

The Economics of Imperfect Labor Markets

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Chapter 4. Anti-Discrimination Legislation

Discrimination Legislation: What Are We Talking About?

Universal Declaration of Human Rights – Article 23 sub (2):

Everyone, without any discrimination, has the right to equal pay for equal work.

Nevertheless, discussion about the existence of discrimination:

- Male – female
- Black – white (US)
- Native – immigrant (Europe)

DL – Workers incentives & employers incentives

- Workers incentives to bring a case before courts
 - Proof = Elements of proof to be provided by the plaintiff
 - Protection = Protection of the plaintiff against victimization
- Employers incentives to comply
 - Publicity = Publicity as sanctions in case of non-compliance
 - Fines = Administrative, civil or penal fines in case of non-compliance
- Not only laws themselves but also interpretation & enforcement of laws important

Workers incentives to bring a case before courts and employers incentives to comply(I)

TABLE 4.1 Worker incentives to bring a case before the courts and employer incentives to comply with antidiscrimination legislation

	Worker incentives		Employer incentives to comply		
	Burden of proof	Protection	Publicity	Fines	Prison
Australia	Proof	Yes	Yes	Penal	Yes
Austria	Strong presumption	Yes	No	Penal, rare, low	No
Belgium	Presumption	Yes	Yes	Gender: none Ethnicity: penal, low	Gender: no Ethnicity: yes
Canada	Proof	Limited	No	None	No
Czech Republic	Strong presumption	Limited	No	Administrative	No
Denmark	Gender: presumption Ethnicity: strong presumption	Limited	No	Penal	No
Finland	Presumption	Gender: yes Ethnicity: limited	No	Penal	Yes
France	Presumption	Limited	Yes	Penal	Yes
Germany	Presumption	Yes	Yes	Administrative and penal, low	No
Greece	Presumption	Yes	Gender: yes Ethnicity: no	Administrative	Yes
Italy	Gender: strong presumption Ethnicity: proof	Gender: no Ethnicity: limited	Yes	None	No

Workers incentives to bring a case before courts and employers incentives to comply(II)

TABLE 4.1 Worker incentives to bring a case before the courts and employer incentives to comply with antidiscrimination legislation

	Worker incentives		Employer incentives to comply		
	Burden of proof	Protection	Publicity	Fines	Prison
Japan	Proof	Yes	Yes	Penal	Yes
Korea	Gender: presumption	Gender: yes	Yes	Penal	Yes
	Ethnicity: proof	Ethnicity: limited			
Mexico	Strong presumption	Limited	Yes	Labor law	Yes
Netherlands	Presumption	Limited	Yes	Penal	Yes
Norway	Presumption	Yes	No	Administrative	Gender: no Ethnicity: yes
Poland	Presumption	Limited	No	None	Yes
Portugal	Presumption	Yes	Yes	Some	No
Spain	Strong presumption	Yes	Yes	Some	Yes
Sweden	Presumption	Yes	No	None	No
Switzerland	Presumption	Limited	Yes	Some	No
United Kingdom	Strong presumption	Yes	Yes	None	No
United States	Proof	Yes	Yes	Some	No

Source: OECD (2008).

Note: Worker incentives = incentives to bring a case before courts; proof = elements of proof to be provided by the plaintiff; protection = protection of the plaintiff against victimization; publicity = publicity as sanctions in case of noncompliance; fines = administrative, civil, or penal fines in case of noncompliance; prison = prison sentences in case of noncompliance.

Various economic theories on discrimination

Focused on male-female; but applicable to black-white, native-immigrant

① Perfect Labor Markets:

Taste-based discrimination

- ① Employers: do not like women
- ② Co-workers: male workers do not like to work with female co-workers
- ③ Customers: do not like to be served by women

② Imperfect Labor Markets

- ① Monopsony: employer has more market power over women
- ② Statistical discrimination: lack of information about individual productivity
- ③ Occupational crowding: access of women to certain jobs is restricted

Perfect LM: Taste-based discrimination (Becker, 1971)

- Framework to analyze the nature and consequences of discrimination based on prejudice
- Labor is homogeneous and labor markets are competitive
- All workers are equally productive
- Firms and workers are wage-takers
- Assume that discrimination if present is against women in favor of men. Discrimination may lead female workers to have a wage w_f which is below the wage w_m of male workers.

