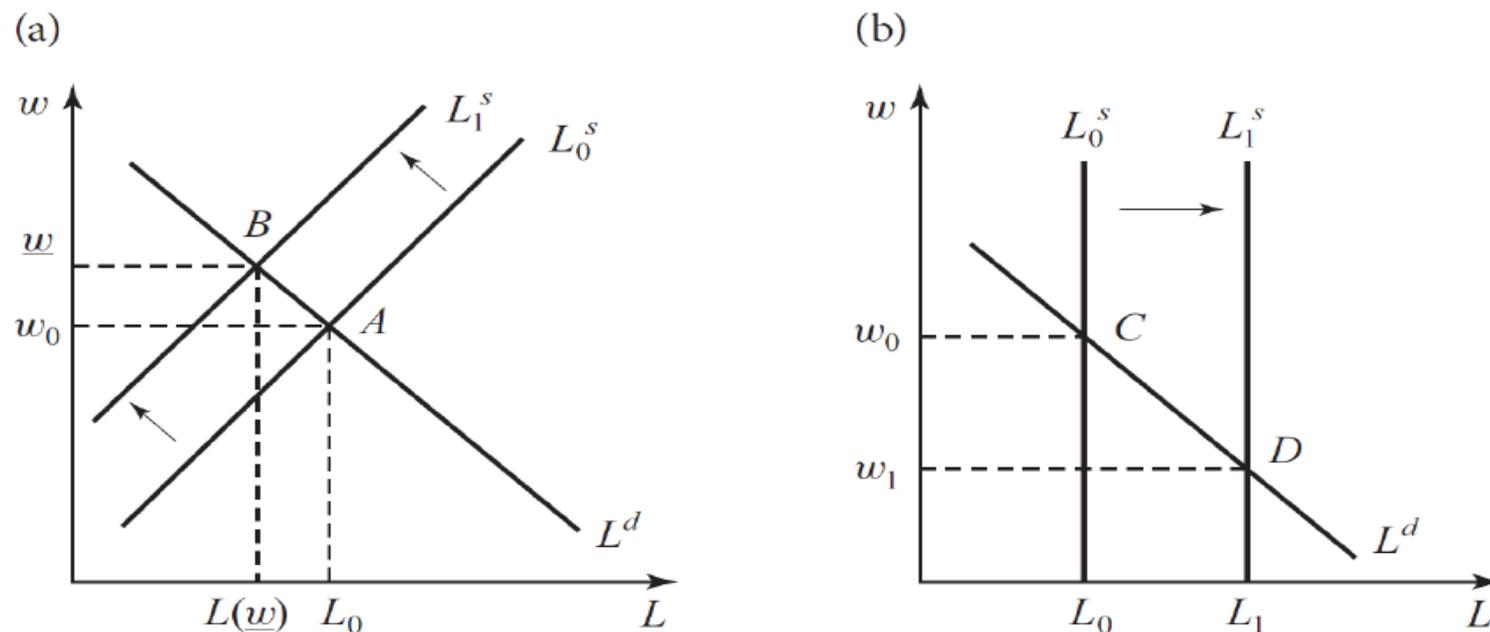


FIGURE 2.4 A dual labor market and the minimum wage: (a) formal sector;

Under the assumption of perfect labour mobility from the formal to the informal sector, the minimum wage has *no effect on* total (formal + informal) employment but creates a gap between formal and informal sector wages.

Monopsony

When employers have monopsony power in wage-setting, the introduction of a minimum wage – at a relatively low level - may *increase* employment.

Classical example: mining company in isolated area (i.e. only one employer, high entry costs preventing competition from other firms, no or little labour mobility). Modern monopsony: many employers, but few vacancies to apply for.