Perfect LM: Taste-based Discrimination – Employers

Men and women equally productive. Some employers prefer to hire men.
Utility function of firm depends on profit AND on # of female workers

$$U = \text{Revenue} - w_m L_m - w_f L_f - \omega w_f L_f \quad (1)$$

U = utility

w_f = wage females

L_f = women workers hired

ω = coefficient of discrimination of this employer; $0 \leq \omega \leq \omega^{\max}$. This generates at the equilibrium wage *discrimination*, measured by the male wage premium

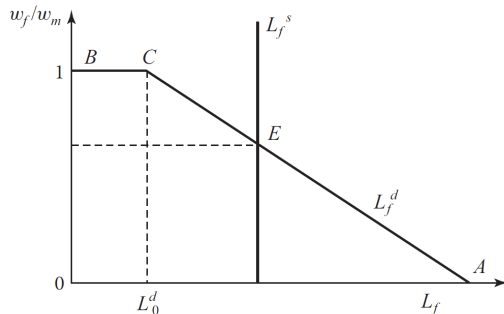
$$\Omega = \frac{w_m - w_f}{w_f} = \frac{w_m}{w_f} - 1 \quad (2)$$

Optimal hiring policy of firms given wages

- Assume $w_m > w_f$
- $w_m > w_f(1 + \omega)$: hire only women
- with increasing ω : hire only at higher wage discrimination
- $w_m = w_f(1 + \omega)$: indifferent between men and women
- Then firm indifferent if: $\omega = \Omega$
- $w_m < w_f(1 + \omega)$: hire only men
- with increasing ω : still only men

Equilibrium with segregation and wage discrimination

Labor demand for women



- at L_0^d only non-discriminating firms
- those with low ω enter the market

FIGURE 4.1 Employer discrimination and the gender wage gap equilibrium

Discrimination is Inefficient

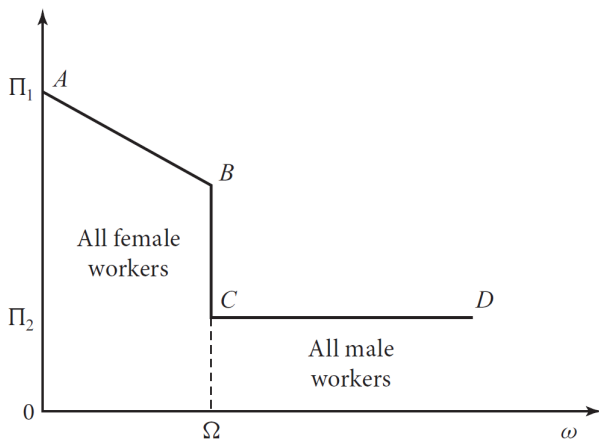


FIGURE 4.2 Profits and coefficient of discrimination

Taste-based discrimination employers: key predictions

- 1 All firms that employ females pay the same low wage $w_f^* < w_m^*$
- 2 The extent of wage discrimination is determined by the *marginal* employer and not by the *average* employer.
- 3 Even if most employers are prejudiced, increase in the number of unprejudiced firms reduces and may drive wage discrimination to zero.
- 4 If $L_0^d > L_f^s$ there is no wage effect of discrimination.
- 5 Prejudiced firms hire more men at high wages $\Rightarrow$ lower profits
- 6 Competition on product market will drive them out of the market

Taste-based discrimination – Co-workers

$$U_m = w_m(1 - \omega I_f) \quad (3)$$

ω = coefficient of employee discrimination

I_f = an indicator of whether or not this worker has one or more female co-workers

Predictions from this model:

- 1 In firms in which women and men co-work, the male worker has to earn more to overcome his disliking of female co-workers. Therefore, firms hire either men or women and the workforce will be segregated.
- 2 If segregation not possible, wage discrimination.

Taste-based discrimination – Customers

Customers dislike being served by women: prices or demand will fall.

Predictions from this model:

- Since firms pay workers according to their marginal product, women will have a lower wage.

Competition and Discrimination in Perfect Labor Markets

Not always competition kills discrimination and segregation.