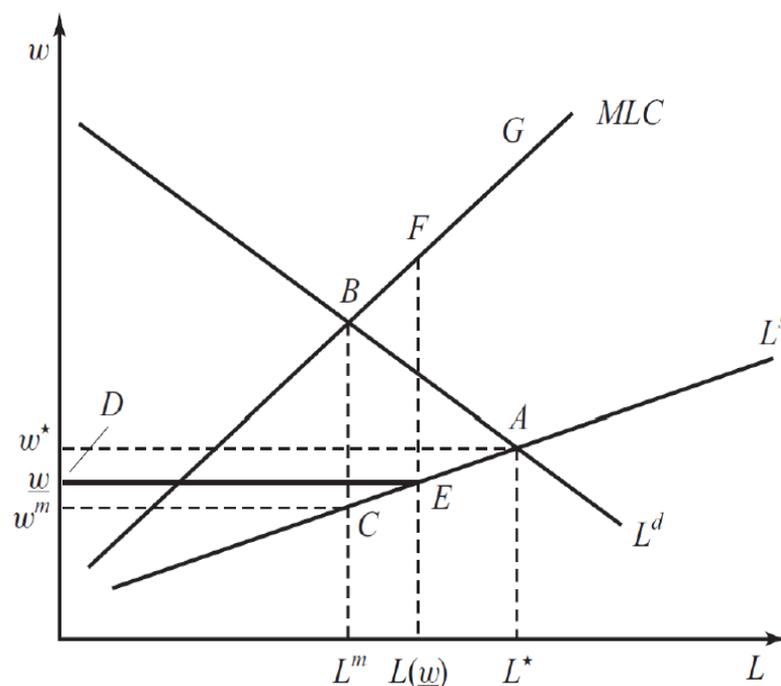


FIGURE 2.3 Monopsony and the minimum wage

Boeri and van Ours (2013).

How to read this graph?

Monopsonistic firm faces upward sloping labour supply curve (i.e. aggregate labour supply curve) → marginal labour cost (MLC) exceeds mean labour cost given by L^S (at any level of employment). (cf. next slides)

Intuition: the marginal cost of hiring a worker is higher than the reservation wage of any additional worker because the pay increase necessary to induce the individual to supply labour has to be granted not only to the marginal worker but also to the entire workforce.

Firm maximizes profits by choosing employment (L^m) that equates the marginal labour cost (MLC) and marginal revenues from labour (given by L_d). Firm pays only w^m as it is sufficient to attract/hire L^m workers. Workers are paid below their marginal productivity.

Equilibrium at point C (w^m, L^m): lower wage and employment level than at competitive equilibrium A (w^*, L^*).

Introduction of a minimum wage between w^m and w^* increases both wages and employment (the new marginal labour cost curve is given by the segment DEFG).

But if the minimum wage is set above w^* , employment will be lower than at competitive equilibrium A.

The marginal labour cost (MLC) of a monopsonist is located above the labour supply curve (L^S) and deviates more and more from the latter.

Intuition: the marginal cost of hiring a worker is higher than the reservation wage of any additional worker (i.e. the wage that has to be paid by the firm to be able to attract/hire an additional worker) because the pay increase necessary to induce the individual to supply labour has to be granted not only to the marginal worker but also to the entire workforce.

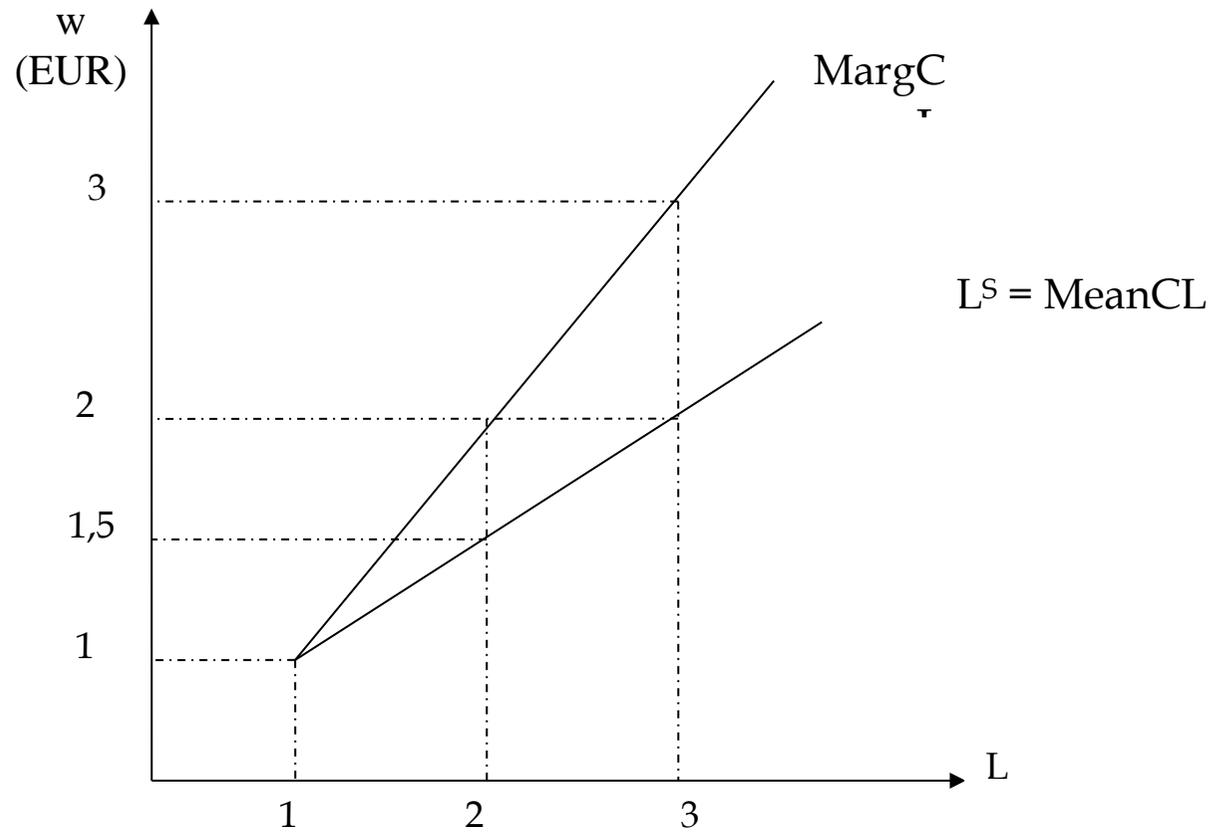
Example :

- 1) Monopsonist attracts/hires **1 worker** if wage = 1 EUR
⇒ Mean Cost Labour (MeanCL) = Marginal Cost Labour (MargCL) = 1 EUR.
- 2) Monopsonist attracts/hires a **2nd worker** if wage = 1,5 EUR
⇒ MeanCL = 1,5 EUR (because both workers receive the same wage)
⇒ MargCL = 1,5 EUR (price that has to be paid to attract/hire 2nd worker)
+
0,5 EUR (repercussion of wage increase on the 1st worker)
= 2 EUR.
⇒ MargCL > MeanCL ($\Delta = 0,5$ EUR)

- 3) Monopsonist attracts/ hires **3rd workers** if wage = 2 EUR
- ⇒ MeanCL = 2 EUR (because all workers receive the same wage)
- ⇒ CMargT = 2 EUR (price that has to be paid to attract/hire 3rd worker)
- +
- 0,5 EUR (repercussion of wage increase on the 1st worker)
- +
- 0,5 EUR (repercussion of wage increase on 2nd worker)
- = 3 EUR.
- ⇒ MargCL > MeanCL ($\Delta = 1$ EUR)

And so on...

Corresponding graph :



In the end ?

What really matters is the level rather than the presence of a minimum wage.