- ① It kills wage discrimination and segregation when it is employers to act discriminatorily
- ② It kills wage discrimination but *not* segregation when it is co-workers to be biased
- ③ It does *not* kill wage discrimination and segregation when it is consumers to be biased

Imperfect Labor Markets: Monopsony explanation (Robinson, 1933)

- Employers may have more monopsony power over women than over men
- women have higher mobility costs $\rightarrow$ labor supply curve upward sloping

Imperfect Labor Markets: Monopsony explanation

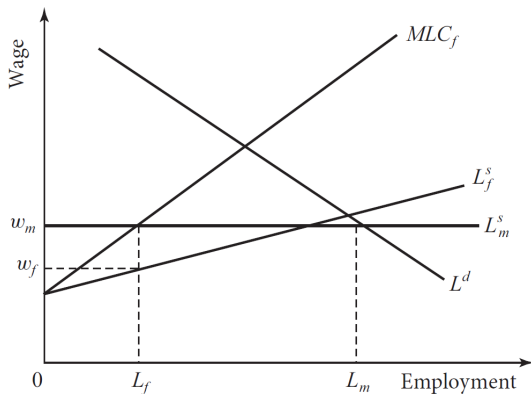


FIGURE 4.3 The gender wage gap in a monopsony model

Imperfect Labor Markets: Monopsony explanation

- Female employment L_f determined by the intersection of MC_f (Marginal Cost curve, upward sloping) and L_s (men's labor supply curve, horizontal)
- At L_f : marginal costs of hiring a man = marginal costs of hiring a woman
- To hire L_f , the employer has to pay $w_f < w_m$
- L_m = total employment; $L_m - L_f$ = male employment
- The gender wage gap originates from labor supply of women being inelastic.

Imperfect Labor Markets: Monopsony explanation

- One explanation = women are “tied stayers”
- Problem: empirical studies usually find bigger labor supply elasticities for women
- Answer: these studies look at general labor supply elasticities but not at particular firms
- And: some studies find at the level of the firm supply elasticities of women are smaller

Imperfect Labor Markets: Statistical discrimination

- Lack of information about *individual* productivities, knowledge only about group-level average productivity
- Employer uses test-scores (or CVs) as *signals*, but these do not predict perfectly individual productivity
 - q = perceived productivity
 - T = “test” score - true test, experience from the past, interpretation of application letter or CV
 - i = individual
 - j = group
 - α = inaccuracy of test score; $\alpha = 0$: perfect; $\alpha = 1$: no value

Stereotyping vs. Differences in Precision

- Perceived productivity of individual i of group j is:

$$q_{ji} = \alpha_j T_j + (1 - \alpha_j) T_i$$
- “Stereotyping”: same precision of the signal on all groups.
 Discrimination if one group does worse on average

$$q_{ji} = \alpha T_j + (1 - \alpha) T_i$$
- Precision: for one group the prediction is more accurate.
 Discrimination even if average productivity in the two groups is the same

$$q_{ji} = \alpha_j T + (1 - \alpha_j) T_i$$
 - for group with less precision disadvantage for high-qualified, advantage for less qualified.
 - problem for recruitment/promotion, if threshold for promotion is high.

Statistical discrimination

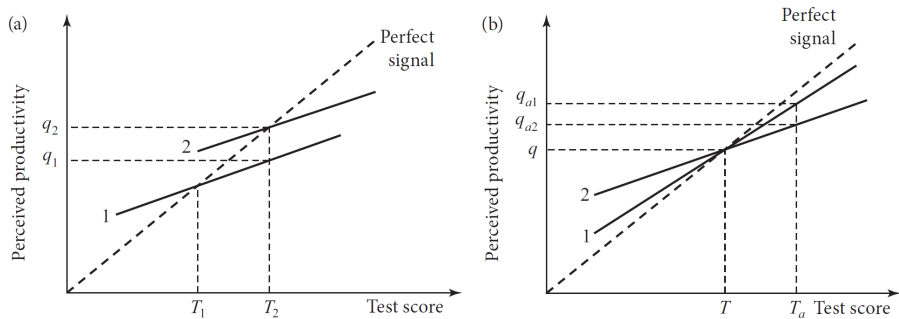


FIGURE 4.4 Statistical discrimination

Statistical discrimination

- Individual discrimination – not group discrimination
- Unlike in perfect markets, it is the *average* rather than the marginal productivity to matter
- If group discrimination: discriminating employers should be worse off
- Note: starting point could be wrong perceptions which could turn into a self-fulfilling prophecy if workers react to this wrong perceptions by choosing the group they stay in

Occupational crowding: ex ante equal jobs – ex post male & female jobs

Women are restricted to work in particular jobs, could be through:

- Unions, Customs, Self-selection
- Also: Marriage bar
- Netherlands: In 1937 a law that prohibited married women in government service was introduced
- The law was abolished in 1957, similar Germany for teachers
- Some big firms “copied” the law

In this case there is no wage discrimination within each industry occupation, but women, on average, are paid less than men having the same productivity.