Although the standard prediction from economic theory is that a minimum wage should reduce employment, some market imperfections may allow the introduction of a minimum wage, set at relatively low levels, to be consistent with the attainment of higher levels of employment and welfare.

Empirical studies ?

They generally conclude that the impact of the minimum wage on employment is limited, except for certain groups of workers notably the youngsters.

Examples of studies based on firm-level data:

OECD (1998): 9 advanced economies, 1975-1996. 10% increase of the minimum wage decreases employment among less than 20 years old by between 2 and 4%. Negative impact but close to zero among 20-24 years old. No effect among 25 years old and more.

Dolado *et al.* (1996), OECD (2006): similar conclusion.

More recent studies, based on matched worker-firm data, find some evidence that individual firms are facing an upward-sloping labour supply curve → evidence of market power and potentially positive employment effects of the minimum wage (Staiger *et al.* 2010: hospitals in the US; Falch 2010: Norwegian teacher labour market; Ransom and Sims 2010: public schools in Missouri).

Examples of studies based natural experiments:

Card et Krueger (1994):

- Data on employment in 410 fast-food restaurants in New Jersey and Pennsylvania, which are two bordering states in the US with similar economic structures.
- The minimum wage (MW) was initially the same (\$4.25 per hour) in both states and was raised in 1992, only in New Jersey, to \$5.05 per hour.

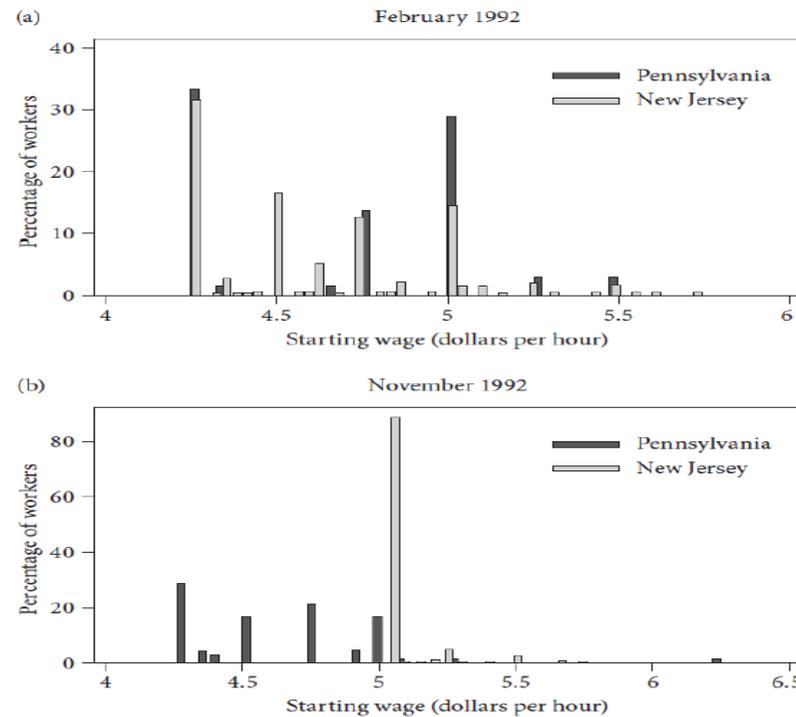


FIGURE 2.5 The wage distribution (a) before and (b) after an increase in the minimum wage

The data were collected in February-March 1992 (when both states had the same MW) and in November-December 1992 (after the increase of the MW in New Jersey).

Impact on employment estimated by taking the difference between the November-December 1992 and February-March 1992 employment variations in the two states \Rightarrow Difference-in-differences estimator

	Employment	
	New Jersey	Pennsylv
Mar 1992	20.4	23.3
Dec 1992	21.0	21.2
Δ	0.6	-2.1
$\Delta\Delta$	2.7	

Note: Employment = number of full-time equivalents working in a fast-food restaurant.

Δ MW of 80 cents, increases employment of 2.7 workers in every fast-food restaurant
 \Rightarrow Δ MW of \$1 creates 3.4 (i.e. $2.7/0.80$) more jobs in every firm.

Conclusion: increase in the MW can lead to an increase in employment when this wage is sufficiently low to start with.

Various replication studies based on other US states that did also increase their MW in the 1990s end up to **similar conclusions** (Card et Krueger, 1995, 2000 ; Neumark and Wascher, 2000)

Draca, Machin and van Reenen (2011):

- National Minimum Wage (NMW) introduced in 1999 in the UK
- Comparison of low- and non low-wage firm using firm level data
- Expectation: low-wage firms are more likely to be affected by the NMW
- Before = April 1 1996- March 31 1999 – After = April 1 1999- March 31 2002
- Difference-in-differences estimator

	Log(average wage)		Profit margin	
	Low	Non low	Low	Non low
Pre-NMW	2.149	2.775	0.128	0.070
Post-NMW	2.378	2.893	0.089	0.058
Δ	0.229	0.118	-0.039	-0.012
$\Delta\Delta$	0.111		-0.027	

Note: NMW = National Minimum Wage; Profit margin = Ratio of profits to sales

Conclusions:

- Findings consistent with “no behavioral response”
- Firms do not adjust employment
- Wage gains from minimum wages map into profit reductions, i.e. wages (profits) increased (decreased) faster in low-wage firms.

To sum up:

- Empirical studies generally conclude that the employment effects of minimum wages are negative but rather small and essentially concentrated on youngsters.
- However, there are also some studies suggesting slight positive (e.g. Card and Krueger, 1994) or no employment effects (e.g. Draca et al., 2011)

The 'transformed' equilibrium

Economic agents no longer assumed to be price-takers

- a) Firms with monopsony power e.g. because many employers but only few vacancies to apply for.
- b) Wages and working conditions collective bargained by trade unions and employers' associations.

Trade unions and collective bargaining: a micro-economic perspective

Several micro-economic models representing the functioning of labour markets in the presence of trade unions [e.g. monopoly union (Dunlop, 1944), right-to-manage (Nickel and Andrews, 1983), efficient (McDonald and Solow, 1981) and general bargaining models (Manning, 1987)]

Provide different prediction regarding the impact of trade unions on employment.

However:

- a) Empirical literature disagrees on which model is most appropriate (Plasman and Rycx, 2001; Boeri, 2013).
- b) Models are subject to criticism: too simple to describe reality (Cahuc and Zylberberg, 1996).

Trade unions and collective bargaining: a macro-economic perspective

Impact of trade unions and collective bargaining on employment performance of advanced economies?

✓ Some stylised facts for 2007 (& 2018):

EU(15) vs. United States :

- Unemployment rate : **6,7 vs. 4,6%** (**7,7 vs. 3,9%**)
- Incidence of long term unemployment (12 months and more), as % of total unemployment : **33,1 vs. 10%** (**37,8 vs. 13,3%**)
- Beginning of 1980s until 2008, and gain since 2012: unemployment rate in EU(15) > US.
- Employment rate : **66,9 vs. 71,8%** (**68,1 vs. 70,7%**)

Source : OCDE (2019), *Employment Outlook*, Paris. Note: Non weighted average for EU(15).

✓ **Key issue**

Why do economies which are subject to broadly similar external developments (such as oil shocks, technological progress, competition from low-wage countries) and which have comparable production capacity **show such diverse labour market performances?**

- Many economists and policy makers consider that Europe's poor record on employment and unemployment can be attributed to the institutional characteristics of the labour market and especially to industrial relations.

a) **Rent-seeking face** of unions:

Trade unions would only represent the interests of their employed members.

They are expected to push wage above the market-clearing level and to resist real downward wage adjustments even after a substantial negative productivity shock, e.g. an oil shock.

b) **Efficiency-enhancing face** of unions:

- Trade unions enhance efficiency when they counteract, at least to some level, the excessive bargaining power of employers.