Occupational crowding

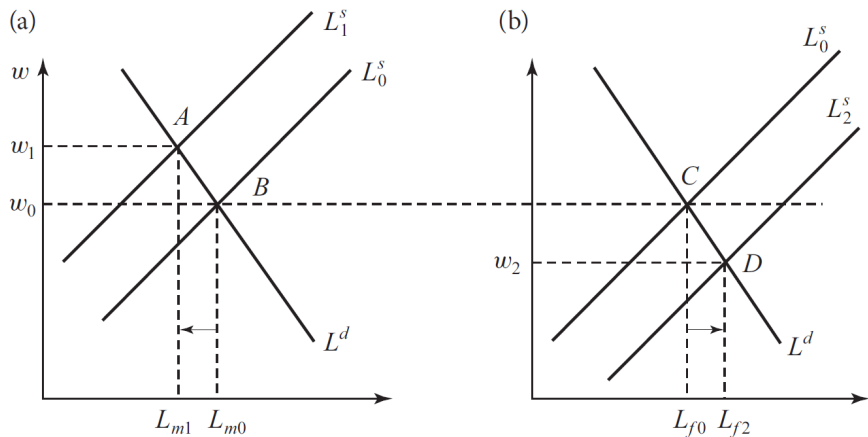


FIGURE 4.5 Occupational crowding: (a) male jobs; (b) female jobs

Discrimination – Empirical Evidence: Unconditional Differences (I)

TABLE 4.2 Gender employment gap and gender earnings gap

	Employment gap, 2010 (%)	Earnings gap, 2009 (%)			Change in gap (%)	
		Median	Percentile		Employment, 1994–2010	Median wage, 1980–2008
			20th	80th		
Australia	15	16	7	20	–6	–7
Austria	9	19	26	22	–12	—
Belgium	11	9	12	10	–15	—
Canada	7	20	21	20	–7	—
Czech Republic	17	18	24	23	48	—
Denmark	5	12	14	15	–5	—
Finland	5	20	16	25	2	–5
France	10	13	9	17	–9	–8
Germany	10	22	25	22	–11	—
Greece	24	10	9	5	–18	—
Hungary	11	4	2	13	–2	—
Iceland	6	14	11	20	–4	—
Ireland	8	10	12	16	–25	—
Italy	25	12	7	–4	–14	—
Japan	23	28	26	36	–9	–11

Discrimination – Empirical Evidence: Unconditional Differences (II)

TABLE 4.2 Gender employment gap and gender earnings gap

	Employment gap, 2010 (%)	Earnings gap, 2009 (%)			Change in gap (%)	
		Median	Percentile 20th	Percentile 80th	Employment, 1994–2010	Median wage, 1980–2008
Korea	26	39	29	41	–12	—
Luxembourg	19	—	—	—	–20	—
Mexico	38	—	—	—	–15	—
Netherlands	11	17	18	19	–17	—
New Zealand	15	8	7	14	–4	—
Norway	5	9	5	16	–5	—
Poland	11	10	8	3	–2	—
Portugal	9	16	14	9	–11	—
Slovak Republic	11	—	—	—	–2	—
Spain	12	12	13	5	–26	—
Sweden	6	15	—	—	4	1
Switzerland	13	15	20	22	–11	—
Turkey	50	—	—	—	–6	—
United Kingdom	11	20	17	21	–4	–14
United States	12	20	14	24	–4	–16

Sources: OECD various statistics; OECD (2008); OECD earning database.

Notes: The gender employment gap is the difference in employment-population ratios of prime-aged men and women. Estimates of earnings used in the calculations refer to gross earnings of full-time wage and salaried workers. — = not available.