In the absence of collective bargaining, monopsonistic firms would offer inferior wages and working conditions than those prevailing on a competitive labour market→ trade unions may reduce wage discrimination and increase employment.

- Trade unions provide collective voice to atomistic agents.

Without such a voice, workers asking in vain for higher pay when productivity increases would have only the option of quitting the job and to search for another job with better pay (exit option).

Unions provide workers the option to continue to stay on the job and to bargain collectively for better pay, which is less costly for the firm as it creates no disruption in the production process

- By transmitting complaints and demands, it is argued that trade unions can improve and correct the work relationship, which in the end may improve productivity.

For instance, unions can force employers to provide more on-the-job training. They may also help achieve higher efficiency by reducing transaction costs associated to individual bargaining.

To sum up:

Economists usually characterize unions as organisations with a good (efficiency-enhancing) face and a bad (rent-seeking face).

✓ Empirical results

Are trade unions too powerful in Western Europe?

Reality is much more complex !

Not very surprising :

- a) Heterogeneity of industrial relations in Western Europe.
- b) Diversity of characteristics that may affect the outcome of collective bargaining.

Diversity of collective bargaining systems

- **Dominant bargaining level :**

- a) National : e.g.. Finland and Norway.
- b) Sectoral : e.g. Belgium, Germany, France, Italy, the Netherlands.
- c) Company : e.g. US, UK, Canada, New-Zealand, Japan.

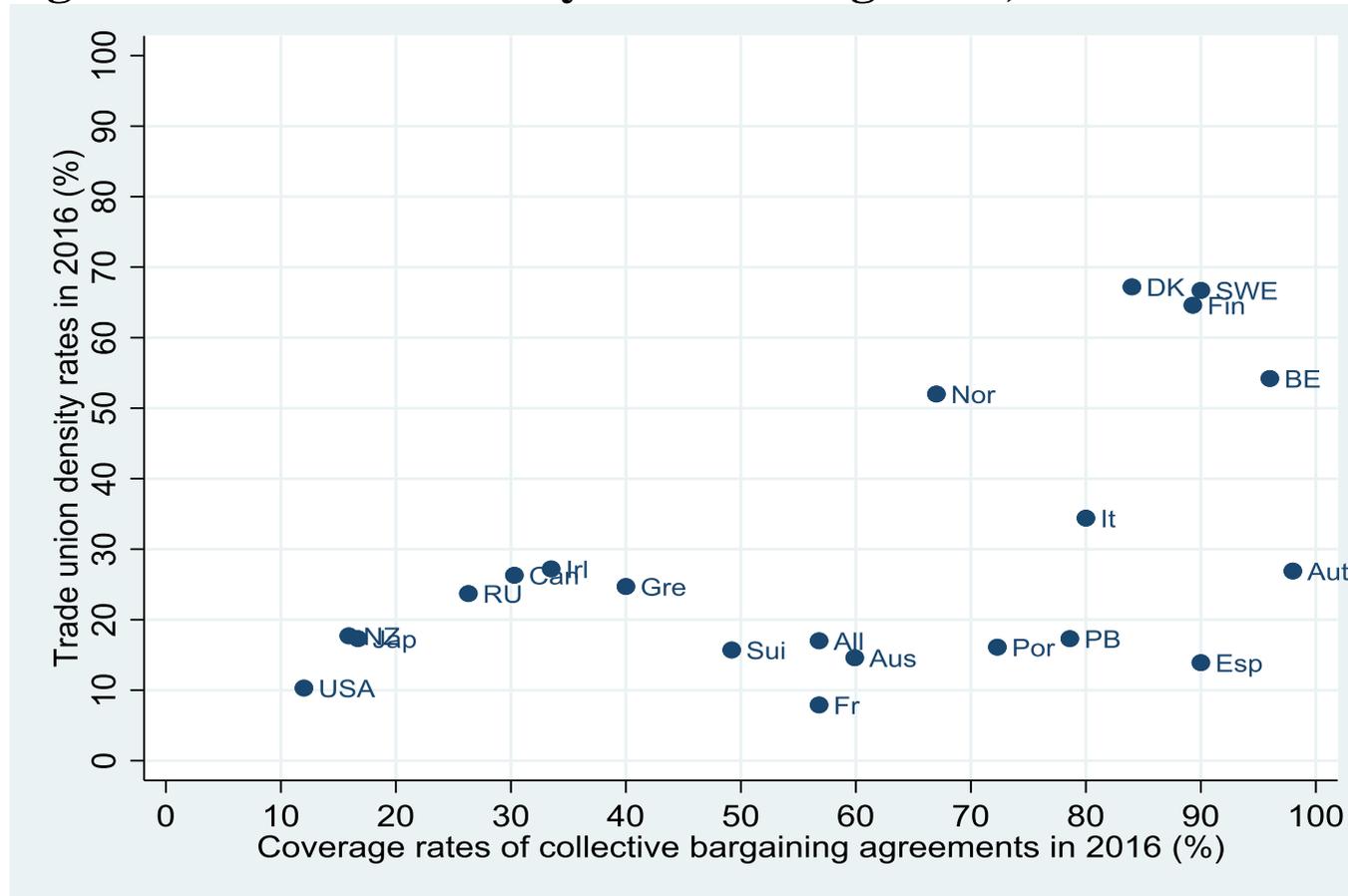
- **Degree of coordination among the social partners* :**