Discrimination – Empirical Evidence

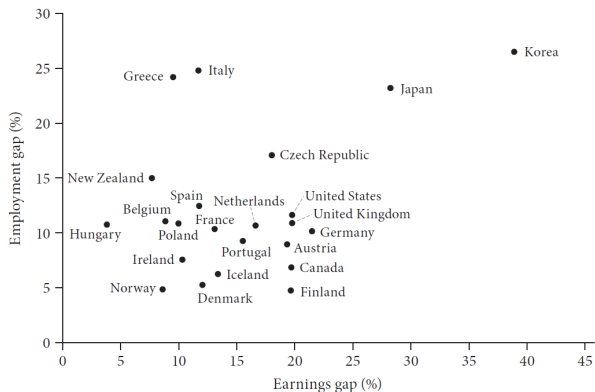


FIGURE 4.6 Gender earnings gap and gender employment gap

Source: Data are from the first two columns of table 4.2.

► Blinder-Oaxaca decomposition

► The sensitivity of Blinder-Oaxaca decomposition

Böheim, Himpele, Mahringer und Zulehner, 2011

Table 2: Blinder-Oaxaca decomposition of wage differentials, Austria

	year	difference	explained gap	unexplained gap
<i>Male-based</i>				
	2002	.305	.121	.184
	2007	.256	.147	.109
	Difference	-.050	.025	-.075
<i>Female-based</i>				
	2002	.305	.069	.236
	2007	.256	.087	.168
	Difference	-.050	.018	-.068

Weichselbaumer – Winter-Ebmer, 2007: Test of the Becker Model

- Analysis of 300 empirical studies that applied a Blinder-Oaxaca decomposition (56 countries, 1970-1998)
 - Meta-analysis: the results of the studies are used as an input for further statistical analysis
 - How does competition affect gender wage differentials?
 - What are the effects of equal treatment laws?
-
- <http://www.econ.jku.at/members/WinterEbmer/files/papers/printed-papers/economic%20policy.pdf>

Figure1: Economic Freedom and the Gender Wage Residual



Table 1: The impact of competition and equal treatment laws on the gender wage residual I^{23}

	(1)	(2)	(3)	(4)
CEDAW	-0.052 (0.020)*	-0.039 (0.024)	-0.033 (0.014)*	-0.043 (0.025)
ILO C111	-0.066 (0.023)**	-0.078 (0.016)**	-0.089 (0.013)**	-0.131 (0.079)
Work ban index (0-2)	0.036 (0.015)*	0.037 (0.010)**	0.036 (0.014)*	0.108 (0.057)
Economic freedom index (0-10)	-0.014 (0.006)*	-0.024 (0.011)*	-0.027 (0.015)	-0.044 (0.011)**
Fertility rate		0.003 (0.018)	-0.010 (0.024)	0.012 (0.024)
Female activity rate		-0.001 (0.001)	0.001 (0.001)	0.001 (0.003)
GDP per capita		0.001 (0.002)	-0.001 (0.002)	-0.003 (0.004)
Proportion catholic			-0.025 (0.083)	
Proportion hindu			-0.026 (0.085)	
Proportion muslim			0.067 (0.123)	
Proportion jewish			0.122 (0.074)	
Proportion confucian			-0.206 (0.134)	
Proportion buddhist			0.017 (0.145)	
Continent fixed effects	No	Yes	Yes	No
Country fixed effects	No	No	No	Yes
Observations	1530	1530	1530	1530
Adjusted R ²	0.38	0.44	0.46	0.59

Hofer, Titelbach, Winter-Ebmer, Wage discrimination Austrians-Migrants

		Immigrants	First generation	Second generation
Men	Wage gap	-0.136	-0.155	-0.023
	Specification I (only productivity-related variables)			
	explained	-0.040	-0.045	-0.018
	unexplained	-0.095	-0.110	-0.005
	Specification II (also firm-and position-specific variables)			
	explained	-0.107	-0.120	-0.034
	unexplained	-0.029	-0.035	0.011
Women	Wage gap	-0.172	-0.181	-0.106
	Specification I			
	explained	-0.020	-0.016	-0.049
	unexplained	-0.152	-0.165	-0.057
	Specification II			
	explained	-0.122	-0.127	-0.083
	unexplained	-0.050	-0.053	-0.024

Gender discrimination in hiring

Goldin and Rouse (2000):

- Auditions at American orchestras: blind rounds introduced
- Comparing blind and not-blind auditions – hiring probabilities:

Group	Selection procedure	
	Blind	Not blind
Female	2.7	1.7
Male	2.6	2.7
Difference	0.1	-1.0
Difference-in-differences	1.1	

- For women the probability of being hired was 2.7 percent with a blind audition while it was only 1.7 percent in a non-blind audition.
- Dif-in-dif: hiring probability for women increased with 1.1 percent-point, an increase of 65%.

Audit Studies & Correspondence Studies

TABLE 4.3 In search for discrimination: correspondence studies

Study	Group	Callback (%)	Country	Sample size
Booth and Leigh (2010)	Male	32	Australia	3,365
	Female	25		
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		2,018
	Female homosexual	26		
Ruffle and Shtudiner (2010)	Male plain	9	Israel	2,656
	Male attractive	20		
	Female plain	14		2,656
	Female attractive	13		

Note: Correspondence studies are faked job applications submitted by mail or over the internet.

Correspondence Studies – outcomes (I)

- Male-female – Booth & Leigh (2010):
 - 3365 applications in Brisbane, Melbourne and Sydney
 - Call-back rates: Females – 32%, Males – 28%
- Black-white – Bertrand & Mullainathan (2004):
 - 2435 applications in Boston and Chicago
 - Call-back rates: White names – 10%, African-American – 6%
- Native-immigrant – Carlsson & Rooth (2007):
 - 1552 applications in Stockholm and Gothenburg
 - Call-back rates: Swedish names – 29%, Middle-Eastern – 20%
- Native-immigrant – Weichselbaumer (2014):
 - 2142 applications
 - Call-back rates: Austrian – 37%, Serbian – 28%, Turkish – 25%, Chinese – 27%, Nigerian – 19%

Correspondence Studies – outcomes (II)

- Sexuality - Ahmed et al. (2011)
 - 1978 applications for males and 2018 applications for females, in Sweden
 - Call-back rates: Male heterosexual – 30%, Male homosexual – 26%
 - Call-back rates: Female heterosexual – 32%, Female homosexual – 26%
- Beauty - Ruffle and Shtudiner (2010)
 - 2656 applications for males and 2656 applications for females, in Israel
 - Call-back rates: Male plain – 9%, Male attractive – 20%
 - Call-back rates: Female plain – 14%, Female attractive – 13%

Policy issue – Is Equal Pay Legislation Effective?

- Equal pay for equal work
- Ineffective since employers may discriminate on job titles or hiring putting women into low paid dead-end jobs
- Comparable worth: determine how job characteristics for males affect male wages; then predict female wages using their job characteristics – difference with actual wages = evidence of discrimination

Policy issue – Does Affirmative Action Reduce Discrimination?

- Give priority to women when hiring new workers
- Even to the extent that quota are being used
- Positive discrimination is still discrimination
- Positive discrimination & quota are sometimes illegal
- May avoid vicious circle of self-fulfilling perceptions in imperfect labor markets (e.g., low investment in education of women)
- Danger of being forced to hire less productive workers

Policy issue – Does Affirmative Action Reduce Discrimination?

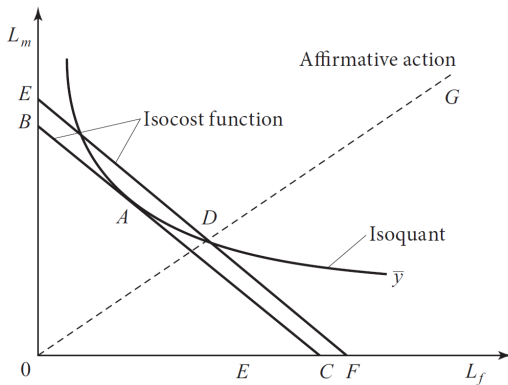


FIGURE 4.7 Nondiscriminatory firms and affirmative action

Interactions with other Institutions

- Education and training – risk of underinvestment for discriminated minorities
- Family policies – gender wage gap and female participation in LM
- Working hours legislation – female part-time work
- EPL – discriminatory layoffs

Why Does Discrimination Legislation Exist?

- ① Distribution – human rights
- ② Inefficient allocation of resources
 - Competition may reduce discrimination
 - Imperfect labor markets: discrimination may persist
 - Feedback mechanism = self-fulfilling prophecy

Review Questions

- 1 In case of discrimination based on occupational crowding, what is the most important empirical prediction for the gender wage gap?
- 2 In a competitive labor market, what is the main difference between the short-term and long-term effects of taste-based discrimination.
- 3 In Becker's discrimination theory, firms, workers and/or customers may be prejudiced against women. Discuss the main differences between these three possibilities in terms of the effects on the gender wage gap.
- 4 How does Equal Pay Legislation affect discrimination in Becker's model?
- 5 What is the main mechanism driving the gender pay gap in the monopsony model of wage discrimination?