- a) Strong *coordination* does not necessarily imply strong centralisation.
Examples : Germany, Japan.
- b) Strong *centralisation* (at least on a formal level) does not necessarily imply strong coordination.
The wage drift...

(*). Ability of trade unions and employers' organisations to coordinate their decisions horizontally (within a given bargaining level) and vertically (between bargaining levels).

For more details see e.g. Visser J. (2016), "What happened to collective bargaining during the great Recession", *IZA Journal of Labor Policy*, 5 :9.

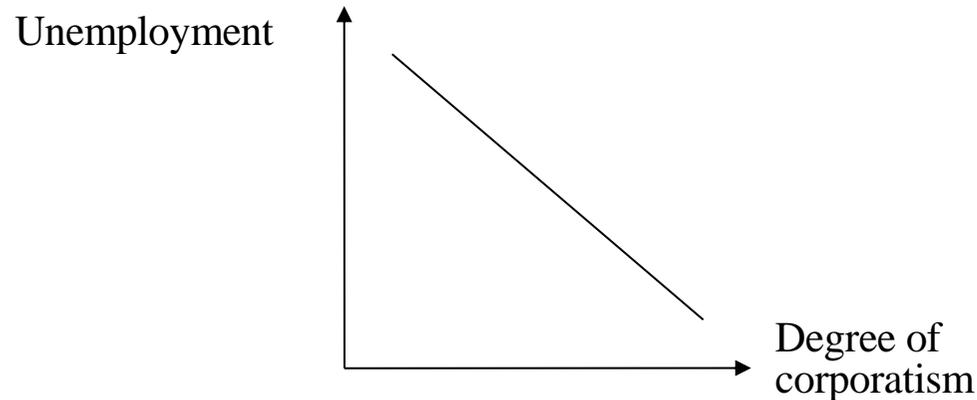
Fig. : Trade union density and coverage rate, 2016



Notes : Trade union density (vertical axis, Y)= % workers affiliated to a trade union organisation in 2016 (except: BE, Esp, Fr, Por, Sui en 2015 ; Gre en 2013) ; Collective bargaining coverage rate (horizontal axis, X) = % workers covered by a collective in 2016 (except: DK, Esp, Fin, It, Po, SWE en 2015 ; Aus, Nor, Sui, Irl en 2014 ; Gre en 2013).