Exercise

Wages for males (w_m) and females (w_f) depend on years of schooling s and years of experience e :

$$w_m = 200 + 10s + 5e \quad (4)$$

$$w_f = 200 + 5s + 3e \quad (5)$$

Men have on average 10 years of schooling and 14 years of experience.
Women have on average 9 years of schooling and 10 years of experience.

- How big is the gender wage gap?
- Use the Blinder-Oaxaca decomposition to calculate what share of the gender wage gap is due to discrimination.
- What share of the gender wage gap would be due to discrimination if we ignore experience?

Prejudice in a Competitive Labor Market (I)

Discriminating employers maximize their utility instead of their profits. As presented in the main text, the utility U an employer derives from employing female workers depends on the profit Π they make and the wage costs they pay to women:

$$U = \Pi - \delta_f w_f L_f \quad (1)$$

where L_f is the number of female workers hired, Π are the profits and δ_f is the *employer-specific coefficient of discrimination*, with $0 \leq \delta_f \leq \delta_f^{max}$.

Prejudice in a Competitive Labor Market (II)

If female workers and male workers are perfect substitutes, female workers are hired if $w_m > (1 + \delta_f)w_f$. Employers determines the number of female workers through

$$\frac{\partial U}{\partial L_f} = \frac{\partial \Pi}{\partial L_f} - \delta_f w_f \quad (2)$$

The larger δ_f , the bigger the difference between utility maximization and profit maximization.

If $w_m < (1 + \delta_f)w_f$, a discriminating employer will only hire male workers and in this case:

$$\frac{\partial U}{\partial L_m} = \frac{\partial \Pi}{\partial L_m} \quad (3)$$

In this case, utility maximization and profit maximization are identical and the magnitude of the coefficient of discrimination does not affect the profits.

Prejudice in a Competitive Labor Market (III)

If $w_m = (1 + \delta_f)w_f$. The employer is indifferent between hiring male or female workers because its utility does not depend on the gender composition of the work force. However, the gender composition of the work force has an impact on profits. Clearly, if the number of workers is the same, the profits of hiring female workers are substantially higher than the profits of hiring male workers.

Monopsony and Gender Discrimination

In a monopsony the employer maximizes profits if the marginal hiring costs of male and female workers are equal to the value of the marginal product. If the labor supply curves of female workers are given by $w^f = L_f^{\varepsilon_f}$ the hiring costs of female workers are equal to $L_f^{\varepsilon_f+1}$. Therefore, the marginal hiring costs of a female worker are equal to $(\varepsilon_f + 1)L_f^{\varepsilon_f}$. Similarly the marginal hiring cost of a male worker are equal to $(\varepsilon_m + 1)L_m^{\varepsilon_m}$. Therefore:

$$(\varepsilon_f + 1)w_f = (\varepsilon_m + 1)w_m \quad (4)$$

And:

$$w_f = \frac{1 + \varepsilon_m}{1 + \varepsilon_f} w_m \quad (5)$$

If the labor supply of women is less elastic, $\varepsilon_f > \varepsilon_m$ and therefore $w_f < w_m$.

ADDITIONAL MATERIAL:

Blinder-Oaxaca decomposition

$$\log w_j = \alpha_j + x_j \beta_j \quad \text{with } j = m, f$$

The wage gap between male and female workers is due to differences in characteristics x plus differences in rewards for given x :

$$\log w_m - \log w_f = (\alpha_m - \alpha_f) + (x_m - x_f)\beta_m + x_f(\beta_m - \beta_f)$$

- $(\beta_m - \beta_f)$ directly related to discrimination: different reward for the same characteristics
- $(x_m - x_f)$ difference in personal and job characteristics: indirectly associated to discrimination: less investments in human capital because of expected discrimination
- $(\alpha_m - \alpha_f)$ may also be related to discrimination

The sensitivity of Blinder-Oaxaca decomposition

Groups compared	Wage difference, 1979 (%)		Wage difference, 1995 (%)	
	Model 1	Model 2	Model 1	Model 2
Male-Female				
Characteristic	2.6	12.6	0.8	7.6
Coefficient	43.8	33.5	27.9	21.1
White-Black				
Characteristic	6.3	10.8	8.2	11.4
Coefficient	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 includes in addition occupation, industry, and job characteristics.