Acronyms: RU: United Kingdom, Sui: Switzerland, All: Germany, Aut: Austria, Esp: Spain. Source : OECD (2018).

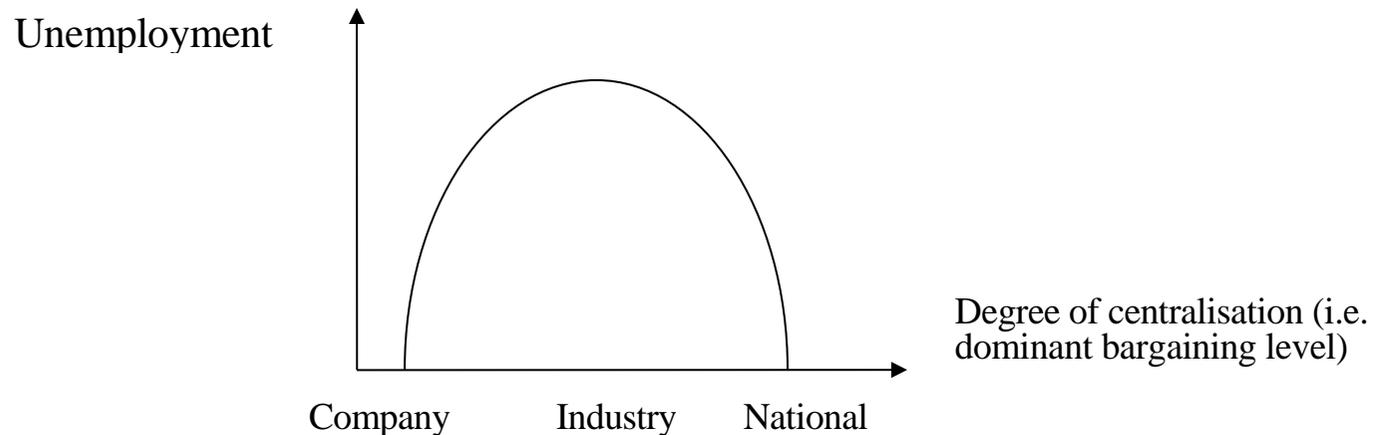
Corporatist relationship



Intuition : High degree of corporatism, and particularly of coordination among employers' organisations and trade unions, prompt the economic players to *internalise* the negative *externalities* of their agreements, mainly on pay.

Examples : McCallum (1983, 1986), Cameron (1984), Bruno et Sachs (1985), Tarantelli (1986), Bean *et al.* (1986), Newell and Symons (1987), Golden (1993).

Hump-shaped relationship



Intuition : Sectoral pay bargaining less efficient because :

- a) Unlike at national level, there is insufficient co-ordination of decision making at sectoral level to encourage the trade unions to internalise *all* the externalities arising from pay increases.
- b) Competitive pressure (and elasticity between employment and wages) is weaker between sectors than between firms.

Examples : Calmfors et Driffill (1988), Freeman (1988), Rowthorn (1992).

Really?

- OECD update (1997) of Calmfors and Driffill's results, for the period 1986-1996, fails to confirm the existence of a hump-shaped relationship.
- Hypothesis according to which the demand for labour is inevitably less elastic at sectoral than at company level has been questioned (international competition).
- Reservations because Calmfors and Driffill ignore the degree of co-ordination among the social partners.

More recent evidence...

Employment performance of an economy with both high bargaining coordination and high unionization is *ceteris paribus*, superior to that of an economy with low coordination and unionization.

When coordination is lacking, better employment outcomes are observed under either centralized or decentralized regimes, with intermediate regimes offering the worst performance.

Exemples : Nickell (1997), Flanagan (1999), Traxler et Kittel (2000), Lesueur et Sabatier (2008), Traxler and Brandl (2012), Boeri and van Ours (2013), Zvakou (2018).